

**EQUITY, EFFICIENCY AND QUALITY OF PUBLIC HEALTH CARE SERVICES:
SPATIAL PLANNING GUIDELINES FOR PUBLIC HEALTH CARE FACILITIES IN
NAIROBI //**

BY:

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B.ENV.S (PLANNING) Hons

**A Thesis submitted in partial fulfillment of the requirement for the degree of
Master of Arts in Planning in the University of Nairobi**

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Declaration

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

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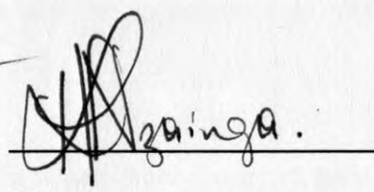
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Signed

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Signed

Mrs. Helen Nzainga

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To my family for their encouragement, support and great love

A NUMBER of people have kindly assisted in the end-state of this work, most of them staff members from the Department of Urban and Regional Planning, University of Nairobi: Special Credit, however, to my supervisors Professor Obello and Mrs. Nzainga for their guidance.

My thanks are also due to Dr. Obello, Prof. Ngari and Mr. Onduu who undertook the unrewarding task of reading my thesis project and offered many helpful comments and criticism.

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Abstract

The basis of this study is the proposition that health care determinants and subsequent utilization of available public health facilities varies throughout socio-economic and geographical settings. Urban informal settlement development follows distinct patterns and unique socioeconomic characteristics that affect population health and associated health care delivery organization.

The broad objective of the study was to examine equity, efficiency and quality of public health facilities as spatial planning guidelines for public health care facilities. The study thus presents a framework for investigating how equity, efficiency and quality of public health care services effect the utilization patterns of available health care facilities by income groups.

The study first presents a brief overview of prevailing trends of thought regarding health infrastructure planning; equity, efficiency and quality of health care services and the response to health care consumption by the income groups in Nairobi. The study used three but linked research instruments to collect data both at the facility and the household level. At the facility level, a client-exit questionnaire and a facility inventory survey were employed to collect data, while at the household level a structured household questionnaire was used to collect data on household socio-economic conditions, disease patterns and attendant health care consumption patterns.

The study established that public health care consumption varied greatly among the income groups in Nairobi. Its principal argument then emerges from the considerations influencing population health and the socio economic analysis of cases of disease and health care consumption patterns. Further analyses elaborate on determinants of health, equity and their importance as variables in public health facility health care service delivery. The study established that the majority of public health care consumers are the low-income groups, whom the existing facility location depicts a spatial inequity on them.

The argument is made that health facilities planning cannot be considered effective and efficient in urban areas without regard to settlement patterns of the different income groups and health care institutional re-organization and the analyses of socio-economic/physical circumstances within which it is embedded. The study critiques the conservative incremental approach that has emerged in health care infrastructure planning despite the tremendous implications it has on the accessibility of health care services to the low – income groups.

It recommends that a rationally grounded approach may broaden the horizons for an efficient health care delivery system based on epidemiological and socio economic analyses of disease patterns, economics of health and attendant consumption patterns and the specification of particular target groups.

Abbreviations

ARI	-----	Acute Respiratory Infections
ASP	-----	Average Staff Productivity
DFRD	-----	District Focus for Rural Development
DHMT	-----	District Health Management Team
DPT	-----	Diphtheria
H/C	-----	Health Care
IEC	-----	Information and Education Communication
KNH	-----	Kenyatta National Hospital
MCH	-----	Maternal and Child Health
MOH	-----	Ministry of Health
NCC	-----	Nairobi City Council
NHIF	-----	National Hospital Insurance Fund
NHSSP	-----	National Health Sector Strategic Plan
NPEP	-----	National Poverty Eradication Plan
PHC	-----	Primary Health Care
PHMT	-----	Provincial Health Management Team
PMO	-----	Provincial Medical Officer
PRSP	-----	Poverty Reduction Strategy Paper
UNICEF	-----	United Nation Children Education Fund
SUR	-----	Staff Utilization Rate
UN	-----	United Nations
WB	-----	World Bank
WHO	-----	World Health Organization

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Definition of Terms/Concepts

Most of the terms used in this study are self-explanatory, while most have their contextual meaning expounded more clearly in the literature review chapter. However, the following terms have been found necessary to be defined within the context that they are used in this study.

- Accessibility:** Those financial, physical and time factors that permit rehabilitative, preventive and curative health care consumption by a health service seeker in a public health institution.
- Cost effective:** The delivery by the public sector of health care services at possible minimum cost.
- Equity** An analysis of whether public facilities clients with similar health care needs receive equal treatment irrespective of their social economic conditions.
- Efficiency** The achievement of good health outcomes with minimum cost in monetary and time factors
- Health:** Health in this study has been defined as the absence of a disease condition.
- Health Infrastructure Planning** Judicious spatial allocation and location of public health facilities to effectively and efficiently meet the diverse population health care needs
- Households:** The total number of persons living in a dwelling unit.

Quality of health care services Clients perception of the value of the utility of given health service/s sought

Policy: A definite course of action selected from among alternatives to determine and guide present and future health care goals and objectives.

Poverty: A state of deprivation of basic needs arising from socio-economic factors.

Informal settlement: A human settlement developed without a formal physical development plan, usually lacking basic sanitary facilities and whereby households live in congested conditions. The settlement is usually not recognized by the government as developed.

Urban poor: Those persons living in human settlements gazetted by the Government of Kenya as urban, living below a monthly income of Kshs. 1500 and who suffer from a state of deprivation of basic needs resulting from their income conditions.

CHAPTER ONE: Background to the Study

1.0. Introduction

Health is profoundly a political issue. Health planning and implementation thus, is not, and will never be a rational process based on objective resource allocation decisions. The success of future health care planning will require international experts to alight from their glorious pedestals into the murky depths of reality. The power, the politics, the players, the users - all matter. A great deal of time and money have been squandered in the ignorance of arrogance, it is time to move from intellectual idealism in healthcare planning to something much more fundamental - realism (Vincente Navarro, 1984).

As far back as 1978, equity was listed as one of the key principles of the Alma Ata Declaration on Health for all, with subsequent declarations by the World Health Organization (WHO) identifying health equity as one of the key challenges facing health authorities across the world.

Africa is undergoing a great population explosion. By the year 2020, it is anticipated that half of Africa's population will be living in urban areas. Unlike in the developed countries however, urbanization in African countries has taken place amidst socio-economic deterioration that has resulted in majority of urban populations living in overcrowded and unhealthy settlements where health conditions and livelihood opportunities are poor.

While recent studies have shown that health inequities are much more prevalent in most urban areas of sub-Saharan Africa where, paradoxically, most health and social services are concentrated, there has been no efforts to spatially allocate health care facilities based on the findings.

While in the developed world, health care planning and policy decisions are at best mediated events, taking the views of the electorate, powerful professional groups, pharmaceutical and insurance

interests and community pressure groups and somewhere in that dynamic process is a role for objective information. It is not the determinants upon which health care planning has been approached in most developing countries; especially in Africa. Healthcare planning has often lacked this participatory and consultative mechanism.

While the general argument for health care infrastructure planning is the potential for improved service quality and coverage; yet the issues of, one, exactly how these benefits can be realized, and two, equitably distributed are not well understood. Several features of health care infrastructure planning (e.g., the controversial nature of equity, efficiency and quality as basis for spatial allocation of health care facilities are more complex and potentially more difficult than in other sectors.). Without proper planning and acknowledgment of these aspects, however, health care infrastructure spatial allocation and location can be disappointing at best and detrimental at worst. This note raises the issues to consider if spatial planning is to bring about beneficial results in this sector.

In Nairobi, the urban population currently stands at 2.3 million recorded in the 1999 census. The city's population increased from 120,000 in 1948, to 350,000 in 1962, 500,000 in 1971 and 2.3 million in 1999. Absolute poverty in Nairobi also increased dramatically from 26 per cent in 1994 to 50 percent in 1997. Today, over 50 per cent of the city's population live in informal settlements, which account for a mere 5% of the total land area used for residential purposes (NPEP, 1999).

High disease and mortality burdens characterize informal settlement communities and derive from complex interaction between unhealthy environmental conditions, access to health services and fragile livelihood conditions. Though by documenting population characteristics and health conditions between income groups has been done in Nairobi-urban, the spatial provision of health infrastructure based on these outcomes has not been pursued.

Unless spatial measure's are taken, adverse health outcomes of the poorer urban populations will continue to widen the health inequalities between them and better off communities living in the urban areas. Thus, the need for practical spatial planning emerges in the identification and the

analysis of unfair processes in health infrastructure planning and to develop spatial guidelines to correct those unfair processes.

The promise of equity, efficiency and quality considerations in healthcare infrastructure planning and distribution is thus an essential basis as it contributes to improved implementation of urban health programs; target populations are more specifically defined; reduction of inequalities between low-income earners and high income earners in urban areas is reduced and; improved intersectoral coordination, particularly in local governments and urban development activities can be effectively achieved.

1.1. Statement of the problem

Settlement patterns are rapidly changing in our urban settings reflecting income disparities and inequalities in the distribution of basic social facilities. While this spatial change in settlement patterns calls for attendant equitable distribution, expansion and organization of such social infrastructure, it has not been clearly pursued as inequitable distribution of such goods and services manifest according to settlement pattern.

Since urbanization is an inevitable consequence of development, efforts should therefore be made to improving urban health infrastructure by ensuring optimal allocation and utilization of facilities with regard to settlement patterns and income levels. It should however, be pointed out that the provision of health infrastructure based on population size alone may not necessary translate to their use.

It is therefore, evident that equity, efficiency and quality of health care have an impact on the spatial location and subsequent effective use of health care facilities. At the same time, changing settlement patterns in relation to income levels will tend to raise or lower the level of need and consumption of public health care services. For example, the allocation and location of a lower level public health facility in a high income area in Nairobi will not correspond to its use, while it leads to a deprivation on the low income groups who make use of such facilities.

Whether, in consequence of the changing settlement patterns and increased population in certain parts of the city, the average level of consumption of health services per capita will continue to rise, however, equity, efficiency and quality of health care services will greatly influence the use of public health facilities.

Current experience today shows that achieving the benefits of health infrastructure planning depends heavily on utilization levels of the different income groups in our urban settings. In general, careful attention must be given to health service needs and priorities in deciding which areas facilities are optimally required.

The complex linkages between equity, efficiency and quality of services therefore, require appropriate planning considerations of their relationships and those of settlement patterns. Serious distortions and hindrances to health service delivery and utilization are created, if spatial allocation and settlement specific structures are devised without full consideration of such factors.

Healthcare planning needs to adapt to local conditions and must be balanced by a common vision about the goals of health care provision and the purposes of spatial planning in furthering these goals. Responsiveness to settlement demands in local area planning level is a crucial benefit of this consideration.

Though equitable provision of an efficient and accessible health care infrastructure in Nairobi urban is a feat physical planners, with responsible planning can help achieve, currently there exists no clear guidelines on health infrastructure planning. But, though, the draft Physical Planning Handbook does acknowledge the existence of such disparities, it does not specify location requirements of health care infrastructure based on effective utilization. Too, the Ministry of Health, which is supposed to regulate health care in the country has no established criteria for defining facility type based on services offered, staffing norms, physical structures and catchment population (NHSSP, 2002). The purpose of this study and which forms the statement of the problem is thus to examine equity,

efficiency and quality of public health care services as a basis for spatial planning of public health facilities in Nairobi.

1.2. Research Questions

The study sought to answer the following research questions.

- (1) What are the levels of equity, efficiency and quality of services in public health care facilities?
- (2) What spatial planning guidelines are necessary in ensuring that equity attainment, efficiency and quality of health services in public facilities is achieved?

1.3. Research objectives

The main objective of this study was to evaluate the levels of equity, efficiency and quality of services in public health facilities on the various income groups as a basis for health infrastructure planning guidelines in Nairobi urban.

The specific objectives of the study are therefore:

1. To examine the level of equity, efficiency and quality of health care services in public health facilities.
2. To come up with spatial planning recommendations and guidelines necessary to ensure equity attainment, efficiency and quality of health services in public facilities?

1.4. Justification of the Study

The view that equates physical planning with urban and regional planning is myopic. It may have had some historical justification but it is clearly out of place at a time when it is necessary to integrate knowledge and techniques in order to wrestle effectively with the myriad of problems afflicting urban populations.

The planning professions' historical concern with the physical environment has warped its ability to see physical structures and land as servants to those who use them. Physical relations and conditions have no meaning or quality apart from the way they serve users. But this is forgotten every time a physical condition is described as good or bad without relation to a specified group.

Who gets what, when, where, why and how are the basic 21st century planning questions that need to be raised about every allocation of public resources. The question cannot be answered adequately if land-use criteria are the sole or major standards for judgment. The need to see an element of city development, land use, in broad perspective will apply equally well to health care planning.

The need for social equality and equity on the part of the urban dweller and the impoverished who live in urban informal settlements require the public to establish the bases for a society affording equal opportunity to all citizens. The compelling need for intelligent planning and organization of health care delivery, for the specification of new social goals and the means for achieving them, is thus manifest. The society of the future Kenya will be an urban one, and city planners will help to give it shape and content in the interests of the public.

But, while acknowledging the need for humility and openness in the adoption of social goals in health care planning, the statement amounts to an attempt to eliminate, or sharply reduce, the unique contribution planning can make: understanding the functional and spatial organization of public health care delivery facilities of the city and recommending future action to improve this condition.

Appropriate planning action cannot thus be prescribed from a position of value neutrality, for prescriptions are based on desired objectives. Thus, values are inescapable elements of any rational decision-making process and that values held by the planner should be made clear. Moreover, the planner should do more than explicate the values underlying his courses of action; he should affirm to them; he should be an advocate for what he deems proper.

The study thus aims at recommendations on health care service infrastructure planning and delivery and will contribute to knowledge, value –driven and need – based solutions on the provision of health care services to the different income groups Nairobi. Moreover, little research has been done on this field, specifically, with regard to equity, efficiency and quality of services as basis for public health care facilities allocation.

1.5. Scope of the study

The study is limited to the following areas of concern

- Division one of public facilities administration area of the Nairobi City Council.
- Household characteristics data collected in Kiambiu Squatter Settlement in Nairobi and Pioneer Estate and an analysis of equity based on public facility clients and household characteristics in the above two settlements. Equity measures have therefore been based on public clients characteristics and care seeking behaviour in relation to their income levels, while the efficiency measures were based on efficiency measures based on public facilities staff time allocation and utilization rates. Quality measures on health care were based on staff availability and services offered and clients perception on quality and availability of services and the way they were delivered.
- The study did not make in-depth analysis on available and availability of alternative sources of health care provision. This was due to the reason that such analysis would not have been completed within the short period of the study. The study thus focused only on public health facilities within the specified division.

1.6. Limitations of the Study

The study was carried out in a constrained financial and time atmosphere. As a result the sample frame for the public health facilities was limited to one division. The same applied to the household sample size, where the minimum descriptive sample size of 30 was actually surveyed. Though these did constrain the study, the findings in this study are representative of the variables surveyed and the population targeted. The findings are therefore a representative of the population characteristics and have therefore been generalized in this study as the population characteristics in the entire City.

1.7. Research Methodology

1.7.1. Introduction

The broad aim of the research was to assess the extent of equity, efficiency and quality of public health services in Nairobi among the different income groups based on existing settlement pattern. The representative sample for both population income groups and settlement characteristics in relation to the above broad goal of the study was Kiambiu Squatter Settlement households, Pioneer estate households and the typical public facility client. This further formed the basis for a generalization on the entire urban setting and subsequent spatial health infrastructure planning guidelines on the wider Nairobi area based on this aspect. To respond to the stated research problem and the specific objectives, the researcher thus developed the following methodology.

Step one of the study was to review past studies on equity, efficiency and quality of services as basis for spatial planning of public goods and services. This formed the basis upon which the study proceeded. The literature review gave the researcher a clearer perspective and a deeper understanding of the research problem.

A familiarization tour of Kiambiu informal settlement and its surroundings was carried out to enable the researcher to have sufficient background knowledge. Sample designs were greatly influenced by such observations.

Pre-survey questionnaires were consequently piloted with a view of testing their efficacy, applicability and relevance in the field and necessary changes and review of the research tools were made. Final information and data specific questionnaires were administered and field data analyzed by validating it so as to easily interpret the outcome.

1.7.2. Data Needs

1.7.2.1. Primary Data

Primary data was collected at three levels - the facility level, client level and the population level (household) - using different but linked data collection instruments.

1.7.2.2. Secondary data

Secondary data was gathered in relation to the broad objective of the study. Equity, efficiency and quality of public services and goods were examined. In addition, secondary data on health services indicators; settlement population and demographic characteristics, government health care manpower and government resources available for health care provision within the settlement and division one of the Nairobi City Council Health Department Jurisdiction were examined.

The study further sought secondary data on recorded cases of diseases in the sampled local government health facilities. Past research materials, journals, periodicals and newspapers were also sources of secondary data. Secondary data was both in qualitative and quantitative nature.

1.7.3. Data Collection

1.7.3.1. Primary Data Collection

In this study, data was collected at three levels - the facility level, client level and the population level (Household) - using different but linked data collection instruments.

1.7.3.3. Facility Characteristics

To collect information on facility characteristics, three (3) questionnaires were administered within the areas of jurisdiction of Division 1(One) of the Nairobi City Council's Health Department. A single abridged questionnaire (Short- Inventory Questionnaire) was also administered. Table 1.0. represents the list of facility questionnaires and where they were administered, while Table 1.1 presents information on the content and source of information for each questionnaire.

Table 1.0. Facility Questionnaires by Ownership

Questionnaire	<i>Health Facilities Within Division 1</i>	
	Public Facilities (4 facilities)	Private Facilities (6 Facilities)
<i>Inventory</i>		
<i>Observation</i>		
<i>Time Allocation</i>		
<i>Client- Exit Interview</i>		
<i>Short Inventory</i>		

Source: Compiled by the author, 2003

Table 1.1. Description of Facility Questionnaires

Questionnaire	Sample	Source of Information	Content
Inventory	One per facility	Officer-in-Charge Interviewer	Facility type, ownership, location, availability of services, staff (Numbers, type, salaries), hours of operation, group talks, staff training, client fees, supervision, basic supplies, staff time use.
Observation	One per facility	Interviewer Observation and facility records	Referrals, service statistics, basic medication and basic equipment.
Time Allocation	Staff who provide direct health services	Health Facility Staff	Starting and ending time of staff activity, type of activity, and type of service provided.
Exit Interview	Number surveyed represented 1/3 of average daily client load per facility	Clients/Patients	Socio-economic characteristics, type of visit, waiting time, duration of consultation, payments, client satisfaction and household characteristics.

Source: Compiled by the author 2003

A number of data gathering techniques were used to collect the facility information. Face to face interviews with facility knowledgeable staff members and those in charge were used to collect information on availability of services, operational features and procedures of the facility.

Direct observations by the interviewer were used to complete the facility inventory questionnaire. Information on health service output and costs was also gathered through a review of facility records. A self-administered timesheet was completed by individual staff members and used to allocate staff time among various activities. A self-administered time sheet was found to be more appropriate in terms of costs and time to get estimates of the staff time spent in contact with

patients/clients. On the time sheet, the staff member recorded the time that patient contact was initiated and ended. This information was collected for a period of 4 days. Patient contact time was monitored for the following health services:

- i. Family planning,
- ii. Acute respiratory infections,
- iii. Diarrhea management
- iv. Malaria and a category for all other types of health services.

In order to estimate total costs, the researcher found it necessary to estimate both the direct and indirect costs of providing each service (family planning, ARI and diarrhea management, malaria and typhoid and a category of all other types of health services).

Unlike the collection and estimation of direct costs, collection of data to estimate the indirect costs was anticipated to be substantially more involving and the researcher would, therefore, have required an in-depth study of service operation in each of the facilities. Thus, considering the high costs and time duration of conducting such an in-depth facility costs studies, 4 (four) facilities were considered representative of the public facilities. Likewise, the researcher found the criteria also applicable to the private facilities. Thus, the composition of indirect costs for the selected facilities was assumed to be the same for the other facilities.

The researcher determined and used a set of criteria to identify the facilities for the in-depth studies. The criteria was based on the Kiambiu Informal Settlement's residents preferred public health care facilities medical care sought, staff availability and facility operating capacity. Thus, the researcher used three facility characteristics to characterize the facilities.

- (1) Physical Infrastructure
- (2) Number of staff, and
- (3) Technical level of staff (availability of physicians, obstetricians, etc.). These indicators received different weights for the composition of a summary index that enabled to rank the

facility. Table 1.2 presents the main indicators and their respective weights that the researcher employed, while Table 1.3 presents further disaggregated indicators and weights used by the researcher.

Table: 1.2. Facility Characteristics and Weight Factors.

Indicator	Weight Factor
<i>Number of Staff</i>	20
<i>Staff Technical Level</i>	55
<i>Physical Infrastructure</i>	25
Total	100

Source: Compiled by the author, 2003

A key issue in measuring cost and efficiency in the delivery of health care services is the distribution of staff time allocation among the different types of activities in which staff are engaged - health service delivery, administrative responsibilities, and non-productive or "down-time".

Table: 1.3. Disaggregated Facility Indicators and Weight Factors

Indicator	Points	Weight Factor
1) Number and Organization of Staff	100	20.00
<i>0-4</i>	30	6.00
<i>5-9</i>	50	10.00
<i>10-14</i>	70	14.00
<i>15 or more</i>	80	16.00
<i>24-hour "On-call" service</i>	20	4.00
2) Staff Technical Level	100	55
Physician	25	14.00
Licensed community Nurse	20	11.00
Auxiliary Nurse	20	11.00
Technician	15	8.00
Obstetrician	20	11.00
3) Physical Infrastructure	100	25
<i>Beds</i>	20	4.00
<i>1-4</i>	15	3.75
<i>5 and above</i>	20	4.00
<i>Sterilization equipment</i>	15	3.75
<i>Electricity</i>	15	3.75
<i>Water Supply</i>	20	4.00
<i>Communication Equipment</i>	15	3.75
Total		100

Source: Compiled by the author, 2003

1.7.3.2. Client-Exit Questionnaire

The client-exit questionnaire was administered to patients/health service clients after being attended to for the health services they had sought. The questionnaire was used to gather information from a sample size of $\frac{1}{4}$ of the total daily load of clients who attended public and private healthcare facilities, where Kiambiu households sought health care services.

Client socio-economic characteristics; reason for visiting the facility that day; services sought and required during the visit, place of residence, travel time and cost, amount if any paid for services received, waiting time, consultation time, level of satisfaction with services received; and the clients assessment of the service providers competence. The client exit questionnaires used most of the socio-economic questions that were used in the household survey, thereby allowing the researcher to augment the household data with a choice-based sample from the client-exit survey. The questionnaire is presented in annex D.

1.7.3.3. Household Survey Questionnaire

The researcher collected the following types of information and data:

- socio-economic and demographic characteristics of households, household composition, proxy measures of income and wealth, age, education and economic activity.
- disease patterns, health and health seeking behavior: description of health problems of household members, choices related to health care and factors that may affect such choices, including seriousness of health problems, whether the person sought care for the problem, source of care, selection of the provider/s, payment methods, travel distance and other associated costs of seeking care and satisfaction with care received. This type of data was collected at both Kiambiu informal settlement and Pioneer Estate for comparison purposes.

The respondent was a randomly selected household head who responded to questions about himself and his/her household. One of his/her children (under Age Five) was also randomly selected as the

subject of a detailed health questionnaire that included information about where healthcare was obtained for the child.

In addition, the household head was asked about health questions about one other person (aged over five) in the household and about availability of health services. This design provided information about a representative sample of household members. For the purposes of this research work, information on children was particularly useful because the basic health services provided in the type of facilities studied are directed specifically to this population.

To classify households based on their economic level, an index summarizing the information contained in the indicators of economic status was developed by the researcher using the method of principal components. The use of this method resulted in a summary index, which was developed without the use of arbitrary weights. Rather the statistical process used by the researcher to develop the index used weights that were based on correlation between the different indicators of household wealth. In this way, the method generated a weighted linear combination of indicators preserving the information provided by the joint use of the indicators.

World Bank researchers (Filmer and Pritchett, 1999 and 1998) have demonstrated that the index resulting from the use of this methodology produces an ordering of households that is similar to that obtained through the measurement of consumer expenditure per person in the household. The measure was thus found by the researcher to be more appropriate for obtaining household orderings that do not make use of the less reliable income component, and it is less affected by the error that plagues the measurement of consumer expenditure. The researcher, thus employed 4(four) quintile level as indicated in the table below.

Table: 1.4. Household Wealth Quintile Levels

Quintile 1	Quintile 2	Quintile 3	Quintile 4
<i>Walking Mode</i>	<i>Bicycle</i>	<i>Television</i>	<i>Motor car</i>
<i>Radio</i>	<i>Television</i>	<i>Video</i>	<i>Washer/Computer</i>
<i>Community Shared Facilities</i>	<i>Sewerage System in Place</i>	<i>Individual Water Connection</i>	<i>Telephone</i>
<i>One-Room Dwelling</i>	<i>One Room Dwelling</i>	<i>Two rooms</i>	<i>3 Room Dwelling</i>
<i>Kerosene/ Charcoal for Lighting</i>	<i>Electricity</i>	<i>Electricity</i>	<i>Electricity/Refrigerator/Gas</i>

Source: Compiled by the author, 2003

Accordingly, the weighted scores were arranged by the researcher from 42.5 to 96 points on the basis of the household wealth quintile level.

Table 1.5. Weighted Scores of Household Wealth

<i>Quintile 1</i>	76
<i>Quintile 2</i>	57.25- 76
<i>Quintile 3</i>	33.25- 57.25
<i>Quintile 4</i>	0-33.33.25

Source: Compiled by the author, 2003

1.7.4. Secondary Data Collection

Literature on health sector reforms, health care determinants, healthcare planning, economics of health and related issues was collected and reviewed from various sources and libraries accessible. They included the World Bank library, UNICEF library, NCC library, MOH library, the WHO library and the UON library. Maps and Physical Development Plans were also used. Both published and unpublished information were identified and used as background studies.

1.7.5. Research Design

Considering the objectives of the study, the main units of analysis were the public health facilities, their clients and Pioneer Estate and Kiambiu Informal settlement households. To better assess the impact of decentralization on the urban poor, the study adopted a comparative approach. Apart from an in-depth inquiry into health care needs of households living in Kiambiu informal settlement, and

whom the study regarded as the low income; Pioneer Estate households were also subjected to this in-depth. The study regarded them as relatively well of socio-economically. The results on equity were thus based on the comparative approach and the analyses of the two settlements and the responses of the client exit questionnaire.

The study design had several advantages. By having information on characteristics of the two settlements, the research design did compare variations in health consumption patterns and income, hence equity. Data for the research study came from a facility survey, a client- exit interview and a household survey on the two settlements. The study focused on four basic health services areas: family planning, preventive and curative services and child health. Specific services within each basic health service area are presented in table 1.6

Table: 1.6. Basic Health Services Examined in the Study

Basic Health Service Areas	Services
<i>Family Planning</i>	<i>Supply of modern reversible contraceptives (IUD, oral contraceptives, Condoms)</i>
<i>Preventive</i>	<i>Provision of Information, Communication and Education (IEC) materials and Vaccinations</i>
<i>Curative</i>	<i>Supply of antimalarial drugs, typhoid, acute respiratory infections (ARI) management to patients aged over 5 years, Eye Nose and Throat (ENT) management.</i>
<i>Child Health</i>	<i>Diarrhea management, ARI management, growth monitoring Immunizations (BCG, Polio, DPT, Measles, etc.).</i>

Source: Compiled by the author, 2003

1.7.5.2.1. Sample Selection

1.7.5.2.1.1. Public Health Facilities

Four public facilities (Nairobi City Council run) within Division One (1) of NCC Health Department areas of jurisdiction were included in the survey. A total of 4 city council facilities were interviewed. All these facilities received the full set of survey instruments- Inventory questionnaire, Observation, Time -Allocation, Client- Exit interview and Short- Inventory. Maps 1.1 present the geographic location of public health facilities that were included in the sample.

1.7.5.2.3. Health Facility Clients

To assess the quality of health care from the clients perspective, a manageable sample of 1/3 Of the total daily load of clients from each public facility were administered with a short client - exit questionnaire.

The number of patients interviewed at each facility was slightly proportional to the average daily number of clients seeking basic health services in each facility. The researcher determined the average daily client load using the monthly service records reported for December 2002 and January 2003. The exit interviews were conducted in each facility on two consecutive days (Thursday and Friday) to ensure that the survey captured clients' views for a large range of services given the general practice of providing specific health services on certain days of the week.

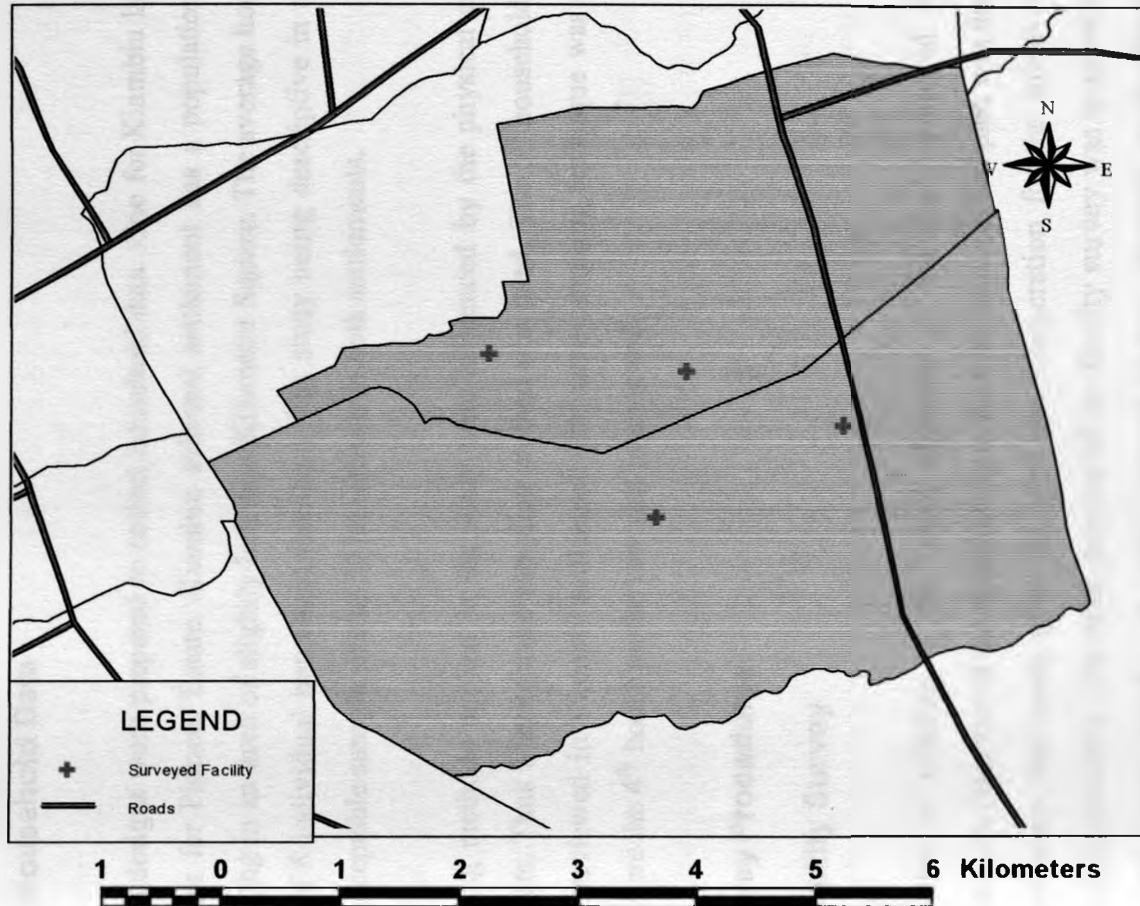
The sample design generated a representative sample of clients. The client exit questionnaires were only conducted from those facilities that Kiambiu informal settlement and Pioneer Estate household's preferred most in seeking health care services.

Table: 1.7. Public Facilities by location, Facility Type and settlement Preference

<i>Facility Type and Name</i>	<i>Location</i>	<i>Settlement Preference</i>	
		<i>Pioneer</i>	<i>Kiambu</i>
Sub Health Centre (Ofafa Jericho)	<i>Division One ((Jericho Estate)</i>	[[
Health centre (Makadara)	<i>Division One (Makadara)</i>	[[
<i>Health Centre (Pumwani)</i>	<i>Division One (Pumwani)</i>		
<i>Dispensary (Bahati)</i>	<i>Division One (Bahati)</i>	[
2 Health Clinics (Operated Under Bahati Dispensary)	<i>Division One ((Bahati and Maringo)</i>	[
<i>Total public facilities</i>		2	4

Source: Compiled by the author, 2003

Map: 1. 1: Location of Public Facilities Surveyed



Source Physical Planning Department 2003

1.7.5.2.5. Household Data

Two sample designs were prepared to collect household data. One for Kiambiu Informal settlement and the other for Pioneer Estate. Kiambiu informal settlement has a population of about 15,000 residents living in an area of slightly less than Kilometre Square. The average household size being composed of 5 individual household members. The study being descriptive in nature employed a minimum acceptable sample size of 30 households in both settlements.

The Sampling methods applied in the study were influenced by the physical arrangement of the dwelling units. Thus a systematic sampling method was used. The 5th household dwelling on each side was interviewed in Kiambiu settlement. The same sampling technique was applied in Pioneer Estate, but here the 4th house on the row was interviewed.

1.7.6. Survey Procedures

1.7.6.1. Facility Survey

The researcher in relation to the broad objective of the study prepared the facility survey questionnaires. A pilot test of the instruments in the four facilities sampled was done. A modification to the instruments was made after the pilot test. Cooperation for the survey was, however, not enthusiastically provided. The main purpose of the facility survey was to provide a measure of the service supply environment in a given moment in time. Surveys on facilities where the short-inventory questionnaire was used were also surveyed. This questionnaire collected information on facility characteristics and inputs and not on facility outputs or processes.

1.7.6.2. Household Survey

After the pilot-test, the proposed household questionnaire schedule was revised to include questions needed for the study. The sample was also revised to ensure accomplishment of the study objectives. It is important to mention that, in order to facilitate survey operations, the complete set of questions was asked in all households surveyed in Kiambiu informal settlements and Pioneer Estate. This meant that the household survey provided relevant data in health and health-seeking behaviours for a representative sample of the population in each of the two settlements.

1.7.6.3. Client Exit Interview Survey

The client exit interview questionnaire was prepared in relation to the objectives of the study. A pilot test of the exit interview questionnaire was done and the questionnaire revised after the pilot test. The survey was done along side the facility survey. After the facility survey was done in the selected health care facilities, the client – exit questionnaire was immediately administered to the first five clients leaving the facility. Data entry and cleaning followed. Processing of data and analysis was subsequently done. It is vital to mention that almost no client refused to answer the questionnaire

1.7.7. Data analysis

Field data was validated and both the qualitative and quantitative data coded and analyzed in SPSS programme. Data entered in the program was analyzed according to the research objectives and variables examined as provided under the analytical framework given below (see section 1.13 below). Regression analysis, correlation, T-tests, etc were used. Descriptive statistics such as the mean, the mode, and the median were also used. The data and information was subsequently presented in graphs, frequency distribution tables, charts and other data presentation techniques.

1.8.1. Analytical Framework for Data Analysis

<i>Objective</i>	<i>Purpose /specific Questions</i>	<i>Types of data</i>	<i>Techniques for analysis</i>	<i>Expected results</i>
1. To examine efficiency, equity and quality of public health care services	<p>What are the most prevalent diseases? How often do they occur in households? What is the household's health status? What economic factors determine health status? What are the utilization patterns of available healthcare facilities and services?</p>	<ul style="list-style-type: none"> • Characteristics of Household dwelling places • Socio-economic and demographic status • Actions taken by household members to regain health status • Sources of care • Economic factors influencing choice of provider • Care seeking behaviour of households • Proportion of household members paying for health care service 	<ul style="list-style-type: none"> • Association between disease and incomes • Association between disease and sanitary conditions • Association between economic factors and care seeking behaviour • % Nature of health care seeking behaviour • Proportion of actions taken to regain health status • Proportion of People paying for services sought • Comparison of health seeking and disease prevalence in Kiambiu and Pioneer estate 	<ul style="list-style-type: none"> • Use of health care services • Sources of services • Economic determinants of service use • Utilization patterns of government health care services • Prevalence of specific diseases • Care-seeking behaviour by disease • User characteristics • Loss of income due to disease/injury • Individual characteristics and health conditions among 5 year and less and 6 year olds and above • Provider type • Impact of user fees on health status and care seeking behaviour • Health care provider preferences for both Pioneer and Kiambu Households
	1. To measure equity, efficiency and appropriateness of health care delivery	<ul style="list-style-type: none"> • Facility location • Hierarchy of services • People served for 	<ul style="list-style-type: none"> • Maps • Tables • Proportion of people suffering 	<ul style="list-style-type: none"> • Capacity of government health facilities • Availability of

<p>in relation to health care needs of Kiambu households</p> <p>2. To determine location factors and perception on quality of health care in relation to care seeking behaviour</p> <p>3. To determine facility characteristics and choice as source of healthcare by Kiambu households</p>	<p>particular diseases over the past one month</p> <ul style="list-style-type: none"> • Proportion of people paying for specific services • Staff time allocation for specific diseases • Services payment • Presence of services • Clients socio-demographic characteristics • Client perception on service quality 	<p>from particular diseases</p> <ul style="list-style-type: none"> • % Of people paying and amount paid • Tables • % Proportion of preventive and curative services available • Socio-demographic characteristics • Perception on quality from clients perspectives 	<p>services</p> <ul style="list-style-type: none"> • Stock-outs of supplies • Impacts of user fees • Staff availability by training • Costs of basic health care services (MCH, curative, etc) • Distribution of facilities by services • Facilities mostly used • Average service cost per visit • Staff productivity by time allocation • Indicators of quality and perception on quality from clients • Comparison of client perception on quality of health care services by private-sector / public sector client • Availability of services
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Source: Compiled by the author, 2003

Chapter Two: Literature Review

2.0. LITERATURE REVIEW

2.1. Health

The World Health Organization (WHO) defines health as the complete mental and psychological well being of an individual and not merely the absence of disease or infirmity. For the purposes of this study, however, Tones definition of what constitutes health as been adopted. Tones (1977) viewed health in terms of the positive well-being -mental, physical or in terms of absence of some dysfunction or disease. Good health maximizes an individual's or a community's potential in terms of their physical, mental and social attributes.

Health problems have therefore always plagued mankind.. Each period of civilization however has shown its interests in health with a different emphasis. Ancient civilizations were most concerned with the health of the individual. As man learned to cope with the most urgent problems of the particular era, he has instituted the necessary community health services (Wilbur 1962). Davies (1955) observed that although man has probably always had some health services, they have developed rapidly in the last few decades. The state of health of a population in addition also involves not only the medical services and the level of scientific knowledge that can be applied in various circumstances but the many social and economical factors as well, and a comprehensive study of difference in health status between socio-economic groups would take these into account.

According to Gwendolyn (1964), in the developing countries of Africa, Asia and Latin American, many of the conditions that affect health are more favourable in large cities than in small towns and rural areas, but these advantages are not always reflected in the comparative level of mortality and morbidity. Despite the fact that there are more medical care and facilities available to urban residents than the rural people, the advantage enjoyed by the wider population is not always reflected by the differences in mortality indices between the rural and the urban inhabitant. This is because

there are two major causes of poor health among the low – income groups of the underdeveloped countries. One being the deplorable living conditions and inaccessibility and unaffordability of conventional health care services. These two factors account for the great differences between underdeveloped and industrialized countries in the prevalence of preventive diseases (WHO, Vol. 14,1960). The potential of a country and its people however, largely depends upon ecological conditions. At community level, the physical and biological environments are primary determinants for health conditions including the existence of “reservoirs” of infection and vectors transmitting diseases (Ojany. 1974)

National health can therefore, be described in different ways depending on the specific aspects of health it is desired to emphasize on and on the matters that are included within the term "health". It is, therefore, possible to describe the health of a community in terms of disease and disability present in it, for example, the number of health ailments, rheumatism causes, etc, occurring annually. However, according to the UN, (1980), health is a product of and an input into the development process, the approach to development is above all, political, the linkage between health, development and politics is organic and dialectical.

Tones (1977), observes that no description of the health of a community can be considered complete without some information concerning socio-cultural disorders of the society. It should thus be observed that in the broadest sense, the health of population depends on factors, which lie deep in its social life. The meaning and importance assigned to national health thus will depend on the level of degree level of civilization and culture, which has been achieved nationally; on the complexity national social structure and on the level of ethical and religious development. Accordingly Sterky (1978) noted that our practical problem today is to break down the barriers created by the medical profession and willingly accepted by society and to put health in the centre of the debate and make it a real political issue. To turn health care from a professionalised service into a self-reliant personal care, exercised in collective forms.

Tactful and thorough health education consequently is necessary to introduce modern preventive and clinical practice. Though, the prevention of disease will achieve greater success in the long run, it is essential that curative and rehabilitative services are provided at the outset and expanded to meet local needs and target population groups. The principles in the prevention of ill health are a fundamental part of medical practice and the organization that provides the necessary community health services to carry out those principles in Nairobi urban is the local government administration. This is the focus of this study.

2.2. Health Care Infrastructure Planning

The general argument for health care infrastructure planning is the potential for improved service quality and coverage; yet the issues of, one, exactly how these benefits can be realized, and two, equitably distributed are not well understood. Several features of health care infrastructure planning (e.g., the controversial nature of equity, efficiency and quality of services as basis for spatial allocation of health care facilities area are more complex and potentially more difficult than in other sectors.). Without proper planning and acknowledgment of these aspects, however, spatial allocation of health care infrastructure and can be disappointing at best and detrimental at worst. This note raises the issues to consider if spatial planning is to bring about beneficial results in this sector.

The promise of equity, efficiency and quality considerations in healthcare infrastructure distribution can be an essential basis as it contributes to improved implementation of health programs, Target populations can be more specifically defined, reduction of inequalities between low-income earners and high income earners in urban areas can be reduced and; improved intersectoral coordination, particularly in local governments and urban development activities can be effectively achieved.

Current experience however, shows that achieving the benefits of health infrastructure planning will depend heavily on utilization levels of the different income groups in our urban settings. In general, careful attention must be given to health service needs and priorities in deciding which areas facilities are optimally required.

The complex linkages therefore between equity, efficiency and quality of services require more planning of appropriate considerations in their relationships and those of settlement patterns. Serious distortions and hindrances to health service delivery and utilization will be created, if spatial allocation and settlement specific structures are devised without full consideration.

Healthcare, planning to adapt to local conditions must therefore be balanced by a common vision about the goals of health care provision and the purposes of spatial planning in furthering these goals. Responsiveness to settlement demands in local area planning level is a benefit of this consideration.

2.3. Economics of Health

2.3.1. Equity

Concerns about equity - interjurisdictional and interpersonal - have been central to the discussion of health care provision (WHO, 1998). Some jurisdictions are better endowed with health facilities than others, perhaps because of size or location. In addition, historical circumstances (e.g., the colonial segregation policy) may have created local health infrastructure problems by allocating more healthcare facilities in their areas of residence. Thus, spatial planning tools may be designed to shift health care conduit resources to disadvantaged settlement areas to ensure that all citizens enjoy a minimum level of service, regardless of location, or receive enhanced assistance to accelerate amelioration of deficits, because of these historical factors in location. The allocation of health care facilities to changing settlement needs and levels should be analyzed within a particular city-wide spatial context since the non consideration at such contexts sometimes results in wealthier areas receiving more resources than poorer areas.

It is usually argued that ultimately, central governments are responsible for ensuring interpersonal equity but local governments also play very important roles in implementing central distributional programs in local level health infrastructure

2.3.2. Equity and Redistribution

2.3.2.1 The Theory

The conventional wisdom, from classic sources in the literature (Oates, 1972, pp. 6-8; Musgrave, 1959, p.181) implies that redistribution has to be carried out by higher levels of government. Factor mobility (particularly labor) will make attempts by lower level jurisdictions to change the distribution of income, which is self-defeating as the poor gravitate to areas of high redistribution, while the rich cluster in areas of low redistribution. In reality however the world does not fully correspond with this theoretical model for many functions of local governments do, in practice, have significant distributional effects: regulatory policies such as land use and planning controls have profound distributional implications, - most notably in health which affect distribution.

Health care Infrastructure services are another area where local government policies can have important redistributive effects – both progressive and regressive. Throughout the world, one of the core areas of responsibility of local governments consist of health infrastructure allocation, and this responsibility indicates the important role of this level of government in attaining efficiency goals.

2.3.2.2. Reconciling Theory with Reality

Although debate on this subject continues, the traditional view that central governments have the major role to play in functions of health infrastructure planning and redistribution still predominates. Some of the most recent contributions to the literature recognize that local preferences for redistribution do matter. The traditional idea that the central government should control or at least coordinate redistribution remains, but there are some interesting differences from the traditional analysis. In particular, Wildasin (1991) argues that an optimal solution in multilevel systems of government is to provide health care services, which, because of differing local preferences for redistribution, are nonuniform by settlement pattern. Wildasin found much behavior in local systems of government, which supports his analysis and planning policy prescription. However, while the goal of reducing the inequalities is explicit in the ideals of local government implementation, such

redistributional ideals do rest on value judgments that are not shared by all (Brennan and Buchanan, 1980). The equity problem on health care infrastructure planning arises because of the "horizontal equity" goal of treating citizens alike no matter where these citizens reside in the city. The problem is that the local authorities attempts to attain interpersonal equity goals are implemented in a piecemeal manner due to their need for revenue collection from

2.4. Health Care Policy

At the time of independence, the government of Kenya singled out three major constraints to national developments as disease, poverty and illiteracy. Since then, attention has been given to improving health, education and the creation of enabling environments to promote economic growth and national development. On this basis, the government then set out a health strategy to address the constraints of diseases. This strategy specified that the majority of her population would have access to adequate health services and other amenities such as decent housing, sanitation services and eradication of poverty among others (Republic of Kenya, 1986).

Accordingly, in a number of government policy documents and in successive National Development Plans, such as the 2002 – 2007 National development Plan, it is set fourth that the provision of health services within easy reach of Kenyans and placed emphasis upon preventive, promotive and rehabilitative services without ignoring curative services (Kenya's Health Policy Framework, 1994). Today, Kenya affirms that health is a basic right of all citizens and provides for the establishment of a National Health System (Kenya's Health Policy Framework, 1994). . The mandate of the national health system is to plan and implement health programmes and services as a co-coordinated effort between the public and private sectors in order to increase the system's responsiveness to the population health initiatives such as MCH and control of vaccine - preventable diseases, promotive and rehabilitative services (Kenya Health Policy Framework, 1994).

Currently, however there is a shift towards a socially inclusive policy framework for the health sector in Kenya. The focus of the 1999 National Poverty Eradication Plan falls under the category of the social policy frameworks. The policy frameworks provide for the identification of objectives and major policy issues, however, they provide for only directions rather than detailed prescriptions, mapping out of capacity building and organizational development approaches, and provide guidance for the prioritisation of expenditures. Kenya's Health Policy Framework of 1994 contents fall under this category and recently the report on health care decentralization of March 2000. However, there are no specifications on the spatial planning guidelines necessary to articulate that all of her citizens have equal access to health care services.

2.5. Organization and Infrastructure

The key actors in the health sector in Kenya are organized into three sub-sectors which include the Ministry of Health and Local Authority, Private and Mission. In terms of population, coverage and infrastructure, the main institution in the public sector are the MOH which administers 50% of the total health care institutions and ministry of Local government which administers just over 3%.

Table: 2.0. Providers of Health Services

Provider	Expenditure	Facilities	Manpower
MOH Total	43.26%	55.34%	69.48%
All others Total (Ministry of Local Government and Missions)	56.74%	44.66%	30.52%

Source: Kenya, 2002

Table 2.1. Distribution of Total Health Manpower by provider

	MOH	OTHER	TOTAL
Urban	36.33%	47.33%	39.87%
Rural	63.67%	52.07%	60.13%
Total	69.48%	30.52%	100.00%

Source: Kenya, 2002

2.5.1. Infrastructure

There are well over 3,200 health care institutions established nationwide (MOH, 1999) including two National hospitals, Provincial hospitals, District hospitals, Health centres, Dispensaries and clinics all established in a pyramidal health referral system extending from the National Hospitals. In terms of infrastructure, the MOH has the most extensive infrastructure (1,100 dispensaries, 400 health centres and 100 hospitals), while the Ministry of local Government administers slightly over 3% of the 3,200 institutions.

2.6. Health Delivery in Nairobi

From sections above it is evident that the historical development of Kenya led to the establishment of a highly centralized government structure. The process restricted the development of local governments and limited the local capacity to make and implement decisions. Since the early 1980s, however, democratization and organization of the state processes have transformed the relationship between the central government and the local authorities. The relationship recognizes the local authorities as active participants in the economic, political and social development of the country.

In Kenya, health reform has, therefore, been part of a broader process of democratization and strengthening of local authorities. A centerpiece of this process has been the decentralization of basic health care services provided by the public sector. It is with this regard that the Kenya Government

recognized that health care decentralization is vital in reinforcing the important role played by local authorities in supporting economic and social development, and the government would thus like to see this initiative of the local government extended to the low-income areas. Accordingly, in the KANU manifesto (1997), the KANU government aimed at reviewing the Local Government Act in order to give Local Authorities more autonomy to manage their affairs more efficiently and effectively. However, the performance of local authorities in the provision of other services is marred by inefficiency, ineffective and a general lack of essential supportive mechanisms.

This scenario has not been different in the provision of health care services to the urban population, moreover, user fees collected from the facilities end up in the general pool of the city council, hence supplies and other facilities find them at unacceptable level. This has had significant impacts on the utilization of health care services. It should also be noted that there are other factors that determine health care consumptions and utilization. World Bank (1990) noted that most patients visiting health facilities come from the immediate vicinity. 40 per cent of the out patients attending a health centre live within 8 kilometers, 30 per cent live more than 8 kilometers away. It can therefore, be noted that accessibility and distance directly determines the number of patients visiting a health facility.

The world Bank study pointed out further that there exists too much emphasis on curative health services which reflects the professional bias of the physician and sometimes the mystique and popular appeal of hospital - based intervention may not comply with local understanding of the prevailing health problems. Consequently, under utilization of health facilities has sometimes resulted due to lack of confidence in the quality or range of services offered and the content with the style of care provided.

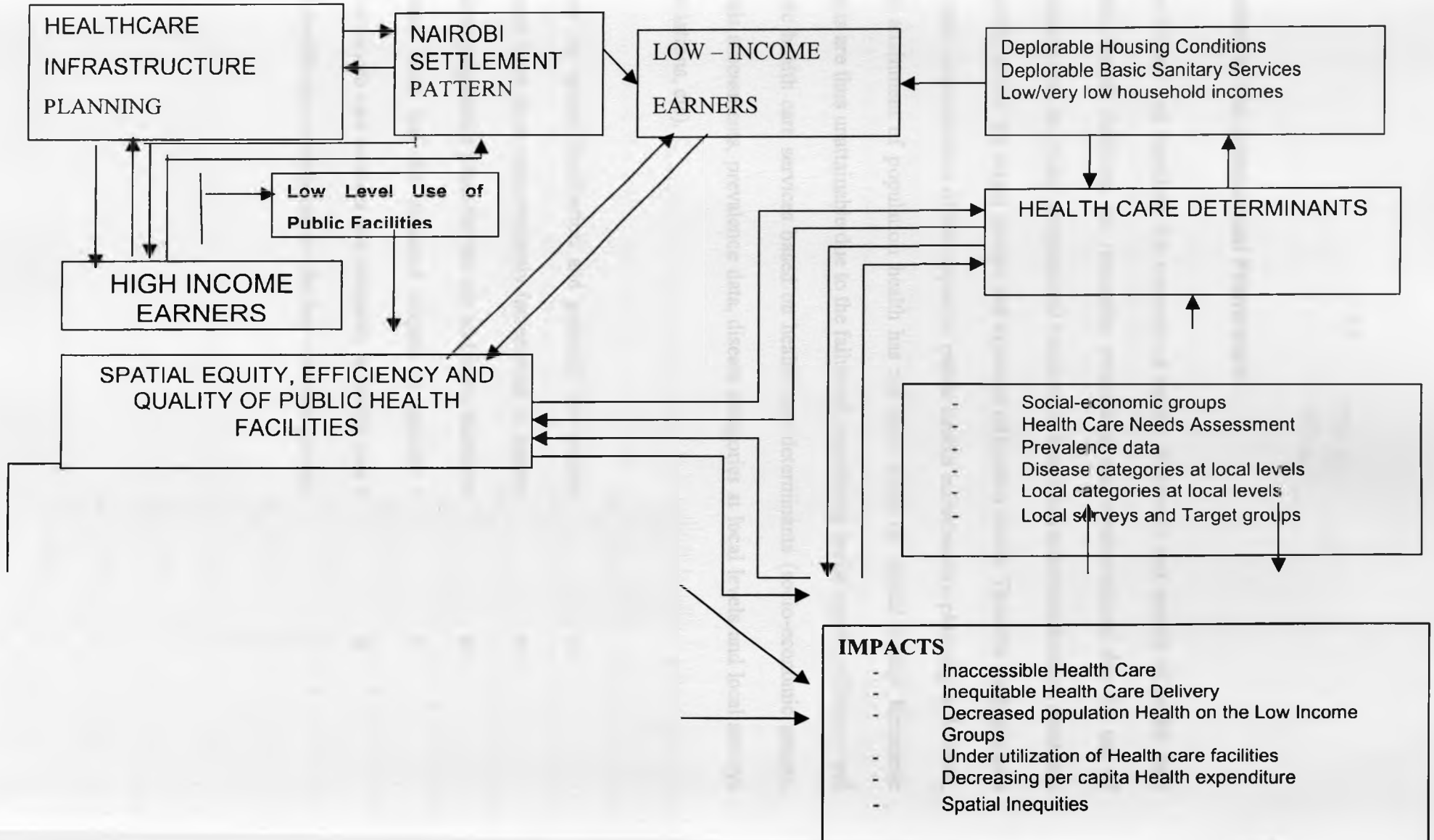
Amanda (1991) differently from the above observes that under utilization of health care facilities may occur because of the gap between the personnel at the modern facility and the tradition bound people it is designed to serve. However, there have been no in depth studies done to evaluate the efficacy and the effectiveness of the spatial organization of the health facilities based on these

observations. Still, however, the question still remains whether the informal settlements (whose residents are the low income groups, and whose principles of equity need apply to) are recognized as special health infrastructure planning entities and as requiring these services?

Advantages can however certainly accrue if health care infrastructure planning looks into at the spatial correlates of disease, that is, the environmental and socio-economic clues that covary with it over space. Dyle (1980) stresses that a disease state should be viewed as a resolution between environmental stressors, population characteristics and cultural behavioural patterns. Clearly, therefore, the planning approaches adopted in the past have tended to ignore urban socio-economic and physical environmental factors which are among the factors that determine equity, quality perceptions and service efficiency that are essential in health care facilities planning. Further poor human development, health attainment and health system performance indicators give evidence that the health infrastructure planning issues have not been successfully tackled through urban planning.



CONCEPTUAL FRAMEWORK



Brief Explanation of the Conceptual Framework

Under literature review and based on the concepts of equity, efficiency and quality of health care services in public health facilities, the researcher established and conceptualized that the use of catchment population and the wider geographical variables in health infrastructure location decisions may not necessarily define the target groups and expected utilization levels. Thus the study pursues that due to the non- consideration of this aspect in public health infrastructure planning in Nairobi, the goal of the attainment of population health has not been based on spatial equity. Economic efficiency outputs are thus unattainable due to the failure of considering health equity, efficiency and quality of public health care services based on health care determinants (socio-economic groups, health care needs assessments, prevalence data, disease categories at local levels and local surveys and; target populations, etc).

This means that the spatial distribution and generally the existing health infrastructure planning strategies adopted have been conservatively incremental in approach and have been based on the former colonial segregationist plans for the city and have, therefore, failed to indicate clear outputs expected at each level and the expected outputs to specific target groups. Eventually then, inaccessibility to health care services and inequality in health care delivery is manifest, especially to those that need health care services most – the low – income groups.

CHAPTER THREE

BACKGROUND TO THE STUDY AREA

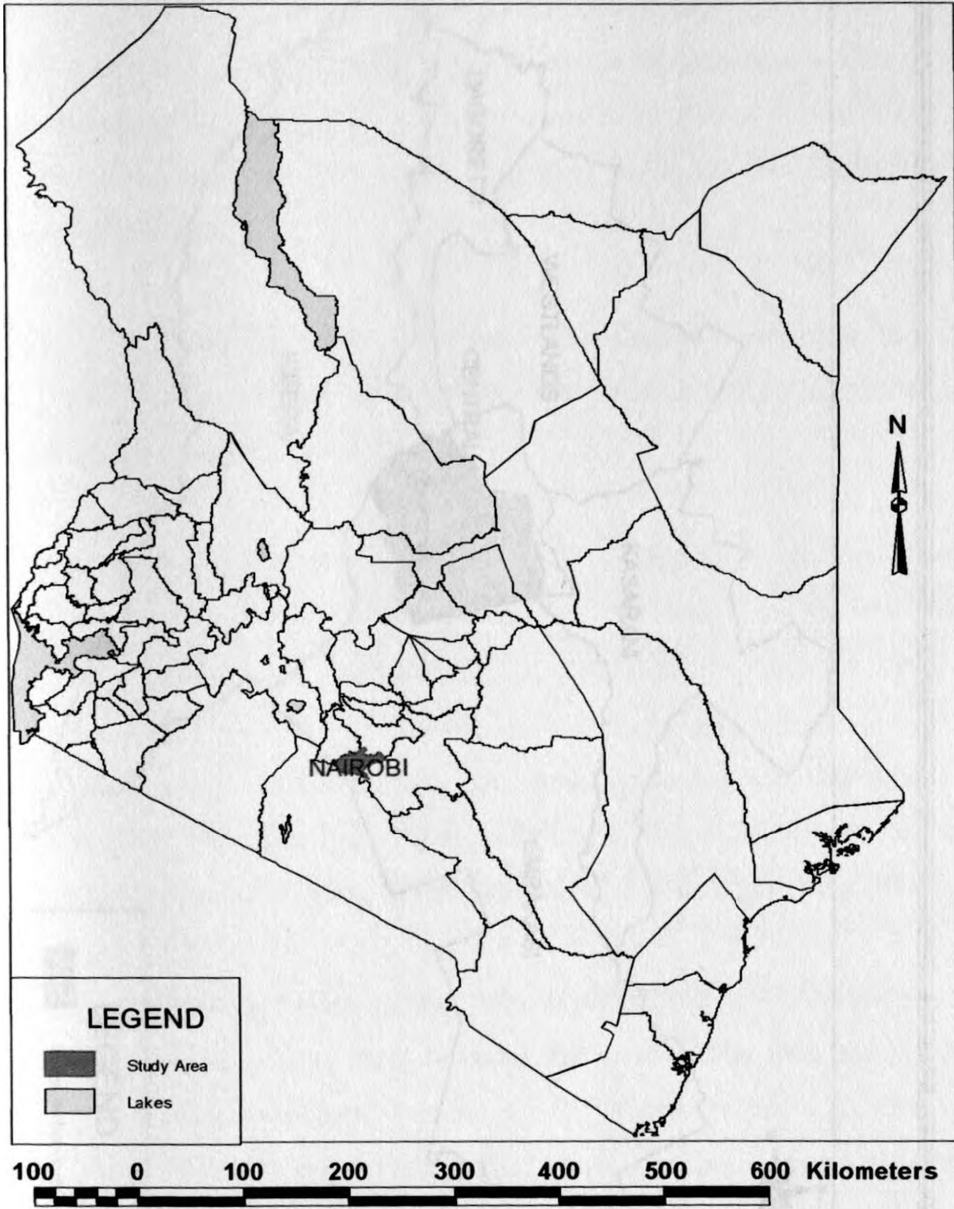
3.1. Physical Settings of Nairobi

Physiography and natural conditions have a direct effect on settlement patterns and disease patterns of an area.

The city's altitude ranges from 1600 meters in the eastern parts to 1800 meters in the western and northwestern parts. Two sections of relief occur as a result of the altitude variation; the western and northeastern sections of the city are well drained and have volcanic soils, while the eastern parts of the city lies on a flat plain and are poorly drained. This section of the city experiences flooding during the rainy seasons.

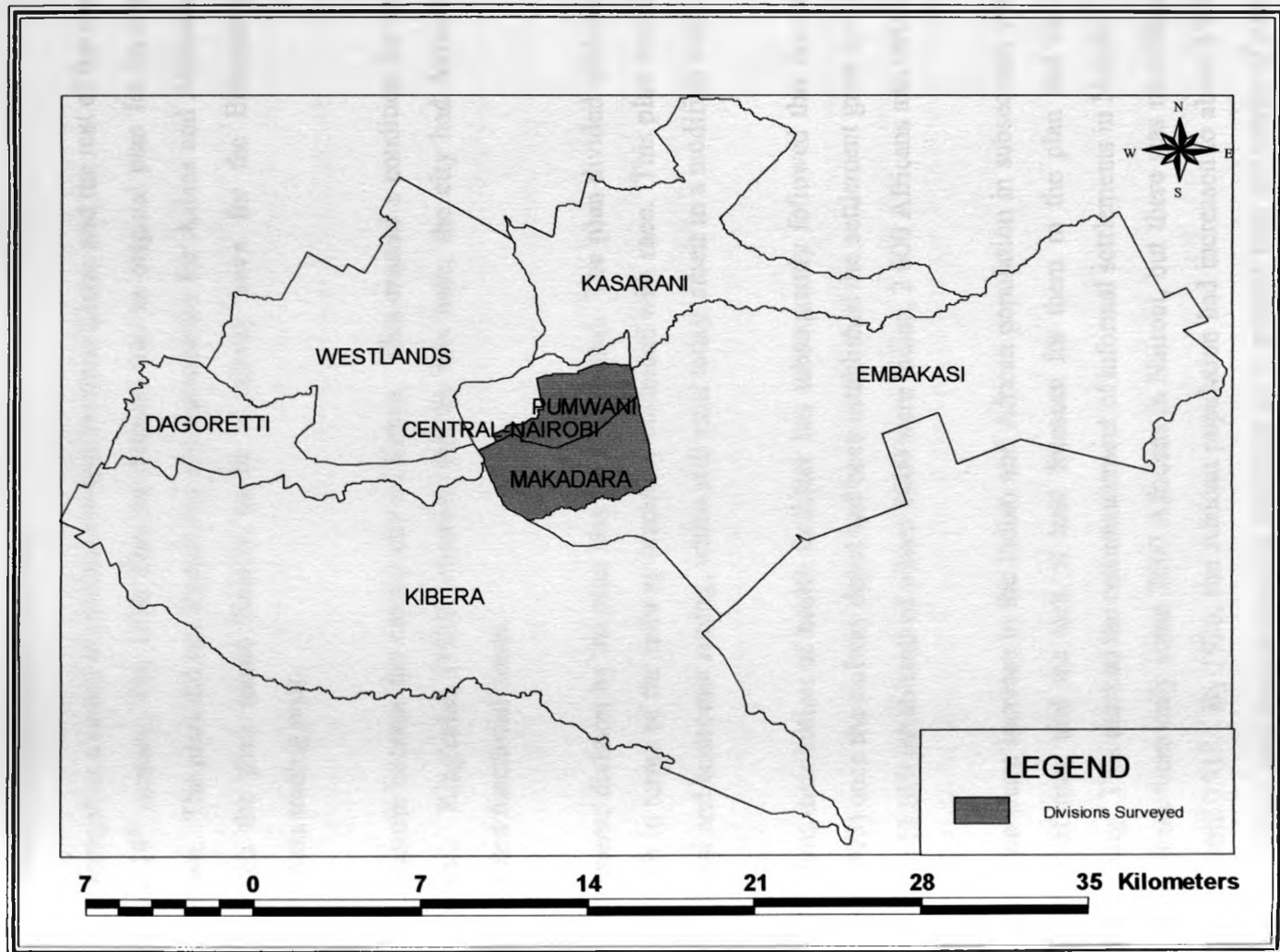
Nairobi's surface drainage is by two main rivers, the Ngong and the Nairobi River and a number of streams. The surface waters are highly polluted and are a health hazard to human settlements (Mostly informal settlements) located along the drainage system banks. The climatic conditions of Nairobi have a linkage with the spatial correlates of disease. Malaria, a tropical disease is an example of an environmentally related disease. Maps 3.1 and 3.2 present the location of Nairobi in the national context and the study area respectively.

Map 3.1: Nairobi in the National Context



Source Physical Planning Department 2003

Map 3.2 Location of the Study Area



3.2. Settlement Patterns in Nairobi

The city emerged as a result of external contact between Kenya and the rest of the world towards the end of the 19th century. The 1898 Plan for Nairobi was an original plan for its development as a railway town. The plan did not foresee the accommodation for Asians and Africans within Nairobi and as such the plan meant Nairobi to be a railway town for the Europeans and a mixed European/Asia trading post.

In 1905, Nairobi became the capital city of Kenya. This created a condition for more growth and development. King'oriah (1980) observes that by this time, the city had formed district human settlement and functional zones.

The settlements division by the plan was thus functional. The plan divided settlements function by class, which in terms of the railway hierarchy coincided with race. This plan was the first example of functional and economic zoning, which still exist today, albeit in a modified form.

The attendant distribution of health facilities has subsequently followed this layout. According to Okumu (1995) once the railway depot had been established the settlement grew quickly and by 1906' it had some 11,600 inhabitants of whom 8000 were Indian, 2 600 Africans and 900 Europeans.

However, the sharp increase in the Indian and African population in subsequent years and in such a short span of time and the lack of land foreseen for them in the plan had its consequences in overcrowding. This marked the commencement of informal settlements in Nairobi.

By 1906, there were only some 2600 Africans in Nairobi, but there was no official home for their residence until 1919. By 1926, the African population had increased to about 18,000, a 60 percent of the population and socio-economic indicators up to present bear the marks of this imperial legacy, with the city's population in informal settlements being about 60 percent and occupying a mere 5%

of its residential land (NPEP, 1999). The distribution and delivery of health care facilities and services respectively have also tended to follow this pattern.

A series of plaques dogged the city resulting from poor environmental conditions. In 1912, after a plague, a commission referred to as the Simpson Commission was established to resolve the incidences of the plagues. The commission report recommended for the establishment of well-defined and separate residential areas of the Europeans, Asians and Africans.

By 1919, a clear racial residential pattern had emerged. The year also saw the city become a Municipality and boundaries altered to include Muthaiga, Eastleigh, Pangani, Kilimani, Parklands and Upperhill. Nairobi continued to expand rapidly. This necessitated the need for a comprehensive land-use plan. In 1947, a South African planning team was given the task of preparing a master plan for the city. This led to the famous "1948 Nairobi Master Plan for a Colonial Capital", that gave more emphasis on land use development based on racial segregation. This officially established the segregation effort by zoning initiated in the original 1898 plan.

Proposals for social divisions through building density regulations were introduced and the city was split into three major areas for Europeans, Asians and Africans and though by 1926, the European population made up less than 10 percent of the total population of 30 000 in Nairobi, they occupied approximately 42 percent of Nairobi and in the best areas. The Asian population made up a 30 percent of the total population and occupied 5 percent of the total area. The rest comprised of Africans. The attendant distribution of health facilities subsequently followed this trend. Today the city has a defined settlement pattern (formal), which has a strong legacy of the colonial planning policies and the informal resulting from our inability to plan and control development.

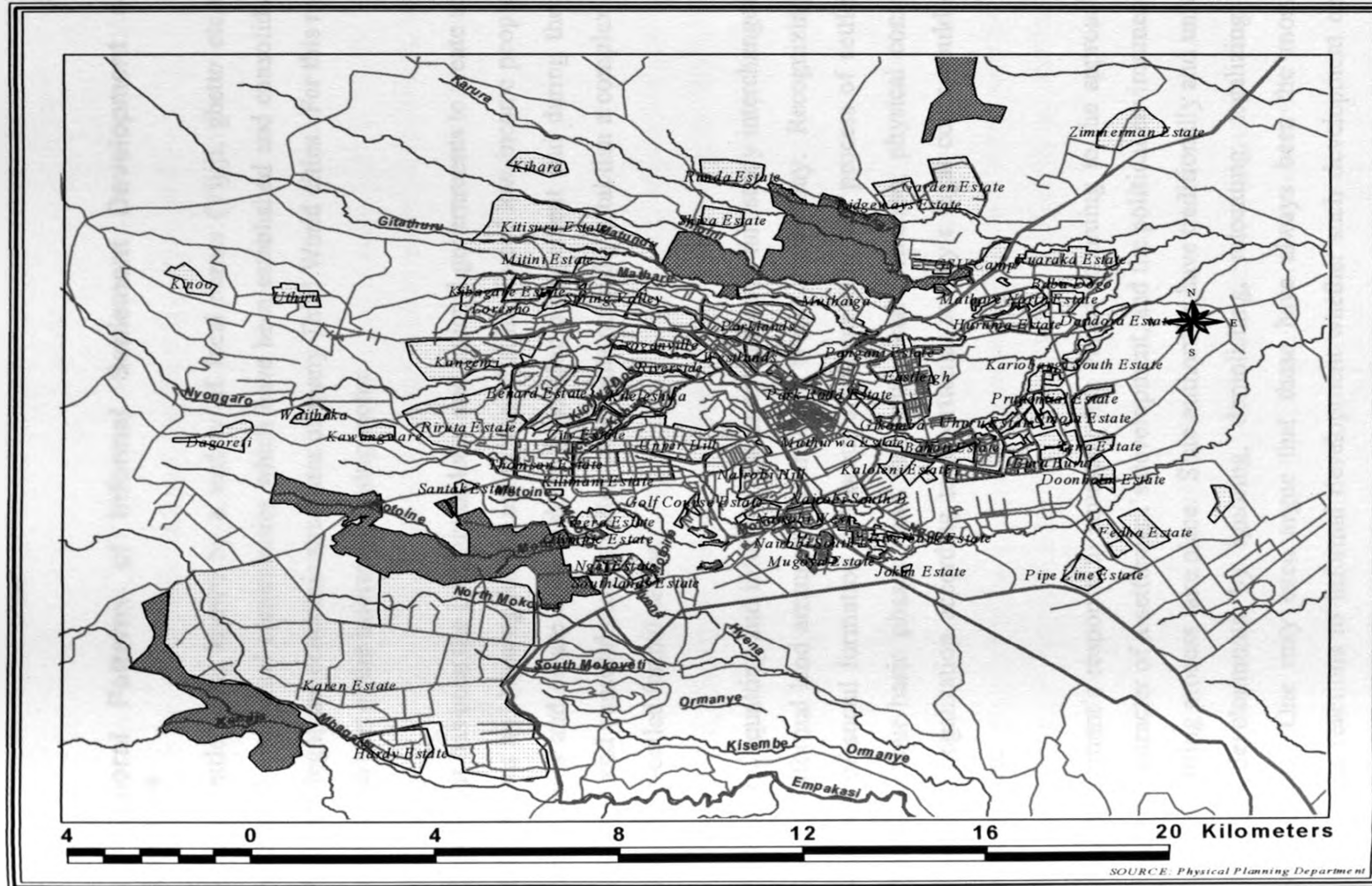
The functional layout and the spatial distribution of population and health care facilities did not change radically after independence. Though, the social barriers and cultures that restricted the movements of Africans were removed, the provision of basic social services, and facilities remained

almost intact. Perhaps what could be termed as the most important development which altered the structure of the city was the relax or de- restriction of African migration into the city.

A subsequent large influx of migrants including a huge "back log" which had been mainly held back by the long arm of the colonial control found back its way to the city. The socio-economic barriers instituted by the imperialists remained and despite some remarkable upward mobility by Africans, the spatial segregation remained almost intact. The socio-economic status of the new ad incoming migrants and the lack of social housing and health care facilities available to cope with this sudden influx led to the deterioration and expansion of the existing informal settlements.

Okumu (1995) observed that the 1973 urban strategy plan prepared by the Nairobi City Council (NCC) preserved the existing status quo of socio-economic population distribution and density. Arcas to the West and North of the city were to be developed as at present low densities for high-income households; these were meant for the remaining Europeans and the wealthy Africans and Asians. The areas to the East and West were to be primarily developed as low and middle-income areas dominated by Africans. Health care facilities spatial distribution, however, never fully reflected the needs of the high-density residential housing as expected.

Map: 3.3. Settlement Patterns in Nairobi



3.3. General Patterns of Informal Settlement Development and Government Response

Informal settlements, known by a variety of local names (Vijiji, ghetto etc.) are a high-density widespread residential communities which have been established and consolidated often outside of the formal legal and economic structures of many Third World cities. For this reason they have been identified as part of the informal housing sector.

Typically, it has been the inability of local and national governments to create adequate employment opportunities and housing for the urban poor that has forced low-income people to invade public or private lands and create such makeshift housing arrangement and during the process of physical settlement and consolidation squatter inhabitants normally establish a complex network of relations with the so-called formal sector.

Historically, squatting and informal settlements (used in this study interchangeably) were the origin of many informal land arrangements in Third World cities today. Recognizing that there are other processes of social formation that occur simultaneously, the process of settlement can be broken down into four basic phases: land invasion, social formation, physical consolidation, and urban maturity. Legalization according to a particular society's legal codes could occur during any of these phases.

The government's response to squatting has varied according to the approach of the settlers, the stage and character of a settlement's development, and the political environment in which the events of the squatting process take place. State authorities have traditionally and universally responded to squatting developments by ignoring, demolishing, relocating, legalizing or upgrading such settlements. One may even argue that these have always been the most common stages in government reactions to informal development whether such development occurs in the Third or First Worlds.

Within the above framework, the particular nature of the squatting process can take on a variety of characters; it may be gradual, communal, mobilizing or generated.

Gradual squatting is a result of spontaneous acts by individual settlers seeking shelter by gradual accretion on a publicly or privately owned site. Communal squatting, by contrast, generally results from a collective act by settlers who have co-coordinated a specific act of invasion. Gradual squatting has a greater chance of being ignored by the authorities if the site occupied is relatively unattractive. This is especially true during the primary phase of settlement formation. But trouble often emerges when the landowner (public or private) finds a renewed interest in the land and the authorities are asked to remove settlers forcefully overnight.

Mobilized squatting is often instigated by political parties or agents with the intention of social mobilization. Mobilized squatting, organized by political opposition groups, may be aimed at threatening the political legitimacy of a government, and it usually involves a confrontation between settlers and police. Authorities try to repress mobilized invasions at every stage because of the political threat they represent.

Like mobilized squatting, generated squatting is also organized, but by official urban authorities in return for electoral gain. This type of squatting has also been known to be encouraged by landowners who want to have urban services provided to their sites. Generated squatting develops peacefully through the course of invasion, since it is officially or unofficially endorsed by the government in office.

Oldham, et al., (1988) in their study of informal communities in Cairo, examined the formation processes of illegal settlements and found that traditional forms of social organization play a significant role in the formation of leadership in squatter communities and in the handling of community problems. They identified three types of informal communities: those that result from the expansion of former villages now embraced by urban areas and the subdivision of agricultural land on the urban fringe and those formed based on occupation of government land.

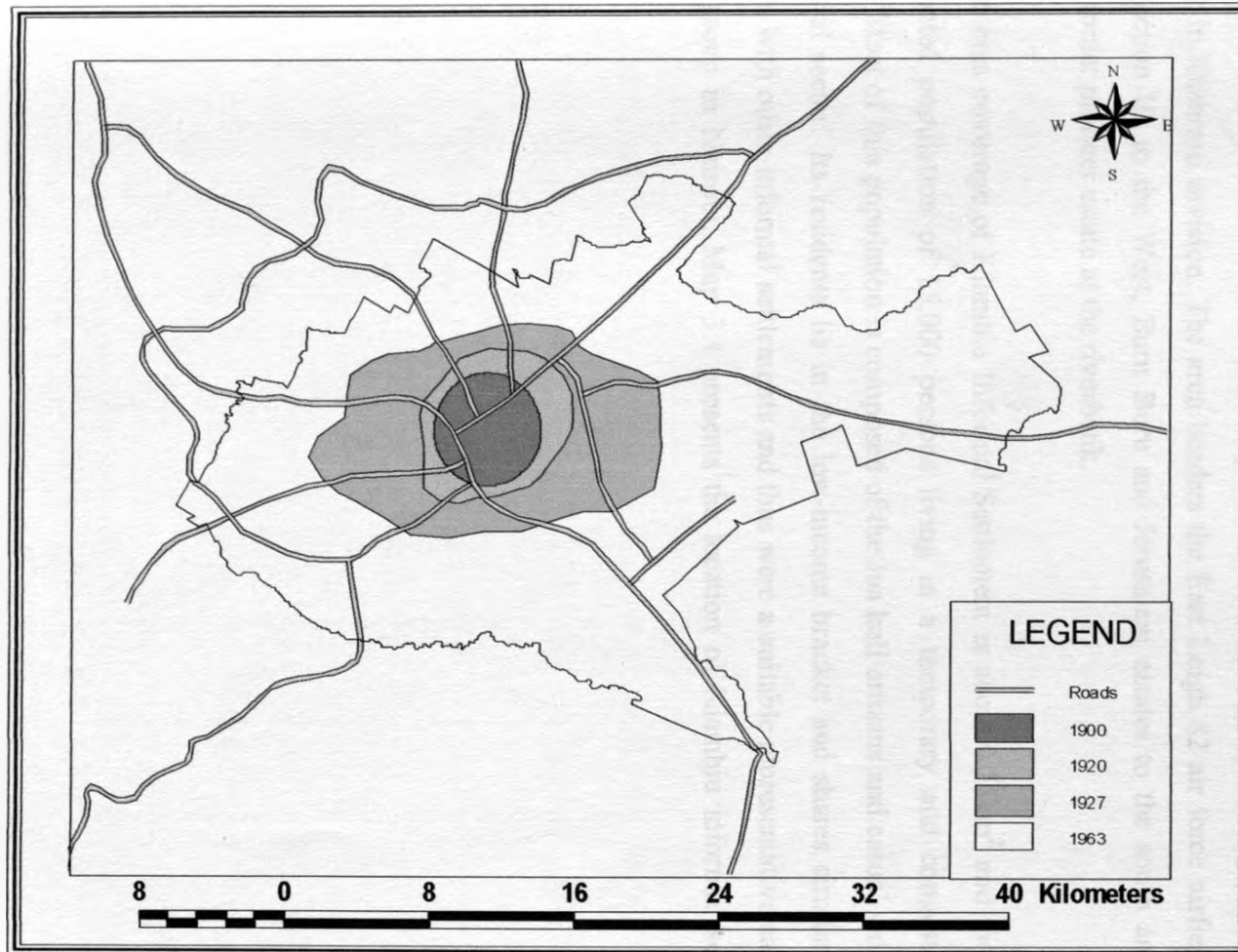
In order to succeed, the latter need take place in large numbers, and therefore is usually a consequence on relocations from the other places. As to the significance of the traditional forms of social organization, they state that in the informal communities where the dwellers have strong connections with their villages of origin, the community problems are handled by a village-based leadership. However, in communities with a heterogeneous urban population, where leadership is not kin-based, they found that the form of social organization remained traditional, based on the influence of the elderly. In particular, they found the leadership in the larger district of El Mounira to be a loosely organized council that met irregularly when there were problems to be discussed. The council tried to resolve conflicts and problems internally, based on a traditional system of conflict-resolution by the elder members of the community.

Despite their need to be represented to the local authorities, informal communities often try to avoid drawing the attention of authorities by seeking official resolution of their problems, because they are illegal. This is one reason why informal communities in Nairobi try to keep their demands to a minimum. Concomitantly, the Kenyan government's reaction to the squatting process has in general been official ignorance. This is true despite the fact that the informal development process is today responsible for some 60 percent of all housing construction in Nairobi.

For the purposes of this study an informal settlement will be defined as a human settlement in the city that has the following characteristics.

- i) A settlement lacking an organized health care services delivery system
- ii) A settlement without basic public social services, including health facilities
- iii) A settlement, whose households due to socio-economic deprivation cannot afford basic public goods and services. The contents of the definition are further expanded under population characteristics, densities and distribution; sanitation and environmental indicators; economic and income characteristics under education and health Indicators.

Map: 3.4. Boundary Changes in Nairobi Since 1900



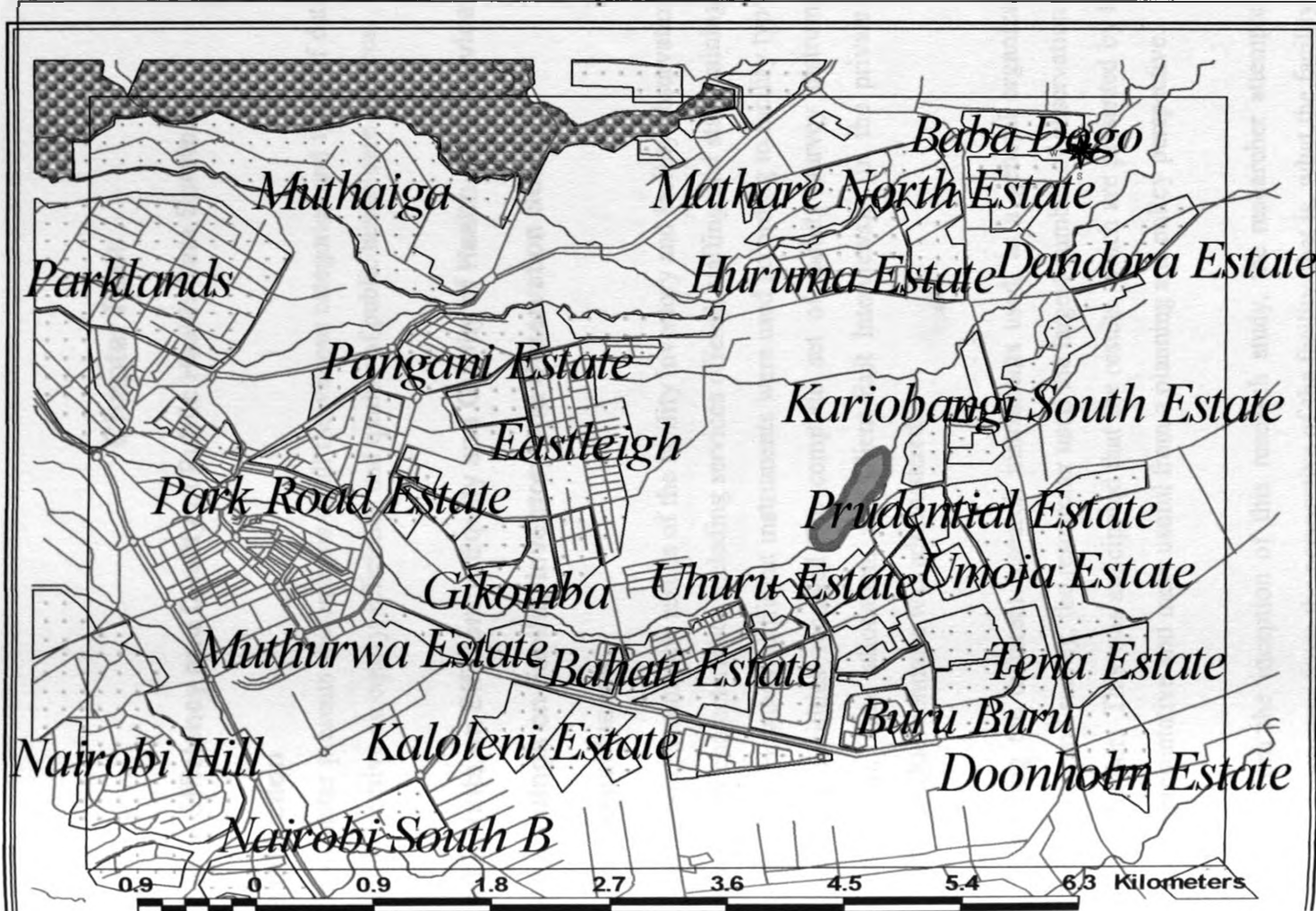
Source: Physical Planning Department 2003

3.6. Kiambiu Informal Settlement

Kiambiu Squatter Settlement in Nairobi is an unplanned settlement located along the banks of the Nairobi River in Kasarani division. The area borders the East Leigh 82 air force airfield to north, East Leigh Section III to the West, Buru Buru and Jerusalem estates to the south and stretches eastwards to border pioneer estate at the riverbank.

The estimated area coverage of Kiambiu Informal Settlement is about 0.25km² and the settlement has an estimated population of 15,000 persons living in a temporary and congested housing environment. Most of this population is composed of the Jua kali artisans and casual workers of the city's industrial sector. Its residents lie in the low-income bracket and shares similar household characteristics with other informal settlements and thus were a suitable representative sample of the low-income group in Nairobi. Map 3.4 presents the location of Kiambiu informal settlement in Nairobi.

MAP 3.5 LOCATION OF STUDY AREA (KIAMBIU)



Chapter Four

Equity, Efficiency and Quality of Public Health Care Services

Introduction

This chapter presents the analysis of all the various categories and types of data collected under the study objective on equity, efficiency and quality of public health care services.

4.0 Results on Efficiency, Equity and Quality of Health Care Services

4.1. Findings on Facility Inventory and Observation Surveys

Conceptual issues

This section presents the results of the facility inventory and facility observation surveys. It presents key facility characteristics including services offered, staffing and staff training, pricing patterns and user – fees. However, different instruments were used according to facility type (Public/Private). All the public facilities received the complete set of facility survey instruments (i.e., Inventory, Observation, Time allocation, and Client-Exit Interviews). In the private facilities, the Short-Inventory Questionnaire was administered.

Considering the different research instruments used, as a general organization principle in this observation and survey, the researcher used the largest number of observations available to estimate each indicator. This was anticipated that the results, which are presented by facility type, would be more representative and more useful from a planning and policy perspective.

Finally, from the inception of this research study, the researcher attempted to define the basic outcome measures from the perspective of the facility, that is, what the facility produces or provides. In other words, the researcher attempted to include the aspects of the facility and service delivery that are potentially within the control of policy makers, spatial planners and those that most influence the quality of, and client's accessibility to health services.

The researcher considered what services were offered and how they were offered, the competence and efficiency of the staff involved. All indicators presented in this section should be viewed in that light.

4.1. Availability Of Health Care Services

Conceptual Issues

A primary interest in this study was to assess the provision of basic health care services, specifically curative, preventive, maternal and child health services. The appropriateness of services was found to be relevant to the quality, equity, efficiency and cost. The number or type of services offered was generally considered a proxy for quality. The extent to which other services were offered is a question of equity. Finally, according to the researcher, the number of services in a particular facility affected both efficiency and cost.

4.1.1. Child Health Care Services

This section presents the level of provision of child health services including immunizations. The study established that most child health services were offered in all public facilities sampled, particularly prenatal care and immunizations. Growth monitoring was the least available service in the public health facilities surveyed; also a lower percentage of private facilities offered child health services. The availability of immunizations and growth monitoring was particularly lower in the private health facilities, particularly in clinics than in all the public facilities surveyed

4.1.2. Preventive Health Care Services

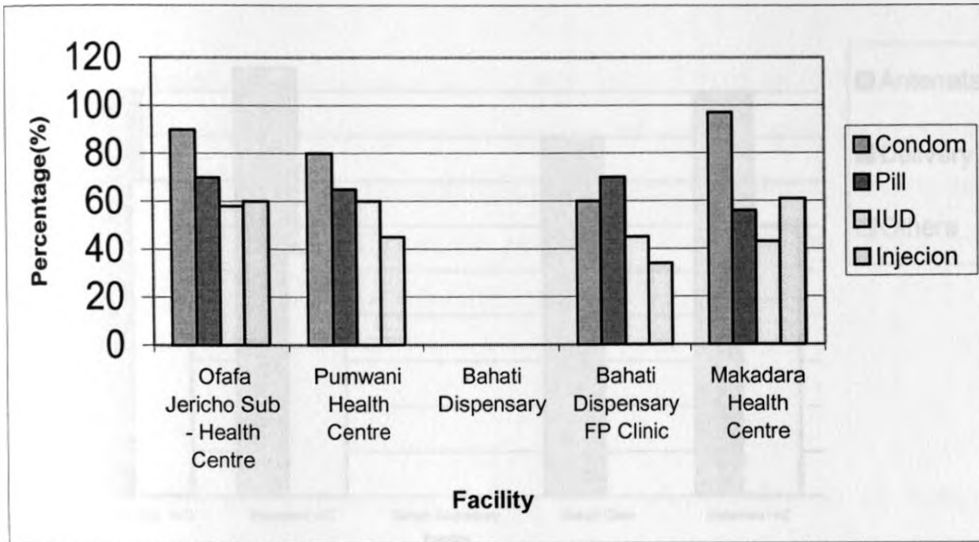
This section presents information on Health Service mostly sought in the public facilities surveyed. The prevalence of certain health care needs defines priority areas in the provision of both personnel and sources towards that health service. It further provides a basis for the identification to target groups and preventive mechanisms to invest into. For example, households with poor provision of sanitary services and with low levels of income may present disease cases as these associate with these conditions. The whole range of curative services for vector borne diseases was offered in all facilities sampled.

4.1.3. Family Planning Services

Availability of Services

The main family planning methods were available at the four public facilities surveyed. However, there were several notable variations in their availability in the sample. Fig. 5.2 shows that the sub-health centres and the health centres offered condoms, pills and intra-uterine services (IUDs). The availability of the three methods was lower in the dispensary and health clinic. IUDs recorded the lowest in the dispensaries, while injections were offered in a larger proportion in the higher hierarchy level facilities. Fig. 4.2 presents availability of FP services by facilities sampled.

Fig .4.2. Availability of Family Planning Services By Facility

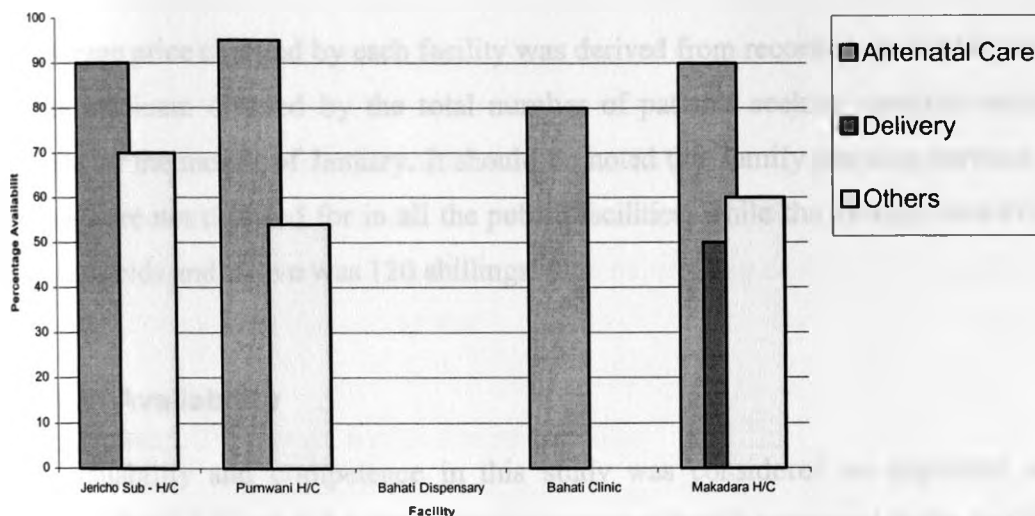


Source: Compiled by the author, 2003

4.1.1. Maternal Health Care Services

The most maternal health services available according to facility type were general prenatal care. However, the dispensary and health clinic offered fewer services than health centres, while the private facilities offered a wider range of maternal services than public dispensaries and clinics. Because they have a limited number of staff and equipment, it is not surprising that dispensaries and clinics offered a narrower range of maternal services. Fig. 4.3 presents maternal health services offered by the facilities sampled.

Fig. 4.3. Availability of Maternal Health Services by Facility



Source: Compiled by the author, 2003

4.2. User Fees

Conceptual Issues

Price is an important aspect of broad service availability and accessibility. The researcher discovered that the amount of fees charged for services offered was important for two reasons. First, amount of fee is directly related to the amount of service consumed through a simple demand relationship, and second, the fee is indirectly important for sustainability reasons through the amount of cost recovery it generated. Everything else being equal, lower fees would reduce the monetary costs of the services to the low – income groups and increase this segment's access to health services. Lower fees, however, were established to increase subsidy burden on the operating

authority (The City Council) because the costs of service remained unchanged for a long time. Fig. 4.5 presents the average charges by both public facilities and private facilities surveyed.

The average price charged by each facility was derived from recorded cases of 6 years old and above seeking medicare divided by the total number of patients seeking curative services from public facilities for the month of January. It should be noted that family planning services and child health services were not charged for in all the public facilities, while the average cost of curative services for 6 year- olds and above was 120 shillings.

4.3. Staff Availability

Staff availability and competence in this study was considered an important aspect of service provision. Table 4.6 and 4.7 summarize the number of health personnel in the facilities surveyed and their training. This information was collected in all the facilities surveyed by the number and type of staff, hours worked and salary information. Table 4.6 presents the total staff available by facility type.

Table. 4.6 Number of Staff Available by Facility Type

Position	Public facilities		Private facilities			
	Jericho H/C	Pumwani H/C	Makadara	Bahati	Hospital	
General Doctors	0	0	0	0	1	1
Pediatricians	0	0	0	0	1	0
Obstetrician	0	0	0	0	0	0
Licensed Nurses	14		20	5	10	6
Auxiliary Nurses	7		5	2	5	2

Source: Compiled by the author, 2003

The differences in the size and capacity of each facility type are clearly represented in this measure of human resources. But unlike previous trends, Jericho sub-health centre were referrals were made to had a significantly lower personnel than the other health centres. All the facilities surveyed did not have any doctor. Licensed nurses primarily staff the facilities.

4.4. Staff Training

Apart from the information on the number and type of health personnel in the facilities, information was also collected on the training that each staff member received. The researcher argues that the distribution of trained personnel has a direct impact on the equity of health and the amount of training each staff received should affect efficiency and quality of service provision. Broad and specific information aspects of training received during in-service and before the time that the staff members were employed at the facility was collected. Fig 5.7 presents information on facilities by staff training in Family planning services provision, treating cases of ARI and diarrhea in children and curative services for those over five.

Fig 4.7. Trained Personnel By Service In Facilities

Facility	Pumwani Health Center				Private Hospital	Private Clinic
Service Trained						
Family Planning	2	3	2	0	4	-
Diarrhea Treatment	5	4	4	2	4	2
Curative (over 6)	8	15	14	4	3	2
ARI	4	2	2	2	1	0

Source: Compiled by the author, 2003

The above table shows that staff trained to offer FP services are quite low. The results suggest a lack of training of auxiliary nurses on family planning services, yet most of the services are offered through the auxiliary nurses. On the other training aspects for which information was collected, Bahati dispensary lagged behind other facility types, yet dispensaries are the majority of health facilities serving the country.

Interestingly, private facilities apparently recorded the lowest number of trained personnel overall. The most common type of training was general curative and the least common was for family planning.

4.5. Group Talks Offered In Facilities

Variables represented in this section were thought of by the researcher as directly related to the quality of services and just as important to potential user as the fact that the service exists. An important aspect of service quality is the quality of information exchanged between health providers and clients. A well-informed user of health services is both more likely to benefit immediately and has a higher probability of using the service in the future. So, the survey collected data about the availability and content of information and educational talks intended to increase the client's awareness of services or health topics offered at facility level. These talks offered in Facilities included general family planning issues and maternal health concerns, child health issues. With exception of Bahati dispensary, all other facilities offered talks in family planning, while child health issues group talks were offered only in Jericho sub-health centre only.

4.6. Results: Service Efficiency

Conceptualization

The economic concept of efficiency describes the manner of how well resources are being used in the production of a good or service. The theoretical concept of efficiency, however, involves two parts.

The first being that given a specific bundle of resources (described by the quantity of each type of input) that the maximum quantity of output that is technically feasible and possible to produce is, in fact produced. The second part requires that given the service of each type of resource, the bundle of resources that is used is the bundle that would require the minimum total expenditure on resources. The two together make up technical efficiency in production. Together they are equivalent to cost-minimizing behaviour by the facility (note that, it is vital to stress that this concept is based on quality of the output being a constant).

As a matter of fact, true economic efficiency in production is an unachievable goal. For the purposes of this research study, what has been considered being of significance is the relative efficiency. That some of the facilities surveyed were more efficient in the production of health care services than others.

The research study concentrated on one dimension of production efficiency, the efficiency of staff-time utilization. This was found critical for a number of reasons; first, staff costs represents a major proportion of total service provision cost. Secondly, research has shown that a major source of variation in relative efficiency across facilities is the result of differences in staff utilization rates. Finally, staff utilization is the easiest of the efficiency concepts to observe, analyze and quantify. It should also be noted that variation in staff- utilization efficiency on staff costs could result from a number of factors including:

- Inappropriate application of various staff categories, for example, provision of services in health facilities with higher paid doctors that could be performed by lower paid nurses.
- Over-staffing facilities relative to the demand for health care services sought.
- Unevenness in the time pattern of demand for services, for example, too many patients at certain time of the day or on certain days (for example Fridays) of the week, too few patients at other times.
- Differences in staff effort-some being lazy, non-committed, or demotivated.
- In excessive demand placed on staff time for administration and other activities unrelated to the production of health care services in facilities.
- Though the above listed factors do represent different underlying causes of these variations, it is vital to recognize that each of these can be affected tremendously by administrative and organizational choices. How staff time is allocated to health care facilities and the different activities within the facility is a choice that the health system can make and adopt and the choices can either lead to higher efficiency or lower efficiency. The same applies to with respect to organizational choices and decisions as staff supervision, facility location in relation to settlement patterns, operating schedules and specific services provided at various types and

hierarchy of facilities. All these decisions and choices may be different under a decentralized organization of health care service delivery.

4.5.1. Approaches

Efficiency measures employed by the researcher were based on the two concepts alluded under conceptualization - average staff productivity and staff utilization rates.

4.5.1.1 Average Staff Productivity

The average productivity measures are simply the total output divided by the total quantity of input used to produce it. So for example, the average staff productivity during a one-month period could be estimated as follows:

$$\text{Average Staff Productivity} = \frac{\text{Total Patients per month}}{\text{Total staff hours per month}}$$

In the above equation, it is seen that average staff productivity is a general measure of the average of patients receiving treatment at the facility per hour of staff time used at the given facility. However, as is the case with cost, resource productivity measures are sensitive to the composition of output produced. Clearly, all else being equal, one would thus expect that a facility that provides nothing but child delivery services, for example in Pumwani Maternity Hospital, which has the highest per unit cost among services rendered by the Nairobi City Council Health Department, would have lower observed staff productivity than a facility; providing only vaccinations, which have the lowest per unit cost.

This research study has, therefore, calculated staff productivity using both the total staff hours as the denominator in equation above and using total hours, less the time devoted to on-call services provision. The first calculation gives an indication of the average number of patients seen per staff hour, while the second equation will give an indication of the average number of patients seen per staff hour by staff employed during normal hours of facility operation.

4.5.1.2. Staff- Utilization Rate by Staff Type

Staff-utilization Rates were employed by the researcher to measure the degree to which staff time was used in the production of health care services relative to staff "down time".

For each of the basic health services surveyed, the average time per patient contact was constructed using data obtained from the time allocation observation logs. Staff utilization rates were thus constructed for each staff type.

An average time requirement (y) was estimated for each type of service (i), for each staff type (j), in each facility (n) as indicated in the equation below.

Y, i, j, n = Average time spent on service (i) by staff type (j) at facility n .

By multiplying the average time spent by a staff member providing a certain service (y, i, j, n) by the total quantity (Q) of the services delivered, the researcher obtained the total amount of staff time devoted to each type of service activity. This relationship is presented in the equation below.

$T_{i, j, n} = y_{i, j, n}, Q_{i, j, n}$

Where;

$T_{i, j, n}$ is the total time spent providing service (i) by staff type (j) at facility (n)

$Y_{i, j, n}$ is the average time spent providing service (i) by staff type (j) at facility (n)

$Q_{i, j, n}$, is the total quantity of service (i) provided by staff type (j) at facility (n)

The total amount of staff time (T) for a specific type of staff that was required to produce the entire mix of services at the facility was obtained by adding up $t_{i, j, n}$ across all the services as provided in the equation below.

$$T_{j, n} = \sum_i t_{i, j, n}$$

$$\square t_{i, j, n}$$

Where

$T_{j, n}$ represents the total amount of time by staff type (j) that is required to provide all the services provided by that staff type at facility (n)

The staff utilization Rate (SUR) simply was regarded as the total staff time required to provide the package of services at a facility ($T_{j, n}$) divided by the total amount of time of staff j , which is employed by the facility. This relationship is shown by the equation below.

$$SUR_{j, n} = \frac{T_{j, n}}{S_{j, n}}$$

$$S_{j, n}$$

Where

$SUR_{j, n}$ is the Staff Utilization Rate for staff type j at facility n

$T_{j, n}$ is the total amount of time of staff type j required to provide all the services provided by that staff type at facility n .

$S_{j, n}$ is the total amount of staff time for staff type j that is employed by facility n .

The SUR by staff type served as a good measure because of cross-facility efficiency. A value of 1 for $SUR_{j, n}$ would, therefore, indicate that at facility n , staff type j was spending 100% of their time in patient contact. The difference of $1 - SUR_{j, n}$ is an estimate of the proportion of "down time" by staff type j , - The total amount of staff time used in the calculation $S_{j, i}$. Could either be measured as the total hours employed at the facility or the total amount employed during normal hours of operation.

4.5.1.3. Staff Utilization Rates by Facility

Though the researcher could have aggregated staff utilization rates across the different types of staff at the same facility to get an overall rate of staff utilization, this would not have taken into account the discrepancies in cost of different types of staff. That is for example, a relatively under utilized doctor is more expensive than an under utilized nurse because the doctors salary is greater.

The final measure of efficiency the researcher employed was the ratio of total labour costs to total incremental labour costs (the total staff utilization rate). Incremental labour costs in this study can be defined as the direct cost of the patient contact ignoring all the "down time" Thus the total incremental cost (*TIC*) for all services provided by a given facility surveyed during a specified time period is given in the equation below.

$$TIC_n = \sum_{j=1}^j \sum_{i=1}^i W_{j,n} Y_{i,j,n} - \sum_{j=1}^j \sum_{i=1}^i W_{j,n} Q_{i,j,n}$$

Where,

TIC_n is the total incremental costs for all services provided at facility *n*.

W_{j,n} is the wage rate for staff type *j* at facility *n*.

Y_{i,j,n} is the total quantity of service *i* provided by staff type *j* at facility *n*

Q_{i,j,n} is the total quantity of service *i* provided by staff type *j* at facility *n*

The researcher therefore, calculated the SUR for each facility as

$$SUR_n = \frac{TIC_n}{TSC_n}$$

Where *TSC_n* is the total medical staff cost at facility *n*, which for the purposes of this study was defined as the basic medical staff cost allocated to service *i* at facility *n*.

$$TSC_n = \sum_j w_j \text{Hours } j, n$$

$j=1$

The Total Staff Cost (*TSC*) was calculated as the total staff cost at the facility rather than the total cost of staff during normal hours of operation.

4.6. Results and Findings

4.6.1. Average Staff Productivity

This provided a measure of the number of patients the staff members attended to, on an average, in a one-hour period. Though not a very good measure of staff efficiency as it does not take into account the fact that patients seeking different services placed widely different demands on staff time. It should be further understood that in this study, that the average staff productivity measure was not a direct measure of the length of time that a staff member spend with patient. The measure was however anticipated by the researcher to provide for a good descriptive overview of staff- patient contacts. The average staff productivity measures were constructed for each of the two main types of basic staff in the four public facilities surveyed as shown in table 4.8.

Table .4.8. Average Staff Productivity By Facility

Facility	Number of Patients	Number of Auxiliary and Registered Nurses	Average Productivity Staff
Bahati Dispensary	822	7	0.56
Jericho Sub health Center	4098	21	0.81
Pumwani health Center	8879	9	6.10
Makadara Health Center	821	25	0.16
Total	14620	55	1.28

Source: Compiled by the author, 2003

Generally then, the above table shows that public facility staff is under utilized. Overall, Makadara health centre, which had the highest number of both auxiliary and community nurses recorded the lowest average staff productivity rate of 0.16 patient per staff hour, while Pumwani had the highest average staff productivity rate of 6 patients per hour by staff. This scenario indicates that public

facilities staff hours are poorly utilized. This generally is as a result of both the perceived low quality of services and their location in relation to the emerging settlement patterns in the city.

Overall, across the facilities sampled, the average staff productivity was approximately 1 patient per staff hour

4.6.2. Staff Utilization Rates (SUR)

Total and staff- specific utilization rates were calculated by facility and are represented in table 4.9. The staff utilization rates are represented as a ratio of the total amount that would have been paid to staff if they had been paid *ONLY* for the patient contact hours to the total amount the staff was actually paid.

Table: 4.9. Staff Utilization Rates By Facility And Staff Type

Facility	Number of Patients	Number of auxiliary Nurses	Number of Community Nurses	Staff Utilization Rates	
				Auxiliary Nurse	Community Nurse
<i>Bahati Dispensary</i>	822	2	5		
<i>Makadara Health Center</i>	4098	5	20		
<i>Jericho Sub – Health</i>	8879	7	14		
<i>Pumwani Health Centre</i>	821	4	5		
Total	14620	21	44		

Source: Compiled by the author, 2003

4.8. Results: Client Perspectives On Service Quality

This section of the study presents the results of the client-exit interview survey module. Information here was collected by the researcher through the client-exit questionnaire schedule, shown in the Appendix under Questionnaire schedule D which was administered to a total of 60 clients of public facilities located in Division 1 of the Nairobi City Council Health jurisdiction division and where residents of Kiambiu Informal settlement mostly sought health care services.

The information from the client - exit survey was found most useful when considering both objective and subjective requirements for spatial health infrastructure planning guidelines. Most of the questions in the interviews involved client description and assessment of aspects of the service that were directly related to the quality in the facilities surveyed, for example waiting times. The information and indicators in this section present the client perspective, which can complement the findings of the facility inventory.

This section is further divided into two parts. This being a description of the socio-economic and demographic characteristics of public facility clients and their perceptions of quality as measured using a number of indicators alluded in the methodology section. The second part analyses the same characteristics and perceptions for the clients of private facilities. The results are presented by health facility type and name.

4.8.1. Characteristics of Public Facility Clients

Table 4.10 presents the socio- economic and demographic characteristics of clients who attended the public facilities sampled. The Information provided a profile of the typical client of public facilities.

Table 4.10. Socio-Demographic Characteristics of Typical Public Facility Client

Respondents Age				
	Frequency	Percent	Valid Percent	Cumulative Percent
5-9	1	1.7	1.7	1.7
15- 19	1	1.7	1.7	3.3
20- 24	5	8.3	8.3	11.7
25- 29	16	26.7	26.7	38.3
30- 34	24	40.0	40.0	78.3
35- 39	12	20.0	20.0	98.3
40 and Above	1	1.7	1.7	100.0
Total	60	100.0	100.0	

Marital Status				
	Frequency	Percent	Valid Percent	Cumulative Percent
Single	17	28.3	28.3	28.3
Married	43	71.7	71.7	100.0
Total	60	100.0	100.0	

Education Level				
	Frequency	Percent	Valid Percent	Cumulative Percent
Primary Education	15	25.0	25.0	25.0
Secondary Education	43	71.7	71.7	96.7
Tertiary Education	2	3.3	3.3	100.0
Total	60	100.0	100.0	

Respondents Age				
	Frequency	Percent	Valid Percent	Cumulative Percent
5-9	1	1.7	1.7	1.7
15- 19	1	1.7	1.7	3.3
20- 24	5	8.3	8.3	11.7
25- 29	16	26.7	26.7	38.3
30- 34	24	40.0	40.0	78.3
35- 39	12	20.0	20.0	98.3
40 and Above	1	1.7	1.7	100.0
Total	60	100.0	100.0	

Employment				
	Frequency	Percent	Valid Percent	Cumulative Percent
Formal	10	16.7	16.7	16.7
Informal	13	21.7	21.7	38.3
Unemployed	2	3.3	3.3	41.7
Casual	12	20.0	20.0	61.7
Household Work	23	38.3	38.3	100.0
Total	60	100.0	100.0	

Respondents Income				
	Frequency	Percent	Valid Percent	Cumulative Percent
Less Than 1500	26	43.3	43.3	43.3
1500-3000	19	31.7	31.7	75.0
3001- 5000	6	10.0	10.0	85.0
5001- 7000	4	6.7	6.7	91.7
Over 7000	5	8.3	8.3	100.0

Total	60	100.0	100.0
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Source: Compiled by the author, 2003

4.9. Results: Equity Indicators and other client characteristics

Conceptual Framework

A common objective in health service infrastructure planning and delivery is the establishment of a health system in which all citizens have easy and equal access to health care services on the basis of their needs. Although the objective of social equity is desirable, its achievements in all its dimensions are complex. This part of study provides an approach on the analysis of equity in public health system in the four health facilities (Jericho Sub-Health Centre, Makadara Health Centre, Pumwani Health Centre and Bahati Dispensary) surveyed using mainly the client - exit responses.

First, two facets of equity in health care emerged and need be differentiated. One, equity in the utilization of health care resources and two, equity in healthcare financing. Equity in the utilization of health care resources and services in this study was examined through whether clients with similar needs received equal treatment irrespective of socio-demographic determinants of the health care service use – that is – sex, education levels, area of residence, etc. It was noted by the researcher that differences in the level of health service utilization by income level is poorly understood as inequity in the health sectors. Income differences should be understood as involving a different use of resources given that medicare is a normal good in the economic sense (meaning that a person with higher income level will consume more of it). So the researcher found it necessary to examine whether individuals with related similar health care needs received equal treatment after controlling for differences in incomes.

As provided for in the background of this study, one other key aspect of equity is the extent to which public resources are directed towards the low – income groups. In this analysis, the researcher found

it acceptable to evaluate whether this group made intensive use of the public health care facilities when they become ill. Consideration was given that if the low – income groups did not make use of the public health facilities, then problems associated with accessibility to health care, its quality and economic mitigators that restrain access should be focused on.

In terms of equity in the financing of health, it was established to imply that wealthier individuals should contribute more to the system than the low – income group or that an individual's contribution to the system should be consistent with their ability to pay. An additional aspect in this analysis of equity led to the discovery that whether individuals who paid taxes, which are then allocated to health services, used the service to which they contributed.

It would be inequitable if the individuals who paid taxes to finance the health care system did not make use of them or were utilized primarily by others. Information and data collected under the client exit interview schedule permitted this analysis of equity in health care infrastructure planning.

4.9.1. Equity In The Utilization Of Health Services

Most of the analysis in this section is descriptive in nature. In this descriptive analysis of the determinants of health service utilization among the different client groups, elements of travel time to health care source, transportation costs, distance to health care facility, household economic level and client income levels were employed.

4.9.2. Distance to Health Care Facility %

More than 82% of clients reported living within 2 kilometers of the public health facility where they sought care (Table 4.11). Public facilities, therefore, served primarily individuals who lived in close geographic proximity. In terms of efficiency in spatial planning then, the use of facilities by those

who live close by could have advantages given that individuals who live in proximity may be the principal users of the public health network.

By using the client exit survey, however it cannot be exclusively concluded that distance was a factor in the utilization of public facilities. It is plausible from the household analysis that a majority of individuals who become ill and who did not seek care did not because they lived far away from a health facility.

Roughly then, 90% of clients reported having to travel less than 30 minutes to reach their source of care. This finding is not surprising given that a majority of clients (about 82%) lived within 2 kilometers of their source of health care. The average cost of travel to source of care was 40 shillings.

Table: 4.11. Travel Distance To Source of Health Services

	Frequency	Percent	Valid Percent	Cumulative Percent
Less Than 1 Kilometers	23	38.3	38.3	38.3
1- 2 Kilometers	29	48.3	48.3	86.7
Over 2 Kilometers	8	13.3	13.3	100.0
Total	60	100.0	100.0	

Source: Compiled by the author, 2003

4.9.3. Public Health Facility Client Socio-Economic Status and Income

Tables 4.12 presents the social and demographic characteristics of clients who attended the four public facilities surveyed, while Table 4.10 presents the social demographic characteristic of public facility clients. Public facility clients were predominantly females with an average of 30 years and married. Two-thirds of the clients reported having attained only an elementary level of education, which was reflected in the generally low levels of reported family income (1500 – 3000 Kshs.) monthly. In addition only 23% of the clients reported either being in formal (10%) or informal (13%) employment while 75% reported having no health insurance (social security or private insurance).

Tables: 4.12. Public Facility Clients Socio-Economic Characteristics on Age's, Education Levels, Monthly Incomes and Insurance Status

Age				
	Frequency	Percent	Valid Percent	Cumulative Percent
5-9	1	1.7	1.7	1.7
15- 19	1	1.7	1.7	3.3
20- 24	5	8.3	8.3	11.7
25- 29	16	26.7	26.7	38.3
30- 34	24	40.0	40.0	78.3
35- 39	12	20.0	20.0	98.3
40 and Above	1	1.7	1.7	100.0
Total	60	100.0	100.0	

Marital Status				
	Frequency	Percent	Valid Percent	Cumulative Percent
Single	17	28.3	28.3	28.3
Married	43	71.7	71.7	100.0
Total	60	100.0	100.0	

Education Level				
	Frequency	Percent	Valid Percent	Cumulative Percent
Primary Education	15	25.0	25.0	25.0
Secondary Education	43	71.7	71.7	96.7
Tertiary Education	2	3.3	3.3	100.0
Total	60	100.0	100.0	

Employment				
	Frequency	Percent	Valid Percent	Cumulative Percent
Formal	10	16.7	16.7	16.7
Informal	13	21.7	21.7	38.3
Unemployed	2	3.3	3.3	41.7
Casual	12	20.0	20.0	61.7
Household Work	23	38.3	38.3	100.0
Total	60	100.0	100.0	

Source: Compiled by the author, 2003

4.9.3.1. Monthly Income and Household Wealth Level

Among public facility clients, the distribution of their monthly income portrays a picture of typical public facility client and income level. Results indicate that 73% of public facility clients were from the poorest households quintile, 20.4% per cent from household quintile II, while the wealthiest quintile (III) accounted for only 6.6%.

The findings indicate that the poorest individuals used public facilities most intensively, while 93% of private facility clients were from the richest household quintile compared to 21% among the poorest. In terms of the relationship between individual income and total payment for health services, a small positive correlation (0.201) between the two variables was noted. An indication that the level of monthly income level had no effect on the amount paid by clients for health services. This means that the poor as well as the wealthy paid similar amount for health services. This indicates inequity in the public health system.

Table: 4.13. Monthly Incomes of Public Facility Clients

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Less Than 1500	26	43.3	43.3	43.3
1500-3000	19	31.7	31.7	75.0
3001- 5000	6	10.0	10.0	85.0
5001- 7000	4	6.7	6.7	91.7
Over 7000	5	8.3	8.3	100.0
Total	60	100.0	100.0	

Source: Compiled by the author, 2003

4.9.3.2 Health Insurance Status

Insurance coverage is a factor that greatly influence's health service use. In the study 75 % of clients reported that they had no health insurance cover, while all the four public facilities sampled in the study were utilized by clients who mainly had no insurance coverage.

Table: 4.14. Insurance Status Of The Typical Public Facility Client

	Frequency	Percent	Valid Percent	Cumulative Percent
None	45	75.0	75.0	75.0
Prepaid	2	3.3	3.3	78.3
Company / Insurance	2	3.3	3.3	81.7
Social Security	11	18.3	18.3	100.0
Total	60	100.0	100.0	

Source: Compiled by the author, 2003

By facilities, the highest level of education was reported in Pumwani, probably due to the thriving "mitumba" business, which attracts unemployed university graduates. Pumwani facility clients also reported the highest average income (5240 Kshs.) while Jericho sub-health centre had the highest proportion of those with health insurance (8.3%), facts which reflect its location relative to the Buru Buru higher income group who made limited use of public health facilities.

Table: 4.15. Education and Income Levels of Public Facility Clients By Facility

		Education Level			Total		
Facility Name		Primary Education	Secondary Education	Tertiary Education			
	Pumwani	1	17	2	20		
	Makadara	5	7		12		
	Bahati	3	1		4		
	Jericho	5	14		19		
	Private Facility	1	4		5		
Total		15	43	2	60		
Income							
		Less Than 1500	1500-3000	3001- 5000	5001- 7000	Over 7000	Total
Facility Name							
	Pumwani	4	8	6	5		20
	Makadara	6	3	1		2	12
	Bahati	1	2	1			4
	Jericho	11	7	1			19
	Private Facility				2	3	5
Total		26	18	9	5	5	60
Health Insurance							
		Health Insurance			Total		
Facility Name		None	Prepaid	Company / Insurance	Social Security		
	Pumwani	17			3	20	
	Makadara	9			3	12	
	Bahati	4				4	
	Jericho	14			5	19	
	Private Facility	1	2	2		5	
Total		45	2	2	11	60	

Source: Compiled by the author, 2003

4.9.3.3. Client Area of Residence

The objective of this analysis was to compare the settlement type (formal or informal) and the utilization of public facilities, their health insurance status and income levels.

By settlement type, 24.7% of the clients were from the informal settlements, and reported having traveled a distance of over 2 kilometers to reach their source of care. Table 7.6 presents public clients place of residence, while table 7.7 presents their travel time to reach a public health facility by place of residence.

Table: 4.16. Public Facility Clients By Place of Residence and Facility Health Care Sought

Area of Residence	Pumwani	Makadara	Bahati	Jericho	Private Facility	
Majengo	9			1		10
Pumwani	7			1		8
Biafra	4					4
Eastleigh		1	3	6	1	11
Makadara		2		2		4
Maringo				1		1
Buru Buru		2		6	3	11
Lunga Lunga		2				2
Pipeline		3				3
Bahati			1			1
Jericho		2		2	1	5
Total	20	12	4	19	5	60

Source: Compiled by the author, 2003

Table: 4.17. Public Facility Clients By area of Residence and Travel Distance to Source of Care

Area of Residence	Less Than Kilometer	11- 2 Kilometers	Over 2 Kilometers	
Majengo	1	7	2	10
Pumwani	3	4	1	8
Biafra	3	1		4
Eastleigh	6	5		11
Makadara		3	1	4
Maringo	1			1
Buru Buru	3	6	2	11
Lunga Lunga			2	2
Pipeline			3	3
Bahati	1			1
Jericho	5			5
Total	22	26	11	60

Source: Compiled by the author, 2003

By income levels and settlement type, public facilities clients from the informal settlements reported having an average monthly income of Kshs. 2,300. By insurance status only 1.2% of clients from the informal settlement had social security insurance. By household quintile, only 6.7% of wealthier clients used public facilities as source of care.

4.9.4. Summary

A majority of clients who attended public health facilities, were from the poorest sector of the population (73 %), of these clients 59 % were from the informal settlements surrounding the planned (formal) settlements as shown in Map 4.1.

Nevertheless, 6.6% of clients came from households in the wealthiest quintile. Findings in this section thus indicate that public health facilities were not exclusively used by the low-income individuals, but also for individuals who had a greater capacity to pay for their own care. A majority of clients paid no, or a small charge for medical services sought at public facilities. The pattern of utilization of these facilities and health expenses indicate a level of regressiveness in the allocation of public facilities in relation to the changing settlement patterns.

There were also no marked differences in the pattern of health expenses by age for those over 6 years or by sex. Almost all clients who attended public facilities reported no insurance coverage. On the basis of client responses, it was observed that distance and travel time to source of care affected use of medical care. This is consistent by the fact that only 53 % of individuals living in informal settlements traveled more than 2 kilometers to access a public health facility. Further on this aspect it was observed that a majority of clients who used public facilities resided near their location. This provides a strong pointer for the need for judicial spatial planning in the distribution and redistribution of public facilities in relation to changing settlement patterns in Nairobi and on the basis of equity, efficiency and quality of services. Subsequently, planning guidelines presented in the next chapter are based on these findings.

4.10. Basic Indicators of Quality in Public Facilities

According to the research survey results, the principle reasons for medical visits were medical consultations and child health services. Public health clients for all types of visits were requested to comment on the general characteristics of the facility and about their experiences during the visit. Among other things, clients were asked about the convenience of facility operating hours waiting times for different services and their general satisfaction with services received.

4.10.1. Convenience of Hours of Operation

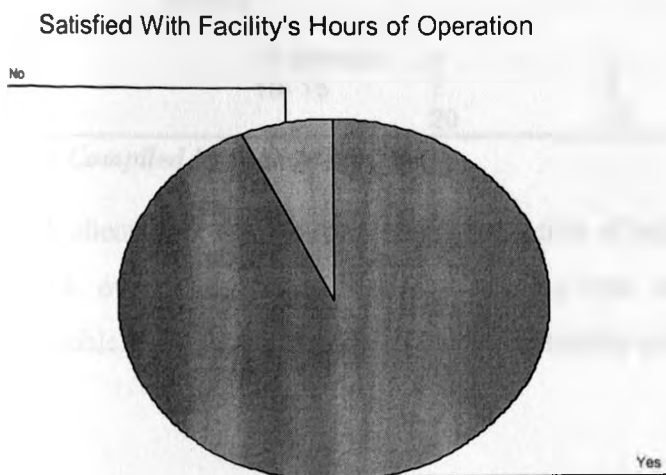
In all the facilities sampled, clients reported a high level of satisfaction with the hours of operation of public health facilities (93 %) as indicated by Table 4.18, and figure 4.19.

Table: 4.18. Client Satisfaction With Facilities Hours of Operation

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	56	93.3	93.3	93.3
No	4	6.7	6.7	100.0
Total	60	100.0	100.0	

Source: Compiled by the author, 2003

Figure: 4.19. Client Satisfaction With Facilities Hours of Operation



Source: Compiled by the author, 2003

Table: 4.22. Public Clients Satisfaction With Duration Of Wait in Minutes to Receive Attention

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	44	73.3	73.3	73.3
No	16	26.7	26.7	100.0
Total	60	100.0	100.0	

Source: Compiled by the author, 2003

Table: 4.23. Clients Satisfaction With Waiting Times By Facility

	Facility Name					Total	
	Pumwani	Makadara	Bahati	Jericho	Private Facility		
Satisfaction With Waiting Duration	Yes	15	9	3	12	5	44
	No	5	3	1	7		16
Total		20	12	4	19	5	60

Source: Compiled by the author, 2003

4.10.3. Availability of medicines

As shown in table 4.24, 30 % of clients reported that the necessary medications were not available at the time of their appointment. By health services sought, the highest proportion of clients reporting inadequate medical supplies were those who sought health care services for illness among 5 – year olds and Malaria treatment. These were some of the services with the longest reported waiting times, indicating a high demand for the services, which may cause stock-out of medicines. The results are shown in table 4.24. Table 4.25 presents clients perception of the availability of medicine in public health facilities.

Table: 4.24. Condition Health Care Sought for Availability

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	42	70.0	70.0	70.0
No	18	30.0	30.0	100.0
Total	60	100.0	100.0	

Source: Compiled by the author, 2003

Table: 4.25. Availability of Services Sought for By Condition In Public health Facilities

		PreNatal Services	Post Natal Services	Diarrhea	Malaria	Typhoid	ARI	Family Planning F/P)	Illness (Among Less than 5 Year olds	Others	Total
Condition	Yes	2	2		11	5	2	5	13	2	42
Health Care Sought for Available	No	1	3	1	1	1	5		4	2	18
Total		3	5	1	12	6	7	5	17	4	60

Source: Compiled by the author, 2003

4.10.4. Willingness to Return to Facility

76.7 % of clients surveyed stated that they would return to the same facility to seek medical care. Nonetheless, it is crucial to note that such high levels of satisfaction might be explained by the lack of alternatives for health care services to the public facility clients interviewed. Table 4.26 presents percentages on the willingness to return to public health facilities to seek health care services.

Table: 4.26. Public Facility Clients Willingness to Return to Facility for Services

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	46	76.7	76.7	76.7
No	14	23.3	23.3	100.0
Total	60	100.0	100.0	

Source: Compiled by the author, 2003

4.11. Summary of findings of the client-exit Interview

Overall clients/patients attending public health facilities in the four facilities sampled reported a high level of satisfaction with facility and service features. Generally, the hours of operation of the facilities seemed convenient to public facility clients. However, clients waited for a long time to receive medical attention, and dissatisfaction increased with the length of waiting time. Despite the positive opinion of clients, a considerable number of clients considered the reason for their visit to be unresolved (27 %).

4.12. Results of the Household Survey

This section of the study presents findings of the household survey. An analysis of health seeking behavior, choice of facility, economic determinants of health care source and factors affecting choice of provider.

4.12.1. Household Utilization Patterns Of Public Facilities Among Less Than Five Year Olds

4.12.1.1. Post – Natal Care

4.12.1.1.1. Use of Post – Natal Care

In both Kiambiu informal settlement and Pioneer estate, 73 % of the children born in the five years preceding survey received postnatal care, and over 50% of the children received postnatal care within 7 to 14 days after delivery. Overall 51% of the children were reported healthy at their first postnatal visit. In Kiambiu, however, over 50 % of children were reported to be ill at the first check up.

Table: 4.27. Percentage Number of Children who Received Postnatal Care

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	44	73.3	73.3	73.3
No	16	26.7	26.7	100.0
Total	60	100.0	100.0	

Source: Compiled by the author, 2003

Table: 4.28. . Number of Children Who Received Post Natal Care By Household Wealth Quintile

		Household Quintile			Total
		Quintile 1	Quintile 2	Quintile 3	
Health Status of Infant as at First Visit	Sick	12	6		18
	Healthy	12	10	9	31
Total		24	16	9	49

Source: Compiled by the author,2003

Among all household economic levels, more than 73 % of the children received postnatal care. Children in the poorest wealth quintile (quintile 1), roughly 50 % received no postnatal care, while almost all children in the wealthiest quintile received care (79%) About 50 % of children from the poorest households were ill at their first postnatal visit compared to 27% children from the wealthiest quintile.

Overall, a majority (69%) of the children of the poorest households received care from public facilities compared to 11 % of the wealthiest households. A majority of women sought care in public facilities for their post-natal care, while a large portion (99 %) of women in the wealthiest households used private facilities.

Table: 4.29. Number of Days Between Birth and First Visit for Postnatal Care

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	7	5	8.3	10.2	10.2
	4	21	35.0	42.9	53.1
	14	4	6.7	8.2	61.2
	6	13	21.7	26.5	87.8
	21	5	8.3	10.2	98.0
	30	1	1.7	2.0	100.0
	Total	49	81.7	100.0	
	System	11	18.3		
Total		60	100.0		

Source: Compiled by the author,2003

4.12.1.1.2. Economic Determinants of use of Post-Natal services

61 % of individuals who sought postnatal care, their source was within 20 minutes of traveling time. Kiambiu households reported higher travel times while Pioneer households reported lower travel times. The average travel time for Kiambiu households was 30 minutes, while that of Pioneer estate was 10 minutes. Table. 4.30 present the frequency distribution of travel minutes by Kiambiu households.

Table: 4.30. Travel Minutes to Facility

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20	17	28.3	37.8	37.8
	10	16	26.7	35.6	73.3
	30	9	15.0	20.0	93.3
	15	3	5.0	6.7	100.0
	Total	45	75.0	100.0	
System	15	25.0			
Total	60	100.0			

Source: Compiled by the author,2003

By household qualities, transport costs were paid more by the poorest households. Only 43% paid no transport costs. Compared to individuals in the wealthiest quintile, those in the poorest quintile spent more time and money to travel to their source of postnatal care.

In terms of direct cost of postnatal care services, table 4.31 shows that about 38% of individuals paid no charge for services they received. By household quintile, the wealthiest paid an average of 1500 Kshs., while the poorest paid an average of 36 Kshs. for postnatal care. This was due to the fact that the majority of the wealthiest household quintile made intensive use of private health care facilities.

Table: 4.31. Amount Paid for Postnatal Services in Public Health Facilities

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	250	3	5.0	10.0
Free	11	18.3	36.7	46.7
170	16	26.7	53.3	100.0
Total	30	50.0	100.0	
	30	50.0		
Total	60	100.0		

Source: Compiled by the author, 2003

4.12.1.2. Immunization

The immunization findings in this subsection refer to immunization of children aged less than 5 years old during the six-month period preceding survey.

4.12.1.2.1. Utilization Patterns

46 % of children under 5 years received no immunization during the six months preceding survey. The proportion of children who received an immunization as well as the proportion by type of immunization was different among the three household quintiles. Table. 4.32 presents percentage number of children who received immunization six months preceding survey.

Table: 4.32. Percentage Number of Child Who Received Vaccination in the Last Six Months in The households Surveyed

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	27	45.0	46.6	46.6
No	31	51.7	53.4	100.0
Total	58	96.7	100.0	
	2	3.3		
Total	60	100.0		

Source: Compiled by the author, 2003

By level of wealth (quintile) there was a marked difference in the proportion of wealthy children who received immunization and the proportion of the poorest who did.

Overall, the majority of the poorest households (Kiambu) sought immunization for their children less than 5 years of age in public facilities (87.5%) compared to the healthiest quintile who accounted for 91 % of those who sought immunization services at private facilities.

Table: 4.33. Vaccination Source By Household Quintile

	Household Quintile	Vaccination Source					Total
		Jericho	Mobile Clinic	Makadara	Bahati	Private Facility	
	Quintile 1	7	1	5	1	2	16
	Quintile 2	4		4	1	3	12
	Quintile 3	1		1		9	11
Total		12	1	12	2	10	36

Source: Compiled by the author, 2003

4.12.1.2.2. Economic Determinants of Immunization Utilization

Overall, the average travel time to reach an immunization site was 20 minutes. The poorest quintile traveled an average of 30 minutes to reach an immunization site compared to 20 minutes in the wealthiest quintile. By travel cost to immunization site, the poorest households paid an average of 40 Kshs., compared to the wealthiest quintile, which paid an average of 20 Kshs. to reach an immunization site. The wealthiest quintile tended to use private clinics located within their settlements.

By household quintile 84 % of the poorest quintile paid no charge for immunization services, while 6.25 % of the wealthiest quintile paid no charge.

Given that a higher population of the wealthiest quintile obtained their immunization from private facilities, a higher proportion (93.75%) of those in the wealthiest quintile paid over 500 Kshs.

4.12.1.3. Childhood Diseases

4.12.1.3.1. Diarrhea

4.12.1.3.2. Prevalence of Diarrhea

Overall, in the two settlements surveyed 23 % of children experienced at least one episode of diarrhea in the one month preceding survey. 32 % diarrhea cases stated that the condition was the most severe health problem among 5 years olds and less, but this proportion ranged from a low of 6 % in Pioneer Estate to 28 % in Kiambiu informal settlement.

Table: 4.34. Percentage Number of Most Prevalent Childhood Diseases

	Frequency	Percent	Valid Percent	Cumulative Percent
Diarrhea	7	11.7	23.3	23.3
ARI	23	38.3	76.7	100.0
Total	30	50.0	100.0	
	30	50.0		
Total	60	100.0		

Source: Compiled by the author, 2003

Diarrhea prevalence was highest among children from the poorest household quintile and lowest among the wealthiest quintile children.

4.12.1.3.2. Care Seeking Behavior

The proportion that sought care outside of the household were lowest in Kiambiu informal settlement and highest in Pioneer Estate. The study established a substantial difference in care-seeking behavior between the poorest and wealthiest quintile groups. 86 % sought of the diarrhea cases in the wealthiest quintile sought attention outside home, compared to only 76 % among those in the poorest quintile.

Table: 4.35. Household Quintile By Treatment Action Sought for Diarrhea

		Treatment Action Sought for Diarrhea		Total
		Out- of- home	In- home	
Household Quintile	Quintile 1	14	4	18
	Quintile 2	6	1	7
Total		20		525

Source: Compiled by the author,2003

Of the wealthiest quintile group majority of them (93 %) sought outside care in private facilities, while 70 % of the poorest quintile made use of the public facilities. Among the poorest household quintile, a majority of individuals who sought outside care cited the cost of services (14.3 %) and distance (71%) as key factors in their choice of provider, while the wealthiest quintile group cited insurance requirement as the key factor of choice of provider.

Table: 4.36. Household Quintile By Treatment Action Sought for Diarrhea and Medicare Facility Diarrhea Treatment Sought

			Treatment Action Sought for Diarrhea		Total
			Out- of- home	In- home	
Medicare Facility for Diarrhea Treatment Private	Household Quintile	Quintile 1	3	7	11
		Quintile 2	7	4	11
		Total	10	11	22
Public	Household Quintile	Quintile 1	7		7
		Quintile 2	3		3
		Total	10		10

Source: Compiled by the author,2003

For the poorest quintile, distance was the main factors in their choice of source of service. The cost of services was further mentioned by 14.3 % of the poorest quintile, while no one in the wealthiest quintile mentioned cost as a factor. Table 4.37 presents results of this finding.

Table: 4.37. Household Quintile 1 By Choice of Facility for Diarrhea Treatment

Household Quintile	Quintile 1	Why Choose This Facility for Diarrhea		Total
		Distance	Cost of Service 5.00	
	10	4	14	28

Source: Compiled by the author, 2003

4.12.1.3.2. Economic Determinants of Diarrhea Care

The household survey indicated that the direct costs (travel time and travel costs) for seeking diarrhea treatment were relatively higher for the poorest household quintile. However, the poorest quintile 89 % reported that they paid no charges for diarrhea treatment, while the wealthiest quintile an average of 960 Kshs. was said to have been paid for diarrhea treatment services. This probably stems from, the fact that this income group sought health care services from private providers.

4.12.1.3.2. Acute Respiratory Infection (ARI)

As shown in table 4.37, among children under five years of age, 60 per cent were reported to have had at least one symptom of ARI during the month preceding the survey.

Table: 4.37. Percentage Number of Children Suffering From ARI Symptoms One month Preceding Survey

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	18	30.0	60.0	60.0
No	12	20.0	40.0	100.0
Total	30	50.0	100.0	
	30	50.0		
Total	60	100.0		

Source: Compiled by the author, 2003

4.12.1.3.3. Prevalence of ARI

Children in the poorest quintile had a higher ARI prevalence (77.7 %) than children in the wealthiest quintile (28.5 %). The differences in ARI incidence may be treated to residence patterns. The poorest groups tend to live in overcrowded and unacceptable housing conditions compared to those in the wealthiest quintiles.

Table: 4.38. Household Quintile By Symptoms of ARI One-Month Preceding Survey

Household Quintile	Child Suffer from ARI		Total
	Yes	No	
Quintile 1	14	8	22
Quintile 2	3	4	7
Quintile 3	1	1	1
Total	18	12	30

Source: Compiled by the author, 2003

4.12.1.3.4. Care Seeking Behavior

By household quintile, at all levels of ARI illness a majority of those in the wealthiest quintile sought care outside the home. Only 28 % of the wealthiest quintile sought care within home, while in the poorest quintile, 77.3 % sought care outside home and 13.6 % sought in - home care. Table 4.39 presents the findings of this analysis.

Among those who sought care outside home, 77.2 % the poorest households sought care from public facilities. Only 31 % sought care from private facilities. Among the wealthiest quintile, 85.7 % sought care from private facilities.

Table: 4.39. Household Quintile By Action taken for Treatment of ARI Condition

Household Quintile	Action taken for Treatment of ARI Condition			Total
	Treated Away From Home	Treated at Home	Not Treated	
Quintile 1	17	3	2	22
Quintile 2	5	2		7
Quintile 3	1			1
Total	23	5	2	30

Source: Compiled by the author, 2003

Overall, the main reasons the poorest household quintile gave for choosing a site for choice of care was distance to provider and costs of health services, while the wealthiest quintile gave insurance requirements and quality of services as the reasons for their choice of site. Among the poorest quintile the reason for choice of provider (public or private) was cost, while in the wealthiest

quintile, the main reason for choice of provider was insurance requirement that they be treated in specified facilities..

Table: 4.40. Household Quintile By Facility Child ARI Health Care Sought

Household Quintile	Facility Child ARI health care Sought			Total
	Public	Private	Herbalist	
Quintile 1	10	7	5	22
Quintile 2	1	6		7
Quintile 3			1	1
Total	11	13	6	30

Source: Compiled by the author,2003

4.12.1.3.5. Economic Determinants of ARI Care

Overall, among the households quintiles 60 % of children traveled 20 minutes or less to reach a care site. Analysis by household economic status revealed that travel time and costs were higher for the poorest quintile compared to that of the wealthiest quintile. Results of this analysis are presented in table 4.40.

Table: 4.40. Travel Minutes Taken to Reach an Immunization Site

	Frequency	Percent	Valid Percent	Cumulative Percent
20	17	28.3	37.8	37.8
10	16	26.7	35.6	73.3
30	9	15.0	20.0	93.3
15	3	5.0	6.7	100.0
Total	45	75.0	100.0	
	15	25.0		
Total	60	100.0		

Source: Compiled by the author,2003

Overall, 79 % of ARI case treated outside home by the poorest household quintile paid no charge for service, while only 18 % paid. Wealthiest quintile group reported to have paid for (96.4 %) for services.

4.12.2. Health and Sickness Among Household Members Over Five Years of Age Analysis Procedures

For a single member of the household who was over five years of age and who experienced sickness or health problem one month preceding the survey, data was collected on characteristics of the individual, nature of health problems, care-seeking behaviour, and the costs and quality of the health services received for the condition. The analysis however, focused more on the extent of the financial burden imposed by an illness.

Table 4.41 presents results for the health and illness characteristics of households by health and illness characteristics of households by wealth (quintile) group. Of the 60 respondents interviewed from the two settlements (Kiambiu informal settlement and Pioneer Estate) 60 % reported that a member of their household who was over the age of five had been ill within the four weeks preceding the survey. By settlement, 70 % in Kiambiu had reported sickness in the month preceding the survey, while 46 % in pioneer estate were reported to have been sick.

Among household quintiles, the wealthiest quintile reported the lowest number of illness in the sample (46 %) compared to 70 % of the poorest household quintile. Individuals were further asked if the sick household member was prevented from engaging in normal activities and if so, the duration of in activity.

Table. 4.42 presents the effects of illness on normal activity, while table 9.17 presents the effects on income. The financial burden due to inability to engage in normal activities (for example, work) was also assessed. Overall, by the two settlements 23 % of individuals reported a diminished capacity to function normally for an average of 3-6 days, only a few cases reported a direct financial loss.

Table: 4.41. Percentage Number Of Days Individuals Unable To Perform Normal Functions Resulting From An Illness

	Frequency	Percent	Valid Percent	Cumulative Percent
1-2 Days	2	3.3	3.3	3.3
3-6 Days	3	5.0	5.0	8.3
One Week	6	10.0	10.0	18.3
Over One Week	3	5.0	5.0	23.3
Never Been sick	16	26.7	26.7	50.0
Was Not Prevented	30	50.0	50.0	100.0
Total	60	100.0	100.0	

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	14	23.3	23.3	23.3
No	30	50.0	50.0	73.3
Have Not Been Sick	16	26.7	26.7	100.0
Total	60	100.0	100.0	

Source: Compiled by the author,2003

Table: 4.42. Percentage Reporting Income Lost Due to Illness

	Frequency	Percent	Valid Percent	Cumulative Percent
None	44	73.3	73.3	73.3
Some	12	20.0	20.0	93.3
Substantial	4	6.7	6.7	100.0
Total	60	100.0	100.0	

Source: Compiled by the author,2003

Both the average number of days of work lost due to illness and the percentage reporting a drop in normal activity were highest in the wealthiest quintile. Poorest household quintile reported an average of 25 % of loss of activity, but a higher number of days lost due to illness.

Table: 4.43. Number of Individuals Prevented from engaging in Normal Activities by Doctor or Household Member By Household Quintile

Household Quintile	Prevented From engaging in Normal Activities By Doctor or Household Member		Total
	Yes	No	
Quintile 1	4	16	30
Quintile 2	10	14	30
Total	14	30	60

Source: Compiled by the author,2003

As results indicate above, although the level of activity lost due to illness seemed substantial, relatively few individuals reported a direct financial loss due to a health problem.

4.12.2.1. Care-Seeking Behaviour

Overall, Table 4.44 presents indicators of health-seeking behaviour. Overall, 65 % of those who experienced an illness sought care outside of the home, 8.3 % received in-home care, while 8 % received no treatment.

Table: 4.44. Percentage Number on Where Treatment Was Sought

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Out-of-home	39	65.0	65.0	65.0
In-home	5	8.3	8.3	73.3
Did not Seek treatment	5	8.3	8.3	81.7
Was Not Ill	11	18.3	18.3	100.0
Total	60	100.0	100.0	

Source: Compiled by the author, 2003

By household quintiles, individuals most likely to seek medical attention outside of the home were in the wealthiest quintile (quintile 2) (approximately 73 %), and those least likely were the poorest quintile (56 %). The poorest received in-home care (13.1%) and the wealthiest were the least likely to forgo care (8.3 %)

Table: 4.45. Out-Of-Home Care Seeking By Household Wealth

	Where Treatment Sought			Total
	Out-of-home	In-home	Did not Seek treatment	
Household Quintile 1	17	3	3	30
Quintile 2	22	2	2	30
Total	39	5	5	60

Source: Compiled by the author, 2003

The main reasons why sick individuals did not seek care were that it was unnecessary (50 %) or they could not afford it (25 %). The proportion of individuals who cited lack of money as reason for not seeking outside home care was highest among the poorest household quintile (25 %).

Table: 4.46. Reasons Given By Individuals For Foregoing Care

	Frequency	Percent	Valid Percent	Cumulative Percent
Unnecessary	2	3.3	50.0	50.0
Lack of Money	1	1.7	25.0	75.0
Too Busy	1	1.7	25.0	100.0
Total	4	6.7	100.0	
System	56	93.3		
Total	60	100.0		

Source: Compiled by the author, 2003

Table: 4.48. Household Quintile By Reason For Not Seeking Health Care

	Reason For Not Seeking Health Care			Total
	Unnecessary	Lack of Money	Too Busy	
Household Quintile				
Quintile 1	1	1		2
Quintile 2	1		1	2
Total	2	1	1	4

Source: Compiled by the author, 2003

4.12.2.3. Source of Care

Individuals seeking outside of home care were further asked a series of questions about the location, quality and price of care.

4.12.2.3.1. Sources of care

As shown in Table 4.49, among individuals who sought care outside of their home, 35.4 % went to a public facility. 52.1 % went to a private facility; and 20 % to other locations

Table: 4.49. Source of out- of - Home Treatment By facility Type

	Frequency	Percent	Valid Percent	Cumulative Percent
Private Facility	25	41.7	52.1	52.1
Public Facility	17	28.3	35.4	87.5
Was Never Ill	6	10.0	12.5	100.0
Total	48	80.0	100.0	
Others		12	20.0	
Total	60	100.0		

Source: Compiled by the author, 2003

By household quintile, individuals in the wealthiest quintile mostly made use of private facilities (93.7%). Although a high proportion of sick individuals in the poorest group sought care of public facilities (73 %). Only a slightly lower proportion sought treatment at a private facility (12.6%).

4.12.2.3.2. Location care sought

Overall, by household wealth quintile, distance, past experience and costs of health care were the most prominent factors in the choice of facility.

In terms of the effects on income among the poorest quintiles, cost of health care service was the most important factor in source choice and was cited by 67 %. While in the wealthiest quintile group insurance consideration and past experience were the main reasons for choice of facility.

4.12.2.4. Economic Determinants of Health Service Use

Table 4.50 summarizes the indirect and direct costs of obtaining medical care. Overall, however, 34 % of individuals who sought care outside of the household traveled 20 or less minutes to reach a site. However travel time costs tended to decline with increases in wealth, with the exception of the wealthiest quintile that had the shortest travel time, but the highest travel costs (over 200 Kshs)

Table: 4.50. Indirect Costs and Direct Costs of Obtaining Health Care

	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 10	9	15.0	22.0	22.0
10-15	5	8.3	12.2	34.1
15-20	9	15.0	22.0	56.1
20-30	13	21.7	31.7	87.8
Over 30	5	8.3	12.2	100.0
Total	41	68.3	100.0	
System	19	31.7		
Total	60	100.0		

Source: Compiled by the author, 2003

Overall, among those who received public health care services, 37 % received free care, while 56 % paid over 100 Kshs. Overall, of individuals based on household quintile, the wealthiest quintile had the lowest proportion of sick who paid no charge

Table: 4.51. Amount Paid For Health Care Services By Source Of Care

	Amount Paid For health Care Services						Total
	Less Than 100	100-200	200-500	500-1000	Over 1000	6.00 Free	
Source of Private Facility and Home Treatment		4	8	8	5		25
Public Facility	1	8	1			6	16
Total	1	8	5	8	8	5	41

Source: Compiled by the author, 2003

4.12.2.2. Availability and use of Public/ Private Facilities

Analysis procedures

Table 4.53 presents information on the choice of health facility by type and income group. Specific information was also collected on an individuals preferred facility and if that was the closest geographically and to identify the closest facility and give reasons for not seeking care from nearest facility.

4.12.2.2.1. Facility of Choice

Overall, 35.4 % of individuals sought care from a public facility, while 52.1% went to a private facility. However, there was a clear relationship between facility choice and household wealth quintile, while the highest proportion using private facilities came from the wealthiest quintile group.

Table: 4.53. Percentage Number By Choice of Facility

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Private Facility	25	41.7	52.1	52.1
	Public Facility	17	28.3	35.4	87.5
	Others	6	10.0	12.5	100.0
	Total	48	80.0	100.0	
Missing	System	12	20.0		
Total		60	100.0		

Source: Compiled by the author, 2003

4.12.2.2.2. Geographic Proximity of Facility

Distance was considered by the researcher as a key factor in facility choice. Overall, 76% of the sample chose the facility closest home. The use of the closest facility was discovered to be direct function of wealth. 60 % of persons in the poorest group used the closest facility, whereas only 23% of the richest went to the facility closest to their residence. Wealthier groups chose private facilities located further away.

A large a proportion of individuals in wealthiest quintile who did not go to the nearest facility reported that the facility was a public facility. Thus it appears that individuals with higher incomes as seen in Pioneer Estate never made use of public facilities.

Table: 4.54. Closest Facility Type Bypassed And Reason For Bypassing

		Reason For Bypassing the Closest Facility				Total
		Unaffordable	Perceived Quality Services	LowHealth ofInsurance Status	Unfamiliarity With Personnel	
Facility Type Nearest Bypassed	Public But	3	6	5	2	16
	Private	4	12	3	3	22
Total		7	18	8	5	38

Source: Compiled by the author,2003

By the poorest household quintile the most by passed facility was the private facility (%). As a result public facilities were the most used by poorest household quintile and highest avoided by the wealthiest quintile.

Table: 4.55. Facility Type Nearest But Bypassed By Household Quintile

		Household Quintile		Total
		Quintile 1	Quintile 2	
Facility Type Nearest But Bypassed	Public	4	17	21
	Private	15	6	21
Total		19	23	42

Source: Compiled by the author,2003

4.12.2.2.2. Reasons for Bypassing Closest Facility

Final indicators presented under this section reveals why individuals in the two settlements (Kiambiu informal settlement and Pioneer Estate) and by household wealth quintiles did not make use of the closest facility, but instead sought care at a more distant alternative.

In the wealthiest quintile the leading reasons were health insurance (52 %), poor treatment or perceived low quality of care (33%) and lack of familiarity with health providers at the facility (6.7 %)

Cost, however was not the most important factor in the wealthiest quintile (7 %), while it was relatively more important among the poorest group (67 %) when compared to the wealthier ones, both quality of services and the attitude of the staff were both much more important than cost of care among the poorest quintile. Since that many in the poorest quintile chose a public facility over others, perhaps this is evidence of a disparity in the quality of service provision among different public providers.

Reason	Percentage
Health insurance	52 %
Poor treatment or perceived low quality of care	33 %
Lack of familiarity with health providers at the facility	6.7 %
Cost	7 %
Quality of services	
Attitude of the staff	
Public facility	

4.13. An Analysis of the Spatial Distribution and Location of Public Health Facilities in Nairobi

The focus here is a critical analysis on the distribution and location of public health facilities in Nairobi based on the current and the emerging settlement patterns of the quintile groups.

The analysis on the distribution and location of the facilities will form the basis for a spatial equity allocation based on the principles of equity, efficiency and quality of health care services.

4.13.1. Existing Situation

Table 4.56 depicts a spatial imbalance based on the size of the divisions. The inner residential areas of the city show a more concentration of public health facilities. However, this concentration does not necessarily depict concentration based on the concepts of equity, efficiency and quality of services. Analytical justification or rejection of this concentration is done after the analysis of the existing situation based on the research findings. Map. 4.2 present the existing settlement patterns in Nairobi.

Table 4.56. Public Health Facilities Dissemble In Nairobi By Division And Division Size

<i>Division</i>	<i>Area (Sq.km)</i>	<i>Facilities (Excluding clinics)</i>	<i>% Share</i>
<i>Central</i>	<i>10.6</i>	<i>9</i>	<i>12.5</i>
<i>Dagoretti</i>	<i>38.7</i>	<i>5</i>	<i>6.9</i>
<i>Embakasi</i>	<i>208.3</i>	<i>8</i>	<i>11.1</i>
<i>Kasarani</i>	<i>85.7</i>	<i>8</i>	<i>19.7</i>
<i>Kibera</i>	<i>223.4</i>	<i>7</i>	<i>9.7</i>
<i>Makadara</i>	<i>20.1</i>	<i>12</i>	<i>16.7</i>
<i>Pumwani</i>	<i>11.7</i>	<i>9</i>	<i>12.5</i>
<i>Westlands</i>	<i>97.6</i>	<i>14</i>	<i>19.4</i>
<i>Nairobi Total</i>	<i>698.1</i>	<i>72</i>	<i>100</i>

Source: Compiled by the author, 2003

Table: 4.57. Existing Distribution Of Public Health Facilities Based On Population Size; 1999 Population Census Results

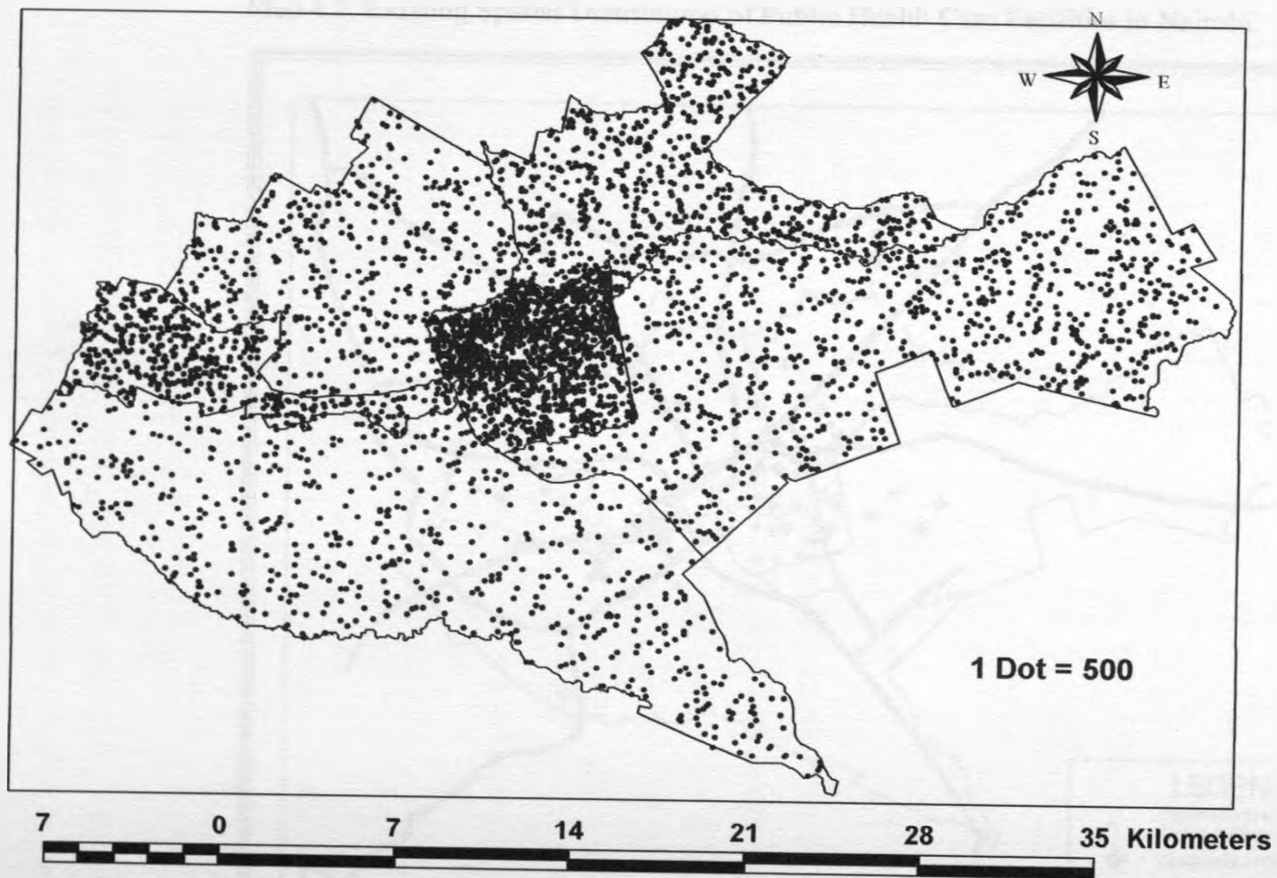
Division	Population Size	Health Facilities (Excluding Clinics)	Nairobi % Population	Facility/Population Ratio
Central	234,942	9	10.96	1:26105
Dagoretti	240,509	5	11.22	1:48102
Embakasi	434,884	8	20.29	1:54361
Kasarani	338,925	8	15.81	1:42367
Kibera	286,739	7	13.38	1:40963
Makadara	197,434	12	9.21	1:16453
Pumwani	202,211	9	9.43	1:22468
Westlands	207,610	14	9.69	1:14829
Nairobi Total	2,143,254	72	100	1:29767

Source: Compiled by the author, 2003

Based on population size (1999 population census results), Makadara division where three of the four public facilities sampled were located reported the highest concentration of public health facilities with a facility/ population ratio of 1:16453. Central, which in table 4.57 reported the highest facility concentration in terms of the division sizes overall, had a facility/population ratio of 1:26105. Based on population size then, central division has the fourth highest concentration of public health facilities, while Embakasi division has the lowest facility/population ratio of 1:54361. Map 4.3 presents the distribution of population densities by division.

Further analysis by the researcher based on utilization levels, equity, efficiency and quality of services serves a difference on the concentration of the public health facilities. Map 4.4 presents the existing spatial distribution of public health care facilities in Nairobi.

Map 4.1 Population Density distribution in Nairobi



Source Physical Planning Department 2003

Map 4.2: Existing Spatial Distribution of Public Health Care Facilities in Nairobi

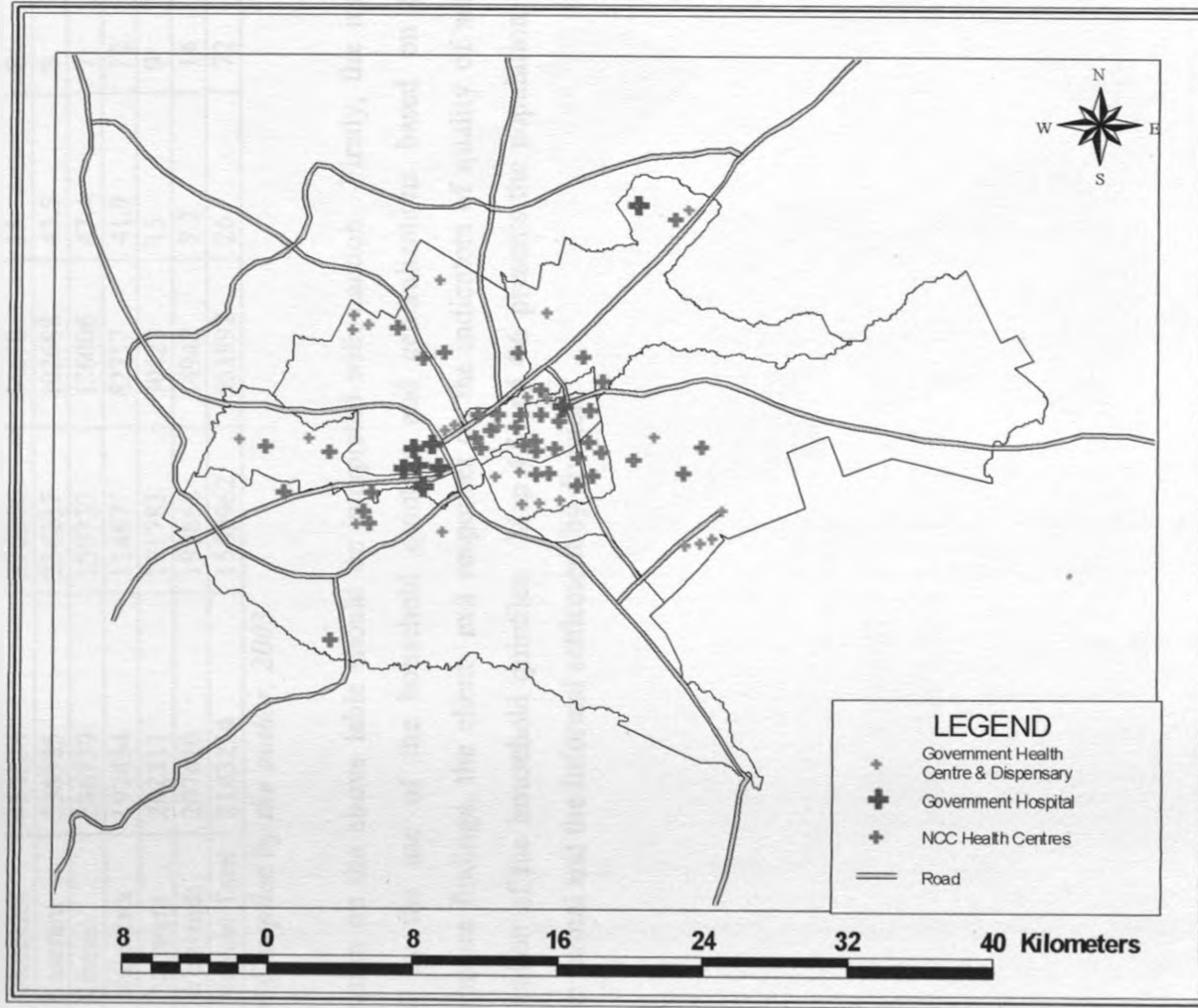


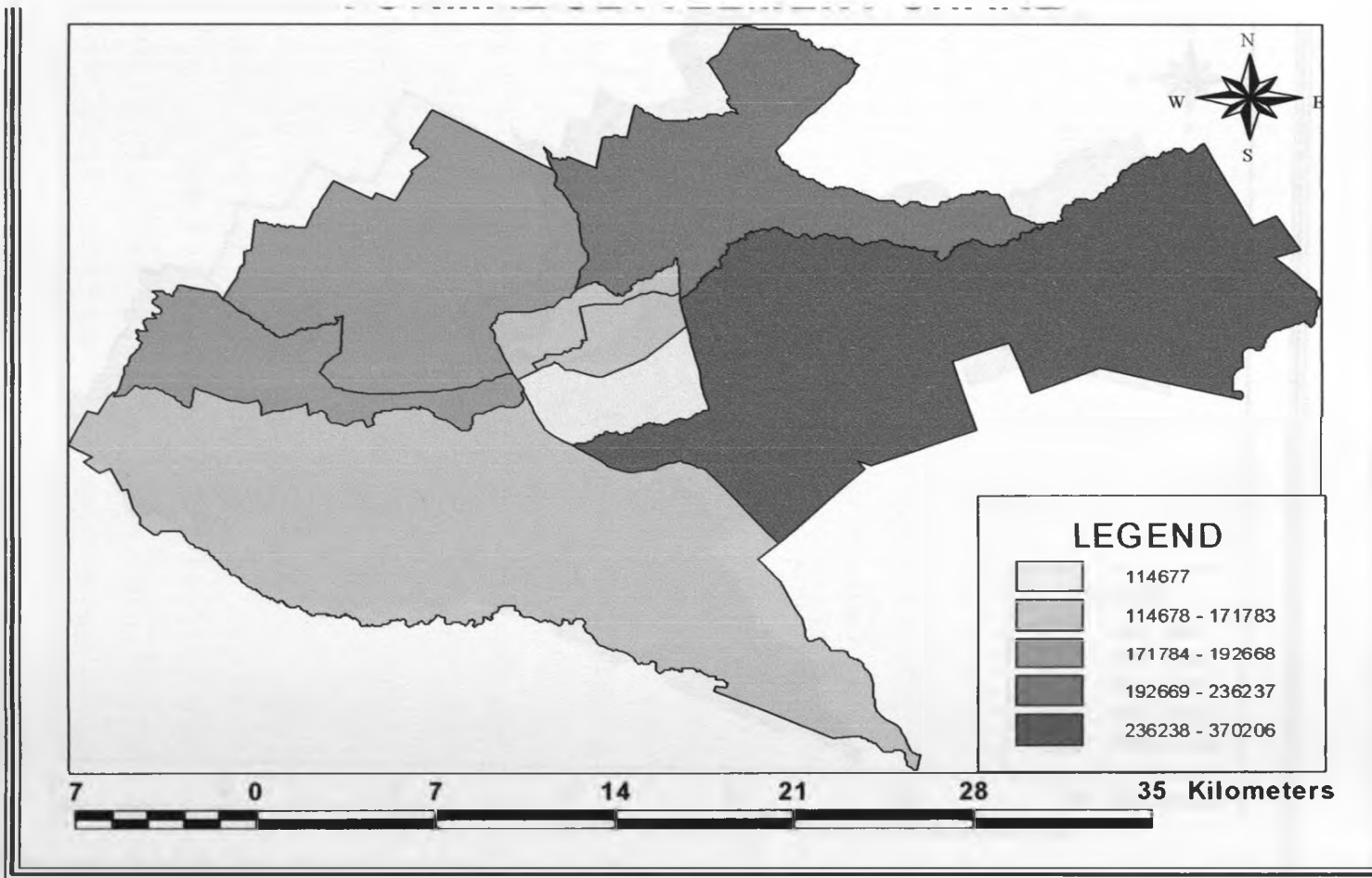
Table: 4.58. Distribution of Nairobi Population By Settlement Type (formal/informal)

Division	Total Population	Formal Settlement	Informal Settlement	Settlement	Share
Central	234942	162377	72565	30.9	9
Dagoretti	240509	191281	49228	20.5	5
Embakasi	434884	370206	64678	15	8
Kasarani	338925	236237	102688	43.5	8
Kibera	286739	150733	136006	47.4	7
Makadara	197434	114677	82757	41.9	12
Pumwani	202211	171783	30428	15	9
Westlands	207610	192668	14942	7.2	14
Nairobi Total	2143254	1589962	553892	26	72

Source: Compiled by the author, 2003

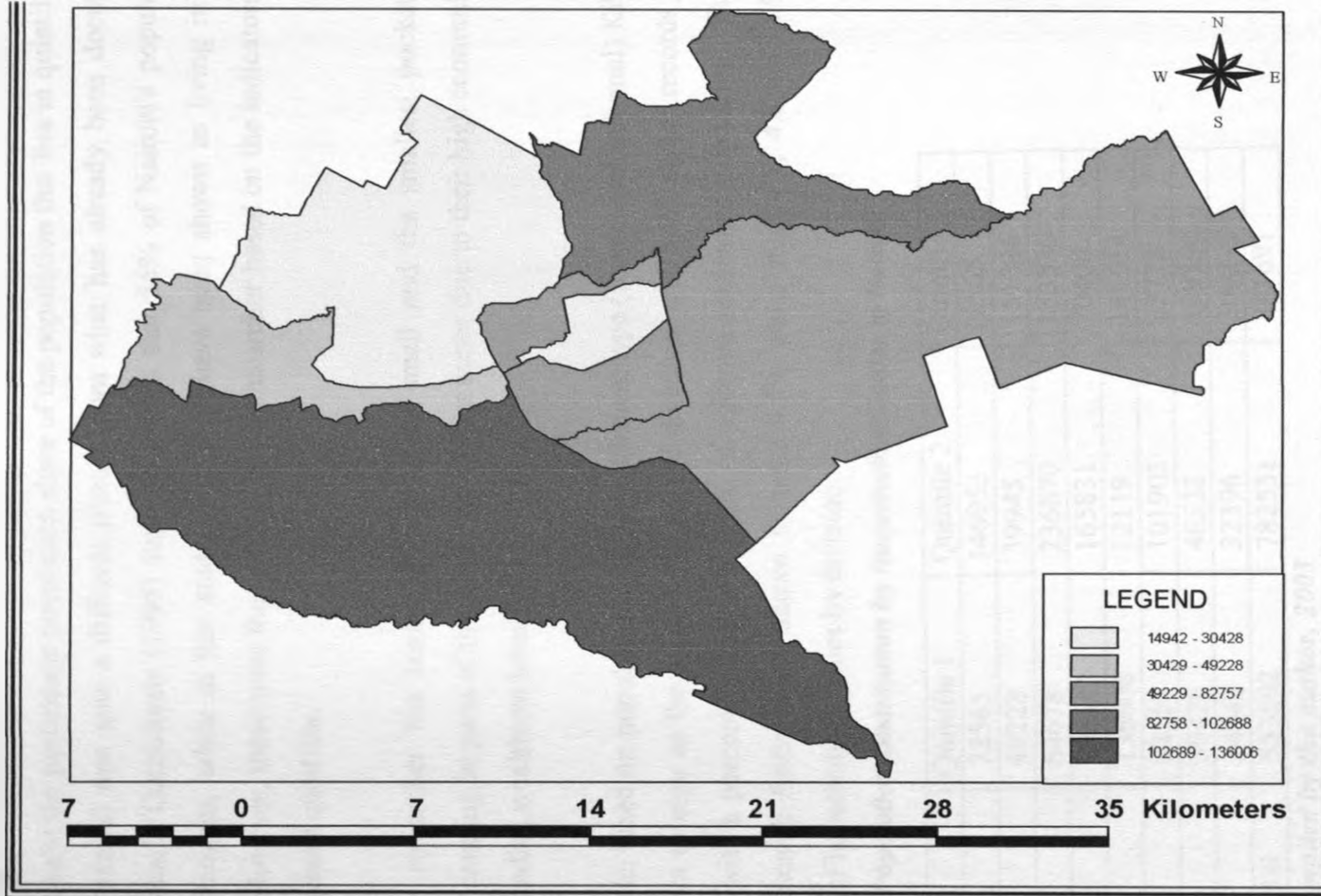
Information on the above table should be interpreted with caution. Firstly, the information was derived by the use of the household quintiles and generalizations based on the household questionnaire findings, the client- exit responses on the indicators of quality of services and the classification of the household quintiles. Map 4.5 and 4.6 presents the population distribution of both the formal and the informal settlement by division.

Map: 4.3. Population Distribution in the Formal Settlement by Division



Source: Compiled by the Author, 2003

Map: 4.4. Map: 4.3. Population Distribution in the Formal Settlement by Division



Source. Compiled by the Author, 2003

When one looks at the percentage population share of the population that lies in quintile 1 (one) (the informal settlement) one gets a different picture from what has already been documented. For example, a Matrix Consultants (1995) study found out that 55% of Nairobi's population lived in informal settlements, while in this study, only 26% have been shown as living in the informal settlements. However, these were the findings of the researcher based on the indicators employed to classify household quintiles.

Further, the researcher has tended to ignore the small and the smallest pockets of squatter settlements occurring in parts of the formal settlement sector due to their high economic dependency on the surrounding wealthiest household quintiles.

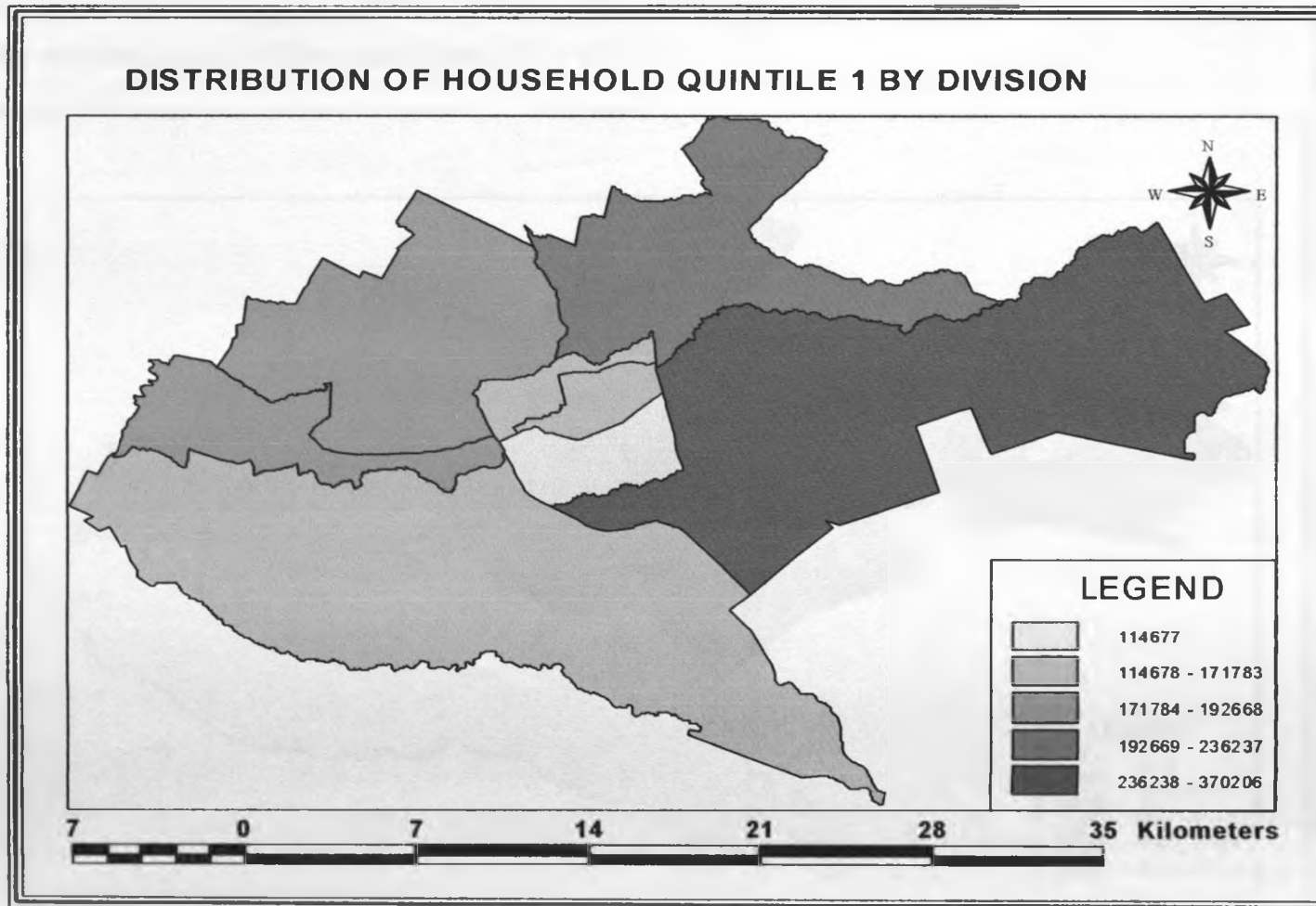
From the table, based on population share by settlement type (formal and informal) Kibera, Kasarani and Makadara emerge as the most under served divisions, while Westlands records as the highest served area with a percentage share of 7.6% of informal settlement population. Further analysis based on research findings are shown in table 4.59, while map 4.7, 4.8 and 4.9 presents the distribution of household quintiles by division.

Table: 4.59. Population Distribution by Household Quintiles in Nairobi

Division	Quintile 1	Quintile 2	Quintile 3
Central	72565	146953	72565
Dagoretti	49228	39945	151336
Embakasi	64678	236870	133336
Kasarani	102688	165831	70406
Kibera	136006	12119	141614
Makadara	82757	101905	12772
Pumwani	30428	46532	139390
Westlands	14942	32396	160272
Nairobi Total	553892	782551	881691

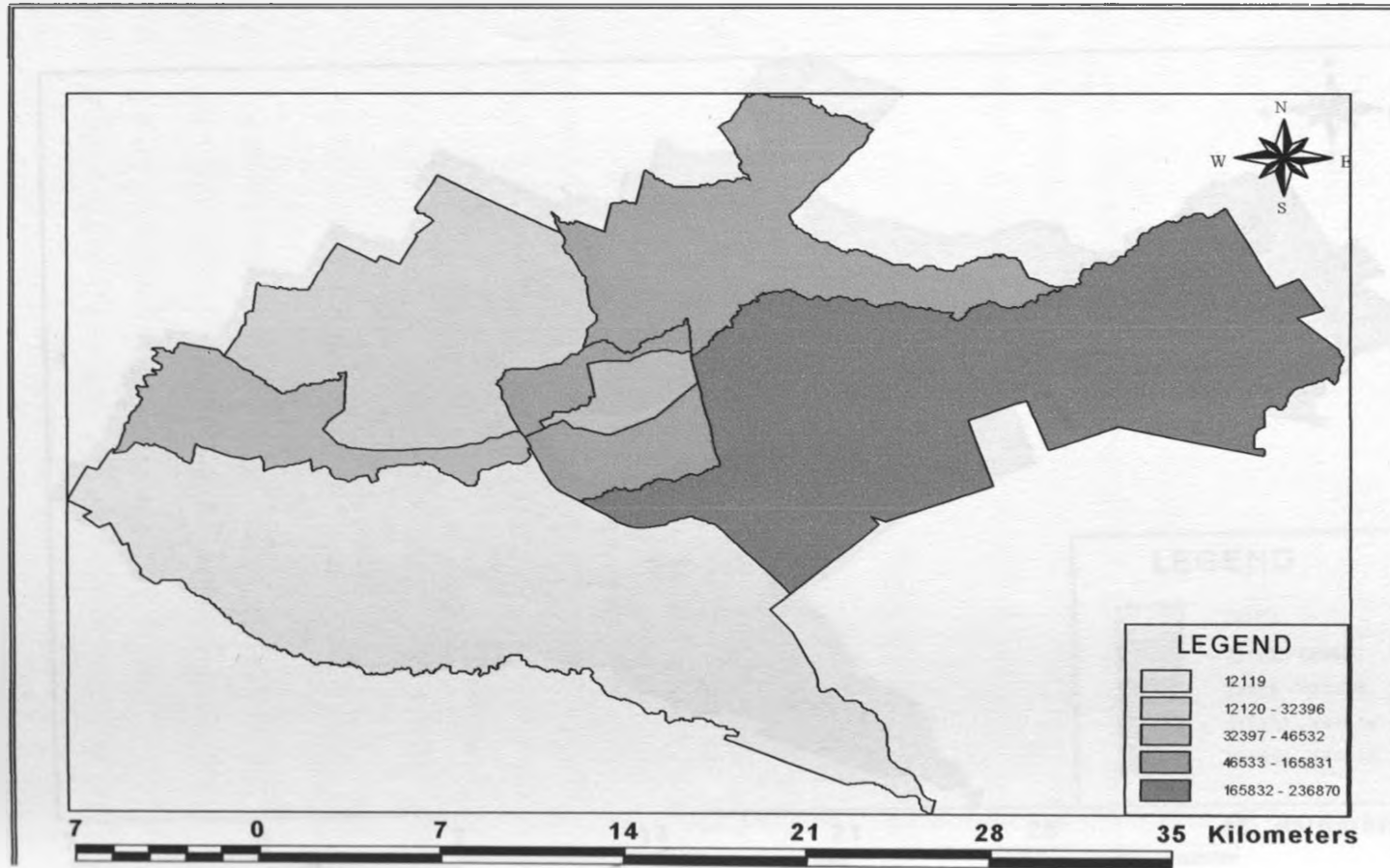
Source: Compiled by the author, 2003

Map: 4.5. Distribution of Household Quintile 1 by Division



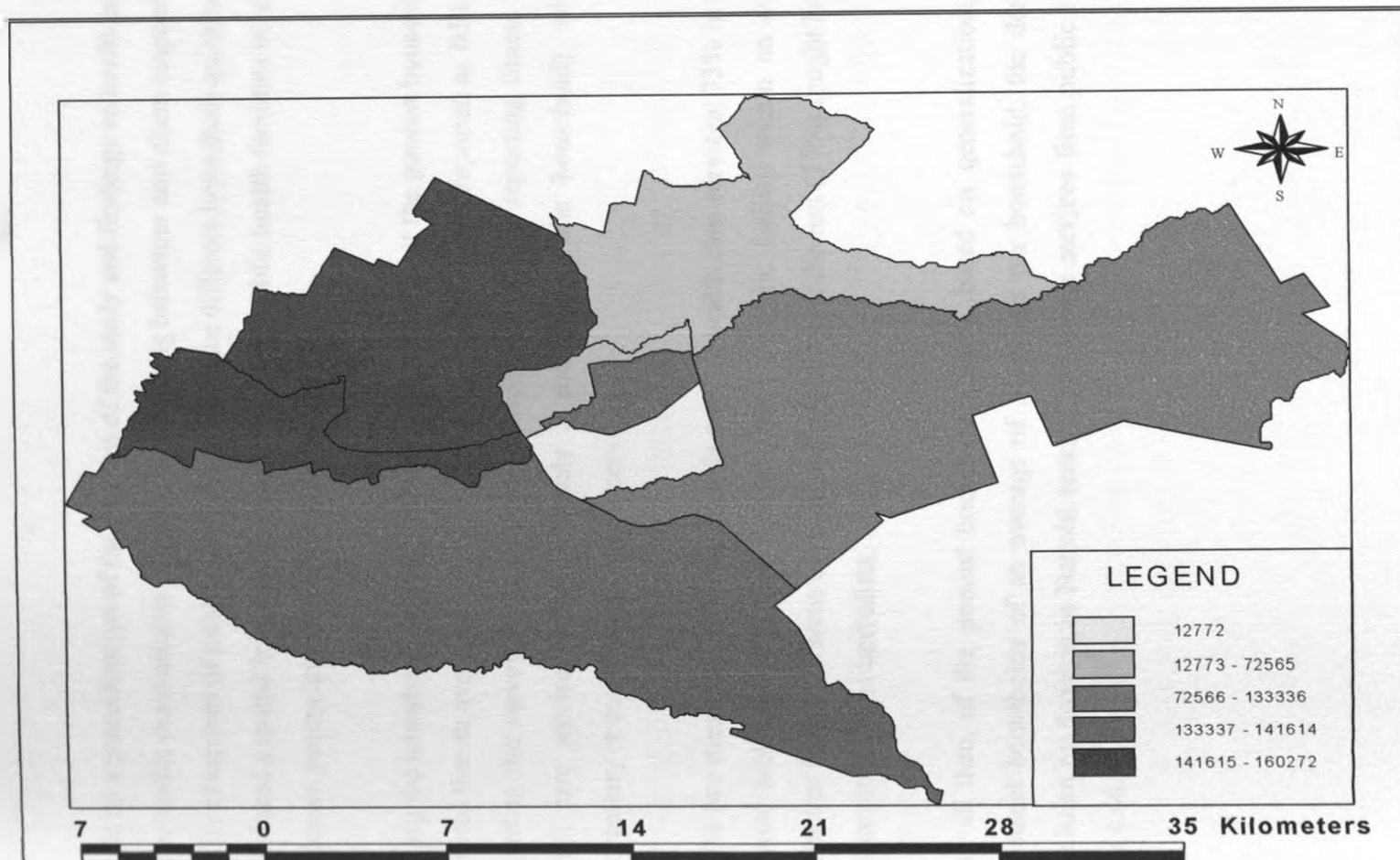
Source: Compiled by the Author, 2003

Map: 4.6. Distribution of Household Quintile 2 by Division



Source: Compiled by the Author, 2003

Map: 4.7. Distribution of Household Quintile 3 by Division



Based on a generalization of the samples of the study and findings on health care seeking behaviour, the economic determinants of health care seeking behaviour and client responses on perception on quality of services of public health facilities of the different household quintiles, the study established a spatial inequity on the distribution of public health facilities in relation to the changing settlement pattern and household utilization levels.

Among the household quintiles, the study established that the poorest household quintile (quintile 1) reported that an average of three household members having reported as falling ill in the four weeks preceding the survey (60%). Of the household members reporting illness 53% reported seeking health care services. (Approximately 2 members of the household), while the rest found it unnecessary or could not afford the services.

Of the two members of the households seeking health care services, 73% in this household quintile reported seeking health care services from a public facility within an average distance of 1.5 kilometres from their areas of residence/origin, while the rest (27%) sought health care services from private providers or herbalists.

Over all then, of the poorest household quintile, based on generalizations of Kiambiu informal settlement households of an average of 5 persons per household, the derived data on the total population by division in Nairobi seeking health care services from public facilities is presented in table 4.60.

Table: 4.60. Household Quintile 1 By Division And Proportion Of Source Of Care In Nairobi In A 4-Week Period.

Division	Population of The Quintile	Number of Households	Number Reporting An Illness	Health Services	Public Source of Care	Private/ Others
Central	72565	14513	8708	84615	3369	1246
Dagoretti	49228	9846	5908	3331	2432	899
Embakasi	64678	12936	7762	4114	3003	1111
Kasarani	102688	20538	12323	6531	4768	1736
Kibera	136006	27201	16321	8650	6315	2335
Makadara	82757	16551	9931	5263	3842	1421
Pumwani	30428	6086	3652	1936	1413	523
Westlands	14942	2988	896	475	347	128
Nairobi Total	553892	110778	66467	35228	25716	9512

Source: Compiled by the author, 2003

By analysing the second poorest household quintile (household quintile 2), the study established that this household quintile had an average of 5 household members per household. However, unlike household quintile 1, it was established that an average of 2 household members had reported an illness the four weeks preceding survey (40%). Of the household members reporting an illness, 82% per cent reported seeking out of home treatment. The rest (about 18%) found it unnecessary or unaffordable.

Of the 82 per cent seeking out of home treatment 20.4 per cent (approximately 20%) sought health care services from a public facility, while the rest sought treatment from the private facilities and traditional herbalists. Table 4.61 presents the generalized sample results on the entire population of Nairobi of the household quintile by division.

Table: 4.61. Household Quintile II By Division And Proportion Of Source Of Health Care In Nairobi In A 4-Week Period

Division	Pop. Of the Quintile	No. Of HH's	Sick	No. Seeking out of home care	Source care public facility	Private/ others
Central	146953	29391	11756	9640	1928	7712
Dagoretti	39945	7989	3196	2621	524	2097
Embakasi	236870	47374	18950	15539	3108	12431
Kasarani	165831	33166	13266	10878	2176	8702
Kibera	12119	2424	970	795	159	636
Makadara	101905	20381	8152	6685	1337	5348
Pumwani	46532	9306	3722	3052	610	2442
Westlands	32396	6479	2592	2125	425	1700
Nairobi	782551	156510	62604	51335	10267	41068
Total						

Source: Compiled by the author, 2003

An analysis of the wealthiest household quintile established a household average of 4 members per household. The wealthiest household quintile reported an average 3 household members reporting an illness the four weeks preceding survey (60 per cent). Of the household members reporting an illness 96 per cent reported seeking out-of-home treatment. The rest found it unnecessary.

Of the 96 per cent seeking out-of-home treatment, only 6.6 (approximately 7%) percent-sought health care services from a public facility, while the rest chose a private provider as a source. Table 4.62 presents the generalized sample results on the entire population of Nairobi of the household quintile by division.

Table: 4.62. Household Quintile III By Division And Proportion Of Source Of Health Care In Nairobi In A 4-Week Period

Division	Population of Quintile	No. of Households	No. Sick	No. Seeking out of home care	Source of care Public facility	Private Provider
Central	72565	18141	10885	10450	732	9718
Dagoretti	1511336	37834	22700	21792	1525	20267
Embakasi	133336	33334	20000	19200	1344	17856
Kasarani	70406	17602	10561	10139	710	9429
Kibera	141614	35404	21242	20392	1427	18965
Makadara	12772	3193	1916	1839	129	1710
Pumwani	139390	34846	20908	20072	1405	18667
Westlands	160272	40068	24041	23079	21616	21463
Nairobi Total	881691	220423	132254	126964	8887	118077

Source: Compiled by the author, 2003

Table: 4.63. Proportion Of Household Quintiles And Their Utilization Pattern Of Public Health Facilities By Division In Nairobi

Division	Households Quintile	Households Quintile II	Households Quintile III
Central	3369	1928	732
Dagoretti	2432	524	1525
Embakasi	3003	3108	1344
Kasarani	4768	2176	710
Kibera	6315	159	1427
Makadara	3842	1337	129
Pumwani	1413	610	1405
Westlands	347	425	1616
Nairobi Total	25716	10267	8887

Source: Compiled by the author, 2003

Table 5.8 above indicates the total population by division using public facilities as source of care. Overall 73% of the poorest quintiles used a public health facility, 20 percent of household quintile II, while only 7 per cent of the wealthiest quintile used public facilities.

The above results of the survey indicates spatial inequity and low levels of use of the existing public health facilities since these are mainly located within the former city boundary which currently forms the residence of household quintile II and III.

Taking into account the utilization of health care services based on the level of household quintile table 4.63 indicates levels of utilization based on settlement pattern of the facilities sampled.

Table: 4.63. Curative Service Utilization Of The 4 Public Facilities Sampled And Amount Of User Fees Collected In The Month Of January 2003

Facility	Clients Attended to the Month of January, 2003	User-fees in Kshs.
Makadara Health Centre	821	8960
Pumwani Health Centre	8879	46140
Jericho Sub-Health Centre	4027	84,300
Bahati Dispensary	822	20,120
Total Clients Served	14549	159,520

Source: Compiled by the author, 2003

Table 4.64 above indicates that Makadara Health Centre, which is located on the periphery of Division 1 settlement area, recorded the lowest level of clients, while Pumwani located in the densely populated Gikomba Market area recorded the highest number of clients. Surprisingly, however, user fees collected at the facility is lowest in relation to the month's client-load. This however can be attributed to the high number of clients exempted and the high number of individuals aged below five years who got free health care services.

Based on population within the division, however, there exists a very low level of utilization as indicated below. For the purposes of this analysis, however, Makadara division will be used to derive the utilization level since three of the four public facilities sampled lies in this division. Pumwani health facility was the only facility sample in Pumwani division and its inclusion may give inaccurate and erroneous picture of utilization levels in the entire division.

By considering that Makadara has a total of 12 public health facilities (dispensaries and health centres), and since only 3 of these facilities were actually surveyed, the researcher has assumed a uniform distribution of clients over the 12 facilities based on results of the 3 public facilities sampled. Therefore by dividing the total number of clients attended to in the 3 facilities and dividing by the number of the facilities. Clients who were attended to in a month summed to a total of 22680 clients in a division with a total population of 197,434 persons, representing only 11.5 per cent of the total population.

Based on the above generalization and the findings of the client-exit survey and the household survey, then 16556 of the client load was composed of the poorest household quintile, 4536 composed of household quintile II, while 1588 was from the wealthiest household quintile.

CHAPTER FIVE

Summary of Research Findings, Recommendations and Conclusion

5.0. Summary of Findings, Recommendations and Conclusion

5.1. Summary of findings

The majority of clients who attended public health facilities were from the poorest sector of Nairobi population. Nevertheless about 7% of clients came from the wealthiest household quintile. This indicates that public health facilities and resources were not used exclusively by low-income individuals, but also by individuals who had a greater capacity to pay for their care. A majority of clients paid a small charge or no charge for medical services received from public facilities.

There were also no marked differences in the pattern of health expenses by age or sex for those over 6 years age. Almost all public facilities clients reported no insurance cover.

On the basis of client responses, it was observed that distance, travel cost and travel time to source of care affected use of medical care. This is consistent with the fact that a majority of clients who used public facilities resided in the same division where the facilities were located.

This provides a strong pointer for the need for judicious spatial planning in the distribution and redistribution of public facilities in relation to changing settlement patterns in Nairobi and on the basis of equity, efficiency and quality of services.

5.2. Recommendations

This section of the study provides both the spatial and staffing recommendations of public health care facilities based on the findings of the study.

5.2.1. Spatial Planning Guidelines for Public Health Facilities in Nairobi

Spatial planning guidelines on this section are based on equity, efficiency and quality of public health services and the concepts of the three indicators as provided for in data analysis; and the current utilization levels derived from the different households quintiles and the client-exit questionnaire responses.

Further consideration is given to the spatial settlement pattern, especially with regard to the household quintiles and the analysis on the existing spatial disposition of public health care facilities in relation to emerging settlement patterns of the quintile groups. The study further gives due consideration to the main objectives on the location of a public health facility. Malczeuski (1990) advances these objectives as:

The minimization of maximum extra distance traveled by clients to a facility. The determinants being the difference between distance to the health facility to which the clients are allocated and the distance to the nearest facility. This is spatial equity and would allow remotely located clients to be more equitably served;

The maximization of the number of clients on the utilization of a health facility. This contributes to economic efficiency in facility utilization. However, in this regard the researcher has gone a step further to define staff needs of the particular facility (basically, the health centres) as a way of maximizing efficiency in the spatial allocation of public health facilities. This was based on the findings on staff utilization rates and staff time allocation; and;

The minimization of the average travel time and travel costs to health facilities. This forms the basis for the delineation of service area pattern and provides for the spatial accessibility of health care

facilities. This was based on the findings of the economic determinants of choice of facility and utilization levels based on household quintiles and the client-exit responses.

Based on the findings and generalization of the household survey, facility inventory survey and the client-exit survey, the spatial disposition of public health centre type facilities in Nairobi based on principles of equity, efficiency and quality of health services should be as shown in Map 5.1.

The number and location of the facilities (health centres) is based on the criteria of the Ministry of Health guidelines for the definition of facility type based on catchment population. However, considerations have further been defined according to the study so as to optimally allocate these facilities to where they will be effectively utilized based on principles of equity, efficiency and quality of services. This applies to only health centres type 1 due to physical distance accessibility factor expounded in this section.

Table: 5.1. MoH Health Facility Classification

Category of Health Facility	Catchment Population
National Referral Hospital	National Population
Provincial Hospital	1-2 million
District Hospital	250000- 1 million
Sub-District Hospital	100,000 - 250,000
Health Centre Type 2	70,000-100,000
Health Centre Type 1	50,000 - 70,000
Dispensary Type 2	10,000-150,000
Dispensary Type 1	10,000

Source: Kenya, Ministry of Health, 1989

Table 5.2. Proposed Division Share Of Health Centre Type 1 Based On The Findings Of The Study And The MOH Criteria

Division	Population Size	Proposed Division Share of Facilities
Central	234942	4
Dagoretti	240509	4
Embakasi	434884	7
Kasarani	338925	6
Kibera	286739	5
Makadara	197434	3
Pumwani	202211	3
Westlands	207610	3
Nairobi Total	2143254	36

Source: Compiled by the author, 2003

Map 5.1 presents the optimal share of public health center type 1 for curative services by division based on the findings of the study.

5.2.1.1. Locational Needs of the Public Health Facilities

The facilities recommended should ideally be located in areas of high accessibility, away from direct road frontage and accessible to other infrastructure services. The facilities should be located in areas of high population concentrations of the household quintile 1 and the distance to the facility should not exceed 1.5 Km from any part of the settlement area. Travel time to the facilities using motorized transport modes should, however not exceed 15 minutes to the household quintile 1, while to the household quintile II, the traveling distance should not exceed 20 minutes of travel by use of the same modes.

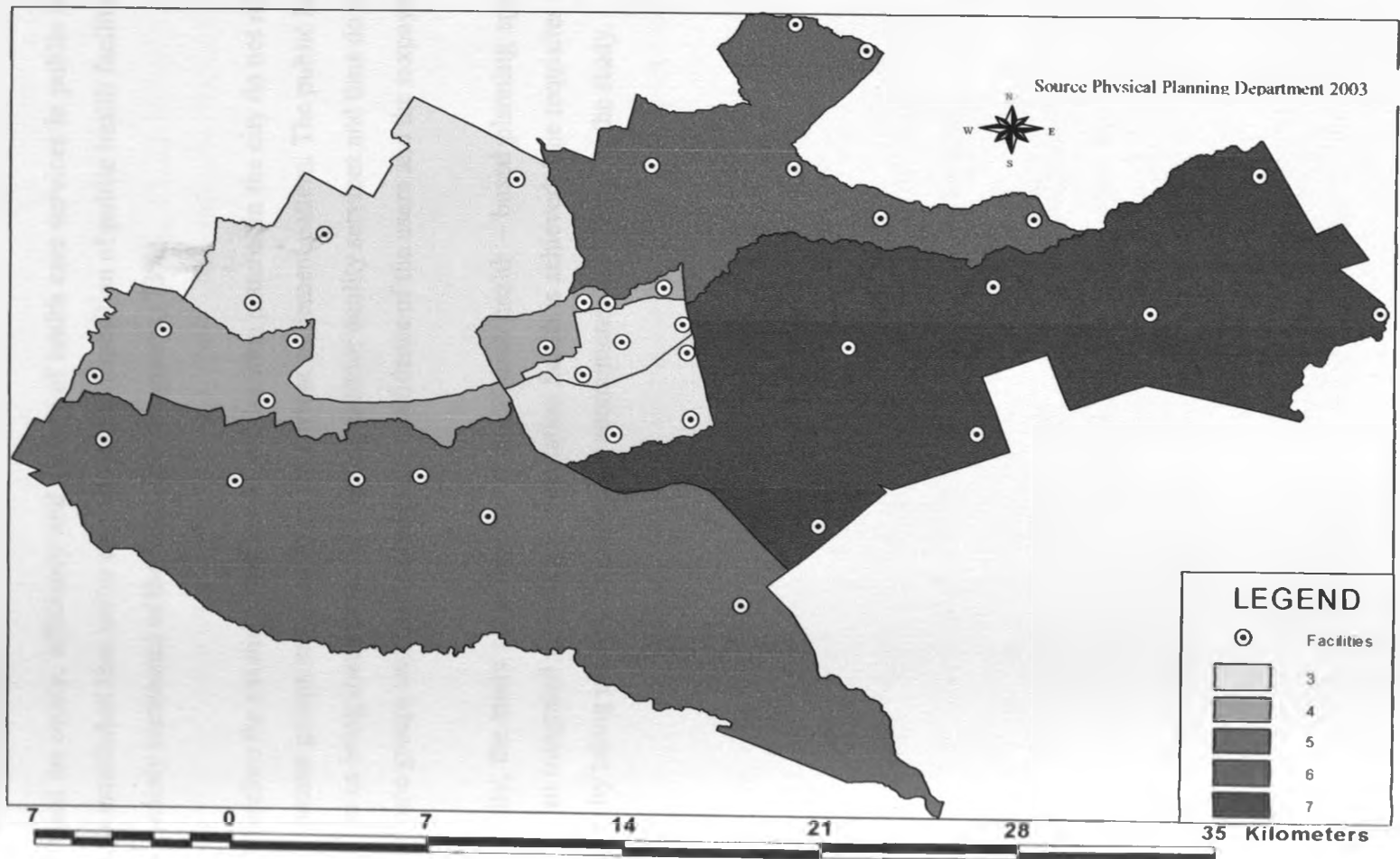
The facilities should also ideally occupy an area of 0.25 of a hectare and the derived area size is based on the population of all the household quintiles and the derived utilization levels. All the facilities should also be of the same hierarchy, that is, health centre type 1. This is because the study established weak cross- facility referrals. Secondly, there were also no marked differences in staff training and staff numbers across the hierarchy of facilities surveyed.

5.2.1.2. Facility Staffing Guidelines

Based on the findings of the study on staff utilization rates and the average staff productivity, the health facilities should be staffed primarily by the auxiliary nurses and the community nurses. The average staff productivity rate should however be at least 2 clients per hour. This should however be based on the settlement socio – economic characteristics and the target population size.

As stated under the conceptual definition of quality of health care, the distribution of doctors should also be considered. This will not only ensure an equitable distribution of such staff, but will encourage an increased confidence in the public health care system across all the quintile groups, which will further facilitate national health financing mechanisms across all the groups.

Map 5.1: Proposed Allocation and Location of Public Health Centre Type 1 in Nairobi



5.3. Conclusion

Based on equity, efficiency and quality of health care services in public health facilities, the study has established that under current spatial disposition of public health facilities, their utilization levels is mainly composed of the low – income groups (73%).

Therefore the existing distribution and location patterns in the city do not reflect the needs of the low – income groups resulting from the current settlement pattern. The public health facilities are looked upon as being inefficient and offering inferior quality services and thus do not equitably serve all the income groups and hence erodes the confidence of the users and the taxpayers.

Finally, the study calls for a more population health – based planning approaches that will ensure that an integrated approach to population health is achieved. The requisites for this approach have to start by taking into consideration the recommendations given in the study.

Selected Reference

- Filmer, D, and Lant., P. (1998). "Estimating Wealth Effects without Income or Expenditure Data, or Tears: Educational Enrollment in India". Policy Research Working Paper No, 1994. Washington DC: **World Bank Development Research Group, Poverty and Human Resources.**
- Filmer, D. and Lant, P., (1999). "The Effect of Household Wealth in Educational Attainment: Evidence from 35 countries". Population and Development Review 25(1).
- Chege, P. G; (1992). "Provision of Public Health Services in Nairobi: Analysis of Distribution, Location and Utilization". Unpublished M. A. thesis: Nairobi. University of Nairobi.
- Gish, O., (1975) Health Economics in Developing World. London: Oxford University Press.
- Hartwig, C., (1975). "Health Politics and National Development in Kenya". Unpublished PhD. Thesis, University of Kentucky. U.S.A.
- Ikiara, G.K., (1988). "Health Care Provision":A paper presented at the First International Conference on Urban Growth and Spatial Planning of Nairobi, Kenya.
- Kirigia, J. M., (1988). "The Economics of Prepaid Health Services. A Case Study of Meru Central Farmers Co-operative Union". Unpublished M.A. Thesis: Nairobi. University of Nairobi.

- Okumu, A.D., (1995). "Informal Settlements in Nairobi – Kenya. A Study of Mukuru Village with an Emphasis on Women's and Children's Problems". Unpublished M. Arch. Thesis, Catholic University, Leuven, Belgium.
- Oyaya, O.C., (1993). "Maternal and Child Health Delivery and Utilization in Low Income Urban Settlements: A Case Study of Nyalenda and Pandipieri, Kisumu, Kenya". Unpublished M.A. Thesis, Nairobi. University of Nairobi.
- Shannon, I.G., et al (1975). "A Method of Evaluating the Geographical Accessibility of Health Services". **The Professional Geographical Journal Vol. 27 No. 1**
- Totowal, N.J., et al., (1985). "The Demand for Primary Health Care in the Third World". New York. John Wiley.
- United Nations Children and Education Fund; (1990). "The State of the World's Children 1990". New York: Oxford University Press.
- World Bank, (1998b). "World Development Indicators 1998". Washington, DC: World Bank.
- World Bank, (1998a). "World Development Report, 1998/99: Knowledge for Development". New York: Oxford University Press.
- World Health Organization., (1981). "Global Strategy of Health for all by the Year 2000". Geneva: WHO.
- World Bank., (1980). "Health Sector Policy Paper". Washington DC. World Bank.
- Wilbur, M.B., (1962). "Community Health Services": New York: Sanders Company.

APPENDIX

UNIVERSITY OF NAIROBI

M.A (PLANNING) THESIS ON EQUITY, EFFICIENCY AND QUALITY OF HEALTH CARE SERVICES: SPATIAL PLANNING GUIDELINES FOR ALLOCATION OF PUBLIC HEALTH CARE FACILITIES IN NAIROBI (2003)

Confidentiality: All Data and Information Collected Under this Survey will be used for Academic Purposes only.

Schedule E: Facility inventory schedule (to be administered to officer-in-charge of facility).

Questionnaire number ()

Facility name:

Facility location:

Type of facility:

(1) Public

(2) Private

Hierarchical level

(1) Dispensary

(2) Health post

(3) H/centre

(4) Hospital

Date of interview

Time of interview

(2) Facility characteristics inventory

(K1a-K1d)

A	B	C	D	E	F	G	H	I	J	K	L	(L1 _a -L1 _n)

Characteristics code:

A: No. Of staff.

B: No. of physicians

C: No. of licensed community nurses

D: No. of obstetricians.....

E: No. of Auxiliary nurses.....

F: Number of technicians.....

G: No. of Beds.

H: Water.....

I: Electricity.

J: Sterilization Equipment **K:**

Communication

Equipment.....

L: Presence of information and Education communication

- IEC Poster Available.....

a) Family planning

b) Antenatal care.....

c) Post natal care

d) Immunizations.....

M: Supply stock-outs

- a) Medicines and supplies.....
- b) Childhood vaccines.....
- c) Syringes.....
- d) Disposable syringes
- e) Gloves.....
- f) Disposable gloves.....

F: Anti-Malarial drugs.**G: Anti-typhoid drugs.....****N: No. of staff on on-call services.....****3) Services offered in the facility****(Please tick services offered)****1) Family planning**

- (1) IUDS
- (2) Oral contraceptives
- (3) Condoms

2) Preventive services

- 1) IEC materials
- 2) Vaccinations

3) Curative

- 1) Anti-malaria drugs
- 2) Typhoid drugs
- 3) ARI management
- 4) ENT management

4) Child health

- 1) Diarrhea management
- 2) ARI management
- 3) Growth monitoring
- 4) Immunizations (BCG, Polio, DPT)

5) What is the Government's remuneration on the following staff members in Ksh.?

- 1) Physicians
- 2) Licensed community nurses.....
- 3) Auxiliary
- 4) Technicians average.....
- 5) Administration staff.....

6) What are the hours of operation of this facility?**7) Do you offer group talks on?**

- 1) Family planning
- 2) Maternal health
- 3) Child health
- 4) Preventive health

8) Do you observe record maintenance in this facility?

- 1) Yes.
- 2) No

9) Do you have separate register for each patient in this facility?

- 1) Yes.

2) No

10) Do you maintain address of each patient in this facility?

1) Yes.

2) No

Health service	Frequency of supervisory visits				
	Within last week	Within last month	Last 3 months	6 months	Never visited
Family planning					
MCH					
Immunization					

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M.A (PLANNING) THESIS ON EQUITY, EFFICIENCY AND QUALITY OF HEALTH CARE SERVICES: SPATIAL PLANNING GUIDELINES FOR ALLOCATION OF PUBLIC HEALTH CARE FACILITIES IN NAIROBI (2003)

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SCHEDULE (C): DETAIL HOUSEHOLD QUESTIONNAIRE TO FOR THE LAST LIVE BIRTH FIVE (5) YEARS PRECEDING SURVEY.

To be administered to household head, preferably female household head

Questionnaire number: ()

Respondent Name:..... (Optional)

1. Has your child ever received postnatal care?

1) Yes

2) No

2. If yes, from a private or public facility?

1. Private

2. Public

3. Please specify the location and name if in Nairobi-----

4. Estimate the length of travel time in minutes to sources of the post-natal care facility---

5. What is the transportation cost to and from this facility in Ksh.? -----

6. How much do you/did you pay for postnatal care in Ksh.? -----

7. Could you provide time in days between birth and first visit for post-natal care?

8. What was the infant's health status at visit?

1 Sick

2 Healthy

9. Has your child received any vaccination in the last sick months?

1. Yes

2. No

10. If yes, Where?-----

11. If yes, what type of vaccination --

1. BCG
2. DPT
3. Polio
4. Measles
5. Others

12. **How did you know that your child needed vaccination?**

13. **Estimate travel time in minutes you took/take to reach a vaccination facility**

1. Public facility
2. Private facility

14. **What was/is the transport cost to the facility?**

1. Public facility-----
2. Private facility-----

15. **Where you assisted by any party to pay for vaccination costs including medication? (Please specify).**

16. **What has been the most prevalent child disease in the last one month?**

1. Diarrhea
2. Acute respiratory infection (ARI)
3. Others (If 2, proceed to question 28)

17. **Please specify number of days your child was sick?-----**

Please specify facility name and whether public or private where you sought child health care? (a)

Name-----

(b) Private/Public-----

18. **Which of these diseases has been more severe to your child?**

- 1) ARI
- 2) Diarrhea

19. **Did your child have these diarrhea symptoms?**

1. Mucous or blood in feaces
2. Dry or wrinkled skin
3. Sunken eyes
4. Dry lips
5. Vomiting

20. **What was the duration of these symptoms?**

- i Mucous/blood in feaces ----- days
- ii Sunken eyes ----- days
- iii Dry lips ----- days
- iv Vomiting ----- days

21. **What treatment action was taken?**

1. Out-of-home treatment
2. In-home treatment
3. No treatment

22. **Where did you seek Medicare care for the child's ailment?**

1. Private facility
2. Public facility
3. Other

23. **Why did you choose the facility for medical care?**

1. Distance

2. Recommended
3. Cost of service
4. Other

24 **Has your child ever been hospitalized for any ailment?**

1. Yes
2. No

25 **Who provided the health care?**

1. Physician
2. Nurse
3. Herbalists

26 **Did your child's condition improve?**

1. Yes
2. No

27 **Did your child have ARI symptoms?**

1. Yes
2. No

28 **What would you say of these ARI symptoms?**

3. Severe
4. Moderate
5. Mild

29 **What was the duration of the symptoms in days? (Specify please).....**

30 **Did your child's ARI condition improve?**

a) Severe ARI

1. Yes
2. No

b. Moderate ARI

1. Yes
2. No

c. Mild

1. Yes
2. No

31 **What action was taken for treatment?**

1. Treated away from home
2. Treated at home
3. Not treated

32. **Where did you seek the child's health care services?**

- 1 Public facility
- 2 private facility
- 3 Herbalist
- 4 Other

33 **What was the reason for choosing the health care facility?**

- 1 Distance
- 2 Reputation
- 3 Past experiences
- 4 Recommendations
- 5 Costs
6. Other

34 **Estimate travel time in minutes to the facility care was sought-----**

- 35 *What was the travel cost to and from the facility in Kshs -----*
 36 *How much did you pay for medication in Kshs. -----*
 37 *How much did you pay for supplies? -----*
 38 *How much did you pay for consultation?-----*
 39 *Where you assisted to pay?*
 1 Yes
 2 No
 40 *If yes, by who? (Specify)*

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M.A (PLANNING) THESIS ON EQUITY, EFFICIENCY AND QUALITY OF HEALTH CARE SERVICES: SPATIAL PLANNING GUIDELINES FOR ALLOCATION OF PUBLIC HEALTH CARE FACILITIES IN NAIROBI (2003)

Confidentiality: *All Data and Information Collected Under this Survey will be used for Academic Purposes only.*

Schedule F: Short Inventory questionnaire Module (to be administered to officer-in-charge of (Private facility).

1. *Facility name (optional)----*
2. *Nature of facility*
 1. Clinic
 2. Hospital
 3. Specialized Hospital
3. *Location of facility.*
4. *Services offered in the facility (tabulate)*

(Please tick services offered)

Family planning	Preventive Services	Curative	Child health
1. IUDS	1. IEC materials	1. Anti-Malaria	1. Diarrhea management
2. Oral contraceptives	2. Vaccination	2. Typhoid	3. ARI management
3. Condoms		3. ARI Management	4. Growth Maintaining
		4. ENT management	5. Immunization – BCG, polio, DPT

5. *How many hours of operation does your facility operate? ----*
6. *How many staff members are on an on-call service ----*
7. *How many more hours do your staff work in a day?--*
8. *How much is charged by your facility for:*
 1. Malarial treatment
 2. Typhoid treatment
 3. Other intestinal treatment
 4. Dental services
 5. Growth monitoring
 6. Minor injuries
 7. Prenatal services
 8. Post natal care

9. ARI
10. Immunization DPT
11. Diarrhea
12. Tetanus toxoid
13. Family planning (FP): Pills
14. FP:IUD
15. FP (condoms)
9. *Do all people pay for services that are rendered?*
 - 1 Yes
 - 2 No
10. *How do they pay?*-----

UNIVERSITY OF NAIROBI

M.A (PLANNING) THESIS ON EQUITY, EFFICIENCY AND QUALITY OF HEALTH CARE SERVICES: SPATIAL PLANNING GUIDELINES FOR ALLOCATION OF PUBLIC HEALTH CARE FACILITIES IN NAIROBI (2003)

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Schedule G: Service Efficiency (to be administered too officer-in-charge of facility questionnaire number ()

Facility name: -----

Type of facility -----

Date of interview -----

Time of interview -----

Hierarchy level:

(1) Dispensary (2) health center (3) Hospital

3) *How many patients have you served in the last 4 weeks? ---- (Provide records)*

4) *How many patients have you served for*

1. Malarial treatment
2. Intestinal diseases
3. ARI (children) below 5 years
4. ARI over 5 years
5. Accidents
6. Others
7. Immunizations

5) *How many man hours do your staff work in a day?-----*

6) *Do you have staff members on on-call services? -----*

1. Yes
2. No

7) *If yes, how many are on an on-call service a day? -----*

8) *If on an on-call service, then for how many hours in a day? -----*

9) *What is the generally universally acceptable staff time allocation for*

1. Consultation-----
2. Prescription-----
3. Purchase issuance of medications-----
4. Patient registration-----

10) *Many doctors does this facility have? -----*

11) *How many nurses does this facility have? -----*

12) *How many ancillary nurses does this staff have?-----*

13) *What is the government gross remuneration for*

a) Doctors in Kshs.----

- b) Nurse in Kshs.-----
- c) Ancillary nurse in Kshs -----
- d) Pharmacist-----
- e. Physicians -----

14) How much is charged by your facility for.

- 1) Malaria treatment-----
- 2) Typhoid-----
- 3) Accidents injuries (minor) -----
- 4) Dental services-----
- 5) Growth monitoring-----
- 6) Pre-natal services-----
- 7) Post natal care-----
- 8) Diarrhea-----
- 9) ARI-----
- 10) Immunization Polio-----
- 11) Immunization DPT-----
- 12) Tetanus Toxoid-----
- 13) Family planning pills-----
- 14) IUD-----
- 15) FP condoms-----

15) What is the number of people who paid for the following health care services in the last 4 weeks?

- 1. Malarial treatment Dental Services
- 2. Immunization: Polio Diarrhea
- 3. ARI Post natal services
- 4. Immunization: DPT
- 5. Typhoid treatment
- 6. Minor injuries
- 7. Growth services

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M.A (PLANNING) THESIS ON EQUITY, EFFICIENCY AND QUALITY OF HEALTH CARE SERVICES: SPATIAL PLANNING GUIDELINES FOR ALLOCATION OF PUBLIC HEALTH CARE FACILITIES IN NAIROBI (2003)

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Schedule G: Staff Time Allocation Questionnaire module (to be filled by Health facility staff)

1. Facility Name-----

2. Type of facility (please tick)

1. Public
2. Private

3. Hierarchical level (please tick)

1. Health post/clinic
2. Dispensary
3. Health center
4. Hospital
5. Specialized hospital (i.e. mental, maternity, etc)

4. Staff specialization/training----- e.g. auxiliary nurse

- Nurse
- Auxiliary Nurse
- Obstetrician
- Doctor, administrative staff
- Physician, pharmacist (please fill as appropriate)

5. Duration of working hours staff allocated in a day-----

6. Health Services Sought by clients/patient (Tick Appropriately)

1. Family planning

- a) IUDS
- b) Oral contraceptives
- c) Condom s

2. Preventive services

- a) IEC materials (information and education communication)
- b) Vaccinations

3. Curative services

- a) Anti-malaria
- b) ARI management
- c) ENT management

4. Child health services

- a) Diarrhea management
- b) ARI management
- c) Growth monitoring
- d) Immunizations
 - i) BCG
 - ii) Polio
 - iii) DPT

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Schedule F: Service Efficiency: Staff Utilization Rates by Staff Type Observation sheet (to be observed by principal Researcher on clients seeking health care service)

Questionnaire number ()

Date of Interview-----

1. Facility name-----
2. Type of facility-----
3. Hierarchal level-----
4. Date of interviews-----
5. Time of interview-----

<i>Service Rendered</i>	<i>Staff type</i>	<i>Time taken in minutes</i>
1. Patient registration		
2. Consultation		
3. Prescription		

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QUESTIONNAIRE SCHEDULE (B): HEALTH AND DISEASE PATTERNS AMONG HOUSEHOLD MEMBERS OVER FIVE YEARS OF AGE

(To be administered to household head/mature household members Sick 3 months preceding survey)

Questionnaire number:.....

Respondent's name (optional):.....

1. Place of residence

- (1) Kiambiu Informal settlement
- (2) Pioneer Estate

2. Sex

- a. Female
- b. Male

3. Age

4. Educational level

- (1) Primary (2) Secondary (3) Post-secondary (4) None

5. Employment

- (1) Formal (2) Informal
- (3) Unemployment (4) Casual
- (5) Household work (6) Study

6. Health insurance

- (1) NHIF (2) Private (3) None

7. Remittances from other households/relatives

8. Monthly income in Ksh-----

9. Specific health problem 3 months to to date (please tick)

- (1) Respiratory Infections
- (2) Intestinal infections
- (3) Diseases of the heart
- (4) Accidents/poisonings
- (5) Dental problems
- (6) Chronic illnesses
- (7) Gynecologic problems
- (8) Others
- (9) Malarial problems

10. Where you prevented from engaging in normal activities by household Members/doctors during your sickness?

- (1) Yes
- (2) No

11. If yes, for how many days did you not pursue normal activities?

12. What would you say of income lost during illness days in Kshs?

13. How much would you say of your daily income lost due to care-taking in Kshs?-----

14. Where did you seek healthcare attention?

- (1) Outside home
- (2) In-home care
- (3) Did not seek treatment

15. Where then did you seek medical attention (specify name of facility and whether Private or public)

16. If you, did not seek healthcare for your illness what was the reason?

- (1) Unnecessary
- (2) Lack of money
- (3) Too far
- (4) Poor quality services
- (5) Too busy
- (6) Lack of transport
- (7) Carelessness

17. If care sought outside home, where?

- (1) Public facility (name)
- (2) Private facility
- (3) Traditional/herbalist
- (4) Other locations
- (5) Pharmacy

18. What was the reason you sought health care services from this particular facility?

- 1) Distance
- 2) Reputation
- 3) Past experience
- 4) Search for best facility
- 5) Cost
- 6) Availability of services
- 7) Insurance requirement
- 8) Other

19. Who provided care?

- (1) Physician
- (2) Pharmacist
- (3) Doctor
- (4) Nurse
- (5) Ill person
- (6) Relative
- (7) Other

20. Did your condition improve?

- (1) Yes
- (2) No

21. Were you hospitalized for the ailment?

- (1) Yes
- (2) No

22. If yes, where?

23. Estimate traveling in minutes to the facility care was sought.....

- 24. What was the travel cost to and from the facility in Kshs?.....
- 25. How much did you pay for medication in Kshs?.....
- 26. How long did you wait to be attended in the facility in minutes.....
- 27. How much did you pay for medical supplies in Kshs?.....
- 28. How much did you pay for consultation in Kshs.?
- 29. Did you purchase any medication?
 - (1) Yes
 - (2) No
- 30. How did you pay?
 - (1) Free
 - (2) Received assistance from source other than immediate family
- 31. If assisted by other source other than immediate family, how much did they provide in Kshs?
- 32. Did you know of a closer, facility, but never attended it?
- 33. Why did you by pass your closest facility?
 - (1) Perceived low quality of service
 - (2) Health Insurance status
 - (3) Familiarity with health care personnel
 - (4) Insurance requirements

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M.A (PLANNING) THESIS ON EQUITY, EFFICIENCY AND QUALITY OF HEALTH CARE SERVICES: SPATIAL PLANNING GUIDELINES FOR ALLOCATION OF PUBLIC HEALTH CARE FACILITIES IN NAIROBI (2003)

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Questionnaire Schedule D: CLIENT EXIT AND PERCEPTION ON QUALITY OF SERVICE QUESTIONNAIRE MODULE (To be administered to health facility exit clients)

Questionnaire number:.....

Respondent's name (optional):.....

- 1. Facility type
 - (1) Private
 - (2) Public
- 2. Facility Name:.....
- 3. Hierarchy level

Area of residence	Marital status	Age	Education level	Income	Employment	Health Insurance

- Code: Sex
 - 1 – male
 - 2 – Female
- Age
 - 1 – 0 – 4
 - 2 – 5 – 9

- 3 – 10 – 14
- 4 – 15 – 19
- 5 – 20 – 24
- 6 – 25 – 29
- 7 – 30 – 34
- 8 – 35 – 39
- 9 – over 40

Educational level

- 1- Primary Education
- 2 – Secondary Education
- 3 – Tertiary Education
- 4 – None

Employment

- 1. Formal employment
- 2. Informal
- 3. Unemployed
- 4. Casual
- 5. Household work
- 6. Study

Marital status

- 1. Single
- 2. Married
- 3. In union
- 4. Separate
- 5. Widowed

Health insurance

- 1. Social Security (NHIF)
- 2. Private/company
- 3. None
- 4. Prepayment

5. ***What is the approximate distance in kilometers to this facility from your place of Residence? -----***

6. ***Are you satisfied with the facility's hours of operation?***

- (1) Yes
- (2) No

7. ***How many minutes do you think you've waited to receive medical attention?***

8. ***Were you satisfied with the waiting duration?***

- (1) Yes
- (2) No

9. ***How would you rate the duration of consultation?***

- (1) Below 10 minutes
- (2) Below 20 minutes
- (3) Over 20 minutes

10. ***Were you satisfied with the length of consultation?***

- (1) Yes
(2) No
11. *Do you think there was sufficient time for consultation that addressed all your concerns?*
(1) Yes
(2) No.
12. *Do you perceive that your privacy during consultation was sufficient?*
(1) Yes
(2) No
13. *Did you receive a clear explanation of your case from the provider during consultation?*
(1) Yes
(2) No
14. *Was the condition that you sought health care resolved by your visit to this facility?*
(1) Yes
(2) No
15. *Do you think you would return to this facility to obtain medical care?*
(1) Yes
(2) No
16. *Where you referred somewhat else?*
(1) Yes
(2) No
17. *If yes where?*
18. *Was the prescribed medication to treat your condition available?*
(1) Yes
(2) No
19. *How would you perceive of the availability of medicine?*
20. *Did you have an alternative source of medical care?*
(1) Yes
(2) No
21. *If yes, why did you attend this facility?*
1. Perceived high quality services
2. Familiarity with personnel
3. Lees expensive
4. Insurance requirements
22. *If yes, why didn't you attend the facility then?*
23. *Did you pay for the services?*
(1) Yes
(2) No
24. *How much did you pay for the service?*
25. *How did you pay?*
26. *Were you assisted to pay from a third party? And who?*
(1) Insurance (2) Relative (3) Self (4) Other person
27. *How much was spent on*
(1) Consultation
(2) Medical supplies
(3) Medications

28. What health care services were you seeking from the facility?

- 1) Prenatal
- 2) Post natal
- 3) Vaccination
- 4) Diarrhea
- 5) Malaria
- 6) Typhoid
- 7) Acute Respiratory Infections (ARI)
- 8) Family Planning
- 9) Illness among less than 5 year olds
- 10) Others

29. Has your illness interrupted your normal activity?

- i. Yes
- ii. No

30. If yes, for how many days?

31. Why did you choose to seek health care in this facility?

32. Do you have a facility that you never attended but it is the closest to your home?

- (1) yes
- (2) No

33. If yes, why did you by pass the facility?

1. Perceived low quality of service
2. Health insurance status
3. Familiarity with health care personnel
4. Insurance requirements

33. What would you say of the health facility's amenity?

- (1) Clean
- (2) Very clean
- (3) Not satisfactory
- (4) Dirty
- (5) Very dirty

34. What would you say of affordability of health services sought?

5. In expensive
6. Expensive
7. Not inexpensive or expensive
8. Very expensive

35. What is your source of water at home?

1. Individual connection
2. Communal connection
3. Water vendor
4. Bore hole
5. Others

36. What do you use for lighting?

2. Electricity
3. Kerosene
4. Gas
5. Other

37. What is your main mode of transport?

1. Private car
2. Public transport
3. Public taxi
4. Walking

38. Which is your chief source of information?

1. The Radio
2. Television
3. Computer
4. Other

39. How much do you pay for your house rent?

40. How much did you pay for cost of medications?

41. How much did you pay for medical consultation?

42. Do you have any of the following durable goods at your home?

1. Telephone/mobile telephone service
2. Video
3. Washer
4. Refrigerator

43. What type of sanitation service do you have in your home?

1. A sewerage system
2. No sewerage system
3. Communal toilet facilities

44. What is the number of rooms in your dwelling unit?

1. One room
2. Two rooms
3. 3 rooms and over