

**Effects of devolution of healthcare services on hospitals infrastructure in mandera county,
kenya**

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DECLARATION

I hereby declare that this research project is my original work and has not been submitted to any other university for the award of a degree.

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DEDICATIONS

I dedicate this research to my family and colleagues for their words of encouragements that made this research work a success.

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First I acknowledge the Almighty God for his blessings and guidance in the course of the research. I further acknowledge the support of my supervisor Dr Felix Kiruthu whose guidance and enlightenment enhanced the quality of this research project. I also acknowledge my colleagues and faculty members who supported me throughout the research process.

ABSTRACT

Devolution of healthcare is supposed to influence the health system performs by reassigning authority and responsibility to governments that are elected locally. The purpose of this survey was to determine the impact of devolution of health services on hospitals infrastructure in Kenya: the case of Mandera County. The survey was steered by the subsequent study objectives: To determine how devolution of health service has influenced health physical infrastructure in Mandera County, to evaluate the effect of devolution of health services on connectivity of ICT in Mandera County health facilities, to determine how devolution of healthcare services affects water infrastructure and to evaluate the effect of devolution on medical equipment in the health facilities of Mandera County. The study was based on two theories: Heresy and Blanchard's Life Cycle Theory of Leadership and Public Management Theory. Descriptive research design was used in this study. The study aimed at gathering data from the County Government officers, officials and the management from the health sector and various health departments' employees. The study utilized primary and secondary sources of data, where primary sources of data was collected from semi-structured questionnaires and secondary sources was collected from journal articles, Government reports, theses, dissertation, and books. The population under constituted the entire health system personnel within Mandera County government: The County health executives i.e. the CEC Health, the Chief officer who is the accounting officer for health in the County, head of various health departments, medical officers, clinical officers, the pharmacists, laboratory technologists, Nurses and social workers working in the hospitals and health facilities. Stratified sampling technique was adopted as it is appropriate when the population of interest is not homogeneous; in this particular case the population of concern consists of different employee groups, is above 10% of the target population and exceeds 30 elements. Editing was done on the questionnaires that were completed to ensure they are complete and consistent. Computable data gathered was evaluated by adopting descriptive statistics method using SPSS. The information was displayed by use of bar charts and diagrams. The research further adopted inferential analysis which was key in measuring the magnitude of association between the study variables. The study was able to obtain a response rate of 89%. The results of the study indicated that there was a positive effect of devolution of healthcare services on the hospital infrastructure in Mandera County. The findings of the research showed a moderate positive effect of devolution of healthcare services on physical infrastructure as shown by a p-value = .511, Sig = .000. The findings of the research showed a strong positive effect of devolution of healthcare services on water connectivity as shown by a p-value = .846, Sig = .000. The study recommends that the county government should adopt better linkages with donor agencies and the national government towards promoting better healthcare service provision within county governments. The study further recommends that health institutions should expand the health management systems as a way of enhancing service delivery and promote universal healthcare coverage.

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OPERATIONAL DEFINITION OF TERMS

County government	Refers to a geographic division proposed by the Kenyan constitution of 2010 as division of decentralised government. There are total of 47 County Governments in Kenya.
De-concentration	This involves the assignment of some common duties performed at the head offices of Ministries Departments and Agencies i.e. MDAs to the County level for them to be closer to the people they serve or are supposed to interface with
Devolution	The substantial transfer of powers from the centre to existing or new units, with an assured degree of permanence through constitutional entrenchment or framework legislation
Empowerment	Refers to increasing the strength of individual persons and communities in terms of spiritual, political, social, educational, or economic aspect
Health care	Refers to undertaking preventive or required medical processes to advance an individual welfare, this may be undertaken through performing surgeries, administering of medicine among other medical services necessary in a person's lifestyle which are provided using a health care system consisting of health facilities and doctors
Health infrastructure	Relates to all the physical structures, health, non-health equipment, transportation, and technological infrastructure (including ICT) necessary for proper service delivery
Management	Refers the act of maintaining and controlling the occurrence of crossbred conflict between two neighbouring communities

Public service

Refers to service that a government provides to individuals who live within its jurisdiction. The services are considered important hence providing them universally should be a guarantee

Public Participation

Refers to where an entity consults with the interested or affected individuals, organizations in the public domain and government entities, before arriving at a verdict

Service delivery

The act service provision to individuals and societies.

Standard of living

This refers to the degree of affluence, luxury, material goods and necessities accessible to a certain status of people in a geographical region

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Devolution involves the allocation of some authorities and duties and resources from the national government to the various selected county or local governments that are developed by laws and regulations (Bosire, Cottrell Ghai & Pal Ghai, 2015). Devolution is known for promoting societal involvement and answerability and improves operational efficacy and equity in managing of public resources. Decentralization has become a recurrent subject in health system reorganizations for a long time. Implementing the decentralized policies in the health sector has taken a range of scope depending on the organisation and nature of the county level where duties are being assigned. Nonetheless the end results of devolution reforms are impacted by various internal and external issues such as motives for devolution and the political scope of a country. Practically decentralization can be viewed as the transfer authority and influence of managing public possessions from the national government level to county government level.

Advocating devolution as an appropriate solution to various healthcare shortcomings has resulted to an increase in countries adopting it as a way to enhance management and solve organizational insufficiencies being encountered by centralized governments (Bartley, 2004). WHO views decentralization of healthcare facilities as a means of supporting higher promptness to the ever-changing customer requirements (Conway & Monks, 2010). Decentralization of health services seeks to effect enactment of health systems by assigning roles, duties and influence to county authorities.

The end results of the strategy of decentralizing healthcare services been both advantageous and disadvantageous worldwide, hence a number of nations have been successful in adopting the strategy to enhance health services whereas other nations haven't been successful. In the

Philippines, decentralization resulted to improved provision of resources, better citizen involvement in handling distinctive health requirements and boosted the ability to make decisions in the county levels (Ansari et al., 2011). Decentralization in the UK, established and facilitated the coexistence of four different health systems (in Britain, Scotland, Wales and Northern Ireland) responding to their unique health needs (Woods, 2004). On the contrary, in Pakistan, Regional managers did not focus on healthcare which resulted to limited resources being allocated to delivering health services causing stagnation of health services (Batley, 2004). In the East African countries, decentralization of health services has enhanced civilian involvement and opinion airing, and facilitated enhanced coordination between services, local situations and citizen's requirements. For human resourcing needs, a research study in Tanzania revealed that decentralization of employment needs amounted to better allocation of health workforce as opposed to centralization of employment requirements, which posted the health workforce without considering the particular needs of each distinct region. However the Tanzanian government opted to recentralize recruiting processes. In Rwanda decentralization reforms in the healthcare service industry are highly successful due to the positive effect of efficacy it affected on delivering services and reduced child and maternal death rate (Nuguid, 2011). Rwanda also emphasized on coaching skillful health employees this accentuated the necessity to research on the impact of decentralization on workers who provide health services region.

Joining nations such as Italy, Spain and the UK, Kenya now has a decentralized health services, which has been necessitated by the prerequisite to avail these services close to the citizens (Barkan, 2006; Batley, 2004). The intention was to enhance public health by enhancing the efficacy when allocating resources and to bring health facilities close to the citizens by focusing

on societal diverseness of the county. Decentralization of health services in Kenya has been fastened on the Constitution of Kenya 2010, and it emphasizes that each individual has a right to get the best achievable standards of health. The principal supposition of decentralizing health services is properly outlined by Murkomen (2012), a decentralization specialist; He said devolution of healthcare services was carried out so as facilitate accessibility of equitable, quality and efficient health care country wide as well as sole bureaucratic issues particularly in procuring health requirements.

At the start of decentralization, the health industry experienced lots of difficulties resulting from a prolonged lack of collaboration between the national and sub-national governments and the other stakeholders of the industry concerning managing of healthcare services. Even after devolving healthcare services, the state government retained the responsibilities of training, welfare and promotions; however the main reason for disagreements has been compensation and payment of salaries, which health practitioners say the local governments lack the skills to manage effectively. In 2016 there were several strikes by health practitioners which had a negative effect on health service quality. Their grievances are inadequate and late salaries, shortage of health care materials and equipment, bad operating settings and poor health infrastructure (Ochieng, 2015).

In 2015, the National Assembly's Committee regarding the execution of targets and objectives suggested that decentralized healthcare roles to revert back to the state government to enable reinstatement of roles which were running to a stop due to frequent industrial actions. Whereas these suggestions sounded perfect to the health practitioners, Governors on the other hand were opposing the recommendation (Ochieng, 2015). Current statistics have revealed that the death

ratio of delivering mothers in Kenya way higher than that targeted by the Sustainable Development Goal 3. The Commission for Human Rights of Kenya (2012), revealed the major causes for the high death ratio of delivering mothers were because many deliveries were performed by midwives who lacked skills to deal with problems arising in the process of giving birth, inadequate health amenities offering pregnancy and childbirth services and absence of healthcare infrastructure and equipment to facilitate proper childbirth as well as deal with any issues arising in the process.

Kenya is among the countries that are behind in achieving the fourth and fifth Millennium Development Goals (MDGs). Current Demographic and Health Surveys (2008) in Kenya showed an increase in death ratio of delivering mothers particularly in the rural regions. This could be due to the poor healthcare infrastructure such as adequate water and electricity supply. The survey also revealed that 58% of health facilities in Kenya had access to water supply throughout the year and that 25% of health facilities experienced continuous supply of power. North-Eastern residents experience most shortcomings related to infrastructure, since 40% of the facilities either lack supply of electricity or fuel for the generators, and just 42.8 % of pregnant women are able to get attendants with childbirth skills, when giving birth due to absence of health amenities or far distances to the facilities.

Another survey carried out in the North-Eastern region in Kenya discovered that the major problems that are negatively affecting accessibility and provision of proper motherly and infant care included insufficient skilled health practitioners, poor roads, inadequate water and electricity supply and poor communities. ICT services and power supply were also major challenges stated by the survey, which made it difficult to avail infant and maternal among other

services 24/7. Absence of power supply made it difficult to store any medical material or substance that required to be refrigerated and operation of several machines and equipment. Decentralization in Kenya was intended to enhance efficacy in delivering services in public health by enhancing fiscal provision, human resources capability and to increase medical supply, equipment, and health facilities. Conversely after decentralization, the newborn and mothers death ratio remained high. Furthermore, several local governments encountered healthcare staff go-slow and strikes because of late salaries, and poor working conditions and equipment breakdowns.

Many surveys have been done concerning the area of devolving of healthcare services. For Example, both Shiraz et al. (2013) and Grundy et al. (2003) carried out a survey on the influence of devolution on the healthcare system and services in Pakistan and Philippines respectively. As there are variations in fiscal settings and legal structures governing decentralization in various countries, the results of these surveys conducted can't be inferred to Kenya. Oyugi (2015) carried out a survey on the effect of decentralization on motivation and job satisfaction of healthcare workers in Kenya. The survey focused on health practitioners and did not indicate the impact of devolution on health service delivery.

The performance of the public healthcare sector in Kenya has been inadequate (WB, 2013). Life expectancy of the population as at 2013 was about 46 years and 51 years for men and women respectively compared to global average of 68 years (KNBS, 2014). Mortality rate was 147 per 1,000 lives which is double the global average. Morbidity and Mortality rates remain high with Kenya being rated 13th high TB burden country in the world (Mohajah, 2014). Globally, the trends in healthcare performance are different, average life expectancy for the Organization for Economic Cooperation & Development (OECD) countries is 80 years; mortality rate is 7.16 per

1,000 persons. Sub-Saharan Africa healthcare is ranked among the lower fifty percent (50%) performing healthcare sectors in the World (WB, 2013).

1.2 Statement of the problem

This survey pursues to evaluate how devolution has influenced healthcare infrastructure in Kenya. Specifically the study will investigate how devolution of healthcare has affected physical health infrastructure, connectivity of ICT, water and medical equipments. Before devolving health services to the counties, public health facilities were administered by the national government and they were known for insufficient delivery of services, and high mother and new-born death ratio. New-born death ratio in Kenya displayed a steady increase from 26 to 33 deaths per 1,000 live births in 2003. The neonatal mortality ratio remains at the top in Kenya today, as opposed to other countries such as Australia, Rwanda and Tanzania who have managed to maintain it at low levels.

Developing countries have put primary focus to providing major medical solutions at maternity facilities, to enable saving and women lives and the infants during child birth, in an effort to hasten progress towards achieving the Millennium Development Goals 4 and 5 for the health indicators of maternal and newborn health. Nevertheless, accessibility of mother and infant care services remains limited and in the event they are accessible they in most cases fall short of essential infrastructure needs for instance medical tools, water supply, power supply and ICT connectivity to perform basic functions as well as emergency functions.

1.3 Objectives of the Study

The general objective of the research is to examine the effect of devolution of healthcare services on hospitals infrastructure in Mandera County, Kenya.

1.3.1 Specific Objectives

The study was guided by the following research objectives

- i. To examine how devolution of healthcare services has affected healthcare physical infrastructure in Mandera County.
- ii. To assess the influence of devolution of healthcare services on ICT connectivity in hospitals Mandera County.
- iii. To establish how devolution of healthcare services affected water connectivity in health facilities in Mandera County.
- iv. To assess the influence of devolution of healthcare services on the status medical equipment in the health facilities of Mandera County.

1.4 Research Questions

The study sought to answer the following research questions

- i. What is the effect of devolution of healthcare services on the healthcare physical infrastructure in Mandera County?
- ii. How has devolution of healthcare services influenced ICT connectivity in Mandera County?
- iii. How has devolution of healthcare services affected water supply in Mandera County hospitals?

- iv. To what extent has devolution of healthcare services affected the status of medical equipment in healthcare facilities Mander County?

1.5 Research Premises

- i. Devolution of healthcare services has significant effect on healthcare facilities physical infrastructure in Mander County.
- ii. Devolution of healthcare services has significant effect on healthcare facilities ICT connectivity in Mander County.
- iii. Devolution of healthcare services has significant effect on healthcare facilities water connectivity in Mander County
- iv. Devolution of healthcare services has significant effect on healthcare facilities medical equipment in Mander County

1.6 Justification and significance of the Study

The former central government resulted to a poor, non-responsive inefficient and inequitable delivery of healthcare services. Mander County among others such as Tana River, Turkana, Wajir, and Narok County were rated below average regarding both availability and coverage of health facilities, as they had limited facilities per 100 square kilometres and per 10,000 people.

Individuals who require healthcare services in these areas will experience inconveniences caused by travel time and long distances to the facility, absence of required medicine, and limited capability of health facilities and equipment, and water and power supply to service all people in the region. Most Health facilities do not have elementary health infrastructure e.g, water and power supply, transportation and road access and ICT connections. Devolution of health services

should enhance accessibility to quality and equitable services, and improve answerability and honesty in delivering health services (Bossert, 1998).

The county governments in the north-eastern region of Kenya, established to solve and change the long periods of political side-lining and inadequate development have been demoralised by dominating clans controlling power and promoting corruption. Due to violence-oriented competition among clans and opposition among chosen county leaders the violent radical Al-Shabaab crusade has been able to increase and work with freedom across the North East region. These assaults resulted confusion in delivering health services as well as overstretched national services. This study ought to bring out the status and the facts of healthcare infrastructure in Mandera County in relation to devolution. The result of this study is expected to assist in further decision making process by the County leadership, health sector stakeholders and act as proof for forthcoming policy making by national and County Governments.

A survey by the United Nations Population Fund (UNFPA, 2014) painted Mandera County as a place that poses the most danger to women giving birth. The reasons that led to these drastic finding included long periods of neglecting and side-lining, insufficient basic health service delivery due to lack of proper health infrastructure, protracted terrorist attacks among others. The death ratio of mothers giving birth in Mandera is high as compared to that of Sierra Leone due to limited maternity facilities, bad hygiene in the health facilities due to absence of rudimentary amenities like water, absence of delivery equipment and transfer as well as transport services such ambulances.

In Five years after decentralization, this survey vital in assessing and determining the impact devolution of health services has had on healthcare infrastructure in Kenya. This research will also purpose to enable more understanding of the decentralized system of the Kenyan

government. Furthermore, it is potentially relevant to other developing countries experiencing underdevelopment and power abuse which may want to deal with these difficulties by decentralizing authority.

The research findings will enable the government to develop and implement policies that facilitate appropriate knowledgeable execution procedure of counties regarding delivering health services, to offer help in implementing county government directives, and lastly it will provide future investigators and academics will reference information for further studies.

Kenya thus provides an on-going opportunity to examine devolution of key health sector management in relation to service delivery. In addition to contributing to the literature on decentralization, this proposal intends to uniquely analyse devolution effects on the health sector infrastructure as they were played out during the five years of the process of implementation. Due to the increasing need to meet the millennium development goals on health, the study will benefit the following stakeholders among others:

1.6.1 National Government

The Kenya Health Policy 2014–2030 goal is to attain the greatest health standards in a way that is receptive to the requirements of Kenyans. This survey will help measure the achievement of this aim and evaluate areas that need to be improved.

1.6.2 County governments

The main goals of decentralization include enhanced service delivery, improved leadership, reduced poverty, enhanced lifestyle, and more constancy. This survey will inform the county governments if they have achieved these goals and where improvement is required in relation to health services.

1.6.3 Communities

This research will enlighten citizens to hold officials responsible for implementing devolution policies accountable, to ensure that they improve delivery of services, efficient allocation of resources, and enhanced cost reduction. The study will also provide information concerning devolution process in counties hence communities will be able to voice their opinions and criticism that may put officials in to check.

1.6.4 Management and staff of Health facilities

This survey is also vital to the administration and employees of health facilities as it inform them of the aspects that require enhanced delivery to facilitate improved health services to individuals.

1.6.5 Academic Researchers

The study will make a significant contribution to the growing body of research on the impact of devolution on development.

1.7 Limitations and Scope of the Study

The focus of this survey was Mandera county health facilities. Respondents will consist of health managers such as the County health minister, County health Chief officer, in-charges of different health divisions, medical officers, pharmacists, clinicians, nurses, procurement officers and Hospital managers. Respondents may be unwilling to provide info as they dread that it may be used to daunt their image or that of the county government. Some may even refuse to fill the questionnaires. This problem will be mitigated by the use of an introduction letter from the University and guaranteeing the respondents information given by them was regarded confidential and it was purely utilized for academic reasons.

The researcher may as well experience difficulties in obtaining information from the respondents as it is subject to aspects of emotions, attitudes and perceptions, which are difficult to accurately quantify impartially, which may lead to no response because of the confidentiality cover in the administrative oath of discreteness and the code of conduct for public workers. To counter this difficulty the researcher should guarantee respondents that the info they provide will be handled with utmost confidentiality. Moreover the study sought information that identifies individuals example: national identity card numbers and names.

CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

This chapter provides literature on devolution of healthcare and general decentralization and its effect on physical healthcare infrastructure, ICT connectivity, water connectivity, and medical equipment. It also presents general assessment on devolution of healthcare with both local and international experiences. This is organized based on research questions as outlined in chapter one.

2.2 Review of Related Literature

2.2.1 Devolution of Healthcare Services and Healthcare physical infrastructure

Kenya's health care provision and implementation of infrastructure include the national teaching hospital, provincial hospitals, district and sub-district hospitals, health centers, and dispensaries, as well as a host of other operators within the private, non-governmental, and traditional/informal sectors. The system is a hierarchical-pyramidal organization comprising of five levels, the lowest being the village dispensary with Kenyatta National Hospital (KNH) at the apex.

The many years of neglect caused by budgetary insufficiencies has reduced most facilities to a sorry state that requires rehabilitation before a maintenance programme can be instituted. Some of Kenya's health facilities lack adequate premises for priority interventions, such as delivery

rooms, maternity, laboratories, theatres, etc. in some instances, Public health technicians who were trained to maintain physical infrastructure are not used for that purpose or are not available. Similarly, because of the low budgetary allocations to health, the few available resources have been fully charged to pharmaceutical and non-pharmaceutical commodities. As a result, the number of health facilities has remained stagnant over the years and the existing facilities have not been rehabilitated for a long period, compromising the quality of care provided. Staff skilled maintenance is rarely available at the district levels and below and where they exist, they are not supported by the necessary tools, consumables or financial resources. General maintenance capacity has therefore been eroded over the years.

Keeping the health facilities in good condition would undoubtedly change the public's perception of good quality care and this in turn would encourage people to use the available health services and motivate workers (GoK, 2005). With establishment of Counties, the National level prioritize establishment of a minimum number of health facilities based on the expected services as defined in the KEPH. According to the most recent health management information system (HMIS) data, there are over 5,000 health facilities across the country operated by three owner systems with the government running 41% of the facilities, non-governmental organizations (NGOs) 15%, and private businesses 43%. The government owns most of the hospitals, health centres, and dispensaries, while clinics and nursing homes are entirely in the hands of the private sector. Health facilities are unevenly distributed across the country. For instance, the best-off Central Kenya has about twice the number of facilities per population as the worst-off provinces (Nyanza and Western). Central, Coast, and Eastern regions have better ratios than the national average. On the other hand, Nyanza has a higher number of hospital beds

and cots per 100,000 populations than Central. North-eastern and Eastern regions have the worst ratios of hospital beds and cots per 100,000 populations, while Coast has the best (144, 145 and 274, respectively). Because of their relatively small geographical sizes, Nairobi followed by Central has the minimal distance to a health facility (Wamai, 2004; MoH, 2010; MoH, 2015).

The deplorable state of the physical healthcare infrastructure has however continued to impact negatively on the care as well as the ability to retain some key health personnel especially the specialized health workers in the public service. A study conducted by the world bank in U.S.A by Kaufman and Kraay (2003) on the location of the facility in relation to the target population showed that patients living more than 20 miles away from a hospital were much less likely to visit ambulatory services for follow up. The death rate in the first year was also much higher for this group although the relationship with treatment may not have been causal. In Japan one study found that access to follow up treatment following treatment for cerebrovascular disease was considerably influenced by access to suitable transportation (Araki, 2006).

Nemet and Bailey (2000) study of the relationship between distance and utilization of health care by a group of elderly residents in rural Vermont, focusing on a county on the Canadian border where 82% of the residents live in rural areas found that people who had to travel more than 10miles to their physician tended to go to their physicians less frequently than those who had to travel shorter distances. A study which was conducted in Kisumu County in Aloo (2017) on the factors influencing on the provision of healthcare services on the devolved systems of Government of Kisumu has found out that most people strongly believed inadequate facilities was a major factor that hampered provision of healthcare services in Kenya.

In 2014, a study by the United Nations Population Fund (UNFPA) found that Mandera County is the most dangerous place in the world for women to give birth. Decades of neglect and marginalization, lack of health facilities and poor primary healthcare service delivery due to poor healthcare physical infrastructure has been attributed to the challenge. While there is consensus on the fact that devolution has a significant potential for enhancing accountability of and local participation in public sector service delivery, it is believed that devolution improves healthcare infrastructure and hence service delivery by taking services and resources closer to the people thereby creating more demand and supply. There is less consensus in the degree to which it necessarily per se will contribute significantly to improved service delivery or poverty eradication for that matter (Mohamedi, 2013).

Some efforts have been made more systematically to assess the impact of devolution on service delivery. One approach applied in study of the relationship has been to compare a large number of countries with varying degree of devolution and compare this with trends in service delivery of various sorts. In one analysis, a comparison was made with all countries in the world with available data between the share of public expenditure managed by sub-national governments and child mortality and other health indicators. The conclusion by the authors was clear: greater fiscal devolution is consistently associated with lower mortality rates.

2.2.2 Devolution of Healthcare Services and ICT Connectivity

In this context, ICT for health refers to any tool that facilitates the communication, processing or transmission of information by electronic means for the purpose of improving human health (Bukachi & Pakenham-Walsh, 2007). Over the last decade, the use of Information and Communications Technology (ICT) has helped develop new ways of providing efficient and

secure healthcare. This has resulted in a rapid increase in the use of ICT applications in health care, collectively, commonly referred to as e-Health (European Commission, 2012). ICT has been referred to as a key instrument in healthcare delivery and public health internationally (Drury 2005). When designed and implemented effectively, ICT connectivity in the healthcare can improve access for geographically isolated communities; provide support for healthcare workers; aid in data sharing; provide visual tool linking population and environmental information with disease outbreaks; and is an effective electronic means for data capture, storage, interpretation and management.

The availability and quality of ICT services are growing rapidly across Africa, with mobile network coverage rising from 16% in the late 1990s to over 90% of its population in 2011. Growth in this sector has led to increased investments, decreased costs and rapid growth in technology-enabled services. However, these gains in ICT infrastructure have not as yet benefitted the health Sector in a systematic way as many of the project remain pilots. Different studies have been done on the use of ICT in health care. Mukama (2003) studied health information systems at local levels in Tanzania and Mozambique where the findings revealed that a number of data collection tools are in use: patient cards, registers, tally sheets and forms. Musukwa (2011) studied user Perceptions on Electronic Medical Record System (EMR) in Malawi where he found that users preferred using the EMR than paper based records and that overall, found it more effective and efficient.

Oumaetal (2013) did a study on implementing successful e-health implementations within developing countries. The findings revealed that just like in the majority of the developing nations, there are very few computers and e-health solutions that are currently used in the

hospitals as a result of various challenges in Kenya. Ranta (2010) studied the role of ICT in improving productivity in the health care sector. As such, the study focused on the related problems and the reasons behind the slow adoption of ICT. The study found that despite its limits, the use of ICT affects the productivity in health care greatly, and has changed the process considerably. The study further found that with the help of ICT, the focus is moving from acute type of care towards more prevention and self-care which in the long run is obviously good for the economy as well as our health.

A study which was conducted in 2015 by Simeon Ominde on ICT and performance on health in Kenya found out that allocation of limited funds for health projects limits the use of ICT in the provision of healthcare and that limited funding is allocated to the construction of ICT infrastructure which hinders the provision of healthcare services. This study therefore seeks to answer the following research questions: How has devolution of healthcare services influenced ICT connectivity in Kenya?

2.2.3 Devolution of Healthcare Services and Water Connectivity

A study which was conducted by Hamisi M .Malebo on water connectivity has found out that in Tanzania All hospitals (district hospitals and regular hospitals) had running water systems in their bathing facilities. However, only 43 % of health centres and 50% of dispensaries had running water supplies in bathing areas. This means as much as half of the dispensaries and still a significant number of health centres where patients and workers would have no running water but depending solely on buckets or some other containers for their supplies. On piped water connectivity, the study found out that 58 out of 96 of surveyed health facilities (60.4%) are not

connected with piped water supply. It was revealed from the survey that, only few hospitals (16.7%) are not connected with piped water supply. However, it was alarming that more than 50% of health centres and dispensaries lacked connectivity with piped water supply.

Back home in Kenya, a study conducted by Kenya institute for public policy and research analysis (KIPPRA) on Healthcare delivery in Kenya under devolved system in early 2018 found out that a significant proportion (92.09%) of health facilities reported to have access to safe water. More urban facilities (96%) had access to safe water compared to 88.7 per cent of facilities in rural areas. Interestingly, more health centres in the country had access to safe water compared to District and County Hospitals reporting 91.94 per cent, 88.37 per cent and 88.89 per cent, respectively. The study further found out that most of the water sources for hospital facilities in urban areas were piped water while most of the facilities in rural areas were supplied with water through boreholes and rain water. Most of the supplied water whether piped or rain water were not treated therefore exposing the hospital facility, the staff and the patient at risk of contracting hospital related (nosocomial) infections. The study assessed facilities with clean running water and the results show that 87.2 per cent of all health facilities had access to clean running water. More urban facilities had access to clean running water than those in rural areas. This study complimented the little available research on devolution and its effect on water connectivity in health facilities.

2.2.4 Devolution of Healthcare Services and Medical Equipment

A study which was conducted by Truphena (2017) on the impact of devolution on healthcare systems has found out that there is an on-going heavy installation of medical equipment in most of the hospitals in Kenya since devolution. Furthermore, the study also found out that there is

lack of comprehensive, coordinated installation of equipment with gaps in some facilities still exist. It also found out lack of maintenance for the equipment.

Before devolution most of the hospitals were under equipped prompting most of the cases that need specialised treatment such as renal equipment, radiology, x-rays, ICU and oxygen machines referred to specific hospitals such as Kenyatta National Hospital. Immediately after devolution, the national Government and the County Governments embarked on a mission to equip most of the level 4 and 5 hospitals in the Counties through a scheme known as the Medical leasing equipment scheme.

The equipment acquired at a cost of 38 billion under the Medical Leasing Equipment Scheme (MLES) were to diagnose diseases and offer treatment like Intensive Care Unit (ICU), life support, dialysis, X-ray among other specialised diagnoses. Most of the selected Counties started the process of acquiring the equipment in order to fast track and address the lack of medical equipment in their facilities which has hindered the delivery of services. A recent report which was carried out on the status of the Medical leasing equipment scheme in Baringo County, Bomet County and Nakuru County of the former rift valley province has revealed a very big gap and challenges in the scheme. As per the report Baringo County received the machines that were installed at Eldama Ravine Sub-county Hospital and Kabarnet County Hospital. However, Baringo patients seeking specialised care are still referred to Moi Teaching and Referral Hospital in Eldoret and Rift Valley Provincial General Hospital in Nakuru despite the installation for lack of a functional ICU department and experts. Although an ICU wing is built at the facility in Baringo, it lacks oxygen to make it operational. Lack of funds has been a major issue in installation and use of the digital machines. And in some departments like radiology which is

operational, there are no specialised doctors to interpret images. According to county Health Executive in charge of the health Ministry, the county has not hired trained medics to bridge the gap due to limited budget.

A study which carried out by MOH (2015) on the impact of devolution on healthcare systems in Nairobi County revealed that, most of medical equipment used in public health facilities is more than 20 years old (some double their lifespan) and characterized by frequent breakdowns. Furthermore, the study revealed that most public facilities do not have modern equipment such as dialysis machines, radiology equipment, laundry machines and theatre equipment. The available equipment falls far short of the required numbers, of those available, about 50% of the equipment is too old to pass required standards and that maintenance of equipment has been inadequate (MoH, 2015).

Similarly MoH (2016) observed that most dispensaries lack placenta pits and septic tanks for the safe disposal of maternity health care wastes. Keeping the health infrastructure and the equipment in good condition would undoubtedly change the public's perception of good quality care and this in turn would encourage people to use the available health services (GoK, 2005). Health infrastructure is key in restoring public perception of good quality care and achieving devolution goals on improvement of primary health care facilities. Not much research has been carried out on the status of medical equipment since devolution on the other parts of the Country especially in Northern Kenya. Therefore there is a need to carry out more study on the influence devolution of healthcare services had medical equipment.

2.3 Gaps in the Literature Review

From the literature reviewed it is evident that the devolved government is expected to promote social and economic development and the provision of proximate, easily accessible services throughout Kenya and especially in Northern Kenya which is perceived to have been marginalised for decades. Most of the studies did not concentrate much on other healthcare infrastructures such as the number of physical health facilities, water connectivity, ICT and power back up which are essential in healthcare systems and the overall health impacts within the population. This study therefore seeks to establish the effect of devolution on the health care infrastructure in Mandera County.

2.4 Theoretical Review

2.4.1 Hersey and Blanchard's Life Cycle Theory of Leadership.

The theory suggests that the effectiveness of a leader varies as the subordinate's degree of maturity varies. The manager grows more considerate and his focus on duties reduces as subordinates show an increase of maturity level. Ethical aspects of leadership as well emerged more recently because of the increased corporate scandals. Since the leader's position bears power and authority it is prone to the difficulty of upholding values of ethics and principles to himself and to others. Johnson (2005) stated, "Ethics is the heart of leadership, when we assume the benefits of leadership, we also assume ethical burdens". In some situations managers find themselves in relations that calls for them in constant awareness that their position of power and authority brings with it results that are both positive and negative to them. O'Toole (2005) advocated for the leadership style of four USA Presidents who he labeled "The Rushmoreans," due to the ways in which they performed their leadership roles. O'Toole stated that as much as

they also had several faults, they listened to other people's advice, encouraged rebellious opinions advisors, delegated authority to their subordinates, and led by example and not by power, influence, or force.

2.4.2 Public Management Theory

Public Management theory is a method used to run public organizations that is utilized by public institutions and agencies, at the sub-national and national levels. It was first coined by academicians in the UK and Australia to define methods established in the 1980s in an attempt to shape the public service in a "businesslike" manner and to enhance its efficacy by utilizing private sector managerial approaches. In the private sector the focus is on consumer service, NPM improvements focused on the significance of citizens as they were the receivers of the service consumers in the public sector. NPM campaigners tried out using devolved service delivery methods, providing local governments liberty in their program and service delivery. In few instance NPM improvements that utilized electronic government systems were able to unite a program or service centrally hence reducing costs. Other governments opted using quasi market structures, to make the public sector to compete against the private sector. The main subjects in NPM included, fiscal governance, value for money, increase in efficacy, identifying and setting aims, continuous monitoring of performance, and handing over power to the senior management executives. Performance assessment was carried out with auditing, benchmarking and evaluations.

The NPM campaigners in other countries worked to eliminate shared agreements and advocated for of a separate rewarding system at the top-management level and brought about a private

sector-style of governing an organization such as the use of a Board of Directors and strategic management.

2.5 Conceptual Framework

Independent variables

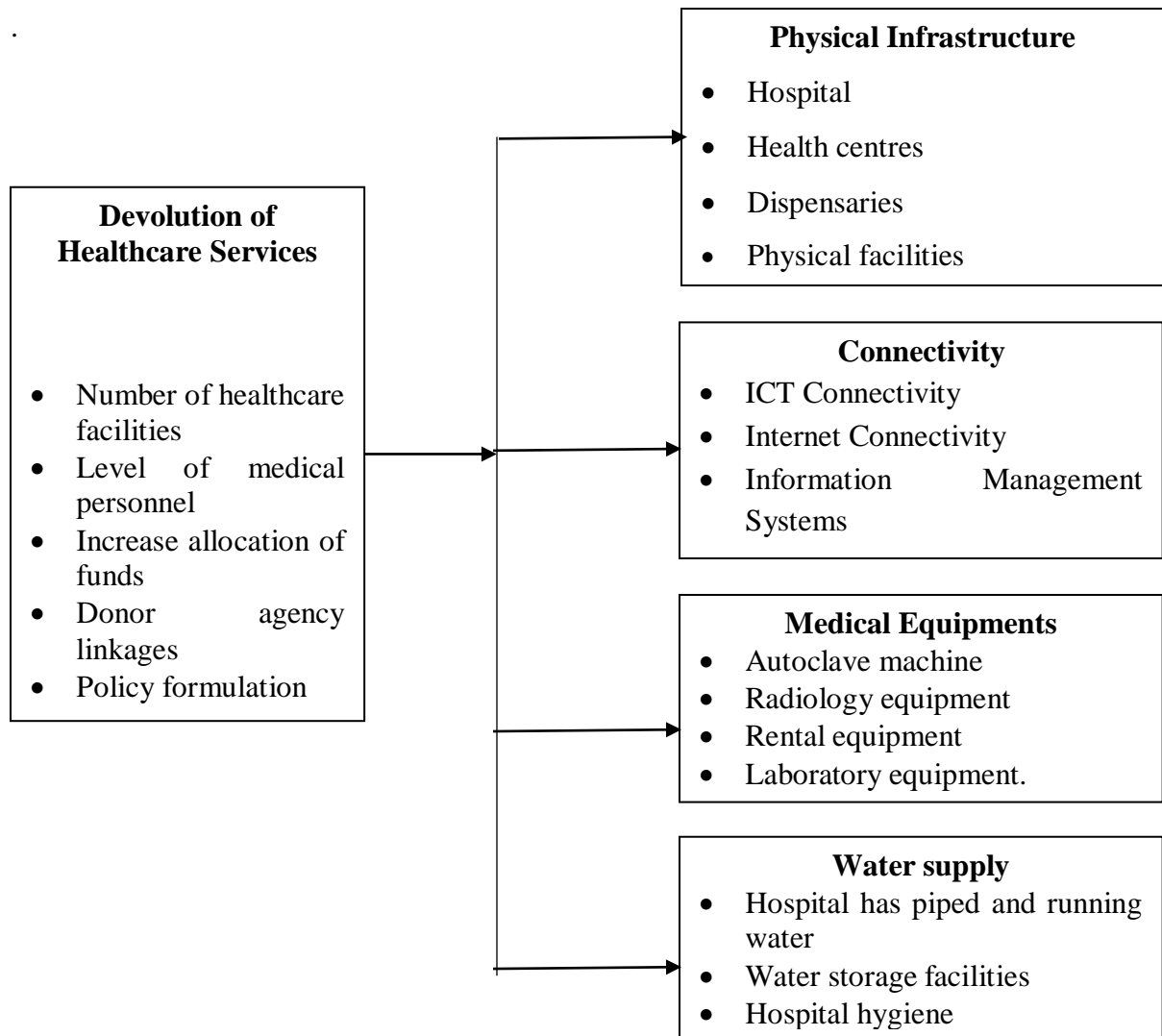


Figure 2.1 Conceptual Framework

Source: Researcher (2018)

The above conceptual framework depicted the interaction between devolution of healthcare services on the hospitals infrastructure in Mandera County, Kenya. The hospital infrastructure was measured using the level of physical infrastructure, the ICT connectivity, the medical equipments and the water supply levels. The devolution of health services was measured by the number of healthcare facilities, the level of medical personnel, the increase in allocation of funds, donor agency linkages and policy formulation.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This section of the study focused on the method of research, it consists of a research design, the study area, the target population and sample size, the process considered in the collection, synthesis, and analysis of data, as well as details of where, when and how it was collected. Ethical Considerations were also considered in all the facets of the research methodology as ethics is very vital in research. Qualitative and quantitative methods of collecting data were used, and data sources included primary and secondary sources.

3.2 Study Design

This study adopted a descriptive research design which as stated by Cooper and Schindler (2009), it's involved with discovering who, what, where and how of a concept without influencing the subjects under study in their environment. Descriptive studies are useful to determine the relationship among variables in the study. The research design was appropriate for this study as it allowed for the analysis of the views of health care personnel involved in healthcare system.

3.3 Population and Sample Design

3.3.1 Target population

Population refers to set of objects or events under study about which a researcher wishes to develop extrapolations (Cooper & Schindler, 2003). In situations where the population is very huge a smaller workable sample of the population is usually selected to make inferences regarding the whole population. The study population included health managers and health employees of Mandera County (a total of 498 workers). Stratified sampling was utilized to

choose respondents founded on groups so as to obtain a sample population that represents the target population.

Table 3.1 Target Population

Cadre/County Officials	Number of Officers
County Executive Committee member for Health	1
Chief Officers Health	2
Directors (Medical services and Public Health)	2
Medical Officers	16
Clinical Officers	60
Nurses	300
Pharmacists	30
Lab Technicians	80
Specialists	6
Procurement Officer	1
TOTAL	498

3.3.2 Sampling Technique and Sample Size

It refers to a list of the entire population being studied from where a sample is developed (Cooper & Schindler, 2003). The sampling frame aims at the populace from which the sample is taken and to which the sample responses will be inferred. The sampling frame for this study is inclusive of chosen hospitals, health facilities and satellite clinics. This study adopted stratified and cluster sampling technique to select respondents, in order to obtain a good representative

sample, improve reliability and validity of the study (Cooper &Schindler, 2003). In this technique the probability of each case being selected is unknown. In situations where the population is large, assessing features of the whole populace using a representative sample is highly efficient.

Table 3.2 Sampling frame

Category of Respondents(county officials)	Target number (Population)	Sample Size (30%)
County Executive Committee Member for Health	1	1
County Chief Officer Health	2	1
Director of Medical services	2	1
Medical Officers	16	5
Clinical Officers	60	18
Nurses	300	90
Pharmacists	30	9
Lab technicians	80	24
Specialists	6	2
Procurement Officers	1	1
Total/Average	498	152

The sample size for the study will be 152 personnel drawn from healthcare services sector within Mandera County.

3.4 Data Collection Procedures

Creswell (2002) defined data collection as method of gathering data from selected units of a study. This study adopted primary sources as well as secondary sources. Primary data is gathered and generated directly from respondents mainly using questionnaires. The questionnaires included both open and closed ended questions. The secondary sources of data are literature that is in existence majorly from government institutions, including Ministry of Health official documents such as the Kenya National Health Sector Strategic Plan (KHSSP) III, draft Health Policy Framework, 2012 - 2030, draft Health Care Financing Strategy, and National government documents such as Vision 2030, Medium Term Expenditure Framework (MTEF) paper and the Constitution. Additional data was collected from, journal articles, among others.

3.5 Pilot Testing

The study carried out a pilot study to undertake the reliability analysis and validate the questionnaire. The pilot info collected was not included in the main study. The pilot study allows for pre-testing of the research instrument, as well as it enables the study to be familiar with research and its administration procedure as well as identifying items that required modification.

3.5.1 Reliability Tests

Cronbach's alpha methodology that is based on internal consistency was used. It measures the average of measurable items and its correlation. A pilot group of 15 people was selected from the target population from any county to test the reliability of the research instrument. Confidentiality and concealment of the respondents is of great importance.

3.5.2 Validity Tests

Berg and Gall (1989) argued that validity is the degree by which the sample of test items signifies the content the test is supposed to test. Content validity refers to the degree of which the information gathered with a specific instrument represents a particular area or content of a specific concept. Mugenda and Mugenda (1999) suggested that the normal process in examining the content validity of a measure is to engage a specialist in a particular field. The precision of the instruments was recognised so as to improve the instrument's validity and reliability, and the results enabled the study to correct inconsistencies rising from the instruments, which ensured they measure what is envisioned within the research frame.

3.6 Data Analysis

Before processing the responses, the completed questionnaires will be edited for completeness and consistency. Quantitative data collected was analyzed by the use of descriptive statistics using SPSS (Version 24) and presented through percentages, means, standard deviations and frequencies. The information was displayed by use of bar charts, graphs and pie charts and in prose-form. This was done by tallying up responses, computing percentages of variations in response as well as describing and interpreting the data in line with the study objectives and assumptions through use of both SPSS and Microsoft Excel to communicate research findings. Content analysis was used to analyze qualitative data from the open ended questions. The study further utilized Pearson correlation in examining the level of association between the research variables. The study further adopted diagnostic tests to ensure the collected data meets the applicable regression assumptions before conducting correlation tests.

Table 3.3 Operationalization of Study Variables

Objective	Measurement	Analysis Technique	Interpretation
To examine how devolution of healthcare services has affected healthcare physical infrastructure in Mandera County.	Means, standard deviation, Pearson correlation	Descriptive analysis Inferential analysis	The higher the coefficient of determination (R^2) the higher the magnitude of influence
To assess the influence of devolution of healthcare services on ICT connectivity in hospitals Mandera County.	Means, standard deviation, Pearson correlation	Descriptive analysis Inferential analysis	The higher the coefficient of determination (R^2) the higher the magnitude of influence
To establish how devolution of healthcare services affected water connectivity in health facilities in Mandera County.	Means, standard deviation, Pearson correlation	Descriptive analysis Inferential analysis	The higher the coefficient of determination (R^2) the higher the magnitude of influence
To examine the influence of financial participation schemes on service delivery at NCWSC	Means, standard deviation, Pearson correlation	Descriptive analysis Inferential analysis	The higher the coefficient of determination (R^2) the higher the magnitude of influence
To assess the influence of devolution of healthcare services on the status medical equipment in the health facilities of Mandera County.	Means, standard deviation, Pearson correlation	Descriptive analysis Inferential analysis	The higher the coefficient of determination (R^2) the higher the magnitude of influence

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3.7 Ethical Considerations

Prior to embarking on this research, the proposal was presented to the supervisor(s) for academic approval. Permission to do research was sought from department public policy and administration of Kenyatta University. The researcher also debriefed the research assistants to ensure they are aware of the ethical guidelines. The researcher also prepared an introduction letter that was presented to the respondents during the data collection process to ensure they are aware of their rights to confidentiality and willingness to participate in the research. In order to be compliant with the government`s policy on research, permission to carry out the study also sought the National Commission for Science, Technology and Innovation (NACOSTI) license permit. This assured the respondents that the research is purely for academic purpose.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

The fourth chapter of the study presented the results of the data analysis. The findings were presented in line with the research objectives. The first section presented the background information, the descriptive analysis, the inferential analysis and the subsequent discussion of the results.

4.2 Demographic Data

4.2.1 Response Rate

The study considered a sample of 152 respondents drawn from the health sector in Mandera County. The results of the study indicated a response rate of 89% response rate (n=136) while only 11% (n=16) did not respond as shown in figure 4.1 below. Kaplowitz, Hadlock, and Levine, (2004) also indicated that a response rate of above 60% is reliable for statistical analysis; hence the research response was deemed appropriate for analysis.

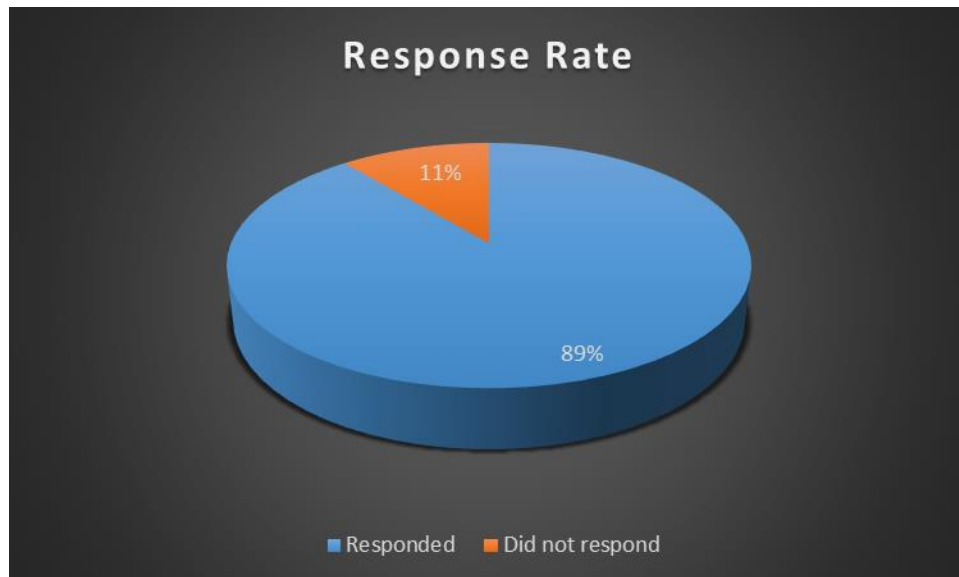


Figure 4.1 Response Rate

4.2.2 Position within the Hospital

Table 4.1 Position within the Hospital

		Frequency	Percent
Valid	Clinical Officer	14	10.3
	Medical officer	17	12.5
	Pharmacist	24	17.6
	Midwife	17	12.5
	Laboratory technician	10	7.4
	Accountant	13	9.6
	Health Information officer	8	5.9
	Nurse	33	24.3
	Total	136	100.0

The results of the study on Table 4.1 above showed that the majority of the respondents 24% (n=33) were Nurses within the hospital, 12% (n=17) were Medical officers, 17% (n=24) of the respondents were pharmacists while 10% (n=14) of the respondents were clinical officers. The findings show that there is growing professional competence within the health services sector with the operationalization of devolved governments.

4.2.3 Level of Education

Table 4.2 Education Level

		Frequency	Percent
Valid	Diploma	28	20.6
	Bachelor's degree	69	50.7
	Master's degree	39	28.7
	Total	136	100.0

The findings of the study on table 4.2 above indicated that the majority of the respondents 51% (n=69) had at least attained Bachelor's degree certification, 29% (n=39) of the respondents had Masters level education while only 20% (n=28) of the respondents had diploma level education. This shows there is growing educational competency among personnel within the health sector in Mandera County.

4.2.4 Gender of the Respondents

The study results sought to examine the gender of respondents within the health sector. The results of the study showed that 32% (n=43) of the respondents were male while 68% (n=93) of the respondents were female respondents as shown in Figure 4.2 below.

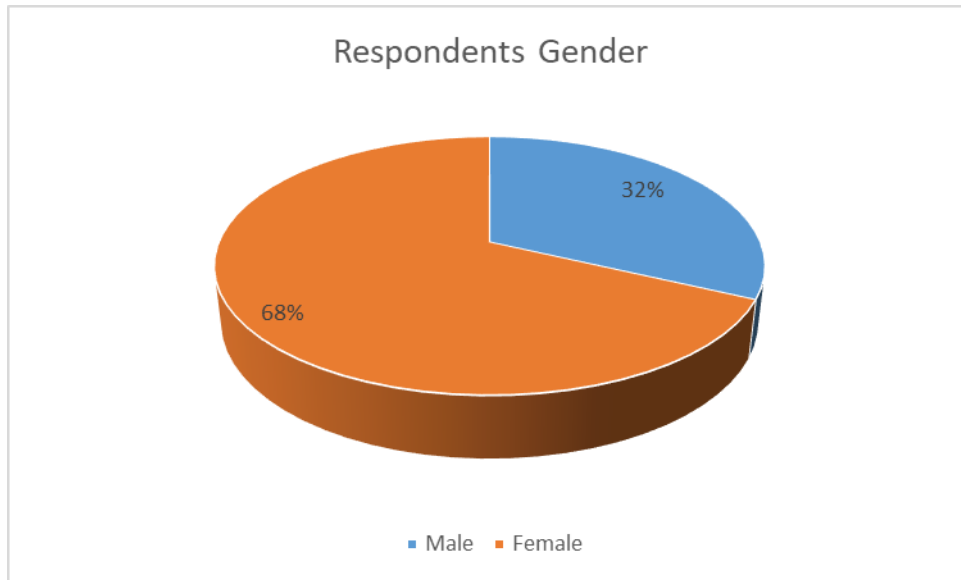


Figure 4.2 Gender of the Respondents

4.2.5 Age of the Respondents

The study further sought to examine the age distribution among the respondents within the healthcare centers in Mandera County. The findings on table 4.3 showed that 34% (n=46) of the respondents were between age 31-40 years and 41-50 years respectively. The results also showed that 19% (n=27) were over 51 years.

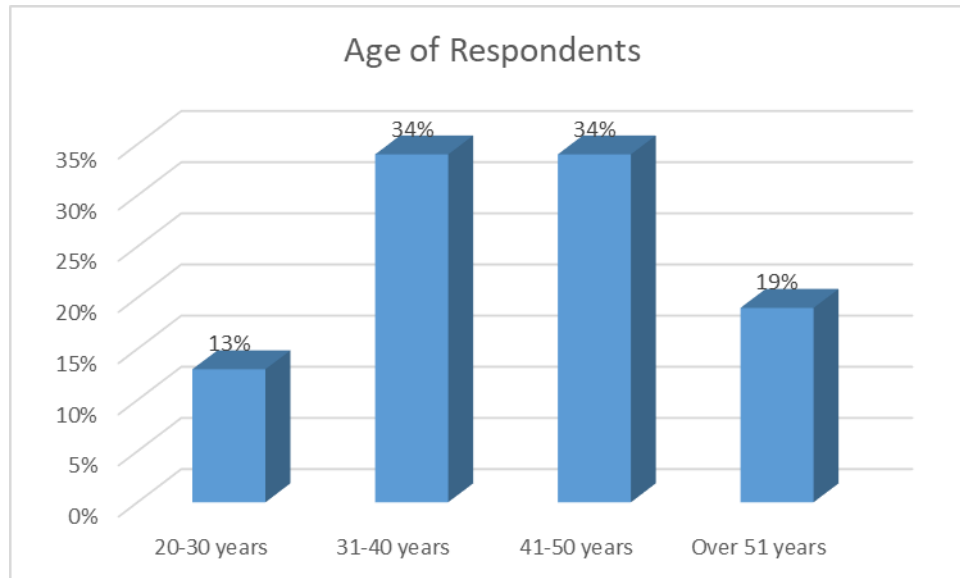


Figure 4.3 Age of the Respondents

4.2.6 Work Experience

Table 4.3 Length of Service in Institution

		Frequency	Percent
Valid	Less than 2 years	12	8.8
	3-5 years	57	41.9
	6-8 year's	64	47.1
	Over 9 years	3	2.2
	Total	136	100.0

The results of the study on table 4.3 above showed that the majority of the respondents 42% (n=64) had worked at the health sector for between 6-8 years, 42% (n=57) had worked for between 3-5 years of experience. The results also showed that 8% (n=12) of the respondents had worked for less than 2 years within the sector. The above shows that the majority of the respondents had extensive work experience that was adequate in elucidating the needed information to solve the research problem.

4.3 Descriptive Statistics

4.3.1 Devolution of Healthcare Services in Mandera County

Table 4.4 Devolution of Healthcare Services

	N	Mean	Std. Deviation
There is increased number of healthcare service providers	136	3.9044	.66532
There is an increase in number of medical personnel within the county	136	4.2721	.62618
There is increased financial allocation within the healthcare sector	136	4.5588	.59335
There is increase in donor agency linkages within the county	136	4.3235	.92602
There is better healthcare sector policy formulation within the county	136	4.3309	.88657

The study sought to examine the devolution of health sector services within Mandera County. The results of the study indicated that with regard to there is increased number of healthcare service providers there was agreement among respondents as shown by a mean value of 3.9044 and a deviation of .66532 showing there was minimal dispersion in the findings. Concerning there is an increase in number of medical personnel within the county there was strong agreement among respondents as shown by a mean if 4.2721 indicating strong agreement. These results are consistent with Mwamuye, and Nyamu (2014) who concluded that devolution had enhanced the access to healthcare services within the country. The researchers further noted that devolution of health services is anticipated to enhance growth of the health sector and promote better service delivery.

In regard to there is increased financial allocation within the healthcare sector there was strong agreement among respondent as shown by a mean value of 4.5588 and a deviation of .59335 showing minimal dispersion in the responses. Similarly Ojaka, Olango, and Jarvis (2014) indicated that increase allocation towards the health sector has enhanced service provision as well as the general development of medical infrastructure in the country. Concerning there is increase in donor agency linkages within the county there was strong agreement among respondents as shown by a mean of 4.3235. In regard to there is better healthcare sector policy formulation within the county there was strong agreement among respondents as shown by a mean value of 4.3309 and deviation of .88657 showing moderate dispersion in the responses obtained. Oyugi, (2015) also noted that enhanced policy realignment had enhanced the professional development among health professionals in the country.

4.3.2 Influence of Devolution of Healthcare Services on Physical Infrastructure

Table 4.5 Devolution of Healthcare Services on Physical Infrastructure

	N	Mean	Std. Deviation
There is an increase in healthcare facilities	136	4.2574	.81646
There is an increase in physical facilities within the county	136	4.2721	.89829
There is increasing condition of health centres within Mandera County	136	4.5588	.79596
There is increased access to health facilities within the county.	136	4.5147	.75016
The health facilities offer basic emergency obstetric care	136	4.2279	1.05386
The health facility have enhanced their access to electricity connection	136	4.3015	.86341

The findings on table 4.5 sought to examine the effect of devolution of healthcare services on physical infrastructure. The findings showed that in regard to there is an increase in healthcare facilities there was strong agreement as shown by a mean of 4.2574 and deviation of .81646 showing moderate dispersion in the findings. With regard to there is an increase in physical facilities within the county there was strong agreement among respondents as shown by a mean of 4.2721. Mwamuye, and Nyamu (2014) were also of the view that devolving health services in the country is expected to foster development of physical facilities within the sector in the country. The results of the study also showed a strong agreement among respondents concerning there is increasing condition of health centres within Mandera County as shown by a mean of 4.5588 and deviation of .79596 showing minimal dispersion in responses obtained.

Noting that there is increased access to health facilities within the county there was strong agreement among respondents as shown by a mean score of 4.5147 and a deviation of .75016 indicating moderate dispersion. The results of the study also showed that with regard to the health facilities offer basic emergency obstetric care as shown by a mean value of 4.2279 representing strong agreement. In regard to the health facility have enhanced their access to electricity connection there was strong agreement as shown by a mean of 4.3015 and a deviation of .86341 showing moderate variation in the responses obtained in the research. These findings are supported by Okech, and Lelegwe (2016) who concluded that the government's policy towards universal healthcare had contributed to an expansion of physical infrastructures as well as provision of better healthcare.

4.3.3 Influence of Devolution of Healthcare Services on Connectivity

Table 4.6 Devolution of Healthcare Services on Connectivity

	N	Mean	Std. Deviation
There is an increase in ICT connectivity within hospitals	136	4.5882	.58967
There is an increase in adoption of information management systems in the county	136	4.0809	1.05448
There is an increase in automation of office records	136	4.4779	.70938
Does the hospital have adequate communication facilities	136	4.5588	.59335
The hospital has adequate funding allocated for ICT connectivity	136	4.5588	.59335

The second objective of the study sought to examine the effect of devolution of healthcare services on connectivity within Mandera County. The results of the study showed that an increase in ICT connectivity within hospitals there was strong agreement as shown by a mean of 4.5882 and a deviation of .58967 showing minimal dispersion in findings. In regard to there is an increase in adoption of information management systems in the county there was strong agreement as shown by a mean value of 4.0809. Concerning there is an increase in automation of office records there was strong agreement among respondents as shown by a mean value of 4.4779 and a deviation of .70938. In regard to does the hospital have adequate communication facilities there was a strong agreement as shown by a mean of 4.5588 and a deviation of .59335. Ramana, Chepkoech, and Walelign, (2013) also indicated that in the recent past the government drive towards improving healthcare has seen a rapid increase in adoption of technology within the healthcare sector.

With regard to the hospital has adequate funding allocated for ICT connectivity there was strong agreement as shown by a mean of 4.588 and minimal dispersion in the responses as shown by the deviation of .59335. These results are consistent with Okech, and Lelegwe (2016) who noted that there has been a rapid increase in adoption of health management systems within the country. This has supported better medical research and service provision in the sector.

4.3.4 Influence of Devolution of Healthcare Services on Water Connectivity

Table 4.7 Devolution of Healthcare Services on Water Connectivity

	N	Mean	Std. Deviation
The Hospital has piped and running water	136	3.9044	.66532
The healthcare facilities have adequate water storage facilities	136	4.5588	.59335
There is an increase general Hospital hygiene due to water connectivity	136	4.3235	.92602
There is an improvement in general the water and sanitation level within the hospital	136	4.3309	.88657

The third objective of the study sought to examine the effect of devolution of healthcare services on water connectivity within Mandera County. The study results showed that with regard to the Hospital has piped and running water there was agreement among respondents as shown by a mean value of 3.9044 and a deviation of .66532. In regard to the healthcare facilities have adequate water storage facilities there was agreement among respondents as shown by a mean value of 4.5588 and a deviation of .59335 indicating minimal dispersion in the results obtained.

Chen, Dutta, and Maina (2016) are also of the view that there has been an improvement in the quality of primary healthcare in Kenya. Concerning there is an increase general Hospital hygiene due to water connectivity there was strong agreement among the responses as shown by a mean value of 4.3235. Findings of the study also showed strong agreement among respondents that there is an improvement in general the water and sanitation level within the hospital as shown by a mean value of 4.3309. Okech, (2016) examined universal health coverage under devolution and noted that enhanced management of health systems has contributed to better health service provision as well hygiene within the sector.

4.3.5 Influence of Devolution of Healthcare Services on Medical Equipment

Table 4.8 Devolution of Healthcare Services and Medical Equipment

	N	Mean	Std. Deviation
The hospital has access to Autoclave machine	136	4.2721	.89829
The hospital has acquired Radiology equipment	136	4.5588	.79596
There is an increase in access to Laboratory equipment within the healthcare sector	136	4.5147	.75016
The hospital has undertook linkages with partners for access to Rental medical equipment	136	4.2279	1.05386
The hospitals within the county have a fully operation ICU Department	136	4.2721	.89829
The county government has made adequate financing plans for medical equipment	136	4.2279	1.05386

The fourth objective of the study sought to examine the effect of devolution of healthcare services on the medical equipment within Mandera County. In regard to the hospital has access

to Autoclave machine there was strong agreement among respondents as shown by a mean score of 4.2721 and a deviation of .89829. In regard to the hospital has acquired Radiology equipment there was strong agreement among respondents as shown by a mean of 4.5588 and deviation of .79596. In regard to there is an increase in access to Laboratory equipment within the healthcare sector there was strong agreement among respondents as shown by a mean value of 4.5147. These results are consistent with Chen, Dutta, and Maina (2016) who indicated that devolution of medical services has seen a rapid increase in the accessibility of better equipments within rural hospital in the Country. These results are also supported by Okech (2016) who noted there is an improvement in primary healthcare in Kenya as results of devolution of the health services.

In regard to the hospital has undertook linkages with partners for access to Rental medical equipment there was strong agreement as shown by a mean of 4.2279. The findings of the study further showed that in regard to hospital within the county have a fully operation ICU Department there was strong agreement as shown by a mean of 4.2721. The results further showed that in regard to the county government has made adequate financing plans for medical equipment there was strong agreement as shown by a mean of 4.2279 and deviation of 1.05386. These results are supported by Kilonzo, Kamaara, and Magak (2017) who indicated that devolution of health services had resulted in improved access to maternal healthcare in the country.

4.4 Inferential Statistics

4.4.1 Diagnostic Tests

4.4.1.1 Collinearity Statistics

Table 4.9 Collinearity Statistics

	Tolerance	VIF
Physical Equipment	.102	9.831
ICT Connectivity	.292	3.430
Water Connectivity	.347	2.878
Medical Equipment	.107	9.310

Findings on Table 4.9 show VIF values which are all less than 10. With this, the study found no multi-Collinearity problem. The Tolerance value checks on the degree of Collinearity where a tolerance value lower than 0.1 shows that the variable could be considered as a linear combination of other independent variables. Thus, in the case of the current study, all the tolerance values are all greater than 0.1 indicating no cases of Multi-Collinearity. Cooper and Schindler, (2003) also indicated that VIF values of less than 10 indicate there are no incidences of multicollinearity problems within the research.

4.4.4.2 Normality Tests

Table 4.10 Normality Test

	Shapiro-Wilk		
	Statistic	df	Sig.
Physical Equipment	.937	136	.008
ICT Connectivity	.842	136	.007
Water Connectivity	.959	136	.009
Medical Equipment	.984	136	.006

As a rule of thumb for any data to be normally distributed, the Shapiro-Wilk test dictates that all the sig value should be above *0.05*. From the results indicated all the variables had a sig. value of above 0.05 hence the data was from a normally distributed sample.

4.4.2 Correlation Coefficients

Table 4.11 Correlation Matrix

		Devolution of Healthcare
Devolution of Healthcare	Pearson Correlation	1
	Sig. (2-tailed)	
	N	136
Physical Infrastructure	Pearson Correlation	.370**
	Sig. (2-tailed)	.000
	N	136
ICT Connectivity	Pearson Correlation	.511**
	Sig. (2-tailed)	.000
	N	136
Water Connectivity	Pearson Correlation	.846**
	Sig. (2-tailed)	.000
	N	136
Medical Equipment	Pearson Correlation	.478**
	Sig. (2-tailed)	.000
	N	136

** . Correlation is significant at the 0.01 level (2-tailed).

The general objective of the study was to examine the effect of devolution of healthcare services on the hospital infrastructure in Mandera County. The first objective of the research sought to examine the effect of healthcare services devolution on the physical infrastructure within hospitals in Mandera County. The findings of the research showed a weak positive effect of devolution of healthcare services on physical infrastructure as shown by a $p\text{-value} = .37$, $Sig = .000$. The second objective of the research sought to examine the effect of healthcare services devolution on the ICT connectivity within hospitals in Mandera County. The findings of the

research showed a moderate positive effect of devolution of healthcare services on ICT connectivity as shown by a $p\text{-value} = .511$, $Sig = .000$. These results are in line with Okech (2016) and Kilonzo, Kamaara, and Magak (2017) who all concluded that devolution had contributed to better access to healthcare systems in the country.

The third objective of the research sought to examine the effect of healthcare services devolution on the water connectivity within hospitals in Mandera County. The findings of the research showed a strong positive effect of devolution of healthcare services on water connectivity as shown by a $p\text{-value} = .846$, $Sig = .000$. The fourth objective of the research sought to examine the effect of healthcare services devolution on the medical equipment within hospitals in Mandera County. The findings of the research showed a strong positive effect of devolution of healthcare services on medical equipment as shown by a $p\text{-value} = .478$, $Sig = .000$. Okech, and Lelegwe (2016) also indicated that devolution had contributed positively to better universal healthcare coverage in the country.

CHAPTER FIVE: SUMMARY CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The fifth chapter of the study presented the summary conclusion and recommendations of the research. The conclusions of the study were aligned in line with the variables of the research.

5.2 Summary

From a review of the collected data the study was able to obtain a response rate of 89% response rate from the considered sample of 152 respondents drawn from the health sector in Mandera County. The majority of the respondents were nurses within the healthcare sector. The results further showed that the majority of the respondents were female personnel with the majority of the respondents having at least a bachelor's degree qualification.

5.2.1 Devolution of Healthcare

The study sought to examine the devolution of health sector services within Mandera County. The results of the study indicated that with regard to there is increased number of healthcare service providers there was agreement among respondents. Noting that there is an increase in number of medical personnel within the county there was strong agreement among respondents. Concerning there's increase in donor agency linkages within the county there agreement among respondents. In regard to there is better healthcare sector policy formulation within the county there was strong agreement among the study respondents.

5.2.2 Devolution of Healthcare and Physical Infrastructure

The findings of the research indicated there is an increase in healthcare facilities. The results of the study also showed there is an increase in physical facilities within the county as shown by the strong agreement among respondents. The results of the study also showed a strong agreement

among respondents concerning there is increasing condition of health centres within Mandera County. Results also showed that with regard to the health facilities offer basic emergency obstetric care as shown by strong agreement. In regard to the health facility have enhanced their access to electricity connection there was strong agreement among the respondents of the study. The findings of the research showed a weak positive effect of devolution of healthcare services on physical infrastructure as shown by a $p\text{-value} = .37$, $Sig = .000$.

5.2.3 Devolution of Healthcare and Water Connectivity

The third objective of the study sought to examine the effect of devolution of healthcare services on water connectivity within Mandera County. The study results showed that with regard to the Hospital has piped and running water. The findings also showed that with regard to the healthcare facilities have adequate water storage facilities. Concerning there is an increase general Hospital hygiene due to water connectivity there was strong agreement among the respondents. The findings of the research showed a moderate positive effect of devolution of healthcare services on ICT connectivity as shown by a $p\text{-value} = .511$, $Sig = .000$.

5.2.4 Devolution of Healthcare and Medical Equipment

The fourth objective of the study sought to examine the effect of devolution of healthcare services on the medical equipment within Mandera County. In regard to the hospital has access to Autoclave machine there was strong agreement among respondents. In regard to the hospital has acquired Radiology equipment there was strong agreement among respondents. In regard to there is an increase in access to Laboratory equipment within the healthcare sector there was strong agreement among respondents of the study. The findings of the study further showed that in regard to hospital within the county have a fully operation ICU Department as shown by the

positive response. The findings of the research showed a strong positive effect of devolution of healthcare services on medical equipment as shown by a $p\text{-value} = .478$, $Sig = .000$.

5.3 Conclusions

The general objective of the study was to examine the effect of devolution of healthcare services on the hospital infrastructure in Mandera County. The study concludes that as the new devolved units are adjusting to the devolution of healthcare services in the country. The findings of the study further showed that devolution of healthcare facilities had contributed positively to an increase in physical facilities within county governments. The results indicated that in general there was a positive and significant effect of devolution of healthcare on physical facilities.

The results of the study also showed that devolution of healthcare led to an increase in water connectivity within healthcare facilities. The study also concludes that there is an increase in piped water storage within the hospitals. The study further concludes that devolution of healthcare has contributed positively to better water management and storage facilities within county hospitals. Overall the study concluded there is a positive and significant effect on the water connectivity.

The findings of the research showed a strong positive effect of devolution of healthcare services on medical equipment as shown by a $p\text{-value} = .478$, $Sig = .000$. The results of the study showed that devolution of healthcare had contributed to increase in computer equipments, better records management systems as well as enhancing internet connectivity. The study further concludes that the devolution of healthcare has enhanced fibre optic connectivity within hospitals in Mandera County.

5.4 Recommendations

The study recommends that the county government should seek to expand their collaboration with research institutions and other medical institutions with a goal of fostering healthcare service provision. Availability and comprehensiveness of health services offered at a health facility is critical in realizing UHC. This partially depends on the availability of a strong, efficient, well-run health system as well as a sufficient capacity of well-trained, motivated health workers and the financing system. In line with the research observation the study recommends that the county government should do more to enhance the adequacy of physical facilities within health sector in the county. The research further recommends that the county government should seek alliances with the National government to boost the capacity of the hospitals within the county. Mandera County being one of the most marginalized counties in the country should seek more collaborative partnerships with aid organizations to support better infrastructure development within the county.

The study recommends that the county government should expand their financing of the healthcare sector within the county. This will help in expanding the provision of healthcare services in the county. The study further recommends that more should be done by the county government in expanding the level of physical facilities within the County. The inadequate facilities within the region have contributed to poor service delivery; hence the county government should expand its financing level as well as seek collaboration with donor agencies to roll out mobile clinics within the County.

The study further recommends that the county government should adopt new water harvesting techniques to help in enhancing the connectivity level within the health centres in the county.

Further the study recommends that the hospital should roll-out new ICT infrastructure to help in the digitalization of health records and management systems that can support better service delivery in the sector. Further the county government should train more of the personnel within the health sector on ICT infrastructure that has been rolled out within the county government. The study further concludes that the county government should adopt new measures geared towards connecting all hospitals within the county to the National Fibre optic network to expand seamless connectivity with other medical referral institutions.

The study further recommends that collaboration with charitable programmes such as the First Lady Initiative (Beyond Zero), Red Cross programs and AMREF Kenya missions can be scaled in the county to help support better healthcare service provision. The study further concludes that health centres within the county should adopt policies geared towards enhancing the professional competency of medical personnel within the county.

5.5 Suggestions for Further Research

The study proposes the following studies to enhance the policy formulation in the county;

- An examination of the effect of corporate governance practices on service delivery within the health sector in Mandera County.
- An examination of the effect of employee engagement on the performance of Mandera County government.

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APPENDICES

Appendix I: Introduction Letter

REF: REQUEST FOR RESEARCH DATA

I am a student of Masters of Public policy and Administration at Kenyatta University, Nairobi. I am required to submit as part of my course work assessment a research project report on ‘the effect of devolution on healthcare infrastructure. The study uses county Healthcare facilities in Mandera County and you have been selected as one of the respondents. I kindly request you to fill the attached questionnaire to generate the data required for this study. This information will be used purely for academic purpose and your name will not appear anywhere in the report. Findings of the study shall upon request be availed to you.

Your assistance and cooperation will be highly appreciated.

Thank you in advance.

Bashir B. Ismail

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Appendix II: Questionnaire

This questionnaire has been designed to collect information from selected staff of county Health facilities and is meant for academic purposes only. The questionnaire is divided into three sections. Please complete each section as instructed. Do not write your name or any other form of identification on the questionnaire. All the information collected from the questionnaire will be treated with strict confidentiality.

PART A: GENERAL INFORMATION

Kindly answer all the questions either by ticking in the boxes or writing in the spaces provided.

1. Position in the Hospital

- Clinical Officer Medical officer Pharmacist Midwife
- Laboratory technician Accountant Nurse Health Information officer
- Procurement officer other (specify)

2. Level of education

- Diploma Bachelor's degree Master's degree

3. Your gender

- Male Female

4. Your age

- 20-30 years 31-40 years 41-50 years Over 51 year

5. The years you have worked in the organization

- Less than 2 years 3-5 years 6-8 year's Over 9 years

PART B: DEVOLUTION OF HEALTHCARE SERVICES AND HEALTHCARE INFRASTRUCTURE

Please tick the level of agreement on the following statements.

Please indicate in the table with a tick (√) or a cross (×) with a scale of

5= Strongly Agree 4= Agree 3= Moderate Agree 2= Disagree 1= Strongly Disagree

No	Devolution of Healthcare Services in Mandera County	1	2	3	4	5
1.	There is increased number of healthcare service providers					
2.	There is an increase in number of medical personnel within the county					
3.	There is increased financial allocation within the healthcare sector					
4.	There is increase in donor agency linkages within the county					
5.	There is better healthcare sector policy formulation within the county					

Based on your own professional observations what are other key metrics witnessed in the devolution of the healthcare services?

.....

No	Devolution of Healthcare Services and Physical Infrastructure in Mandera County	1	2	3	4	5
1.	There is an increase in healthcare facilities					
2.	There is an increase in physical facilities within the county					
3.	There is increasing condition of health centres within Mandera County					
4.	There is increased access to health facilities within					

	the county.					
5.	The health facilities offer basic emergency obstetric care					
6.	The health facility have enhanced their access to electricity connection					

Has the County Government put in place the following departments and structures in hospital facility and are they operational?

Department	Yes	No	Operational	Not operational
Labour wards				
Theatre				
Radiology Department				
Laboratory department				
Renal unit				
ICU Department				

No	Devolution of Healthcare Services and Connectivity in Mandera County	1	2	3	4	5
1.	There is an increase in ICT connectivity within hospitals					
2.	There is an increase in adoption of information management systems in the county					
3.	There is an increase in automation of office records					
4.	Does the hospital have adequate communication facilities					

5.	The hospital has adequate funding allocated for ICT connectivity					
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No	Devolution of Healthcare Services and Water Connectivity in Mandera County	1	2	3	4	5
1.	The Hospital has piped and running water					
2.	The healthcare facilities have adequate water storage facilities					
3.	There is an increase general Hospital hygiene due to water connectivity					
4.	There is an improvement in general the water and sanitation level within the hospital					

How often is water available in the hospital?

Daily Twice a week Weekly Monthly others specify

No	Devolution of Healthcare Services and Medical Equipment in Mandera County	1	2	3	4	5
1.	The hospital has access to Autoclave machine					
2.	The hospital has acquired Radiology equipment					
3.	There is an increase in access to Laboratory equipment within the healthcare sector					
4.	The hospital has undertook linkages with partners for access to Rental medical equipment					
5.	The hospitals within the county have a fully operation ICU Department					
6.	The county government has made adequate financing plans for medical equipment					

Thank you for taking your time to complete this questionnaire