

**IMPACT OF DEVOLUTION ON HEALTHCARE INFRASTRUCTURE: A
CASE STUDY OF BOMET COUNTY**

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**A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF
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NAIROBI**

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DECLARATION

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

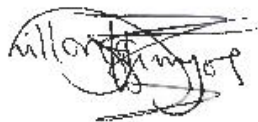
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DEDICATION

I dedicate this report to my father Joseph Bett and my mother Juliana Bett who have been a strong pillar to my academic journey and for their unfailing support.

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First I wish to recognize the Almighty God for the gift of life and strength throughout my studies. Special thanks goes to my supervisor Prof. Peter Wanyande for his guidance and invaluable support while undertaking this project. Much thanks to all my lecturers who taught me various units in the Department of Political Science and Public Administration, and Kenya School of Government for availing all the assistance I required, and the University of Nairobi for allowing me to study this worthy programme. Besides, I appreciate my siblings for encouraging me throughout the period I undertook the study. Lastly, I wish to appreciate the healthcare workers of Bomet County Government where I conducted the study for their cooperation.

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ABBREVIATIONS AND ACRONYMS

| | |
|----------------|--|
| CT | Computerized Tomography |
| EMMS | Enhanced Medical Management Services |
| EMS | Emergency Medical Service |
| HMIS | Health Management Information System |
| ICT | Information Communication Technology |
| ICU | Intensive Care Unit |
| IMF | International Monetary Fund |
| IRA | Individual Retirement Account |
| KEMSA | Kenya Medical Supplies Authority |
| KEPH | Kenya Essential Package for Health |
| KNH | Kenyatta National Hospital |
| LAO | Lead Amateur Operation |
| MRI | Magnetic resonance imaging |
| NACOSTI | National Commission for Science, Technology and Innovation |
| N.C.D.s | Non-Communicable Diseases |
| N.G.O.s | Non-Governmental Organizations |
| SPSS | Statistical Package for Social Sciences |
| S.S.A. | Sub-Saharan Africa |
| UK | United Kingdom |
| U.K. | United Kingdom |
| UNFPA | United Nations Population Fund |
| WHO | World Health Organization |

ABSTRACT

The study was to investigate the impact of devolution on healthcare infrastructure in Bomet County. The specific objectives of the study were to: investigate the impact of devolution on the number of medical equipment in Bomet County, investigate whether devolution has led to an increase in the capacity of healthcare physical infrastructure - public hospitals, laboratories, and hospital ward capacity in Bomet County, and investigate whether devolution has led to an increase in the number of ambulances in Bomet County. The study adopted a descriptive survey research design. The target population of the study was 143 public health facilities in Bomet County. They included 5 hospitals, one medical center, 110 dispensaries, and 27 health centers. The sample size was 103 public health facilities. The study used primary and secondary data to conclude the study, and a questionnaire was used in collecting primary data. Data analysis was done using the Statistical Package for Social Sciences (SPSS). The process involved sorting out the questionnaires, coding, data entry, and eventual generation of analysis summarized as frequencies, percentages, and measures of central tendencies summarized in tables and graphs. Inferential statistics involving the use of regression analysis were used to draw conclusions for the study. The study results indicate a positive impact of devolution on the number of medical equipment in Bomet County, as shown by $r=0.411$ and $p\text{-value}=0.001$. In addition, the research findings also showed a strong positive impact of devolution on the number of healthcare physical infrastructure- public hospitals, laboratories, and hospital ward capacity in Bomet County, as demonstrated by $r=0.638$ and $p\text{-value}= 0.00$. Additionally, the research findings showed a positive impact of devolution on the number of ambulances in Bomet County, as shown by $r= 0.525$ and $p\text{-value}=0.00$.

To conclude, the study recommends that Bomet county government should seek more collaborative partnerships with aid organizations to support better infrastructure development within the county on matters medical equipment, ICU departments, radiology departments, renal departments and the rolling out of mobile clinics within the County. The study recommends that Bomet County government should expand their financing of the healthcare sector within the county as this will help in expanding the provision of healthcare services in the county. The county government should ensure that sub-county hospitals - Ndanai, Kapkoros, Sigor, and Cheptalal should have operational Intensive Care Unit departments. The research further recommends that Bomet County Government should seek alliances with the National government to boost availability of ambulance services within the county.

CHAPTER ONE: INTRODUCTION

1.1 Introduction and Background of the Study

The idea of devolution refers to the decentralization of political structures in which control and funding are given to regional and local administrations. The essence is to empower communities through the development of social enablers that enable people and communities to participate in governance issues. (Liebmann, 1993). Devolved governance systems are preferred by democratic governments that uphold values like citizenship, inclusivity, consent to government, and minority rights because they allow for free government and make it easier for citizens to participate in local and republican affairs than centralized systems of government (Liebmann, 1993). In order for their citizens to bargain and negotiate for the leadership and services they desired within their various, regional and local jurisdictions, countries like the United Kingdom in the 1990s and France in the 1980s adopted devolved governance units, according to Ayres, Flinders, and Sandford (2018).

Kenya's journey towards devolution began at independence. Six Regional Development Authorities which were Tana and Athi Rivers Development, Lake Basin Development Authority, Kerio Valley Development Authority, Ewaso Ng'iro South Development Authority, Ewaso Ng'iro North Development Authority and Coast Development Authority were included in the country's centralized administrative structure, which it inherited from the colonial authority, to plan and coordinate development initiatives (KHRC, 2010). According to Ngigi and Busolo (2019), the then-ruling parties, KANU and KADU who had assumed power after independence, were geared toward launching a devolved system of governance but were unable to come to terms with the underlying philosophical tenets, which caused them to put the discussion on Devolution on hold.

It became clear that there were no systemic procedures to assist development initiatives at the dispersed levels while strategic goals for the first decade after independence were being developed in 1963. As a result, the central government started experimenting with financial decentralization programs at both the central and local government levels in order to find a solution to this problem (Kibua & Mwabu, 2008). The District Focus for Rural Development Strategy, established by the government in 1983, put the district in the forefront of setting priorities for strategic development (Barkan and Chege, 1989). By establishing a few distinct

roles and mandates at the local levels, these initiatives decentralized the administrative personnel of the central ministry and empowered local authorities.

However, instead of defining authority borders, these experimental methods increased administrative inefficiencies (Barkan and Chege, 1989). Many assessments concluded that Kenya remained extremely centralized as a result, making decentralization initiatives ineffective (Ndii, 2010; Ndavi et al., 2009). The limited scope for local governments to make decisions (Muriu, 2013), the inadequate legal foundation for decentralization (Chitere, 2004), and low levels of citizen participation, among other things, have also been found to weaken previous decentralization strategies, according to various studies (Muriu, 2013; Chitere, 2004; Oyaya, 2004). Other concerns included a lack of capability within local governments, ongoing civil servant influence, and a preference for results over processes (Chitere, 2004; Oyaya, 2004).

Decentralization and deregulation were being supported by structural adjustment programs run by the World Bank and International Monetary Fund (IMF) by the 1990s. For instance, the World Bank established the Local Government Reform Program in Kenya to provide direct funding to local governments (Esidene, 2011). These changes gave local governments more control over service delivery while maintaining centralization of decision-making. Due to overlapping mechanisms developed by the Rural Development and Structural Adjustment Programs, such as the Rural Development Fund and the Local Authority Transfer Fund, finances were vertically decentralized during this time (KHRC, 2010).

When Kenya's first Constitutional Review Commission was established in 2000, the country's governing system underwent change. But the contested 2007 presidential election served as the impetus for action. The sides to the conflict reached a settlement, which included having a Committee of Experts develop a new constitution with a revised governance framework (Constitutional Review Committee of Experts, 2010). As a result, the devolved system promised under Kenya's 2010 constitution was put into place (Hope, 2014).

The legislature laid out plans to build a more sustainable and empowering governance design for the rest of the population after realizing that the centralized power system of governance

with Nairobi as its capital had considerably hindered other jurisdictions' access to and control of resources (Norad, 2009). Ngigi and Busolo (2019) state that it was also clear that prior programs and efforts to fight poverty, promote economic growth, and create sustainable growth within the centralized system of governance had not yielded the desired outcomes. The modification was required. Government policy was enacted across the provinces, and the then-established Ministry of Local Government exercised a strong and central oversight of local government. The decentralized levels had access to 13 different vertical funding options by 2010.

After receiving 67 percent of the vote in a public referendum in August 2010, the new constitution was approved and put into effect, signaling a new push towards devolution. The 2010 constitution's drafters used Kenya's 1992 district system as the foundation for their proposal for devolution (The Republic of Kenya, 1992). This idea resulted in a decentralized government with legal backing that consisted of 47 newly established counties and had control over administrative, political, and financial duties. Select administrative, political, and financial responsibilities would be handled by locally elected officials under this new county-governance framework. They would depend on formula-based federal funds combined with locally produced income. Sections like Article 91, which enshrined the constitutional right of individuals to participate in political processes by devolution, strengthened these advances even further.

The Fourth Schedule of the 2010 Constitution set forth clear rules for the services that the county government would provide and those that would continue to fall under the purview of the national government. These services included early childhood education, drug prevention, county transportation, and county street lighting. The majority of these services were already managed at the county level. Decentralization of financial resources and increasing autonomy would promote the success of these projects.

Along with the aforementioned services, certain essential ones were also transferred from the centralized system to the sub-national level. According to Mwenda (2010), counties were in responsible of overseeing the provision of housing, health, and agricultural services. The sub-

national elected governments were increasingly relied upon to maintain these services, on the whole. The national government, often known as the central government under devolution, would only be in charge of policy matters in these sectors when counties achieved political autonomy. The administration, which consists of the Governor, the Deputy Governor, and appointed county assembly members, now runs counties as separate governmental units. These county assemblies provide their approval to proposals, pass legislation, supervise the county administration, and ensure that the needs of the electorate are adequately served. The performance of the health services sector in the devolved system of government will be especially examined in this study.

A four-level scheme is used to classify public health facilities. Community health services make up the lowest level one, primary health services make up level two, county referrals make up level three, and national referral hospitals make up the highest level. According to the decentralized system of governance, county governments are in control of levels one through three of the healthcare system and are fully responsible for providing all healthcare services, with the federal government only acting as a policymaker. The total national income, which as of 2010/2011 was equal to 103 billion Kenyan shillings, is divided among the counties at a rate of 15%. When compared to other industries like agriculture, which is a major source of revenue for the Kenyan economy, each county only spends roughly 27% of its budget on health.

The national government faced numerous difficulties with resource management prior to devolution. Some of these challenges included the inequitable distribution of resources, marginalization of particular communities, and mismanagement of resources. The health sector also bore the brunt of these challenges. Devolution meant that society would be organized into smaller, better structures, more easily manageable units that are easier to call to account. This study will seek to examine how the devolved health sector is performing with a specific focus on Bomet County.

1.2 Statement of Research Problem

Before the Constitution of Kenya 2010, which engendered devolution, healthcare was under the central government, currently the national government. As such, the national government managed all healthcare activities and functions. This role included recruiting doctors and nurses, financing public health facilities, and supervising public health facilities and staff. This expansive responsibility resulted in an inefficient system as the Ministry of Health faced many challenges resulting from mismanagement of funds, challenges in distributing resources equitably to cater to the vast widespread population, and unclear resource distribution structures (Kimalu, 2001). The centralized system also brought about spatial inequalities resulting in the marginalization of certain communities (MOH, 2013a).

According to the 2012 report by the Office of the Deputy Prime Minister, the facilities that provided healthcare services in Bomet District (the present Bomet County) were dispensaries such as Itembe, Chebiroi, Tarakwa, Singorwet, Chebunyo, Kapkoros, Silbwet, Cheboin, Ndanai and Bomet. The major hospitals that handled complex health problems were Tenwek Mission Hospital and Longisa District Hospital. Unfortunately, these healthcare facilities proved inadequate to cater to the population of over eight hundred thousand.

The 2012 report also revealed that hospitals lacked well-equipped laboratories, making them dependent on testing facilities at the Moi Teaching & Referral Hospital in Eldoret and the Kenyatta National Hospital in Nairobi. For example, in 2012, Ndanai hospital in Sotik Constituency, Bomet District, had more patients seeking services in the facility, outweighing the hospital's capacity. The facility lacked essential medical equipment for the theatre and other specialized equipment such as CT scanners and MRI machines. Another example is Longisa Hospital, which was on the spot for many deaths attributed to a limited number of ICU beds, most of which were non-functional (Chepkoech, 2012).

Most of the health facilities in Bomet also lacked ambulance services. Only the larger hospitals, Longisa District Hospital and Sigor Hospital used to rely on ambulances from national government specifically from The National Hospital Insurance Fund. However, they were hardly helpful in responding to emergency services because they were very simple vehicles with no major medical equipment.

The devolution of health services was necessary to improve access to adequate, streamlined, quality, and effective health care nationwide and resolve administrative issues, especially in health procurement requirements (Murkomen, 2012). However, although the financial allocation for healthcare services is relatively high compared to other social-economic sectors in Kenya, taking 27% of county budgets, health statistics reflect an enormous decline in performance. Issues such as maternal and infant mortality rate remain high (National Council for Population Development, 2015).

Against this background, the study sought to ascertain whether the implementation of devolution has led to an increase in the number and quality of health care infrastructure in Bomet County. Put differently, has the introduction of devolution improved health care infrastructure (number of medical equipment, number of healthcare physical infrastructure, ambulance services in Bomet County)? To address this issue, we studied and reviewed the situation before and after the healthcare sector was devolved.

1.3 Research Questions

The study sought answers to the following research questions,

What impact has devolution had on:

- i. the availability of medical equipment in public healthcare facilities in Bomet County?
- ii. the number of healthcare physical infrastructure in Bomet County?
- iii. the availability of ambulance services in Bomet County?

1.4 Objectives of the Study

The general objective was to investigate the impact of devolution on healthcare infrastructure in Bomet County.

The study's specific objective was to investigate whether or not the introduction of devolution has led to an increase in the number of:

- i. medical equipment in Bomet County.
- ii. healthcare physical infrastructure in Bomet County.
- iii. ambulances in Bomet County.

1.5 Hypotheses

1. Devolution has led to an increase in medical equipment in public healthcare facilities in Bomet County.
2. Devolution has influenced an increase in the capacity of healthcare physical infrastructure in Bomet County.
3. Devolution has led to an increase in the number of ambulances in Bomet County.

1.6 Justification of the Study

1.6.1 Academic Justification

The study findings would assist in expanding knowledge of the impact of devolution on healthcare infrastructure. This area of study has minimal research currently, and this study would be handy for students, scholars, and researchers who can use it as a guide for future studies and discussions. It would thus form the basis for future studies by interested individuals on devolution and especially its impact on healthcare infrastructure.

1.6.2 Policy Justification

The national government has consistently declared its intention to improve public health care sector. The Kenya Health Policy 2014–2030 states that one of its goals is to attain the highest standard of public health in a manner responsive to the needs of the Kenya population. This study will help develop policies, track progress, and assess areas of improvement regarding public health service delivery within the devolved system. In addition, it would inform the Bomet County government on whether it has met its healthcare goals as a devolved unit and identify areas that need improvement regarding the County's healthcare infrastructure. This information will help the county government develop appropriate policies to ensure that devolution significantly enhances the County's healthcare infrastructure.

1.7 Scope and Limitations of the Study

The research was centered on devolution of healthcare infrastructure and only investigated three aspects of healthcare infrastructure: medical equipment, healthcare physical infrastructure, and ambulance services. The study was conducted in Bomet County and targeted health managers like the County Executive Committee member in charge of health, County

health Chief officer, officers in charge various health divisions, hospital managers, pharmacists, nurses, clinicians, procurement officers, and medical officers. The study was done from March 2021 to July 2021.

Some respondents were unwilling to provide info as they dread that it may be used to daunt their image or that of the county government. Some even had refused to fill the questionnaires. This problem was mitigated by the use of an introduction letter from the University, research permit from National Commission for Science, Technology & Innovation (NACOSTI) and guaranteeing the respondents information given by them was regarded confidential and it was purely utilized for academic reasons.

The researcher as well experienced difficulties while collecting data as some of the respondents would go for lunch especially in the health centers for more than three hours and when they came back, they would want to close the facility and go home. The researcher overcame this by exercising patience and waiting for the respondents until they arrived.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter examines the literature on the relationship between devolution and healthcare services. The approach taken is to start from a global view, i.e., what has been written about the subject in other parts of the world, including Europe and the Asian countries. After that, the chapter will narrow down to the East African Region and, finally the documented Kenyan perspectives on devolution and healthcare services. Finally, the chapter provides an empirical review of devolution, medical equipment, healthcare physical infrastructure, and the number of ambulances.

2.1.1 Devolution

Devolution refers to the decentralization of systems of government such that power is devolved and resources are distributed from a central government to local authorities. This decentralization of power takes the form of central government distributing core functions and service mandates to leaders in local regions such as states, provinces, districts, counties, constituencies or local governments. Decentralization empowers local communities with resources, resource management capacity, an increased sense of inclusion and participation such that devolved governance units become associated with public service responsibility, autonomy and accountability (Katikireddi, Smith, Stuckler, and McKee, 2017); Williamson and Mulaki, 2015). Nyongesa, Munguti, Odok, and Mokuu (2015), in agreement, cited Regmi (2010) in highlighting that devolution constitutes various events whose results include the transfer of decision-making, authority, and "power" to the grassroots governments. Devolution of governance impacts various critical sectors of the economy encompassed by a nation, including education, health care, transportation, telecommunication, utilities, and energy. In seeking to understand the impact of devolution, this project looks at how the devolution of the public health sector has impacted healthcare facilities in the local government context.

Esidene (2011) argues that devolution has an element of separateness. It is entirely separate from decentralization, a concept of resource management where the central government divests functions to lower governance units and has no direct control over them. He and others argue that decentralization and devolution are different phenomena where

decentralization is used within an organization while devolution applies between organizations, i.e., national and devolved units (Gaogallo, 2015). This review nonetheless looks at decentralization as a core aspect of devolution rather than separate occurrences. The Constitution of Kenya (2010) refers to devolution as the decentralization of state organs so that some of its functions and services move from the capital to the local county government authorities. One of the key principles of devolution as identified by this constitution is a separation of powers. In this context the, devolution is a decentralized system which fosters a separation of powers from a centralized system to diverse sub units. The element of separation here thus is the separation of powers.

Successful devolution is associated with far-reaching benefits. As per the findings of Fitzgerald, McGrath-Champ, Stacey, Wilson, and Gavin (2019), there has been an improvement in the management, access, and utilization of health services in countries where devolution has been effectively managed. In the same breath, in countries that register successful devolution, it is suggested that health facilities have adequate health workers to attend to patient needs promptly, and drugs and other medical supplies are always available. However, despite this positive record, there are crucial challenges in some countries despite an elaborate implementation of decentralized healthcare (Bebber & Eren, 2018). These challenges include expenditure queries manifested in delayed or inadequate disbursement to various health facilities where favouritism and political networks take precedence. In addition, the challenges mentioned above oblige public health facilities to resort to extraneous ways of generating requisite funds (Lind, 2018).

The devolution of healthcare in European countries has had diverse effects. Some of the reported positive outcomes of devolution to the county councils include improved efficiency of service delivery, patient-centred health care provision, the capacity to innovate, and a boost in cost-consciousness. Another gain of decentralization is an improvement in the accountability of local, regional, and higher authorities. Despite this positive report, there has been great concern in some European countries, especially on the issues of inequities in service provision and resource capacity (McCollum, Limato, Otiso, Theobaldm & Taegtmeyer, 2018). Katikireddi (2017), in their assessment of the devolved health sector in the UK observe that some of the

political determinants of inequalities in the health sector are outside the scope of the health sector even in a devolved system. They note that macroeconomic welfare policies on healthcare services remain centralized and thus pose various opportunities and threats to the devolved health system even if the services are run independently.

Ansari et al. (2011) did a study in the Philippines and observed that devolution improved the provision of resources, increased citizen involvement in handling distinctive health requirements, and boosted the ability to make decisions at the county levels. The involvement of the majority of the staff in decision-making also makes health devolution workable. In Thailand, at least half of the health centres' staff devolved. The medical staff were expected to voluntarily transfer to Lead Amateur Operation (LAO), the new devolved employer. LAO became responsible for primary health service delivery through health centres. They were in charge of planning the day-to-day operations of the health subunits, including financial and human resource management. The Ministry of Health continued to be responsible for technical policy, supervision, training, and regulation of fifteen (15) health professionals. This staff involvement ensured a buy-in which made the transition smooth.

Batley (2004), in his study of devolution in Pakistan, observed that regional managers did not focus on strengthening the devolved healthcare sector, which resulted in stagnation of the health services delivery. The fact that the regional leadership also had to work with the limited resources provided by the central government meant that the regions were also financially strained. Bashaasha, Mangheni, and Nkonya, (2011) emphasize that devolution does not automatically lead to improved health services, as indicated by many health status indicators reflecting stagnation or a worsened system.

According to Frumence, Nyamhanga, Mwangi, and Hurtig (2013), challenges experienced by health departments during the implementation of health sector decentralization in Tanzania included the inadequate capacity to carry out supportive supervision at the health facility and community levels. Other challenges were in monitoring and controlling the quality of health service delivery in the whole council. There was also a lack of capacity in transport caused by insufficient and poor maintenance of vehicles (Frumence, Nyamhanga, Mwangi, and Hurtig 2013).

In Uganda, devolution was introduced in 1997 under the local government Act, with the main focus being the management of natural resources, education, health, and agricultural advisory services. In a case study examining decentralization in Uganda, Najjemba (2020) found that health services did not improve. This finding was supported by the numerous health status indicators showing stagnation or worsening conditions. Generally, the decentralization of education and health services did not result in greater citizenry participation and public servants' accountability to the community. Further, the study argues that lack of community participation, inadequate financial and human resource, a narrow local tax base, a weak civil society underscored the need to ameliorate them if devolution was to lead to the envisioned results. The referenced case study of Uganda cautions against romanticizing devolution as the new-found solution for past and current institutional and socioeconomic distortions. It further argues that devolution can make state institutions more responsive to the needs of the communities only if it allows people to hold public servants accountable or if it ensures community participation in the development process.

In 2010, Kenyan registered voters voted for a change of governance, which led to the promulgation of the new and current constitution that embraced the concept of devolution. In its structure, devolution in Kenya saw the introduction of 47 county governments that would manage resources and have authority released by the national government. The counties were formed after the March 2013 general elections, where the local governors and other county public officials were elected into their respective offices.

Three distinct principles characterize devolution in Kenya. They are:

The principle of oversight. This principle deals with the supervision of how the devolved units are run and manage resources, and it is carried out by independent institutions such as the senate and office of the auditor general

The principle of interdependence. This principle emphasizes the interdependence between the national and County governments since they both serve the same people, and some of their roles overlap. For example, the national government deals with policy formulation work while county governments implement the designed and approved policies.

The principle of being distinct. This principle implies that every government level, national and County, has clear boundaries, resources, and roles.

The new constitution mandated the creation of several bodies to ensure an efficient transition from the national system to county governance. These bodies have the mandate of overseeing counties to enhance accountability, such as the auditor general's office and the Senate (Vasconcellos Grubow, 2018). Devolution in Kenya has several objectives that include: The promotion of equality in the allocation of local and natural resources, ensuring the upholding of the rights of the minority and marginalized groups, acknowledging communities' rights in the management of their affairs to promote localized development and to guarantee that services are easily accessible throughout the country to facilitate economic and social development, and lastly, ensuring balances and checks and separating powers.

Devolution extended the following powers to county governments. The power to: form agencies, enter into public and private partnerships to allow service delivery contract, delegate some of its roles to officers and other units, and accomplish various roles.

Health service delivery was one of the devolved functions, and it has since been a responsibility of the county governments. In Kenya, the devolution of the health sector presented new opportunities and challenges that have shaped and influenced effective service delivery. County governments have the expense to redesign or implement innovative service delivery models and interventions that address the unique health sector needs in their contexts for sustainable healthcare service delivery. While addressing the arising and existing challenges, the county governments have a broad scope to determine their health system, identify citizen priorities, and make autonomous and quick decisions on resource mobilization, allocation, utilization, and management.

Every Kenyan has a right to essential nutrition, healthcare, and shelter, according to Article 53 of the new constitution provides. In addition, Article 56 of the same constitution requires the state to formulate and institute frameworks to ensure that the marginalized and minorities can have access to health services, infrastructure, and water. To fulfill these rights, devolution

divided health provision responsibilities between the county and national governments, and it provided particular guidelines in which services national and County governments were to offer. For example, primary health care provision was the role of the county administrations while the national government retained management of national referral hospitals and health policy formulation.

Four main inputs are needed to allow smooth transition and provision of primary health services to more than 62% of Kenyans, and they are: a well-developed network of health centers, trained and motivated staff, a supply of necessary medicines and adequate finances to allow the maintenance and operation of health facilities (Dang, Visseren-Hamakers & Arts, 2018).

The counties are responsible for community health services, primary care services, and county referral services. In this structure, Community health services constitute community-led demand activities such as utilizing community health units as referral systems in the villages. Primary care services comprise clinics, dispensaries, and health centers that act as patients' first point of contact. County and sub-county hospitals, rural health centers, dispensaries, and rural health training and rehabilitation centers fall under the County's run facilities (Kipruto & Letting, 2017). Since the transfer of operational and strategic oversight to the counties, the management of these facilities has significantly changed. County referral services are hospitals managed by the counties and are structured as level four and level five health facilities. National referral services comprise facilities that provide highly specialized services and include all tertiary referral facilities.

A research study of Kisumu County by Aloo (2017) on the factors affecting healthcare service provision in the devolved system of the Kisumu County government focused on the location of health facilities, medical staffing, management, and procurement of medical equipment on the provision of healthcare services. Aloo established that many people strongly believed inadequate hospitals were a critical factor that hindered Kenyan healthcare service provision. He studied the elements using a descriptive survey and a case study design.

A significant challenge in the supply chain management for devolved units is the embedment of the procurement process in central government structures (Leach, Stewart & Jones, 2017). This means that there is high dependence on direct funding from the Ministry of Finance and inadequate freedoms of responsibility to perform duties independent of the national government. Devolution of purchasing power to counties is providing more discretion to districts. Depending on the central government will delay the good intentions because the procurement process faces delays and lacks the means to manage drugs adequately at the devolved level, including quantification of need and keeping an adequate buffer stock. Therefore, many donors have called for a change in the procurement process into a (semi-) independent trust. Discussions regarding institutional changes are underway, with concerns about the long processes and whether they will ever be free from political interference (Tsofa et al., 2017).

In general, decentralization of health services may or may not result in increased participation by the local community or accountability by the public servants under the county government. These elements, inadequate financial and human resources, a narrow local tax base, and a weak civil society underscore the need to improve devolution to yield the anticipated results (Bashaasha et al., 2011). One of the simplest yet fruitful approaches to adopt is to empower the local community members to hold public servants accountable and participate in the development process. This is an initial step that supporters of devolution can take to ensure state institutions are more responsive to the local communities' needs. Since 1994, decentralization has been a stated policy objective for Kenya (Kibui et al., 2015). However, the process and functions of allocating health sector financial resources have remained highly centralized and opaque. They primarily rely on previous years' budget allocations rather than health needs indicators. Equitable or fair resource allocation is achieved by considering variations in the citizenry's health needs across geographic and economic groups. However, as revealed by a health policy initiative research, the differences in health achievement, access, and provision costs across the regions, provinces, and districts are not factored in or accounted for during budgetary allocation (Kibui et al., 2015).

A report by Ayres, Flinders, and Sandford (2018) revealed that Kenya faces a crisis in human resources for health. The study cites some of the major causes of the problem: high staff turnover, inadequate and inequitable distribution of health workers, poor planning and management of the health staff, insufficient information systems, and less satisfactory working conditions to attract and retain health practitioners. The report has considerably dealt with the general aspects of human resources for health but did not specifically look at the effects of devolution on human resource capacity in the area of study. The scenario after devolution is different, and recruiting and retaining the best staff is the county government's responsibility.

2.2 Provision of Medical Equipment

The availability of functional equipment and an adequate supply of drugs is vital in the uptake and utilization of healthcare facilities. Therefore, producing health services requires: the availability of critical inputs such as drugs, equipment, and infrastructure, Skilled service providers, and providers who exert the necessary effort in applying knowledge and skills.

Brazil (2004) stated that the availability of medical equipment is essential for providing reliable healthcare services. A study conducted on the health sector in India by Kumar and Dansereau (2014) established that the number of newborn deliveries was higher when the facility had suitable beds, essential obstetric medicines, medical devices, energy supply, and communication facilities.

Truphena (2017) conducted a study on the impact of devolution on healthcare systems. She focused on the effects of devolution on access to health services, healthcare infrastructure, and the healthcare workforce. Truphena found out that there has been an ongoing heavy installation of medical equipment in most hospitals in Kenya since devolution. Furthermore, the study also found lack of comprehensive, coordinated equipment installation in some facilities, with existing gaps. Finally, it also found a lack of maintenance for the equipment.

Some of Kenya's health facilities do not have premises for priority interventions, such as delivery rooms, maternity, laboratories, theatres, screening, and isolation facilities, among others. Trained public health technicians whose assignment is to maintain the hospitals' physical

infrastructure are not engaged in these functions. As counties stretch the low budgetary allocations, the few available financial resources are reserved for pharmaceutical and non-pharmaceutical commodities. As a result, the equipment has not been replaced for a long time, diminishing the quality of care. Furthermore, skilled maintenance staff is scarcely available at the County and lower-level facilities. When available, they are incapacitated in performing their roles because they lack the necessary tools, consumables, or financial resources. As a result, the general maintenance capacity and abilities have eroded over the years. As highlighted by the national government, proper maintenance of the country's (or a county's) health infrastructure and equipment would change the public's perception of good quality healthcare. In turn, this would encourage people to use the available and more affordable public health services (GoK, 2015).

Tsofa et al. (2017) examined the effect of devolution on the management of health commodities and the workforce in Kilifi County, Kenya. The researcher undertook a qualitative case study design guided by the decision space for inquiry and data analysis. The study found that devolution resulted in salary delays and confusion over the conduct of roles. The research also noted that devolution deprived the county of its capacity to undertake healthcare functions relative to its population, besides political interference in healthcare affairs. However, despite the challenges, the study found that devolution had expanded the decision-making space for management teams, especially those responsible for medical supplies and human resource management.

Ministry of Health (MoH) carried out a study (2015) on the impact of devolution on healthcare systems in Nairobi County. It revealed that most public health facilities operate with medical equipment that is more than 20 years old (some double their lifespan) and frequently encounter failures. In addition, the study revealed that most public facilities lack modern equipment such as radiology equipment, dialysis machines, laundry machines, and theater equipment. Overall, the available equipment falls significantly short of the required amount. Furthermore, of those available, maintenance has been inadequate, and almost half are too old to pass the current quality checks and meet the threshold standards (Ministry of Health, 2015). In another report by the MoH in 2016, there was a similar observation with most dispensaries lacking placenta pits and septic tanks for the safe disposal of maternity health care waste.

While the citations and references above indicate the challenges experienced since the devolution of healthcare services, the available research covers only a portion of the country's 47 counties. Therefore, extensive research on medical equipment status in other parts of the country is yet to be done to establish the situation countrywide, especially in Rift valley, Kenya. Therefore, there is a need for more studies on the influence of the devolution of healthcare services on medical equipment.

2.3 Healthcare Physical Infrastructure

Healthcare physical infrastructure is fundamental to the provision and execution of health services. It allows for and supports the critical health goals, including creating environments that promote quality health service delivery. Healthcare physical facilities must develop an equitable capacity to provide defined health services based on the population and level of care.

Further, various healthcare norms relating to critical physical infrastructure inputs have been identified by the World Health Organization (WHO) to efficiently, effectively, and sustainably offer the healthcare service delivery package. Healthcare physical infrastructure norms outline the number of physical healthcare facilities required for equitable capacity to deliver the defined health services. For example, the World Health Organization (WHO) recommendation is that for every 30,000 people, there should be 15 health centers and 45 dispensaries per 10,000 people. Additionally, the national norms require each person to live within a 5 km radius of a health facility to ensure access to essential health services. Further, utilization of health services is influenced by various factors, namely: unlimited access to services, which is determined by the distance traveled or cost incurred to reach the service facility; relative access to services, determined by the crowding and waiting time at the service delivery point; and availability of specialist medical inputs.

Devolution brings the decisions on healthcare infrastructure closer to the people it serves. Accessibility to healthcare institutions is the first step towards attaining comprehensive healthcare, and therefore, health centers and hospitals are built and operationalized as per the population's preferences. This approach, however, may be detrimental to the provision of public services (Strumpf et al., 2001).

Under the World Bank in the USA. Kaufman and Kraay (2003) conducted a study on health facility location concerning the target population. The study showed that people living more than 20 miles away from a hospital were much less likely to visit ambulatory services for follow-up. Unfortunately, the death rate in the first year of illness was also higher for this study group. The disclaimer, in this case, was that the relationship with treatment may not have been causal. In contrast, one study found that access to follow-up medical care after a cerebrovascular disease treatment in Japan was considerably influenced by access to suitable transportation (Araki, 2006).

Nemet and Bailey (2000) studied the length and utility of healthcare for a group of older people in rural Vermont, a county on the border of Canada where 82 percent of the population lives in remote areas. Their study revealed that people who had to commute more than 10 miles for medical access managed to see their doctors less regularly than those with shorter travel periods. Brazil's devolved system received development funds directly from the federal government with incentives to invest more in hospitals, laboratories, and high-tech equipment (World Bank, 2003) to increase service coverage and access to the public.

As a developing country, Kenya's health care provision and infrastructure implementation include research and development. This status is evidenced by the existing and operational national teaching hospitals, provincial hospitals (some act as referral hospitals), district and sub-district hospitals, health centers, and dispensaries. In recognizing the need for more accessible and affordable healthcare, the government has also licensed many private, non-governmental, and traditional/informal operators. The health service system is a hierarchical-pyramidal organization comprising five levels. The lowest being the village dispensary, and the highest being the national referral hospital (Kenyatta National Hospital (KNH)) in Nairobi.

With the establishment of counties, there is a minimum number of health facilities that the national government prioritizes to have, based on the expected services as defined in the Kenya Essential Package for Health (KEPH). Secondary data gathered from the health management information system (HMIS) most recent data showed there are over 5,000 health

facilities across Kenya. They are operated by three owner systems, with the government running 42% of the facilities and non-governmental organizations (NGOs) 15%. The private sector takes on the remaining 43%. While most hospitals, health centers, and dispensaries are government-owned, the private sector has a strong presence in setting up and operationalizing clinics and nursing homes.

However, the deplorable state of the healthcare physical infrastructure has continued to impact patient care negatively. The situation is made worse by the county's inability to retain some key health personnel, especially the specialized health workers in the public service. According to the World Health Organization data (2010), universal health coverage works best within a robust, efficient, well-run health system. Additionally, it requires a solid health infrastructure in physical facilities, medical equipment, communication, and ICT. The health sector needs an effective organization and management system to deliver on the KEPH. Unfortunately, many years of neglect due to budgetary inadequacies have reduced most facilities to a deplorable state requiring rehabilitation before a maintenance program is implemented.

For example, cases, where specialized doctors complained of underutilization of their skills have been reported, with many opting to join a private practice or resign to pursue further studies. Should the situation remain unaddressed, patients are likely to be attended to by less qualified health personnel providers or seek alternative health care services. However, the quality of these services is not guaranteed. Worse still, others may seek medical assistance from private facilities, which maybe relatively expensive. Moreover, this particular alternative negates the expected gains of financial risk protection pursued under the enhanced National Hospital (Okech, 2016).

With the establishment of county governments, the national government prioritized having a specific number of health facilities in every County by considering what services should be delivered at the primary health facilities (Munge & Briggs, 2013). Most healthcare infrastructure investments focus on establishing modern health centers under the economic stimulus program, Government of Kenya (2008). Besides, there are more than 80 hospital

projects under construction. Despite all this, some challenges continue to affect equity in the distribution of infrastructure. The national government has put mechanisms to ensure specific hospitals, especially Level 5's, have been installed with medical equipment. These efforts are in collaboration with the county governments, although the process has encountered several challenges that have prevented their realization, according to Zulu et al. (2014). The main difficulties identified are the limited investment in the maintenance of medical equipment and the lack of comprehensive and coordinated investments.

For the population to access healthcare services, health facilities must be physically available. According to the International Rescue Committee (2015:12), distance to a facility is a significant factor contributing to the decreased demand for healthcare in the country, considering Kenyans with access to government health services within an hour of their homes are about 63 percent. It is important to note that there is a significant variation across the forty-seven counties in the distribution of health facilities. For example, in the expansive Turkana County in the Northern part of Kenya, some residents access a health facility after traveling for about two days. As a result, health indicators are much below average compared to other counties. Out of 4,929 health facilities, there are only sixty-five public health facilities in the country and twenty-one private facilities out of 3,794, according to 2014 Ministry of Health data.

Available data indicates that for every 10,000 people in half of the counties in Kenya have access to fewer than two health facilities and less than 4.2 facilities per 100 square kilometers. The densely populated cities (which are also counties) of Mombasa (134 facilities) and Nairobi (124 facilities) have ratios of 2.9 and 2.4, respectively, for every 10,000 people per 100 square kilometers. The larger counties of Marsabit, Tana River, and Isiolo have the lowest ratios of health facilities per 100 square kilometers. In contrast, they have above-average numbers of health facilities per 10,000 people, according to Ministry of Health (2013:67) data. In analyzing the statistic, one will realize that these counties may have sufficient facilities for the population. However, patients must travel long distances to reach them (Muoko and Baker 2014:16).

Another concerning statistic is that while the national average of births at a health facility is at 61.2 percent, in Turkana county, only 18 percent of births are delivered at a health facility, and an average of 23.9 percent of people experience stunted growth, compared to the 2.6 percent national average. A study of Mandera County by the United Nations Population Fund (UNFPA) in 2014 found that this County is the most dangerous place in the world for women giving birth. The situation has resulted from years of neglect of the physical infrastructure and marginalization, inadequate health facilities, and poor primary healthcare service delivery.

There is consensus that devolution has significant potential for enhancing accountability and local participation in public sector service delivery. It is also believed that it improves healthcare infrastructure leading to better service delivery while taking services and resources closer to the people. In the end, there is growing demand and supply for healthcare services. However, there is less agreement on the extent to which it will necessarily contribute significantly to significantly improved service delivery or, for that matter, poverty eradication (Mohamedi, 2013). Patient care continues to suffer due to the deplorable state of the physical healthcare infrastructure in the county. In addition, the inability to retain key health personnel, especially the public service specialized health workers, makes the situation worse.

Ismail (2018) studied the impact of the devolution of health services on hospital infrastructure in Mandera County, Kenya. His study was based on two theories: (i) Heresy and Leadership Life Cycle Theory propagated by Blanchard and (ii) Public Management Theory proposed by academicians in the UK and Australia. The study by Ismail used a descriptive research design and established an average positive effect of devolution of healthcare services on healthcare physical infrastructure. Tsofa et al. (2017) examined the impact of devolution on commodities, hospital management, and the healthcare workforce. Specifically, the study evaluated the early implemented experiences in Kilifi County, Kenya. Concerning the management of medical supplies and essential medicines, a significant element of the health system, the study analyzed the early implementation of the system at the county level. The study established that similar to other county functions, the management functions of Electronic Management of Medical Supplies (EMMS) were rapidly transferred to the counties before putting in place the requisite county-level structures and capacity. Concerning EMMS, the study revealed that

devolution was characterized by considerable procurement delays, which resulted in long stockouts of essential drugs in devolved public health facilities. Nevertheless, the study observed that when the counties got the capacity to procure medicines, there was reportedly a better order fill rate, particularly when juxtaposed against the period before the health function was devolved.

Sang (2018) examined the effects of healthcare devolution on the technical efficiency of the delivery of healthcare services in Bomet County, Kenya. His specific research objectives were to determine the (a) levels of technical efficiency changes in Bomet county before and after devolution (b) returns to scale of health production in Bomet county before and after devolution (c) change in the number of hospitals and functional primary healthcare facilities occurring after devolution and (d) human resources for health numbers and composition changes that have been done since devolution took place. The study used a cross-sectional design and quantitative data collected from secondary sources, which was analyzed using a parametric economic technique. Sang established that healthcare devolution had a positive impact - the number of facilities increased from three (before devolution) to eight by 2015. In addition, an increase in primary healthcare facilities to 132 from 109 and an 87% increase in healthcare staff was also observed.

On the same breadth, Oketch (2017) analyzed the devolution of public health care services in Kenya and its implications for universal health coverage. The study empirically examined how devolution has influenced access to universal health care with respect to the quality of care, equity concerns, and allotment of health resources such as medical supplies and essential medicines. In its results, the study indicated that stock-outs of medical supplies and drugs were some of the most significant challenges. According to the research, other equity concerns included dilapidated or inadequate health infrastructure and a skewed distribution of health resources. The study's recommendations focused on the need for enhancing the pharmaceutical management information system to have both reliable and accurate evidence premised on medical supply needs and the estimation of essential medicines. Muchomba and Karanja (2015) emphasize that to improve service delivery in health facilities, health sector players should improve the financing of critical health investment areas, particularly those

relating to enhancing the quality of care. Okech (2014) argues that tax-funded health budgets are essential in promoting an equitable geographical allocation of resources. In particular, general tax revenue, in most cases, combined with donor funding, is the only funding source that can be actively redistributed between geographic regions to promote equity in access to health care services. Increased tax funding, coupled with a significant reduction in out-of-pocket payments, can significantly reduce financial access barriers, thereby minimizing incidences of catastrophic health expenditures.

Bashir (2018) conducted a study on the effects of the devolution of healthcare services on hospital infrastructure in Mandera County, Kenya, using a descriptive research design. The study utilized semi-structured questionnaires to gather primary data from the county government and various health departments' employees, elected county officials, and the health sector managers/ overseers. Literature review (journal articles, government reports, theses, dissertations, and books) was the source of secondary data.

The study showed that the devolution of healthcare services in Mandera County had a positive effect on the hospitals' infrastructure. However, the reported positive impact was of moderate value on the physical infrastructure, as shown by a p -value = .511, Sig = .000. On the other hand, regarding water connectivity, a vital element of infrastructure and health services, the findings showed a strong positive effect of devolution indicated by a p -value = .846, Sig = .000.

The emerging recommendation from the study was that there should be a concerted effort in building and adopting better linkages with the national government and donor agencies for the promotion and achievement of better healthcare service at the county levels. The study also recommended adopting, improving, and expanding effective health management systems to enhance service delivery and promote universal healthcare coverage.

Wanjohi (2019) studied the effect of devolution of health services on the availability of non-communicable diseases medication based on a case study of the Makueni County Referral Hospital. The study employed a mixed-methods approach. First, the availability of selected

drugs for NCDs was described before and after devolution (2011–2012 and 2017–2018). Then, the reasons underlying observed patterns and staff perception of factors that may have influenced availability were examined through in-depth interviews. The study found that three cardiovascular products, nifedipine, enalapril, and hydrochlorothiazide, were mostly unavailable pre-devolution. Post devolution, the availability of nifedipine and hydrochlorothiazide improved substantially, with enalapril availability remaining a challenge. Metformin and glibenclamide, two tracer diabetes medications, were always available in the pre-and post-devolution periods.

However, insulin had good availability post-devolution. Asthma drugs (salbutamol inhalers, salbutamol nebulizing solution, and budesonide inhalers) had higher stock post-devolution. The relatively cheap amoxicillin, paracetamol, and ibuprofen had good pre-and post-devolution availabilities, with ceftriaxone, a more costly antibiotic, only having good availability post-devolution. Reasons for the better availability included increased funding, better structured quarterly orders, better collaboration across actors, better public participation, and an overall increased staff number.

Bulinda and Kiruthu (2019) conducted a study on the effects of devolution on maternal health care based on the case of level four hospitals in Nairobi City County, Kenya. This study was taken using a descriptive research design within the four level-four hospitals in Nairobi County and 189 selected medical health workers in the same hospitals. There were 57 respondents chosen through simple random sampling, and questionnaires and an interview guide were used to collect data.

The study reported positive findings on the status of maternal healthcare infrastructure in the County. However, according to the results, most health workers opposed the county management of maternal health care infrastructure and preferred that the national government handle the same. The study further revealed that even though the national government formulated maternal healthcare programs, county governments had yet to implement them. The study finally showed some of the significant challenges influencing the implementation of maternal healthcare services as: attitude and perception of health professionals, resistance to

devolution by health workers, strikes by health workers, shortage of healthcare workers, corruption and tribalism, increased pressure on hospital equipment and infrastructure and running out of stock of essential commodities in the facilities.

Similar findings have been recorded in other studies, including the World Bank (2012) study, which points out that a centralized system of healthcare results in a lack of capacity building, political stability, and uneven resource allocation. Also, Gimoi (2017) assessed the impact of devolution on health care systems - a case study of Nairobi County Health Facilities. In this study, one of the assessment objectives was to establish the effect of devolution on health infrastructure. The findings revealed that the state of the medical equipment had improved, and new equipment was being bought. In addition, there was access to piped water, proper waste disposal, and protected placenta disposal pits.

2.4 Ambulances Services

The Ministry of Health's referral system provides that patient cases that lower-level facilities cannot handle are referred up the service delivery pyramid, making the availability of ambulance services critical. As provided by the Constitution of Kenya (2010), every person has the right to the highest possible standard of health, including the right to health care services. Additionally, a person shall not be denied emergency medical treatment.

There is concern that emergency care remains underdeveloped and ill-equipped both in public and private health facilities where victims and survivors of road accidents, terrorism, poisoning, fires, collapsed buildings, disease, or epidemics are exposed to avoidable death. The county assembly acknowledges that ambulance services provide a 24/7 primary response to medical and trauma-related emergencies. In addition, they also note that the lack of proper emergency services in county governments contributes significantly to the cause of thousands of deaths every year. Therefore, the county assembly urges the health County Executive to provide at least one fully equipped ambulance with well-trained emergency medical care personnel in every facility in addition to having a medical emergency policy and charter in the County.

Kenya has been gripped by emergencies that have increased the need for ambulance services. The quality of ambulance services is a critical factor in preventing deaths and suffering among emergency victims. Also, emergency response services are a product of the efficiency of the reporting systems and procedures for allocating resources earmarked for the emergency response. The constitution apportions this responsibility to county governments requiring that the county government provide ambulances for its people. The absence of some of these standards is likely to expose the county governments to liability since they have to provide ambulance services. Unfortunately, even at a policy level, this issue has received very little attention. Patients' rights to these services are also poorly enforced since none of the counties have formulated a client service charter for ambulance services to guide their provision to communities.

Emergency Medical Service (EMS) is activated at the community level when someone identifies a perceived emergency condition, which needs urgent care. This situation triggers a series of events resulting in a timely response of expertise, resources, and service directed to patient stabilization and safe emergency patient transportation to the nearest health facility. The delivery of efficient emergency medical services (EMS) is critical in reducing mortality and disability rates. In addition, some studies have found a vital relationship between response time and mortality rate.

Evidence has shown that the current norm in many low- and middle-income countries, even when EMS has an active presence in these communities, is to use a private vehicle or a taxi to transport injured or ill persons to the hospital. Inadequate ambulances have also been a significant challenge in developing countries whereby one will find a single ambulance allocated to cover a large geographical area. Such an expectation is impossible to fulfill because of the infrastructure conditions, leading to the rapid wearing of the ambulance and translating to poor performance.

After devolution, improvement in health services is not automatic, as indicated, with many health status indicators either stagnating or worsening (Bashaasha, Mangheni, & Nkonya, 2011). According to Frumence, Nyamhanga, Mwangi, and Hurtig (2013), challenges experienced by

health departments during the implementation of health sector decentralization in Tanzania included the inadequate capacity to carry out supportive supervision at the health facilities and community levels. Others were challenges in monitoring and controlling the quality of health service delivery in the whole council. There was also a lack of capacity in transport, reflected by insufficient and poor maintenance of vehicles (Frumence, Nyamhanga, Mwangu, and Hurtig 2013). In general, decentralization of health services does not result in greater participation of the ordinary people and accountability of service providers to the community. Lack of community participation, inadequate financial and human resources, a narrow local tax base, and a weak civil society underscores the need to ameliorate them if devolution was to attain the anticipated results (Bashaasha et al., 2011).

Shrestha (2010) argues that there may be an adequate supply of facilities and staff close to the people, but they may not be affordable. In such scenarios, people tend to move to other areas searching for affordable services. Therefore, it is essential to factor in the affordability aspect. This dimension includes indicators such as the percentage of the population insured, subsidized programs for some groups, and out-of-pocket expenditure as a percentage of the total private cost on health (IOM, 1993). Muchiri, Muturi, Kariuki,

Orare, Mwangandi, and Kyalo (2018) conducted a study on operation assessment on ambulance services based on a case study of Machakos County, Kenya. One of the longest-used indicators of ambulance service quality is response time. Performance Standards have been in place in England since 1974, and they specified that within 8 minutes, 50% of all calls should be responded to, 95% within 14 minutes in urban services, and 19 minutes in rural services. All Ministries of Health worldwide aim to have effective Emergency Medical Services (EMS). However, many developing countries have a long way to go before having integrated, efficient, and functional pre-hospital care.

Miriti (2016) examined the influence of devolution on the provision of healthcare services at the Meru Level Five hospital in Kenya. The study assessed the lines of finance, information communication technology (ICT), and leadership styles in the hospital, having adopted a descriptive research design with a sample of 111 participants randomly selected from the

medical staff of the subject hospital. Open and closed questionnaires were the primary data collection tools. The data was analyzed using the Statistical Package for Social Sciences (SPSS). The research established that while ICT use had increased, the disbursement of finances vital for facilitating hospital activities was inadequate. In addition, the hospital had improved management activities characterized by clear communication and strategic planning. Ambulance services are crucial in providing healthcare services to reduce mortality and disability rates. As per Araki (2006), in his study in Japan, the availability of patients to follow-up treatment was significantly affected by access to appropriate transport after attending cerebrovascular disease therapy. Muchiri et al. (2018) studied Operation Assessment on Ambulance Services: A Case Study of Machakos County, Kenya. Using household heads, the ambulance fleet manager, procurement officer, and human resource manager of Machakos County Emergency Services as the study population, the researcher applied a cross-sectional study design. The data was collected via an essential informant interview guide, a desk review, and semi-structured household questionnaires. As demonstrated by the results from the household survey, residents were aware of the free ambulatory services being offered by the county government.

2.5 Summary of the Literature Review and Gaps

Most of the previous literature reviewed has not clearly shown the trends between devolution and health. The studies have revealed mixed outcomes of devolution on health, and hence there is no specific direction on how devolution impacts health. Therefore, each county needs to be investigated individually through empirical data. For example, a study by Patrick (2013) focused on the effect of devolution on a national level, and it shows that there is a need to analyze individual county impacts.

Some scholars found a negative relationship between devolution and health, such as Willet and Giovannini (2014). Although the results of their studies may not necessarily be trusted as a representative of the impact of devolution, they found out that in the United Kingdom (UK), the concept of devolution lacked a crucial factor of community participation. In turn, it did not meet the set targets as it significantly reduced the accessibility of funds by the local governments, thereby changing the emphasis on governance. On the other hand, other scholars found out that devolution led to improved health care provision.

According to Anit (2016), Brazil introduced a new constitution in 1988 that made access to health a fundamental right and implemented a unified health system for all. Devolution changed the health model from a privatized system to a state system, with the private sector only supplementing the government's service delivery. States and municipal authorities were mandated with health delivery, and they were to ensure that health was accessible to all. Therefore, the nation's citizenry could access the state's primary and secondary health care through public and private health facilities. By 2012, 54.8% of the population were covered, which was a manifestation of health care coverage. In addition, devolution led to increased community and public health centers, which significantly improved health outcomes across the country.

Other scholars found that devolution did not have any impact on health. A study by Patrick (2013) found out that there was zero health improvement in Uganda, as shown by various health indicators when devolution was implemented in 1997. He argued that devolution did not achieve the set objectives of ensuring greater participation by people in health and education because of insufficient capital and staff, lack of involvement by the community, weak civil society, and a very narrow tax base. The Ugandan case shows us that devolution can improve state institutions if the local people are part of the decision-making process. They can also hold civil servants accountable.

The study by Sang (2018) on the effects of devolution of health services on the technical efficiency of healthcare delivery in Bomet County provides some basis for researching the impact of devolution on healthcare infrastructure. Sang focused on changes in the number of hospitals and functional primary healthcare facilities occurring after devolution. He did not look at the ward capacity at these health facilities, which this study has considered.

The research by Ismail (2018) on the impact of devolution on healthcare services on hospital infrastructure in Mandera County remains silent on the number of dialysis machines and essential equipment in healthcare services. This issue is a gap that the proposed study tended to fill.

Akacho's (2014) study focused on the factors affecting healthcare delivery in Uasin Gishu District Hospital in Eldoret, Kenya. Although she mentioned a lack of equipped wards and laboratories, there was an unaddressed issue in the number of healthcare facilities/hospitals that the study ought to fill.

The study by Muchiri et al. (2018) on Operation Assessment on Ambulance Services: A Case Study of Machakos County, Kenya, only focuses on whether the residents were aware of the county government's free ambulatory services. This study seeks to address the additional issue of the number of ambulances available in that County.

Most of the empirical studies cited on healthcare service delivery were conducted in developed and developing countries in Asia and Latin America (Kyriacou & Roca-Sagale, 2011; Wei-qing & Shi, 2010). According to Gasbarrini (2016), the central allocation of resources for health services has hampered the implementation of health care projects in Italy, such as public hospitals and local community dispensaries. Dickovick and Riedl (2010) observed that though devolved governance promised better delivery of services to the citizenry on the continent, different devolved units in various countries had exhibited mixed results in terms of their performance. A study in India evaluated the role of participation in public service delivery in devolution. After devolution, public service delivery was measured using availability, accessibility, and quality of service as the measures of the services rendered to the public.

2.6 Definition and Operationalization of Key Terms

2.6.1 Devolution

Devolution refers to the decentralization of government systems such that power is devolved and resources are redistributed down to the local government units of a Nation. This decentralization of power takes the form of central government distributing core functions and service mandates to leaders in local regions such as states, provinces, districts, counties, constituencies, or local governments (Katikireddi et al., 2017).

Devolution is expected to produce results such as the empowerment of local communities with resources, giving local community leadership direct resource management capacity, and an increased sense of inclusion of local communities in public affairs. It is characterized by increased responsibility, accountability, and overall autonomy of sub governance units and participation such that devolved governance units become associated with public service responsibility, autonomy, and accountability. Williamson and Mulaki (2015), Nyongesa et al. (2015), and Regmi (2010) describe devolution as a decentralization of power such that decision-making capacity, authority, and "power" are transferred to the grassroots governments.

2.6.2 Medical Equipment

Medical Equipment refers to devices used in health facilities to aid health practitioners in providing the best services. They are used to diagnose, treat, and manage various patient health conditions. Medical devices have been instrumental in improving the quality of medical care. The quality and technological capacity of the equipment is used to measure the overall reliability and competence of a health facility. The availability and adequacy of medical supplies and equipment are also paramount to the quality of service during and immediately after delivery (Wang et al., 2006).

Medical equipment may pose certain hazards, and employment of safety measures in assessing the quality of a device is critical to health service provision. Quality may be measured by the technological level of the device, its accuracy, safety in use, assurance in performing the task it is intended for, maintenance, and lifespan (Perry and Malkin, 2011). This study hypothesizes that devolution of the health sector has made it easier for County governments to obtain better medical equipment and sustain their quality with greater ease since they have easier access to resources and less bureaucracy to navigate to obtain these facilities. They, therefore, have a better chance of offering efficient medical care. Medical equipment range from small instruments like thermometers and bedpans to larger medical equipment like radiology machines. The availability of these facilities enhances the efficiency of health facilities.

2.6.3 Healthcare Physical Infrastructure

Health physical infrastructure entails medical facilities and environments that promote quality health service delivery and equitable capacity to provide defined health services based on the population and level of care required in a specific area. In this study, it includes all the physical infrastructure required for the effective delivery of services at the County Government levels, such as patient beds, equipment, transport, and technological facilities such as computers.

Perry and Malkin (2011), in assessing health care infrastructure in developing nations, note that many years of neglect due to budgetary inadequacies have reduced most facilities to a deplorable state requiring rehabilitation and maintenance. In addition, there are insufficient premises for priority interventions, such as delivery rooms, maternity, laboratories, theatres, and others. These remained a significant consideration of this study, including the human resource required to maintain the infrastructure.

This study focuses on the number of hospitals, access to these health facilities, and ward capacity. World Health Organization (WHO) recommends that for every 30,000 people, there should be 15 health care centers and 45 dispensaries per 10,000 people. Each person is expected to live within a 5 km radius of a health facility to ensure easy access to essential health services. The government of Kenya (2008) has endeavored to provide modern health centers under the economic stimulus program; the nation has operational national teaching hospitals, provincial hospitals, district and sub-district hospitals, health centers, and dispensaries which point to improved healthcare infrastructure leading to better service delivery. This study will observe how the impact of this effort is felt at the County government level post-devolution with a specific focus on Bomet.

2.6.4 Ambulances Services

Ambulances are critical to medical emergency responses. They can rapidly transport paramedics and other first responders to the scene, carry equipment for administering emergency care and transport patients to hospitals or other definitive care.

This variable relates to providing clinical interventions on the scene for seriously ill patients and transferring people to the hospital in an emergency. The proper infrastructure allows ambulances' movement, which eases patient transportation to health facilities and impacts referral services. On the issue of transport, the county government has purchased ambulances for their hospitals and health centers. But there are significant gaps in the availability of utility vehicles. To supplement these efforts, the government must invest in maintain these investments (Zulu et al., 2014). Therefore, the number of ambulances was the reference point for this variable.

2.6.5 Policy Formulation

Policy formulation entails procedures that go into the development of standardized guidelines and expectations of certain operational activities. Such regulations are critical to establishing sanity in the health care system and setting the tone of proven workable standards. It is an essential plan of action used to guide desired outcomes and is a fundamental guideline to help make decisions (Dimick and Ryan, 2014).

This study explores how the policy of devolution in Kenya has impacted the health sector and how redistribution of functions to the County Government has impacted health infrastructure. It assesses implementations around infrastructure development in the health sector post-devolution.

2.6.6 Healthcare Services

Health care services encompass medical professional support offered on a need basis for restoring or enhancing health through analysis, disease treatment and prevention, of illness, injuries, and other physical and mental deficiencies in human beings. These services are intended to support families, communities, and larger populations (Alkhenizan and Shaw, 2011). This study looks into the accessibility of health care services based on access to quality equipment and patient-centered infrastructure.

2.7 Theoretical Framework

Theoretical Framework can hold or support the premise of a research study as it presents and explains the theory of why the study problem exists and how the approach is relevant for the study.

2.7.1 Musgrave's Theory of Functional Assignment

This theory occupies a central place in government conversations on the division of fiscal functions. Professor Richard Musgrave recommends that the allocation of resources should ideally differ between states so that the specific needs of citizens of each state are effectively catered for. While propositioning a separated allocation of resources model, Musgrave emphasizes the need for centralized primary responsibility at the national government level. He proposes four core principles of tax assignment: the first is that highly progressive taxes meant for redistribution should be collected and disbursed at the central level of government. The second principle emphasizes that the central government distances itself from highly mobile tax bases. The third is that the central government retains primary authority over the distributed tax jurisdictions using a specific approach to each tax base. The fourth principle states that user taxes are best left as a revenue stream for the decentralized governance units as a benefit tax (Krane, Ebdon, and Bartle, 2004; Musgrave, 1969).

These principles by Musgrave are largely confirmed as useful ideas for stabilizing fiscal functions at the central level and further distributing to the decentralized units (Hansjürgens, 2000). However, the theory does not specifically account for the allocation of functions at these governance units.

As a general observation, central governments have expectedly been the key spenders of national revenue in income tax. Local governments were mainly left to rely on property taxes from their command areas. It is assumed that taking an approach of devolution under these fiscal principles will make room for local governments to adopt responsibilities that will fuel revenue growth within the local governance units and increase efficiency (Krane et al., 2004). For instance, a look at the US federal system shows that states have become more adept at revenue collection and have developed more efficient systems that are not overly reliant on the central government to function.

2.7.2 Tiebout Hypothesis and the Theory of Competitive Federalism

This theory assumes a market-based approach to governance in establishing governance units. Charles Tiebout proposes a decentralized governance model that cultivates interlocal competition. It is based on the assumption that local government officials compete for citizens and their taxes by manipulating their market mix in view of the quality of public goods and services offered in their jurisdictions (Krane et al., 2004). Tiebout proposes that citizens shop for municipalities that offer them the best-negotiated combination of taxes and access to quality essential public goods and services, just as they would in a regular competitive market.

He sees this as a possibility in a nation with several local governments and ease of mobility across the nation. Tiebout envisions that if the marginal cost of city services matches that of the taxes, the overall result would be that local governments would work as efficiently as the private sector regarding the allocation of resources, its acquisition, and distribution of it (Garzarelli, 2004). He predicts that this will also create more proactive citizens who vote with their feet. Tiebout argues that local governments in these cases will compete to have the most favorable taxation systems and attractive public service provisions in their cities.

2.7.3 Theoretical Justification

These theories both point to how devolution in the context of Kenya is taking shape, especially concerning the allocation of Fiscal functions from central government to local governments, as depicted by Musgrave. However, county governments in Kenya are at the moment primarily reliant on central government revenue to finance their functions, especially in the health sector. Since the system of devolution in Kenya is only just over ten years old and there are increasing efforts to streamline its functions, the systems may eventually develop and take on the Competitive approach that Tiebout proposes. This is especially because the Kenyan government already considers county governments as autonomous entities such that the local entities even elect their leaders and create their own structures. Local functions determine the central government's distribution of resources to the local County governments. While 15% of the national revenues go to county governments, the money is distributed under the parameters population, fiscal responsibility, land area occupied by a County and poverty index. In this model, counties which manage their resource allocations better and mobilize their

own more efficiently get rewarded with a higher share of the national resources based on the responsibility parameter. These units also have revenue collection powers, have budgetary autonomy, and enjoy transparency in their budgetary assignments. Units such as the health sector in Kenya discussed in this study could grow significantly in their infrastructure and service provision through the devolution model of governance.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter highlights the methods and procedures used in undertaking the study and establishing conclusions on the impact of devolution in the health sector. It discusses the research design, the target population, sampling frame, sampling technique, sample size, data collection instruments used, and the data analysis techniques used by the study in chapter four.

3.2 Research Design

The creation of a research design involves developing a logical and systematic approach to conducting a study so that the primary objective of a study is met. Having a research design ensures that the evidence obtained from the field survey can be used to generate clear responses to research questions (Mitchell & Jolley, 2010). This research utilizes descriptive research design methodology which is handy in assessing the relationships between variables.

The researcher achieves this by creating a profile that best fits the subjects under study by outlining the challenges and events in line with the research variables to answer the questions how, what, where, who, and when and as relates to the study (Okonta and Rossouw 2014). In the case of this study, the researcher uses this design to establish how devolution has impacted healthcare infrastructure in Bomet County, what medical equipment indicate this impact and when these changes were realized. Descriptive surveys scrutinize events in a society, whilst measuring the how the population interacts with a certain phenomenon. They explain phenomena that measures and defines day-to-day social realities in the world (Mitchell & Jolley, 2010). The method is also ideal owing to the fact that the researcher is detached from exerting any influence on the population being studied. This study will adopt a quantitative approach in assessing the impact of devolution on healthcare infrastructure in the public health sector. The dependent variable is healthcare infrastructure and independent variable is devolution.

3.3 Population and Sampling Design

3.3.1 Population

According to Taherdoost (2016), a population implies the larger group of units to which a study applies to and in turn affects the quantitative expectations and findings of a study. The various units in a population share certain specific characteristics and features that a study proposes to capture and establish inferences and conclusions from. The similar characteristics shared by these subjects make them all potential units to be used in confirming the study. The total population of this study includes 143 public health facilities in Bomet County. They are categorized into five hospitals, one medical Centre, 110 dispensaries, and 27 health centers

3.3.2 Sampling Frame and Sample Size

A sampling frame is akin to a map indicating the direction taken in selecting a suitable sample group for a study. A sampling frame coalesces the number of subjects from which a definite sample is drawn. The subjects in the sampling frame displays characteristics that are closely related to the larger population of study (Taherdoost, 2016). The sampling frame of this study comprises health facilities in Bomet County. The sampling frame for this study was established using the Krejcie and Morgan (1970) table which groups and summarizes the ideal sample sizes to be used for specific population sizes as demonstrated in the table 3.1 below.

The study therefore settled on a sample size of 103 public health facility workers derived from the total target population of 143 health facilities located in Bomet County. A sample size is the representative fraction set of a larger population (Cooper and Schindler, 2006).

Table 3.1: Sample Frame

| <i>N</i> | <i>S</i> | <i>N</i> | <i>S</i> | <i>N</i> | <i>S</i> |
|----------|----------|----------|----------|----------|----------|
| 10 | 10 | 220 | 140 | 1200 | 291 |
| 15 | 14 | 230 | 144 | 1300 | 297 |
| 20 | 19 | 240 | 148 | 1400 | 302 |
| 25 | 24 | 250 | 152 | 1500 | 306 |
| 30 | 28 | 260 | 155 | 1600 | 310 |
| 35 | 32 | 270 | 159 | 1700 | 313 |
| 40 | 36 | 280 | 162 | 1800 | 317 |
| 45 | 40 | 290 | 165 | 1900 | 320 |
| 50 | 44 | 300 | 169 | 2000 | 322 |
| 55 | 48 | 320 | 175 | 2200 | 327 |
| 60 | 52 | 340 | 181 | 2400 | 331 |
| 65 | 56 | 360 | 186 | 2600 | 335 |
| 70 | 59 | 380 | 191 | 2800 | 338 |
| 75 | 63 | 400 | 196 | 3000 | 341 |
| 80 | 66 | 420 | 201 | 3500 | 346 |
| 85 | 70 | 440 | 205 | 4000 | 351 |
| 90 | 73 | 460 | 210 | 4500 | 354 |
| 95 | 76 | 480 | 214 | 5000 | 357 |
| 100 | 80 | 500 | 217 | 6000 | 361 |
| 110 | 86 | 550 | 226 | 7000 | 364 |
| 120 | 92 | 600 | 234 | 8000 | 367 |
| 130 | 97 | 650 | 242 | 9000 | 368 |
| 140 | 103 | 700 | 248 | 10000 | 370 |
| 150 | 108 | 750 | 254 | 15000 | 375 |
| 160 | 113 | 800 | 260 | 20000 | 377 |
| 170 | 118 | 850 | 265 | 30000 | 379 |
| 180 | 123 | 900 | 269 | 40000 | 380 |
| 190 | 127 | 950 | 274 | 50000 | 381 |
| 200 | 132 | 1000 | 278 | 75000 | 382 |
| 210 | 136 | 1100 | 285 | 100000 | 384 |

Note.—*N* is population size. *S* is sample size.
Source: Krejcie & Morgan, 1970

3.3.2.1 Sampling Techniques

Individuals from the public health facilities were selected using stratified sampling to participate in the study. In this sampling method, the target population is divided into groups, and random samples are selected from each group of hospitals, dispensaries, and health centers. Stratified random sampling was preferred because it would allow the researcher to only interview select employees who are knowledgeable about events occurring in various departments in these health facilities. The employees selected to participate in the research included clinical officers, health information officers, medical officers, procurement officers, nurses, accountants and lab technicians. Cooper and Schindler (2006) underscore the importance of carefully selecting sample respondents of a populace since the select representatives determine the accuracy of the findings obtained by the study. The stratified method of selection used by this study was intended to keep the findings as accurate as possible.

3.4 Data Collection Methods

Questionnaires were used in gathering data from the sampled respondents. A questionnaire is a document containing tactically formulated queries with the goal of capturing data to be used for developing an analysis (Kothari, 2004). The tool used in this study contained closed ended questionnaires. The questions are premeditated to fit the objectives of the study whilst ensuring that the respondents are also able to make sense of it. It is organized into the subsections medical equipment, healthcare physical infrastructure, ambulances and demographics of the respondents. Three of the subsections cover for each of the variables of the study. The questions on these sections are closed ended and measured using a 5 point Likert scale, where 1 is strongly disagree and 5 is strongly agree. Closed ended questions provide relative ease in developing an analysis. All respondents responded to the same set of questions. Self-administered questionnaires were also preferred for their ability to elicit more honest, unbiased responses especially because they ensure anonymity.

3.5 Research Procedures

In order to achieve content validity, the researcher sought expert opinion from the supervisor and face validity was obtained through carrying out a pilot test which was conducted for 5 public health facilities in Bomet central sub-county to verify the validity of the items in the closed-ended questionnaire. Based on the responses of the pilot test, the questions were adjusted appropriately to increase clarity and ascertain the time required to complete. The final questionnaire was reviewed and sent out to the respondents. An authorization letter from the University of Nairobi, the National Commission of Science Technology and Innovation (NACOSTI) and another from the County Government of Bomet stating the purpose of the study was also attached to each questionnaire. According to a study by (Creswell, 2008) validity of any research instruments is the range by which the outcomes from a study through analysis will show the phenomena under study. Validity is of two types, content validity which deals with the probability a question set will be either misunderstood or misinterpreted. The second type of validity is face validity which is the validity that shows all types of a social set up.

The researcher carried out a reliability test in order to ascertain whether the questionnaire formed were able to give consistent outcomes. This was done through measuring internal consistency and Cronbach's internal constituency based alpha methodology was used. It assesses the average correlation of measurable items. If the value is less than 0.7, then it's not reliable. If the value is above 0.7 then it's reliable. According to (Creswell, 2008), reliability can be defined as the degree through which a research instrument such as questionnaire, interviews produce stable and consistent results

The researcher also sought the help of a Research Assistants to follow up on the questionnaires since the study covered a wide area within a short period of time and help was necessary to ensure the completion of the study in good time. The Research Assistants made follow up calls to remind participants to take part in the study. The tool was designed to take just 5 to 10 minutes max for the respondents ease and convenience. The data was later fed into the Statistical Package tool for Social Sciences (SPSS) software to enable analysis.

3.6 Data Analysis Methods

Following data collection, questionnaires were coded and responses keyed into SPSS. Descriptive statistics were run to produce descriptive summaries of the variables assessed as means, percentage frequencies and standard deviations. These findings were summarized in tables, graphs and pie charts. Regression analysis was later carried out to establish the relationship between the independent variable devolution and dependent variables of health infrastructure. The linear regression model was used to establish the aggregate contribution of devolution on health infrastructure. The coefficients of regression and their 95% confidence intervals were reported and presented together with their P-values.

The dependent variables are healthcare infrastructure, ambulances and medical equipment while the independent variable is devolution. They are as presented in the regression model below:

$$Y_1 = 0 + 1X +$$

$$Y_2 = 0 + 2X + \quad Y_3 = 0 + 3X +$$

Where,

Y = the dependent variable of healthcare infrastructure

θ = Constants

$\beta_1, \beta_2, \beta_3$ = the slope representing the degree to which healthcare infrastructure as the dependent variable changes by one-unit variables.

X = Devolution

y_1 = Access to medical equipment in the health facilities
 y_2 = Health care physical infrastructure

y_3 = Ambulance services

ϵ = error term

CHAPTER FOUR: DATA ANALYSIS, INTERPRETATION AND PRESENTATION

4.1 Introduction

The chapter presents findings of the study regarding the devolution of the health care sector in Bomet County and its impact on medical equipment, physical infrastructure, and ambulance services. Lastly, the chapter presents the test of hypotheses.

4.1.1 Response Rate

The researcher administered 103 questionnaires, but only 74 questionnaires were returned, giving a response rate of 71.8%. This rate is well above 50% and is considered a significant response rate for statistical analysis, as Gillham (2011) prescribed.

Table 4.1: Response Rate

| | Number of Respondents | Percent |
|---------------|------------------------------|----------------|
| Response | 74 | 71.8 |
| Non- Response | 29 | 28.2 |
| Total | 103 | 100.0 |

4.2 Respondents' General Information

This section covers the respondents' general information, including designation in the hospital, education level, gender, age, and the period they have worked in the healthcare facility. The findings are presented in various subsections.

4.2.1 Designation in the Hospital

The respondents were asked about their designation in the hospital. The findings are presented in Table 4.2 below.

Table 4.2: Designation in the Hospital of the Respondents

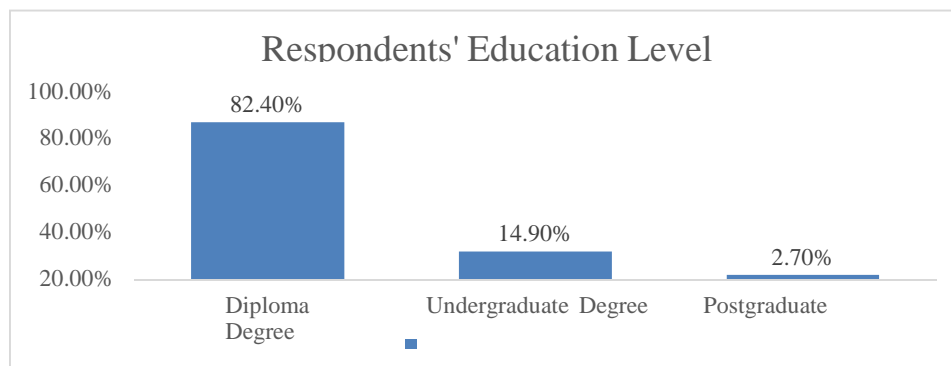
| | Frequency | Percent |
|----------------------------|-----------|-------------|
| Clinical Officers | 17 | 23% |
| Pharmacists | 7 | 9.5% |
| Midwives | 2 | 2.7% |
| Lab Technicians | 9 | 12.2% |
| Accountants | 2 | 2.7% |
| Nurses | 26 | 35.1% |
| Health Information Officer | 11 | 14.9% |
| Total | 74 | 100% |

As per the findings, most respondents (35.1%) indicated they were nurses, followed by 23% clinical officers, 14.9% Health information officers, 12.2% lab technicians, 9.5% Pharmacists, 2.7% accountants and midwives 2.7%. The researcher took an inclusive approach selecting the hospital Knowledgeable personnel involved in the study in order to ensure a non-bias result. The findings show that there is growing professional competence within the health services sector in Bomet County with the operationalization of devolved governments.

This population was therefore deemed sufficient for the intention of the study which was to assess the impact of devolution on healthcare infrastructure.

4.2.2 Education Level

The respondents were asked about their education level, and the findings are shown in Figure 4.1.

**Figure 4.1: Respondent's Education Level**

As per the findings, 82.4% of the respondents had a diploma, while 14.9% indicated possessing undergraduate degrees, and the remaining 2.7%, a postgraduate degree. This record shows that all the respondents were sufficiently knowledgeable to answer the research tool's questions comprehensively and also that there is a growing educational competency among personnel within the health sector in Bomet County.

4.2.3 Gender of the Respondents

The respondents were asked to specify their gender. The findings are illustrated in Figure 4.2.

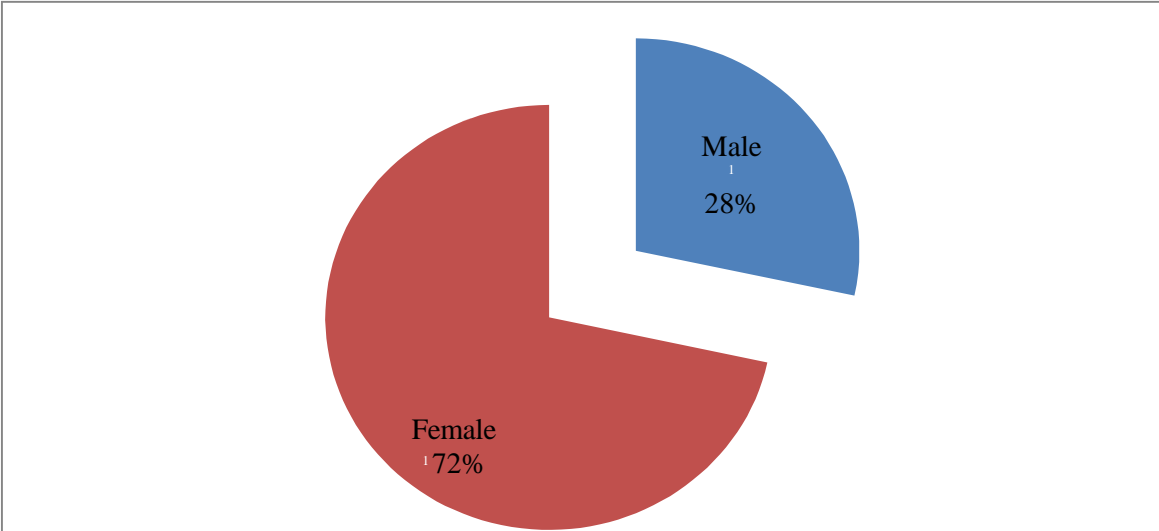


Figure 4.2: Gender of the Respondents

As per the findings, most of the respondents (72%) indicated they were female, while 28% indicated they were male. Considering that the sample population was drawn from various health facilities across Bomet county, these findings indicate that the health sector in Bomet might be primarily dominated by female members of staff or that the female employees may have been more responsive to the study. While these findings indicate that the opinions may reflect gender bias, the nature of the study being quantitative to healthcare infrastructure significantly eliminates the likelihood of bias responses.

4.2.4 Age of the Respondents

The researcher also sought to know the respondents' ages, and the findings are illustrated in Table 4.3.

Table 4.3: Age of the Respondents

| | Frequency | Percent |
|--------------------|------------------|----------------|
| 20 to 30 years | 37 | 50% |
| 31 to 40 years | 29 | 39.2% |
| 41 to 50 years | 6 | 8.1% |
| More than 51 years | 2 | 2.7% |
| Total | 74 | 100% |

While the study attracted diverse age groups findings indicate that a majority of the respondents (50%) were aged between 20 and 30 years. We may conclude in this study that a majority of the employees in the health Sector in Bomet are of the youthful population. The researcher also observed that some of the sampled senior staff had their juniors respond to the questionnaires instead. Given that Devolution has also encouraged an increase in health facilities at the county level, the youthful population may indicate more hiring in recent years. Owing to the quantitative nature of the study, we can say that the age groups of the respondents do not necessarily impact the findings.

4.2.5 Respondents' Length of Service in the Health Institutions in Bomet County

The respondents were asked about how long they worked in the hospital, health center or dispensaries they were currently in, and the findings are illustrated in Figure 4.3.

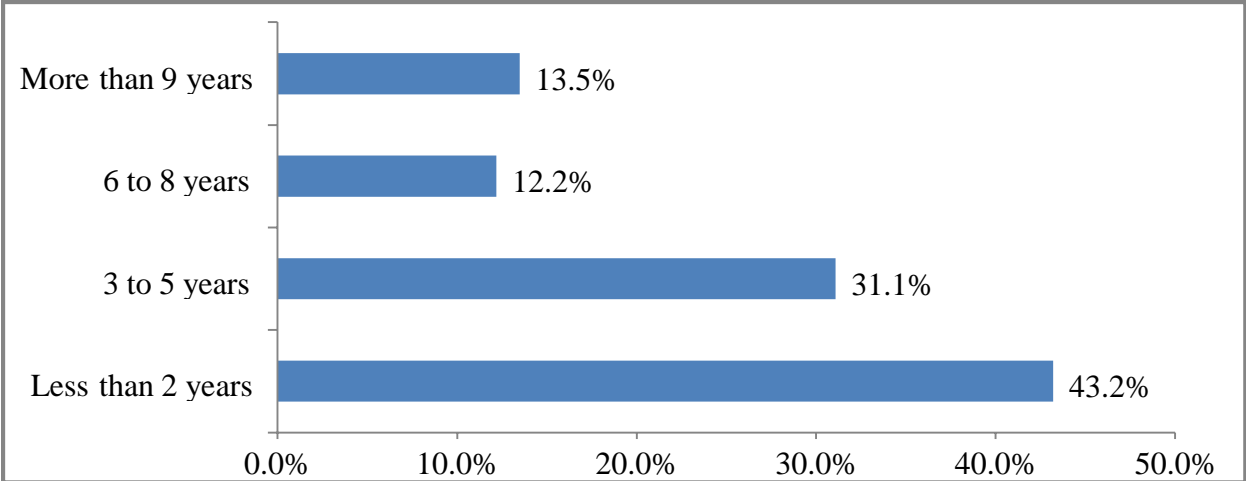


Figure 4.3: Years Respondents have worked in the Organization

According to the responses, most respondents (43.2%) indicated they had worked in the organization for less than two years which further explains the occurrence of a majority youthful population. Thirty-one-point one percent of the respondents recorded that they had been working in Bomet county health centers for a period of 3 to 5 year, 12.2% had been serving for 6-8 years, and 13.5% for more than nine years. This data shows that the majority of the respondents had extensive work experience that was adequate in elucidating the needed information regarding the impact of the devolution of the health sector, public healthcare infrastructure in Bomet County.

4.3 Descriptive Statistics of the Study Variables

The study employed the use of descriptive statistics to analyze the respondents' data obtained through the use of structured questionnaires. In the questionnaire, respondents were to choose their answers from five options, i.e., Strongly Agree, Moderately Agree, Agree, Disagree, and Strongly Disagree. The researcher used a five-point Likert scale to analyze the respondents' answers. As per the scale, where the responses were 'strongly agree,' five points were awarded, while the 'strongly disagree' answer received one point. Across the continuum, two points were awarded for 'disagree,' three points for 'moderately agree,' and four points for 'agree.' The descriptive statistics used for this study were the frequencies, percentages, mean and standard deviation.

4.3.1 Impact of Devolution on Medical Equipment in the Public Health Sector of Bomet County

The researcher employed the use of various variables to assess whether the quality or quantity of medical equipment had improved in Bomet County post devolution. The strength of these statements was measured using a 5-point Likert scale as labeled below: 1 is Strongly Disagree (SD), 2 is Disagree (D), 3 is Moderately Agree (MA), 4 is Agree (A) and 5, is strongly Agree (SA).

These measures imply that a mean of: Less than 1.5 denotes strongly disagree, 1.5 Mean < 2.5 denotes disagree, 2.5 Mean < 3.5 denotes moderately agree, 3.5 mean < 4.5 denotes agree and mean 4.5 denotes strongly agree.

The findings on the impact of devolution on medical equipment in the Public Health Sector of Bomet County are illustrated in Table 4.4.

Table 4.4: Statements on Impact of Devolution on Medical Equipment in the Public Health Sector of Bomet County

| Statements | SD (%) | D (%) | MA (%) | A (%) | SA (%) | Mean | Std. Dev. |
|---|--------|-------|--------|-------|--------|-------|-----------|
| There is access to autoclave machine in the hospital after devolution | 35.1 | 21.6 | 4.1 | 17.6 | 21.6 | 2.689 | 1.613 |
| The Radiology equipment has been acquired in the hospital after devolution | 63.5 | 21.6 | 2.7 | 2.7 | 9.5 | 1.730 | 1.253 |
| The hospital has access to renal medical equipment post devolution | 56.8 | 25.7 | 1.4 | 5.4 | 10.8 | 1.878 | 1.334 |
| Health facility have increased access to Laboratory equipment since devolution | 10.8 | 27 | 20.3 | 27 | 14.9 | 3.081 | 1.258 |
| The health facility has a better operational Intensive care unit department as a result of devolution | 63.5 | 18.9 | 2.7 | 6.8 | 8.1 | 1.770 | 1.277 |
| Financing plans for medical equipment have been adequately made by the county government after Devolution | 40.5 | 24.3 | 16.2 | 6.8 | 12.2 | 2.257 | 1.376 |

The first objective of the study sought to examine the Impact of Devolution on Medical Equipment in the Public Health Sector of Bomet County.

The variable there is access to an autoclave machine in the hospital had a mean score of 2.68 and a deviation of 1.613 indicating a moderate agreement among respondents. The variable Health facilities have increased access to Laboratory equipment since devolution had a mean score of 3.08 and a deviation of 1.258 indicating moderate agreement among respondents.

These results are consistent with that of Bashir (2018) who indicated that devolution of health services on hospital infrastructure in Mandera County, has seen a rapid increase in the accessibility of autoclave machines and Laboratory equipment within the healthcare sector in Mandera County.

Radiology equipment has been acquired by the hospital by the County after devolution also had a weak mean of 1.73 and a deviation of 1.253 also reflecting strong disagreement among respondents. The variable the hospital has access to renal medical equipment post devolution had a mean of 1.87 and a deviation of 1.334 indicating disagreement among respondents.

The variable Health facility has a better operational Intensive care unit department as a result of devolution had a mean score of 1.770 and a deviation of 1.277 showing strong disagreement among respondents.

The variable Financing plans for medical equipment have been adequately made by the county government resulted in a mean of 2.25 and a deviation of 1.376 indicating disagreement among respondents.

These results are in tune with that of Truphena (2017) who found out that there is a lack of comprehensive and coordinated equipment installation in the health facilities in Kenya, existing gaps and a lack of maintenance for the equipment despite the ongoing heavy installation of medical equipment in most hospitals in Kenya since devolution.

These results are also supported Ministry of Health (2015) who noted that most public health facilities in Nairobi operate with medical equipment that is more than 20 years old (some double their lifespan) and frequently encounter failures. In addition, the study revealed that most public facilities lack modern equipment such as radiology equipment, dialysis machines, laundry machines, and theater equipment. Overall, the available equipment falls significantly short of the required amount. Furthermore, of those available, maintenance has been inadequate, and almost half are too old to pass the current quality checks and meet the threshold standards

4.3.2 Impact of Devolution on the Healthcare Physical Infrastructure in Bomet County

Four variables were used to test the impact of devolution on public healthcare physical infrastructure in Bomet County. The results were rated using a 5 point Likert scale where 1 is Strongly Disagree (SD), 2 is Disagree (D), 3 is Moderately Agree (MA), 4 is Agree (A) and 5 is Strongly Agree (SA).

This implies that a mean of: less than 1.5 denotes strongly disagree, 1.5 Mean<2.5 denotes disagree, 2.5 Mean<3.5 denotes moderately agree, 3.5 mean<4.5 denotes agree and mean 4.5 denotes strongly agree.

The findings are illustrated in Table 4.5.

Table 4.5: Statements on Impact of Devolution on Healthcare Physical Infrastructure

| | SD (%) | D (%) | MA (%) | A (%) | SA (%) | Mean | Std. Dev. |
|---|--------|-------|--------|-------|--------|-------|-----------|
| Number of hospitals in the county have increased following devolution | 24.3 | 17.6 | 14.9 | 18.9 | 24.3 | 3.014 | 1.530 |
| Access to healthcare facilities have increased in the county post devolution | 13.5 | 14.9 | 14.9 | 33.8 | 23 | 3.378 | 1.352 |
| There is an increase in the ward capacity in the healthcare facilities in the County following devolution | 8.1 | 21.6 | 18.9 | 20.3 | 31.1 | 3.446 | 1.346 |

The findings on table 4.5 sought to examine Impact of Devolution on Healthcare Physical Infrastructure. On the variable that number of hospitals in the county have increased following devolution there was moderate agreement as shown by a mean of 3.014 and deviation of 1.530.

Munge & Briggs (2013) also noted that with the establishment of county governments, the national government prioritized having a specific number of health facilities in every County by considering what services should be delivered at the primary health facilities. Additionally, Government of Kenya (2008) also observed that most healthcare infrastructure investments focus on establishing modern health centers under the economic stimulus program and there are more than 80 hospital projects under construction.

Further, on the variable that access to healthcare facilities has increased in the county due to devolution, there was a moderate agreement shown by a mean of 3.378 and a deviation of 1.352. These findings are supported by World Health Organization (WHO) who recommends that for every 30,000 people, there should be 15 health care centers and 45 dispensaries per 10,000 people. Each person is expected to live within a 5 km radius of a health facility to ensure easy access to essential health services.

In regard to there is an increase in ward capacity in the healthcare facilities in Bomet County there was moderate agreement as shown by a mean of 3.446 and a deviation 1.346. This in line with Sang (2018) findings where he noted that healthcare devolution had a positive impact on the number of facilities in Bomet county with an increase in primary healthcare facilities to 132 from 109.

4.3.3 Existence of Departments in the Hospital Facilities in the County and if they are Operational

Further, the researcher assessed the availability and operationality of various departments and structures in hospital facilities and if they are operational. The respondents were asked to offer Yes and No responses as to whether the facilities Labour wards, Theaters, Radiology departments and Laboratories were existent and whether they were operational. The researcher also made observations in these hospitals to verify the accuracy of this information. The findings are summarized in Table 4.6.

Table 4.6: Existence of Departments in the Hospital Facilities in the County and if they are Operational

| | Yes (%) | No (%) | Operational (%) | Not operational (%) |
|------------------------|---------|--------|-----------------|---------------------|
| Labor ward | 67.6 | 32.4 | 77 | 23 |
| Theatres | 13.5 | 86.5 | 29.7 | 70.3 |
| Radiology Departments | 29.7 | 70.3 | 20.3 | 79.7 |
| Laboratory Departments | 75.7 | 24.3 | 63.5 | 36.5 |
| Renal units | 24.3 | 75.7 | 33.8 | 66.2 |
| ICU Departments | 14.9 | 85.1 | 21.6 | 78.4 |

The findings show that hospitals have labor wards, as indicated by 67.6% of respondents indicating yes, most of them also indicate that these wards are operational, as shown by 77% of respondents saying that they were functional.

An inquiry on whether these hospitals have theatres has only 13.5 percent of respondents indicating that they have theaters, 86.5% indicate not having theaters. In cases where the hospital has a theater, a majority are not operational, as shown by 70.3% indicating that their theaters are not operational.

The researcher also sought to establish whether the hospitals had radiology departments, findings show that most hospitals don't have radiology departments, as shown by 70.3% respondents indicating they did not have them. As for hospitals that have them, most of them are not operational, as shown by 79.7% respondents indicating they were non-operational.

Further, findings show that most hospitals have Laboratory departments, as shown by 75.7%, and most of them are operational, as shown by 63.5%. In addition, the results show that most hospitals don't have Renal units, as shown by 75.7%, while those that have them, most of them are not operational, as shown by 66.2%. Finally, findings indicate that most hospitals don't have ICU departments, as shown by 85.1%, while those that do, most of them are not operational, as shown by 78.4%

4.3.4 Impact of Devolution on Availability of Ambulance Services

The researcher assessed how devolution has impacted Ambulance Services in Bomet County. The variable tested was measured using a 5-point Likert scale where 1 is Strongly Disagree (SD), 2 is Disagree (D), 3 is Moderately Agree (MA), 4 is Agree (A) and 5 is Strongly Agree (SA).

This implies that a mean of: less than 1.5 denotes strongly disagree, 1.5 Mean<2.5 denotes disagree, 2.5 Mean<3.5 denotes moderately agree, 3.5 mean<4.5 denotes agree and mean 4.5 denotes strongly agree.

The findings are illustrated in Table 4.7.

Table 4.7: Statements on Devolution and Ambulance Services

| | SD(%) | D (%) | MA(%) | A (%) | SA(%) | Mean | Std. Dev. |
|---|-------|-------|-------|-------|-------|-------|-----------|
| There is an increase in the number of ambulances in the health facility | 55.4 | 21.6 | 8.1 | 6.8 | 8.1 | 1.905 | 1.284 |

Findings on this variable show that there is minimal increase in the number of ambulances in health facilities as shown by a mean of 1.905 and a deviation of 1.284. The findings are supported by Shrestha, 2010 where she observes that there is a worldwide uniform objective by Ministries of Health to have responsive and reliable pre-hospital care services for their citizenry. But, unfortunately, responsive, integrated, efficient, and functional Emergency Medical Services (EMS) in developing countries is seen to be a pipe dream. The dampening Ambulance situation in Bomet is synonymous to the findings by Shrestha where developing nations appear to be struggling with provision of emergency ambulance facilities

4.3.5 Devolution of Health in Bomet County

The following variables were tested to understand the state of devolution of health in Bomet County. They were rated on a 1-5 Likert scale where 1 is Strongly Disagree (SD), 2 is Disagree (D), 3 is Moderately Agree (MA), 4 is Agree (A) and 5 is Strongly Agree (SA).

This implies that a mean of: less than 1.5 denotes strongly disagree, 1.5 Mean<2.5 denotes disagree, 2.5 Mean<3.5 denotes moderately agree, 3.5 mean<4.5 denotes agree and mean 4.5 denotes strongly agree.

The findings are illustrated in Table 4.8.

Table 4.8: Statements on Devolution of Health in Bomet County

| Statements | SD (%) | D(%) | MA (%) | A(%) | SA(%) | Mean | Std. Dev. |
|--|--------|------|--------|------|-------|-------|-----------|
| Financial allocation within the healthcare sector in the county have increased post Devolution | 27 | 35.1 | 18.9 | 14.9 | 4.1 | 2.338 | 1.150 |
| There is increased healthcare sector policies in the county after Devolution | 18.9 | 31.1 | 25.7 | 16.2 | 8.1 | 2.635 | 1.200 |
| Donor agency linkages have increased in the county post Devolution | 18.9 | 23 | 27 | 23 | 8.1 | 2.784 | 1.231 |

From the findings on the variable Financial allocation within the healthcare sector in the county have increased post Devolution, there was disagreement shown by a mean of 2.338 and a deviation of 1.150. These findings are in consonance with Leach, Stewart & Jones (2017) who noted that high dependence on direct funding from the Ministry of Finance and inadequate freedoms of responsibility to perform duties independent of the national government is what is ailing the health sector in Kenya. Kibui et al (2015) also noted that the process and functions of allocating health sector financial resources in Kenya have remained highly centralized and opaque. They primarily rely on previous years' budget allocations rather than health needs indicators. An increase in financial allocations due to devolution means that the county government of Bomet can improve its health infrastructure and the lack of it in this case reflects the challenges of growth as observed in most of the objectives assessed.

In regard to there is increased healthcare sector policies in the county after devolution, there was moderate agreement among respondents as shown by a mean value of 2.635 and deviation of 1.200. These findings are in line with Dimick and Ryan (2014) who noted that policies are critical to establishing sanity in the health care system and setting the tone of proven workable standards. It is an essential plan of action used to guide desired outcomes and is a fundamental guideline to help make decisions.

One of the policies was Guidelines for enhancing management of health workforce including the County Public Service Board, County Health Leadership and Department of Public Service and Administration in Bomet County. The purpose of the policy was to bridge the gap in all workforce fields and to ensure that all workers are attracted, retained, happy, motivated and very productive at Bomet county level. The researcher established there were fewer health policies before devolution than after devolution. An increase in health policies due to devolution means that the county is putting in the effort to improving the healthcare sector in County of Bomet.

Concerning Donor agency linkages have increased in the county post devolution, there was moderate agreement among respondents as shown by a mean of 2.784. An increase in donor linkages due to devolution means that the health sector post devolution has received donor attention and may be attracting hancing gain of devolution.

4.4 Hypothesis Testing

The study undertook a stepwise regression analysis to test the research hypothesis meant to establish the impact of devolution on healthcare infrastructure in Bomet County.

4.4.1 Test of Hypothesis One

The hypothesis under testing stated, “devolution has led to an increase in medical equipment in the public healthcare facilities in Bomet County.” The findings are shown in Tables 4.9, 4.10, and 4.11.

Table 4.9: Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error |
|-------|--------------------|----------|-------------------|------------|
| 1 | 0.376 ^a | 0.141 | 0.129 | 0.954 |

^a. Predictors: (Constant), Devolution

The findings in Table 4.9 show that $r=0.376$. This result indicates that devolution has a positive relationship with medical equipment in the public healthcare facilities in Bomet County.

In addition, R^2 was 0.141, which indicates that devolution accounts for 14.1% of the increase in the medical equipment in the public healthcare facilities in Bomet County.

Table 4.10: ANOVA^a

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|----|-------------|--------|-------------------|
| 1 | Regression | 10.756 | 1 | 10.756 | 11.821 | .001 ^b |
| | Residual | 65.517 | 72 | 0.910 | | |
| | Total | 76.273 | 73 | | | |

^a. Dependent Variable: Medical Equipment

^b. Predictors: (Constant), Devolution

The ANOVA results show that the F-computed was 11.821, and the p-value was 0.001. In addition, the F-computed was greater than F-critical (3.9739), and the p-value was less than 0.05. These computations imply that the overall regression model results were significant, and therefore devolution significant positive relationship with medical equipment in the public healthcare sector in Bomet County.

Table 4.11: Coefficients^a

| Unstandardized Coefficient | | Standardized Coefficients | | T | Sig. |
|----------------------------|-------|---------------------------|-------|-------|------|
| Model | B | Std. Error | Beta | | |
| 1 (Constant) | 1.172 | 0.328 | | 3.571 | .001 |
| Devolution | 0.411 | 0.119 | 0.376 | 3.438 | .001 |

^a. Dependent Variable: Medical Equipment

The regression model can be substituted as follows: $Y = 1.172 + 0.411 D$ using the coefficients findings in Table 4.11

Where;

Y = Medical equipment in the public healthcare facilities

D = Devolution

The findings showed that a unit change in devolution would lead to a positive change in medical equipment in the public healthcare facilities in Bomet County, as shown by a regression coefficient of 0.411 and a p-value of 0.001. However, the p-value was less than 0.05. Hence, the study accepted the alternate hypothesis that “devolution has led to an increase in medical equipment in the public healthcare facilities in Bomet County.” As such, the research made similar conclusions to those of previous studies observed in the literature review.

4.4.2 Test of Hypothesis Two

Similar to hypothesis 1, the study conducted a stepwise regression analysis to test hypothesis 2, which stated, “devolution has led to an increase in healthcare physical infrastructure (public hospitals, laboratories, and Ward capacity) in Bomet County.” The findings are shown in Tables 4.12, 4.13, and 4.14.

Table 4.12: Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error |
|-------|--------------------|----------|-------------------|------------|
| 1 | 0.562 ^a | 0.316 | 0.306 | 0.884 |

^a. Predictors: (Constant), Devolution

The findings in Table 4.12 show that $r=0.562$. This computation indicates that devolution is positively related to healthcare physical infrastructure in Bomet County. In addition, R^2 was 0.316, which shows that devolution accounts for 31.6% of the increase in the healthcare physical infrastructure in Bomet County.

Table 4.13: ANOVA^a

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|----|-------------|--------|-------------------|
| 1 | Regression | 25.959 | 1 | 25.959 | 33.216 | .000 ^b |
| | Residual | 56.269 | 72 | 0.782 | | |
| | Total | 82.228 | 73 | | | |

^a. *Dependent Variable: Healthcare Physical Infrastructure*

^b. *Predictors: (Constant), Devolution*

The ANOVA results show that the F-computed was 33.216, and the p-value was 0.000. The F-computed was higher than F-critical (3.9739), and the p-value was less than 0.05. The computation implies that the overall regression model results were significant, and devolution significantly predicts changes in healthcare physical infrastructure in Bomet County.

Table 4.14: Coefficients^a

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|--------------|-----------------------------|------------|---------------------------|-------|------|
| | B | Std. Error | Beta | | |
| 1 (Constant) | 1.629 | 0.304 | | 5.356 | .000 |
| Devolution | 0.638 | 0.111 | 0.562 | 5.763 | .000 |

^a. *Dependent Variable: Health Physical Infrastructure*

The regression model can be substituted as follows: $Y = 1.629 + 0.638 D$ using the coefficients findings in Table 4.14,

Where;

Y = Healthcare physical infrastructure

D= Devolution

The findings show that unit change in devolution led to a positive difference in healthcare physical infrastructure in Bomet County, as shown by a regression coefficient of 0.638 and a p-value of 0.00. The p-value of less than 0.05 indicates a significant relationship between devolution and healthcare. Hence, the study accepted the alternate hypothesis that “devolution

positively impacts healthcare physical infrastructure in Bomet County” and concluded that devolution had increased healthcare physical infrastructure in Bomet County.

4.4.3 Test of Hypothesis Three

As with the two other hypothesis tests, the study conducted a stepwise regression analysis to test hypothesis 3, which stated, “devolution has led to an increase the number of ambulances in Bomet County.” The findings are shown in Tables 4.15, 4.16, and 4.17.

Table 4.15: Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error |
|-------|--------------------|----------|-------------------|------------|
| 1 | 0.545 ^a | 0.297 | 0.288 | 0.759 |

^a. Predictors: (Constant), Devolution

The findings in Table 4.15 show that $r=0.545$, indicating that devolution is positively related to the number of ambulances in Bomet County. In addition, R^2 was 0.297, indicating that devolution accounts for 29.7% increase in the number of ambulances in Bomet County.

Table 4.16: ANOVA^a

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|--------------|------------|----------------|-----------|-------------|--------|-------------------|
| 1 | Regression | 17.534 | 1 | 17.534 | 30.457 | .000 ^b |
| | Residual | 41.449 | 72 | 0.576 | | |
| Total | | 58.983 | 73 | | | |

^a Dependent Variable: Ambulance Services

^b Predictors: (Constant), Devolution

The ANOVA results show that the F-computed was 30.457, and the p-value was 0.000. The F-computed was higher than F-critical (3.9739), and the p-value was less than 0.05. This computation implies that the overall regression model results were significant, and devolution significantly impacts the number of ambulances in Bomet County.

Table 4.17: Coefficients^a

| Unstandardized | | Standardized | | T | Sig. |
|----------------|------------|--------------|-------|-------|------|
| Coefficients | | Coefficients | | | |
| Model | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.401 | 0.261 | 5.365 | .000 |
| | Devolution | 0.525 | 0.095 | 5.519 | .000 |

^a. *Dependent Variable: Ambulance Services*

The regression model can be substituted as follows: $Y = 1.401 + 0.525 D$ using the coefficients findings in Table 4.17

Where;

Y = Ambulance services

D= Devolution

The findings showed that a unit change in devolution positively influences the number of ambulances in Bomet County, as indicated by a regression coefficient of 0.525 and a p-value of 0.00 which is less than 0.05 indicating significance. Hence, the study accepted the alternate hypothesis that “devolution has led to an increase in the number of ambulances in Bomet County.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter details the summaries, conclusions, and recommendations of the study while comparing it to the summaries obtained in the literature review. It develops conclusions on the objective of the study which was to assess the impact of devolution on healthcare infrastructure with a specific focus on Bomet County. This chapter relates the findings by this study to those reflected in the literature review in line with the specific objectives.

5.2 Summary of Findings

The first objective that the study sought to investigate was the impact of devolution on the number of medical equipment in Bomet County.

The findings indicate that devolution has a weak positive relationship with medical equipment. The study found that in Bomet County, devolution has led to increased access to laboratory equipment and an increased access to autoclave machines in most hospitals. Other variables tested such as acquisition of radiology equipment, access to renal medical equipment and the availability of a fully functional Intensive care unit reflect no improvement following the introduction of devolution in the health sector. This situation could be because of inadequate financial allocation for the devolved health sector as indicated in the variable there is a clear financial plan by the county government to finance the acquisition of medical equipment which had a low mean of 2.25 leaning heavily towards disagreement. Brasil (2004) stated that the availability of medical equipment is crucial in providing healthcare services.

These findings in part align with those in the literature review where Truphena (2017) in her study on the impact of devolution on healthcare systems which focused on the effects of devolution on access to health services, healthcare infrastructure, and the healthcare workforce, found that there has been an ongoing heavy installation of medical equipment in most hospitals in Kenya since devolution. This may explain the increase in slight indication of availability of radiology equipment and autoclave machines in the county. Truphena (2017) further found a lack of comprehensive, coordinated equipment installation in some facilities, with existing gaps.

Finally and found that there was a lack of maintenance for the equipment these findings in the literature review coincide with the many gaps indicating a lack of efficient medical equipment.

Furthermore, most health facilities lack modern equipment such as laundry, theatre, dialysis, and radiology equipment. Moreover, the available equipment is below the required quality. Regrettably, about 50% of the available equipment cannot meet the required standards as they are too old, and the overall equipment maintenance has been inadequate. These findings coincide with the literature review where it is observed that Some of Kenya's health facilities do not have premises for priority interventions, such as delivery rooms, maternity, laboratories, theatres, screening, and isolation facilities, among others. Trained public health technicians whose assignment is to maintain the hospitals' physical infrastructure are not engaged in these functions. It was seen in the literature review that counties had been forced to stretch the low budgetary allocations, and where mostly channeling available financial resources are reserved to pharmaceutical and non-pharmaceutical commodities (GoK, 2015). Available equipment had hence not been replaced for a long time, diminishing the quality of care. Further, counties lacked skilled maintenance staff to manage their facilities.

The study also established that most hospitals in Bomet County have no access to renal medical equipment and have Intensive Care Unit departments which are not fully operational. Furthermore, according to the study results, the county government has not adequately made financing plans for medical equipment. As seen in chapter 2, Tsofa et al. (2017) found that devolution resulted in relative confusion at the county level and the local governments were struggling to align their systems. However, despite the challenges, the study found that devolution had expanded the decision-making space for management teams, especially those responsible for medical supplies and human resource management.

The second objective the study sought to investigate was whether devolution has led to an increase in healthcare physical infrastructure.

Specifically, it sought to find out whether devolution has led to an increase in the number of public hospitals, the access to healthcare, and hospital ward capacity in Bomet County.

The study established that devolution had a significant positive impact on healthcare physical infrastructure in Bomet County with the regression analysis indicating the ($r=0.638$ and $p\text{-value}=0.00$) indicating a significant positive influence of devolution on health infrastructure. The objective impact of devolution on physical healthcare infrastructure indicated positive results in all the variables tested. There has been an increase in access to healthcare facilities, hospitals and the county ward capacity following adoption of devolution.

The study also showed that hospitals in Bomet have operational Labor Wards and Laboratory departments. Sang (2018) established that healthcare devolution had yielded an increase in the number of hospitals in the county to eight by 2015 from three before devolution in 2020 this number had gone up to 9 hospitals as observed by the researcher. The study also observed a rise in primary healthcare facilities with a positive change from 109 to 132 and an 87% increase in healthcare staff after devolution. The literature review also found that devolution brings the decisions on healthcare infrastructure closer to the people it serves (Strumpf et al., 2001). This may point to the positive findings realized on the viable assessing development in health infrastructure.

With the establishment of county governments, the national government prioritized having a specific number of health facilities in every County by considering what services should be delivered at the primary health facilities (Munge & Briggs, 2013). Another observation in chapter two is where Okech (2014) argues that tax-funded health budgets are essential in promoting an equitable geographical allocation of resources. In particular, general tax revenue, in most cases, combined with donor funding, is the only funding source that can be actively redistributed between geographic regions to promote equity in access to health care services. Devolution in this care has made it possible for devolved sectors to access tax revenue for their health budgets which explains the positive development in healthcare infrastructure in Bomet.

The third objective the study sought to investigate was whether devolution has led to an increase in ambulance services in Bomet County.

The study established that devolution had a significant positive impact on ambulance services in Bomet County ($r= 0.525$ and $p\text{-value}= 0.00$). However, for Bomet County, the study results

showed a very small increase in the number of ambulance services in its health facilities. Before Devolution, Bomet District the present Bomet County used to rely on ambulances from the national government specifically from National Hospital Insurance fund which were very simple vehicles with no medical equipment inside. As at 2022 Bomet county has two ambulances one is active and the other one is inactive due to mechanical issues. According to the Director of Public Health, the County Government of Bomet have recently purchased two ambulances but are not yet in use because of pending insurance issues. There is a policy also coming up to guide on emergency services provision by the County Government of Bomet.

As observed in the literature review there is a worldwide uniform objective by Ministries of Health to have responsive and reliable pre-hospital care services for their citizenry. But, unfortunately, responsive, integrated, efficient, and functional Emergency Medical Services (EMS) in developing countries is seen to be a pipe dream (Shrestha, 2010). The dampening Ambulance situation in Bomet is synonymous to the findings in the literature review where developing nations appear to be struggling with provision of emergency ambulance facilities.

Further the literature review indicates that there is concern that emergency care remains underdeveloped and ill-equipped both in public and private health facilities where victims and survivors of road accidents, terrorism, poisoning, fires, collapsed buildings, disease, or epidemics are exposed to avoidable death. The county assembly acknowledges that ambulance services provide a 24/7 primary response to medical and trauma-related emergencies (Orare, Mwangandi, and Kyalo, 2018). The Ministry of Health's referral system also provides that patient cases that lower-level facilities cannot handle are referred up the service delivery pyramid, making the availability of ambulance services critical. As provided by the Constitution of Kenya (2010), every person has the right to the highest possible standard of health, including the right to health care services. Additionally, a person shall not be denied emergency medical treatment. While the goals to improve emergency health are recognized in the health sector in Kenya as seen in this literature, Bomet County indicates that more effort is needed to realize these expectations.

5.3 Conclusions

The study concluded that devolution has led to an increase in medical equipment in public healthcare facilities in Bomet County. In addition, most health facilities have increased access to laboratory equipment. However, Bomet County is still struggling to procure medical equipment as most hospitals have no access to renal medical equipment, and radiology equipment. The county government 's failure to make adequate strategic financial plans for medical equipment of Bomet County to procure the necessary equipment may be contributing to this situation.

Based on the results, it is clear that healthcare physical infrastructure in Bomet County have increased. As such, the study concluded that devolution has led to an increase in public hospitals, laboratories, and hospital ward capacity in Bomet County. Access to health facilities has also increased due to a rise in hospitals post devolution. In Bomet County, most health facilities have increased their ward capacity, and hospitals in Bomet have operational labor wards and laboratory departments. However, there are inadequate radiology departments, Renal units, and ICU departments in Bomet county hospitals.

The study further concluded that devolution has led to an increase in ambulance services in Bomet County. However, Bomet County health facilities are still struggling to respond to emergency services because ambulances are only two after devolution. One ambulance is active and the otherone is inactive due to mechanical issues. The County Government of Bomet have recently purchased two ambulances in 2022 but are not yet in use because of pending insurance issues. This insufficiency makes it hard to coverall the sub-counties in Bomet County for efficient and quick response to emergency services.

5.4 Recommendations

Based on the study findings, this study recommends that:

In line with the research observation the study recommends that Bomet county government should seek more collaborative partnerships with aid organizations to support better infrastructure development within the county on matters medical equipment, ICU departments, radiology departments, renal departments and the rolling out of mobile clinics within the County. The study

recommends that Bomet county government should expand their financing of the healthcare sector within the county as this will help in expanding the provision of healthcare services in the county. The county government should ensure that sub-county hospitals - Ndanai, Kapkoros, Sigor, and Cheptalal should have operational Intensive Care Unit departments.

The research further recommends that the county government should seek alliances with the National government to boost availability of ambulance services within the county and also seek to sort out the insurance issues for the two ambulances currently purchased to be able to operate and assist Bomet county residents. This increase will reduce the ambulance response time to emergency services because a quicker response to emergencies lowers mortality rates.

The study recommends that Bomet 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.

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

5.5 Suggestions for Further Research

Based on the findings, this study proposes further research in the following areas: An examination of:

- a) the effect of devolution on Information, Communication, and Technology (ICT) in healthcare facilities in Bomet County
- b) the impact of devolution on employee engagement and the output and performance of the Bomet County healthcare workforce

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APPENDICES

Appendix 1: Questionnaire

PART A: GENERAL INFORMATION

Please answer every question by ticking the boxes.

1. Designation in the hospital

- Clinical Officers
- Medical Officers
- Lab Technicians
- Accountants
- Nurses
- Health Information Officers
- Procurement Officers

Others (specify).....

2. Education Level

- Diploma
- Undergraduate degree
- Postgraduate degree

3. Your gender

- Male
- Female

4. Your age

- 20 to 30 yrs
- 31 to 40 yrs
- 41 to 50 yrs
- More than 51yrs

5. The years you have worked in the organization. Less than 2yrs

- 3 to 5yrs
- 6 to 8 yrs
- More than 9 yrs

PART B: DEVOLUTION AND HEALTHCARE INFRASTRUCTURE

6. Please indicate your agreement level with various statements using 1-5 Likert scale where **1=Strongly Disagree, 2 is Disagree, 3 is Moderately Agree, 4 is Agree, and 5 is Strongly Agree**

| No | Devolution of Health in Bomet County | 1 | 2 | 3 | 4 | 5 |
|----|---|---|---|---|---|---|
| 1. | Financial allocation in the healthcare sector in the county has increased post devolution | | | | | |
| 2. | There are increased healthcare sector policies in the county post devolution | | | | | |
| 3. | Donor agency linkages have increased in the county in the period of devolution | | | | | |
| No | Devolution of Health in Bomet County and medical equipment | 1 | 2 | 3 | 4 | 5 |
| 1. | There is access to an Autoclave machine in the hospital after devolution | | | | | |
| 2. | The Radiology equipment has been acquired by the hospital during devolution | | | | | |
| 3. | The hospital has access to Renal medical equipment due to devolution | | | | | |
| 4. | Health facilities have increased access to Laboratory equipment with the devolved government | | | | | |
| 5. | The health facility has a fully operational Intensive care unit department post devolution | | | | | |
| 6. | Financing plans for medical equipment have been adequately made by the county government | | | | | |
| No | Devolution and healthcare physical infrastructure in Bomet County | 1 | 2 | 3 | 4 | 5 |
| 1. | The number of hospitals in the county have increased post devolution | | | | | |
| 2. | Access to health facilities have increased in the county post devolution | | | | | |
| 3. | There is an increase in the ward capacity in the health facilities in the county following devolution | | | | | |

7. Please indicate if the County Government have put in place the following departments and structures in hospital facilities and if they are operational?

| Department | Yes | No | Operational | Not operational |
|------------------------|-----|----|-------------|-----------------|
| Labor ward | | | | |
| Theatres | | | | |
| Radiology Departments | | | | |
| Laboratory Departments | | | | |
| Renal units | | | | |
| ICU Departments | | | | |

| No | Devolution and ambulance services | 1 | 2 | 3 | 4 | 5 |
|----|--|---|---|---|---|---|
| 1. | There is an increase in the number of ambulances in the healthfacility | | | | | |
| 2. | There is a decrease in ambulance response time to emergency services | | | | | |

Thank you for taking your time to complete this questionnaire.

Appendix II: University of Nairobi Field Letter



University of Nairobi
COLLEGE OF HUMANITIES AND SOCIAL SCIENCES
Department of Political Science & Public Administration

Telegrams: "Varsity", Nairobi
Telephone: 318262 ext 28171
Telex: 22095 Varsity
Email: dept-pspa@uonbi.ac.ke

P.O. Box 30197
Nairobi, Kenya

23/ 3/ 2021

TO WHOM IT MAY CONCERN

AUTHORIZATION TO CONDUCT FIELD RESEARCH

This is to confirm that Mercy Bett Chepkemai of Registration Number (C51/12366/2018) is a bonafide student at the Department of Political Science and Public Administration, University of Nairobi.

Mercy is pursuing a Degree in Master of Public Administration. She is researching on, "**The Impact of Devolution of Public Healthcare Infrastructure: A Case Study of Bomet County.**"

She has successfully completed the first part of her studies (Coursework) and is hereby authorized to proceed to the second part (Field Research). This shall enable the student to collect relevant data for her academic work.

It is against this background that the Department of Political Science and Public Administration, University of Nairobi requests your assistance in enabling the student in collecting relevant academic data. The information obtained shall be used specifically for academic purpose.

The student is expected to abide by your regulations and the ethics that this exercise demands. In case of any clarification please feel free to contact the undersigned.

Thanking you for continued support.

Yours Sincerely,



Professor Fred Jonyo
Chairman,
Department of Political Science and Public Administration

Appendix III: National Commission for Science Technology and Innovation (NACOSTI) Research License

| | |
|--|---|
|  REPUBLIC OF KENYA |  NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION |
| Ref No: 894155 | Date of Issue: 22/April/2021 |
| RESEARCH LICENSE | |
|  | |
| This is to Certify that Miss. MERCY BETT CHEPKEMOI of University of Nairobi, has been licensed to conduct research in Bomet on the topic: THE IMPACT OF DEVOLUTION ON PUBLIC HEALTHCARE INFRASTRUCTURE : A CASE STUDY OF BOMET COUNTY, for the period ending : 22/April/2022. | |
| License No: NACOSTI/P/21/10166 | |
| 894155 Applicant Identification Number |  Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION |
| | Verification QR Code  |
| <small>NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.</small> | |

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is Guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014

CONDITIONS

1. The License is valid for the proposed research, location and specified period
2. The License any rights thereunder are non-transferable
3. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research
4. Excavation, filming and collection of specimens are subject to further necessary clearance from relevant Government Agencies
5. The License does not give authority to transfer research materials
6. NACOSTI may monitor and evaluate the licensed research project
7. The Licensee shall submit one hard copy and upload a soft copy of their final report (thesis) within one year of completion of the research
8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice

National Commission for Science, Technology and Innovation
off Waiyaki Way, Upper Kabete,
P. O. Box 30623, 00100 Nairobi, KENYA
Land line: 020 4007000, 020 2241349, 020 3310571, 020 8001077
Mobile: 0713 788 787 / 0735 404 245
E-mail: dg@nacosti.go.ke / registry@nacosti.go.ke
Website: www.nacosti.go.ke

Appendix IV: Office of the County Commissioner Research Permit



OFFICE OF THE PRESIDENT

MINISTRY OF INTERIOR AND COORDINATION OF NATIONAL GOVERNMENT

Telegrams: "DISTRICTER", Bomet
Telephone: (052) 22004/22077 Fax 052-22490
When replying please quote

COUNTY COMMISSIONER
P.O BOX 71- 20400
BOMET

REF: EDU.12.1VOL.IV/(83)

28th April, 2021

The Deputy County Commissioners
BOMET

RE: RESEARCH AUTHORIZATION – MERCY BETT CHEPKEMOI

The above named person has been authorized to carry out research on "**The Impact of Devolution on Public Healthcare Infrastructure in Bomet County,**" for the period ending 22nd April, 2022 by the National Commission for Science ,Technology and Innovation vide their letter Ref. No.894155 dated 22nd April, 2021.

Any assistance accorded would be appreciated.

COUNTY COMMISSIONER
BOMET COUNTY
[Signature]
20 APR 2021

Hesbon Kayesi
P.O BOX 71-20400, BOMET
For: County Commissioner
BOMET

Appendix V: Ministry of Health Bomet County Permit

REPUBLIC OF KENYA



COUNTY GOVERNMENT OF BOMET DEPARTMENT OF MEDICAL SERVICES & PUBLIC HEALTH

Director Medical Services
P.O. Box 19 - 20400
Bomet

REF: CGOB/MS & PH/GEN.CORR./2021

28th April, 2021

TO WHOM IT MAY CONCERN

RE: AUTHORITY TO CONDUCT RESEARCH – MERCY BETT CHEPKEMOI

Reference is made to research a letter Ref. No. NACOSTI/P/21/10166 dated 22nd April, 2021

The above mentioned student is authorized to carry out research on "*The Impact of Devolution on Public Healthcare Infrastructure a case study of Bomet County*" which is scheduled to be conducted for the period ending 22nd April, 2022.

Please accord her the necessary assistance for the research.

Regards



Dr. Leonard
Director Medical Services