

CHAPTER 1

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction

The health situation in most sub-Saharan African countries improved significantly following independence. This was partly due to the expansion of state investment in social services driven by the desire to mainstream populations previously marginalized by the colonial policies of separate and unequal development.

However, Africa's once highly socialized and equity-oriented health systems are being abandoned in most countries including Kenya due to declining resources and the changing role of the state. Health inequities and inequalities are increasingly, aggravated by poverty, uneven development resource allocation, inadequate planning, resource misappropriation, corruption and bad governance.

The disease burden in Africa is persistent and increasing. For example malaria continues to present a major challenge. It is estimated that about 80% of episodes of malaria occur in Africa and these account for between 20% and 50% of all admissions in healthcare facilities. Overall mortality due to malaria is rising by 5% per year among children and 10% among adults (World Bank, 2000; World Health Organization, 1998)

The emergence of HIV/AIDS has altered the pattern of major causes of death in the adult population. One in every 40 adults in sub – Saharan Africa is infected with HIV virus. Also associated with HIV/AIDS is the rising incidence of tuberculosis. Other vices bedeviling developing countries in Africa include: high infant mortality, high maternal mortality rates, decreasing life expectancy and poverty (World Bank, 2005).

1.2 Global Health Concerns

In an attempt to improve the state of global health, programmes and initiatives have been launched to better diagnose, treat, control and even eradicate diseases and other health related problems. Principal among these are the Millennium Development Goals (MDGs). A significant number of which are direct health- related: reducing the child mortality rate by two – thirds by 2015; reducing the maternal mortality rate by three – quarters by 2015; controlling the great pandemic diseases of HIV/AIDS, malaria, and tuberculosis; giving access to safe drinking – water and sanitation; and alleviating hunger and under nutrition (Sachs, 2004).

It is also worth noting that the first MDG – to reduce by half the proportion of the population in extreme poverty (the so – called ‘dollar a day’ poverty) by 2015, cannot conceivably be accomplished if the health goals are not achieved.

Some concerns have, however, been raised that developing countries may not achieve health – related MDGs by 2015 (Wagstaff & Claeson, 2004).

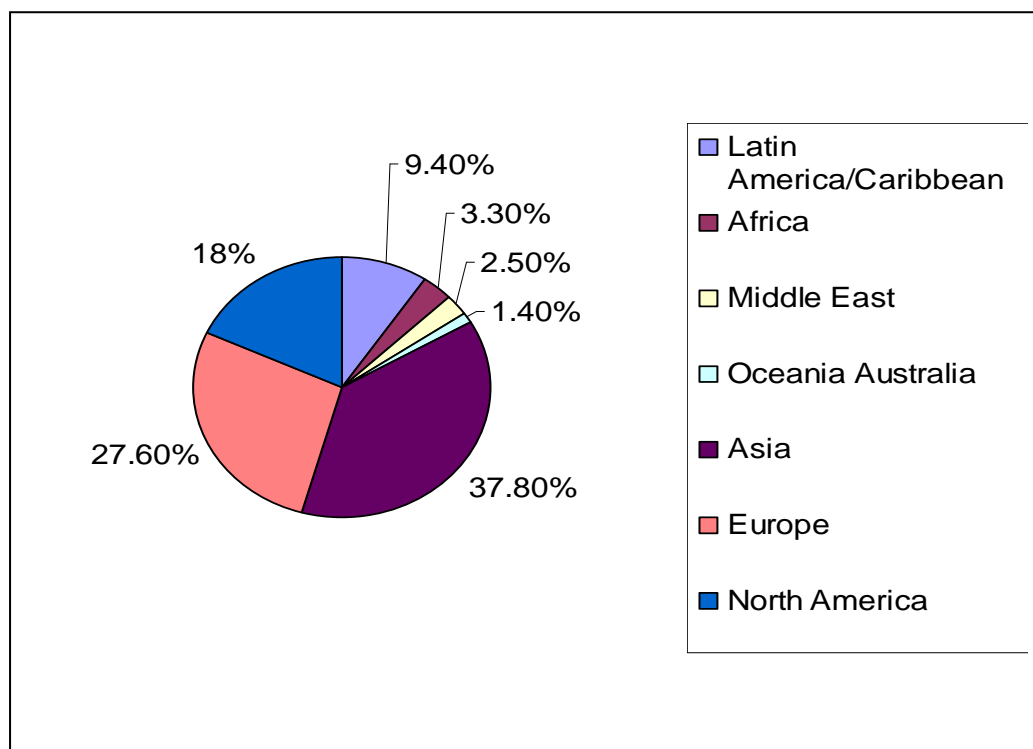
Analysis of the reasons for unsatisfactory progress suggests the existence of system – wide barriers and formidable challenges in implementation and scaling up because of weak health systems. The systems constraints relate to the realization that lack of access to adequate health information and knowledge may also slow down the progress towards achieving the goals (Travis, et al, 2004; World Health Organization News, 2004).

In 1994, a conference ‘Getting Information from the Developed to the Developing World’ held to review global access to health information concluded that most health professionals in the developing countries had inadequate access to information and that the information available to them was often unreliable or irrelevant (Kale, 1994). At that time there was optimism that by 2004, all or nearly all-healthcare professionals in the developing countries would have access to information they needed to provide the most effective healthcare services with the available resources. The world was at the peak of the information age: Information and Communication Technologies would mean that lack of access to reliable and relevant information would no longer be a barrier to effective and quality healthcare services.

In a statement on the right of access to information and communication, the Millennium Assembly of the United Nations emphasized the importance of information in relation to learning, research and debates (United Nations, 2000). While ICT is providing healthcare professionals in the developed countries with unprecedented access to information, the same groups in the

developing countries have very limited access to any information apart from out dated text books (Godlee et al, 2004). Because many medical journals are continuously being delivered in electronic formats, many healthcare professionals in Africa including Kenya are disadvantaged because of limited access to the Internet. Africa has only 3.3 percent of global Internet access; most of this is concentrated in South Africa and Nigeria.

Figure 1.1: Global Internet Access – 2007



Source: www.internetworldstats.com

Although the Internet use in Africa grew by 903.9 percent from 2000 to 2007, the Internet penetration still remain low at only 4.7 percent, compared to the world average penetration rate of 20.3 percent (www.internetworldstats.com, 2007). The cost of connectivity exacerbates the problem of access to the Internet in Sub-Saharan Africa. The average cost of dial-up Internet account for 20 hours a month in Sub-Saharan Africa is about USD 60.00 (including

usage fees and local call telephone time, but not telephone line rental). In comparison, 20 hours of Internet access costs around USD 22 a month (including telephone charges) in the United States, USD 33.00 in Germany and USD 39.00 on average for other European Union (EU) countries. All these countries have per capita incomes at least ten times greater than the Sub-Saharan average (Jensen, 2002).

The situation in developing countries may improve due to the shared goal of 'Universal access to healthcare information.' In the latest World Health Organization's: 'World report on Knowledge for better health,' equitable and universal access to healthcare information is recognized as an important part of the world – wide strategies to reduce disparities in health and achievement of health-related Millennium Development Goals (MDGs) (World Health Organization, 2004).

In the recent years there have been some moves to dismantle some of the barriers to accessing research information. Recognizing that few researchers and healthcare professionals in developing countries can't afford the high cost of journal subscriptions, several initiatives have been implemented to provide health professional with free online access to full text of health information. These are in essence all planned with very benevolent aims to improve the situation at the primary healthcare level. There is a proof of the commitment of the organizers and funding agencies behind such initiatives (INASP, 2007). These initiatives however, are in many instances uncoordinated and may at best constitute attempts to address information

needs of healthcare professionals of developing countries as perceived by the developed world. It is therefore essential for the African health policy makers within these structures to investigate ways of appropriate collaboration which would focus and respond more to country – and region - specific health information needs; economies of scale in terms of ICT infrastructure; and local end–user involvement so that reciprocal flow of relevant information can take place.

1.3 The Kenyan Situation

The Kenya Demographic and Health Survey (2003) indicates that the country's achievements in health and demographic indicators increased during the 1980's and early 1990's are declining steadily. Life expectancy decreased from 60 years in 1993 to 47 in the year 2000. Mortality increased from 64 per 1000 in 1993 to 72 per 1000 in 2003. It is estimated that 36% of children die before reaching their 5th birthday. Maternal mortality also remains high, (GoK, National Development Plan, 2002/8) increasing incidence of epidemics such as malaria and easily preventable diseases have contributed to the deteriorating health situation. In such areas as child immunization, only 32% of children are immunized against measles and 42% against tuberculosis.

HIV/AIDS has become a major factor behind the deteriorating health situation. According to the national analysis the prevalence rate is higher in urban areas where the increase is from 16.3% to 17.5% compared to the rural areas where the increase has been from 11% to 13% in 2000. The

declining health situation is a reflection of the worsening socio-economic situation as well as the inadequate resources devoted to health services in Kenya, where public expenditure represent only 1.7% of GDP compared with the average 2.5% for Africa. (African Development Bank, 2002). Education and information have long been vital tools for promoting health, controlling diseases and raising the quality of life for the people. Many of the practical problems encountered in the health care system in the country can be traced to lack of accurate and timely information. Many of the deaths could be avoided and several problems faced by health care workers could be overcome by adequate health information at hand when needed. The Government of Kenya acknowledges this fact: 'Most of the diseases encountered at the health facility levels are preventable at household and community levels if the public is well informed on the preventive measures' (GOK, 2002). Investments in terms of improved information systems would make profound change to the efficiency of healthcare services.

The World Development Report 1978 – 1999/2000 observes that one of the essential steps towards improving health is to understand the distribution of diseases, death and disability. This requires a systematic collection, analysis and dissemination of timely and accurate information on mortality, morbidity and the risk factors. Such data, the report said were a cornerstone of public health efforts in any country, and the government's role was central in creating them because the private sector had little interest in producing such public good (World Bank, 2000).

The report further noted that developing countries, Kenya included suffered from several disadvantages including inadequate funding and low priority usually given to information and research activities. An effective information system provides the required information at all the functional levels of demand at the right time for the relevant decision-making and should be accessible to all the beneficiaries promptly.

One of the aims of Kenya's National Health Sector Strategic Plan 1999 – 2004 was to make the national health care delivery system more responsive to the changing health needs, more efficient, more broadly participatory and more cost effective. These could only be achieved if an appropriate information system is put in place, which is able to provide relevant, accurate and timely information to the different categories of users promptly.

Health information services in Kenya are available from a variety of sources. Different service providers scattered throughout the country, but with no coordination provide the services. The Ministry of Health operates a variety of health management information systems. These systems however, lack integration and are disjointed and widely dispersed, with no effective coordination to ensure that the information is readily available to the users. The systems are at different stages of integration of ICTs in their service delivery, highly localized and thus are often inaccessible.

1.4 KNH and Its Context

This section provides the characteristics of the case study organization and basic contextual information in order to help the readers to understand the study findings. Some of the information presented here is based on the organizational publications. Because of the confidentiality concerns, some specific citations are not supplied in this document.

1.4.1 History and context

Kenyatta National Hospital (KNH), originally called the Native Civil Hospital, was established in 1901 with a two-ward bed facility. Extensions were made in 1939, 1951, and 1953 increased its bed capacity to 600. It was renamed the King George VI Hospital in 1951. In 1957, the Infectious Disease Hospital was added with 234 beds, and in 1965 the British Military Hospital in Kabete was taken over as the Orthopaedic Unit, and later a Dental Wing was added. After independence in 1963, it was renamed Kenyatta National Hospital, in honour of the first president of the Republic of Kenya, Mzee Jomo Kenyatta.

The training of mid-wives in the hospital was started in 1965, and the University of Nairobi, Medical School which was located at the hospital was established in 1967, when the first group of medical students was admitted into the MBChB degree programme. The construction of the ten-storey tower block was completed and put into use in 1981, which brought the bed capacity to 1800. In 1987, the hospital became a State Corporation under the Ministry of Health.

Kenyatta National Hospital provides facilities and resources for training, teaching and research to the College of Health Sciences, University of Nairobi, and other training institutions, both local and international. It is the major training institution for health personnel in various medical disciplines, and a reference point for training post-graduate medical doctors in various specialities and also for providing internship for health care professionals. The hospital works closely with University of Nairobi's College of Health Sciences, Kenya Medical Training College (KMTTC), Kenya Medical Research Institute (KEMRI), Government Chemist Department, National Radiation Protection Centre, National Public Health Laboratories and National Blood Transfusion Services (NBTS) of the Ministry of Health.

As a national referral hospital, KNH offers highly specialized services such as: radiotherapy, cardiothoracic surgery, neurosurgery, plastic and reconstructive surgery, critical care services namely, intensive care services, high dependency services, newborn services, orthopaedic surgery, renal services (including kidney transplantation) and burns management.

The Legal Notice No. 109 of 6th April 1987 mandates the hospital to:

- Receive patients on referral from other hospitals or institutions within or outside Kenya for specialized health care;
- Provide facilities for education and training of students at College of Health Sciences (CHS), University of Nairobi and Kenya Medical Training College (KMTTC), and carry out clinical research either directly or through cooperation with other health institutions;

- Provide facilities for education and training in nursing and other health and allied professions;
- Participate as a national referral hospital in national health planning.

Kenyatta National Hospital's mission statement is formulated as: "To provide specialized quality health care, facilitate medical training, research and participate in national health planning and policy." Furthermore, its vision is formulated as: "To be a regional centre of excellence in the provision of innovative and specialized healthcare." This vision expresses its shared aspiration as an organization and places the patient at the centre of attention.

1.4.2 Organizational structure and management of KNH

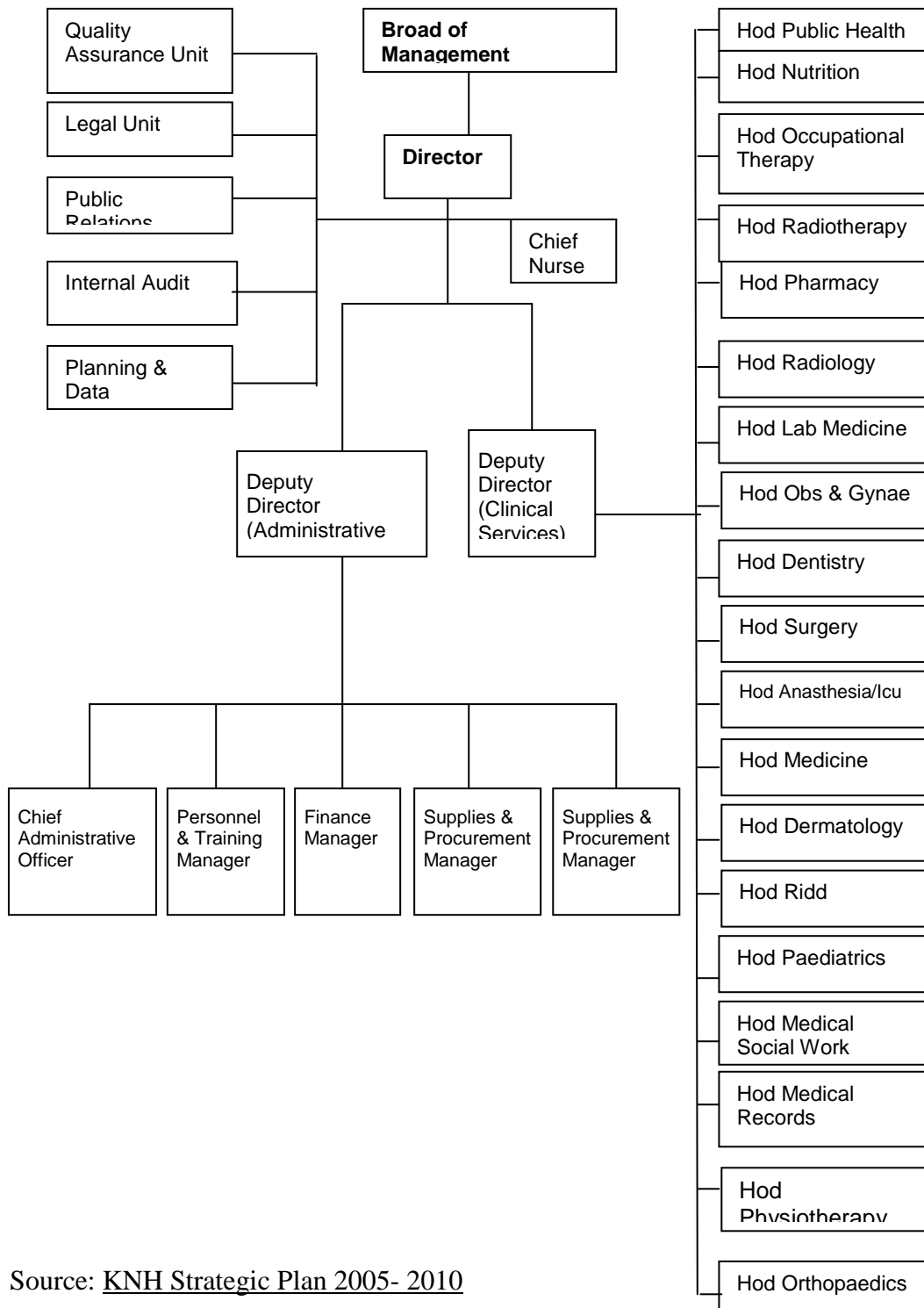
KNH is the second largest hospital in Africa with a bed capacity of 1800, out of which 225 beds are for the Private Wing. It has 50 wards, 20 out-patient clinics, 24 theatres (16 specialized) and an Accident & Emergency Department. There is a Doctors Plaza consisting of 60 suites for various consultant specialities. At any given day the hospital hosts in its wards between 2500 and 3000 patients. On average the hospital caters for over 80,000 in-patients and over 500,000 out-patients annually.

The 2005 annual report indicates that the KNH has staff strength of 4,955 employees, with a complement of 271 doctors who offer patient care in clinical, diagnostic (radiology and laboratory services) and pharmaceutical services. Out of these, 220 are involved in direct clinical care of patients. The

hospital is currently being reorganized and restructured, in response to the health needs in Kenya (NHSSPII) and within the region, and to cope with the various challenges of providing quality specialized health care, training and research and outreach services that fall within its mandate.

A statutory board runs the hospital. There is, however a management team for the purpose of proper execution of policies and effective management. The Director is in-charge of the day to day running of the hospital. There are two deputy directors, one responsible for Clinical Services and the other in-charge of administration and finance. Below these positions are senior positions of professionals in various clinical and non-clinical services, in the general hospital administration, finance, planning, procurement and engineering that provide leadership in various services in the hospital. The current organization structure is as shown in Figure 1.2.

Figure 1.2: Organizational Structure of KNH



Source: KNH Strategic Plan 2005- 2010

The hospital relies on a Local Area Network (LAN) system for its administrative and financial applications. The LAN provides access to directors, managers, administrative staff and some of the ancillary departments. The 'library', which forms part of training service, is housed in a small single office room within the personnel and training department. The room is not connected to the local area network neither does it provide access to electronic health databases. During the fieldwork one library assistant was responsible for the supervision of library activities in addition to other responsibilities within the department. As an information source, the 'library' possesses some printed materials. According to the library assistant, it holds about 2000 books and reports covering various subjects and not journal holdings. The library does not provide access to electronic databases such as Medline since it is not connected to both the LAN and the Internet. There is little evidence that medical professionals at Kenyatta National Hospital have access to adequate and reliable information to guide their clinical work. This study was, therefore aimed at investigating the availability and use of ICT in health information access by medical professional at Kenyatta National Hospital.

1.5 Statement of the problem

Since independence in 1963, Kenya has continued to promote access to modern healthcare services. In 1978, the government adopted primary health care strategy in response to World Health Organization sponsored 'Health for All' declaration. This was meant to ensure access to basic health services to all people regardless of their social status and geographical

location. The strategy relies on awareness creation and sensitization among the people to facilitate informed decision-making for good health. To this end a proactive and pervasive provision of appropriate reliable health information system and services is necessary in order to empower the Kenyan communities to contribute to their own health.

In spite of the awareness and the heavy investment in the health care facilities and healthcare professionals, the majority of Kenyans continue to suffer from curable and preventable diseases. To a large extent many of the deaths could be avoided and several of the problems faced by health professionals could be overcome by provision and access to adequate and timely information.

It is known that healthcare is information and knowledge-based service and therefore providing access to reliable information for healthcare professionals is potentially the most cost-effective strategy for improving the quality of healthcare delivery. Medical profession is one of the most information intensive fields, so that there is such a tremendous amount of information being produced in a multiplicity of languages and in a vast number of information sources. It is therefore impossible for a professional in a given field of speciality to cope with more than a relative small fraction of it. This is why reliable health information systems and services are necessary for an effective healthcare delivery service. Such an information system should be able to identify and anticipate the information needs of health care professionals and supply them with relevant, reliable and timely information

for their practice. This is mandatory for health professionals if they are going to provide safe and effective health care services. In most cases they are the only source of information for the health consumers in Kenya.

Information and communication technologies (ICTs) are not only limited to the transfer of information. In the developed countries ICTs are also used to promote better health behaviour, to improve decision making, to promote information exchange among peers, for self care and professional support, and to enhance the effectiveness of health institutions. Innovations such as electronic medical records, hospital information systems, Intranets, health decision-support systems, telemedicine and community health information systems have altered the cost, quality, accessibility and delivery of health care services.

There are a plethora of vehicles and media for disseminating ICT applications ranging from locally networked computers, the Internet, dial-up services, satellite and other wireless modes, CD-ROM, DVD and other information storage and delivery technologies. A combination of these technologies is breaking down the organizational barriers that have stood between medical professionals, researchers, and actual users (the general public and patients). In addition to exerting influences on personal health decisions and behaviours, ICTs continue to offer new opportunities including improved access to individualized health information and promotion of interaction and social support among users, consumers and medical professionals.

The potential of information and communication technologies have not been fully harnessed systematically to bring about improvements and quality healthcare services. Kenya continues to face health threats characterized by ravaging HIV/AIDS pandemic, spread of infectious diseases and malaria, high levels of infant mortality and maternal mortality, low levels of life expectancy and deteriorating healthcare facilities (NDP, 2000).

There is little evidence that the majority of healthcare professionals in Kenya have any better access to relevant and reliable health information. There are problems in the healthcare delivery services in Kenya as a result of lack of access to adequate and reliable information. Known and assumed barriers to using information in practice include lack of awareness of what is available, lack of relevance of available information (i.e. not meeting people's needs in terms of scope, style or format), lack of time and incentives to use information, and lack of interpretation skills. These problems have also been attributed to information systems and services, which according to Godlee et al. (2004) are not understood, unmanaged and under-resourced. For information systems and services to be accessible and satisfy the information needs of a particular user group, they must take into account the characteristics and needs of the user group (Odini, 1993). The information needs of medical professionals are poorly understood; consequently the information system has not been able to serve them adequately. They lack adequate and relevant information to enable them to perform efficiently. Once information needs are identified, relevant information can be located and made available.

If the priority action for change in healthcare delivery system in Kenya is to respond to current challenges due to advent of knowledge-driven society and the trends towards globalization; then it will require that computerized health information systems be put in place in order to accommodate these emerging trends. To meet the Millennium Development Goals (MDGs) and achieve 'Health for All' by 2015 increased access to health information and knowledge by health professionals is essential. Information and communication technology applications have the potential to change totally the way medical professionals acquire and disseminate health information and the way they provide healthcare services.

This study intends to provide evidence on medical professionals' current utilization of ICT in health information access. It is expected to produce new knowledge and insights into the current situation with regard to the application of ICT in health information access. It envisages establishing the challenges and problems encountered by medical professionals in accessing health information.

1.6 Aim of the Study

The aim of this study was to investigate the availability and utilization of information and communication technology in health information access by medical professionals at the Kenyatta National Hospital in Kenya

1.7 Objectives of the Study

The following objectives are designed to achieve the aim stated above: -

1. Identify the information needs of medical professionals at Kenyatta National Hospital.
2. Determine the sources and channels of information used by medical professionals at Kenyatta National Hospital.
3. Identify the factors for which medical professionals require ICT support in accessing health information.
4. Establish the extent of the current usage and level of adoption of ICTs among medical professionals at Kenyatta National Hospital.
5. Determine the potential challenges and prospects of utilization of ICTs in accessing health information by medical professionals.
6. Suggest and recommend measures to be taken into account in improving adoption and use of ICTs by medical professionals at Kenyatta National Hospital.

1.8 Research Questions

The study was guided by the following research questions: -

1. What kinds of information do medical professionals need for their daily clinical practice?
2. How do medical professionals at KNH obtain information to guide their clinical practice?
3. To what extent does the existing health information systems/services meet their information needs?

4. What kinds of ICTs are available to the medical professionals; and to what extent are they utilized in accessing information for clinical purposes?
5. What are the impediments to ICT utilization by the medical professionals?
6. How can the use of ICTs be enhanced for improved access to relevant information and knowledge for medical professionals?

1.9 Assumptions

In this study the following assumptions were made:

1. That the medical professionals lack access to current and up-to-date information to enable them to do their work effectively due to over reliance of textbooks and other traditional print formats, while much of the information is continuously being delivered in electronic formats.
2. That if factors that contribute to lack of access to adequate and reliable health information are objectively identified, realistic alternatives and possible solutions could be recommended.
3. That there is a significant potential for ICT use in the provision of health information by medical professionals in Kenya.
4. The questions asked of interviewees were comprehensive, reliable and valid to determine concepts of information systems and information access.

5. The perceptions of the participants of this study regarding utilization of ICT in health information access reflected their ideals and reality at the time of the study.
6. The medical professionals selected had the information and knowledge concerning the phenomena under investigation and were representative of Kenyatta National Hospital work practices and culture.

1.10 Significance of the Study

The outcome of this research will therefore have implications for the five major stakeholders as outlined below:

1. The Government and health sector policy-makers: With the majority of healthcare professionals working in the public sector, this information will provide the employers, health administrators and managers with useful information that could be used in the planning and management of ICTs for the purpose of providing quality healthcare service.
2. Educators: Recommendations developed from this study will also be aimed at medical education providers to ensure that healthcare professionals are adequately prepared to adapt to the eminent changes in their workplace, to be able to effectively utilize ICTs and importantly, to be able to apply their knowledge to maximize their client's to use ICTs for accessing relevant health information.
3. Healthcare professionals: Measures designed to extend and enhance the capacity of healthcare professionals to utilize the potentials of

ICTs is in the interest of the profession. Healthcare professionals will increasingly find themselves needing to use ICTs both in their work tasks and in their interventions with patients.

4. Information professional: It is hoped that the knowledge created in this research will be of interest to the information professionals as recommendations will be put forward for the professionals to improve the utilization of ICTs and thus the marketability of their information products and services.
5. Researchers: The study will contribute to advancement of knowledge and extend the theoretical validity and empirical applicability to existing knowledge to healthcare professionals.

1.11 Scope and Limitations of the study

Scope of this study concerns the boundary of the problem, the individuals to be studied, and the setting of the study. The aim of this study was to investigate the availability and utilization of ICTs in health information access, as well as the factors that enable or inhibit effective access to timely and relevant information by medical professionals at Kenyatta National Hospital. It is also designed to identify the potential opportunities of ICT utilization. The research questions and the methodology used are designed to generate this information and provide empirical data on availability and utilization of ICTs in information access at Kenyatta National Hospital. Data was collected from medical professionals who offer patient care in clinical, diagnostic (radiology and laboratory) and pharmaceutical services. Nurses and other health care professionals were excluded in the study since their

information needs and communication patterns may be quite different from those of other medical professionals engaged in clinical and diagnostic services.

For the purposes of this study ICT will be defined as information systems and communication; as well as data exchange between the medical professionals and the key constituents (physicians, patients and the hospital), involved in the clinical and administrative functions of healthcare delivery at Kenyatta National Hospital. Medical devices and equipments involved in diagnosis and treatment will not be part of the scope of this study.

Limitations of this study include the bias of the researcher, the effect of the observer in the environment on the action of the subjects, the role of the perception and memory to recreate history and the generalizability of the findings. Qualitative research has natural generalizability limitations and the results of this study may not be applicable to all health care institutions. In general, it is clear that a given phenomenon, situation, or response may be appropriate for one person or situation but not for another.

Another limitation involves the method of data collection. It requires an opinion and perception of each of the participants. The probing questions, observation and evaluation of additional materials combined to reveal the lived experience by the particular actor in this particular circumstance. But the evaluation of the data in this instance is infused with the interpretation of the researcher.

Another limitation of the study is the sample size. Qualitative research does not collect numeric data from a representative sample of the target audience. As a result, this type of research cannot be subjected to statistical analysis to estimate to what extent opinions expressed by the participants reflect the opinions of the population studied. Medical doctors at Kenyatta National Hospital are a small proportion of the entire medical professionals in Kenya. Therefore the findings of the study would only be generalized in the study area and not the entire country. The most important implication of this limitation is that researchers should refrain from drawing any conclusions about the actual prevalence of specific concerns, attitudes, or beliefs among the target audience.

The quality of the data collection and the results are highly dependent on the skills of the moderator or interviewer and on the rigour of the analysis. Because all of these methods are dependent on interpersonal exchanges with respondents, any number of variables, including the dress, demeanor, language used by the interviewer may influence the quality and quantity of information given by respondents. The skills and experience of the researcher / analyst also influence how well the data are summarized into themes and insights that are useful for subsequent programme planning.

1.12 Definition of terms and concepts

A number of terms and concepts are used in this study, and which are often taken for granted, which can lead to mis-interpretation of the results. To avoid this, these key terms and concepts are defined in this section in the context of this study.

Medical professionals: For the purpose of this study, the term includes all physicians/ medical practitioners who offer treatment and patient care in clinical, diagnostic (radiology and laboratory), dental and pharmaceutical services. Many of these medical professionals are also trainers and researchers and/ or producers of information materials for other healthcare providers.

Information and knowledge: These terms have been variously defined, and there is ongoing debate as to how, and indeed whether, they differ from each other. One view simply expressed is that knowledge is what is inside peoples' heads, while information is what you get when you write it down (or incorporate it into a discussion, lecture, tape or video); information is therefore an expression of knowledge. Another view is that, if information is the assimilation of data (facts, experiences, and statistics), knowledge is information made actionable or mobilized for decision making. This study takes the view that there is a spectrum that encompasses knowledge and information and that different parts of this spectrum are relevant, and necessary, to different people at different occasions.

Information and Communication Technologies (ICTs): The term ICT is defined as “ a shorthand for the computers, software, networks, satellite links and related systems that allow people to access, analyze, create, exchange and use data, information, and knowledge in ways that until recently, were almost unimaginable. It refers to the infrastructure that brings together people in different places and time zones with multimedia tools for data, information, and knowledge management in order to expand the range of human capabilities” (Herselman & Britton, 2002). Thus ICT, basically, is previously separate immobile units of data and technologies (IT) incorporated into new communication methodologies and technologies. In the context of this study ICT refers to information systems and communication; as well as data exchange between the medical professionals and their key constituents (physicians, patients and the hospital), involved in the clinical and administrative functions of healthcare delivery.

Information seeking: Information seeking is the search for information, a human process that is closely related to learning and problem solving, can be defined as ‘a process in which humans purposefully engage in order to change their state of knowledge’. In this study the definition is taken from Marchionini (1995) who also argue with the notion that information seeking is always purposeful and directed, and can be obtained and stored in an incidental manner and then` used at a later date.

Personal Digital Assistant (PDA): A small handheld wireless device capable of storing and/or transmitting pages, data messages, voice calls, faxes and e-mails.

1.13 Structure and organization of the dissertation

This dissertation is organized into eight chapters: Chapter one provides an overview of the components of the proposed study. These include the development of the context by providing the background information. The purpose of the study, the explicit statement of the problem and the research questions are presented as well as the significance of the study.

Chapter two provides the literature review and presents the theoretical framework, informed by the relevant literature from the field of Information Sciences. The chapter presents and extends an alternative to the diffusion perspective based on the concept of Actor Network Theory (ANT). Collectively, this information aided in providing the necessary context from which this study was conceptualized.

Chapter three, research design and methodology discuss the methodological approaches adopted for the research. Here, interpretive case study research is described as the baseline for this study, drawing upon qualitative methods. Data collection and analysis consistent with grounded theory approach (GT) are described. Ethical considerations as well as trustworthiness of the research findings are also discussed.

Chapters four to six present the results relating to the categories and their subcategories as identified from the data analysis. Three major themes and sub-themes identified during the analysis are used as the framework for data presentation in these chapters.

Chapter seven presents a discussion of the key findings in the context of existing literature. Chapter eight presents the summary of major findings and conclusions of the study. The chapter ends with recommendations and suggestions for further research.

1.14 Summary

Information and communication technologies have taken the world by storm, and in the process, made information and knowledge increasingly accessible and communication networks more efficient and effective. The development of the context of the study is provided. The statement of the problem and research questions are explicitly stated as well as the significance of the present study. Key terms and concepts and the general layout of the dissertation are discussed as well.
