FACTORS INFLUENCING THE SUSTAINABILITY OF UNIVERSAL HEALTH COVERAGE (UHC) IN KENYA: A CASE OF MACHAKOS COUNTY

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DECLARATION

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ABSTRACT

This study sought to investigate the factors influencing the sustainability of Universal Health Coverage in Machakos County, Kenya. Universal Health Coverage represents a significant ambition within global health policy, aimed at ensuring all individuals have access to the necessary healthcare services without suffering financial hardship. Machakos County, like many regions in Kenya and other developing countries, faces numerous challenges in achieving and maintaining UHC, including financial constraints, inadequate healthcare infrastructure, and disparities in healthcare access. The study specifically aimed to address the following objectives: (i) to determine the effect of management competence on sustainable Universal Health Coverage in Machakos County, Kenya; (ii) to establish the effect of digital technology on sustainable Universal Health Coverage Machakos County, Kenya; (iii) to determine the effect of conflict of interest on sustainable Universal Health Coverage in Machakos County, Kenya; and (iv) to determine the effect of bureaucratic obstacles on sustainable Universal Health Coverage in Machakos County, Kenya. The study was anchored on resource dependence theory and supported by dynamic sustainability theory.

The study's target population comprised of healthcare workers in Machakos County, with a study sample size of 112 (97 healthcare workers and 15 key informants). The primary research tool was structured questionnaire for the health workers and an in-depth interview for the key informants, while SPSS software supported the analysis of descriptive and inferential statistics.

Management competence emerged as a significant contributor to sustainability of UHC by establishing structures with conflict of interest being the biggest hindrance to the achievement of sustainable UHC. UHC initiative presents a transformative revolution for the Kenyan healthcare system, aiming to elevate the standard of services provided in both public and private medical establishments.

Key words: Sustainability, Universal Health Coverage, Management competence, Digital technology, Conflict of interest, Bureaucratic obstacles.

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LIST OF ABBREVIATIONS AND ACRONYMS

AI	Artificial Intelligence
COI	Conflicts of Interest
DST	Dynamic Sustainability Theory
GDP	Gross Domestic Product
ICT	Information and Communication Technology
KIs	Key Informants
LMIC	Low/Middle-Income Countries
OECD	Organisation for Economic Co-operation and Development
RDT	Resource Dependence Theory
SDGs	Sustainable Development Goals
SHI	Social Health Insurance
SPSS	Statistical Package for Social Sciences
UHC	Universal Health Coverage
UK	United Kingdom
USA	United States of America
WHO	World Health Organization

DEFINITION OF KEY TERMS

COI Conflicts of Interest - a situation in which judgement, decisions and actions in the workplace are compromised in a biased way due personal, financial or social interest that favor family members, relatives, friends and acquaintances (Daniush & Shaghayegh, 2022).

ICT Information and Communication Technology – set of technological tools and resources used to transmit, store, create, share or exchange information. (Ospina, Cunill-Grau & Maldonado, 2021)

UHC Universal Health Coverage - (WHO, 2010) defines UHC as the access to promotive, preventive, curative, rehabilitative and palliative health services as needed, of sufficient quality to be effective, while ensuring that users are not exposed to financial hardship.

Sustainability Verguet & Jamison (2018) defines sustainable healthcare integrates medical services to satisfy present health demands while saving resources for future needs.

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DEDICATION

I devote my exposition work to Almighty God. An exceptional appreciation to my late mum, Hadija Osman for unwavering support in my pursuit of knowledge when I needed it the most. I likewise devote this exposition to my companion Abdirahman Ibrahim for his support and uplifting statement throughout my project.

CHAPTER ONE
INTRODUCTION

1.1 Introduction of Chapters

This dissertation is structured into five distinct chapters. The first chapter serves as an introduction to the study, providing an overview of the current state of Universal Health Coverage (UHC) in Kenya and factors affecting the sustainability of UHC in Machakos County, Kenya. It also outlines the research problem, objectives, scope, and significance. Moving on to chapter two, a theoretical framework is presented to explain how various factors affect the sustainability of UHC. The empirical literature section in this chapter reviews experiences from various countries, including Kenya, and identifies gaps in knowledge that inform the conceptual framework guiding this study. Chapter three focuses on the research methodology employed, while chapter four presents the research findings. Lastly, chapter five delves into a discussion of the key findings, conclusions, and recommendations derived from the study.

1.2 Background to the Study

The quest for Universal Health Coverage (UHC) has emerged as a pivotal agenda in the global health landscape, marked by the inaugural UN high-level meeting on UHC in September 2019. This global movement underscores a commitment to ensuring that all people have access to the health services they need without facing financial hardship. (WHO, 2010) defines UHC as the access to promotive, preventive, curative, rehabilitative and palliative health services as needed, of sufficient quality to be effective, while ensuring that users are not exposed to financial hardship.

At its core, UHC encompasses the provision of comprehensive protection from financial risks, the availability of quality primary healthcare services, and the assurance of access to essential medicines and vaccines that are both affordable and of high quality. To achieve universal health coverage countries should address the issues of funding of health sector, overreliance on out of pocket at the point of health service provision and inefficient and equitable use of the available resources (WHO, 2010). The urgency of this initiative is amplified by the alarming reality that a significant portion of the global population still grapples with basic healthcare needs, a situation that undermines the

Sustainable Development Goals (SDGs), particularly SDG 3.8 which aims for universal health coverage.

In Kenya, access to quality healthcare is a constitutional right. However, scarcity of quality health facilities and high cost of treatment has hindered many people from accessing healthcare (Ayeni, 2015). The significance of affordable, quality primary healthcare as the foundation of UHC cannot be overstated. It represents a long-term investment in human capital, crucial for the well-being of women, children, adolescents, and individuals affected by mental health issues. Despite the vital role of primary healthcare services in achieving UHC, projections by the World Health Organization (WHO) suggest that, if current trends persist, up to 5 billion people will remain unable to access healthcare by 2030. The WHO's global UHC service coverage index shows some progress, yet about 2 billion people still face the dilemma of catastrophic health spending. This disparity underscores the urgent need for intensified efforts towards UHC, a necessity echoed by the Sustainable Development Goals' emphasis on health and well-being.

Kenya government has introduced specific measures to ensure that there is population coverage in terms of expanding access to health care services and protecting the citizens from financial risks when seeking medical services. Such initiatives include the introduction of free maternal services and abolishment of user fee in 2013. Despite these measures, there is still low coverage in the country with disparities between the rich and the poor with 24 million not able to access health services and another 14 million not being protected from financial risk protection (Barasa et al., 2019).

The financial aspect of healthcare is a daunting challenge, with the United States recording the highest per capita healthcare expenditure among OECD countries. In contrast, developing nations witness their citizens shouldering a significant burden of healthcare costs out-of-pocket, a factor that exacerbates poverty and hinders access to necessary healthcare services. Kenya, despite allocating a higher percentage of its GDP to health compared to its regional peers, still falls short of the average spending for lower middle-income countries. This scenario illustrates the complex financial landscape that nations navigate in the pursuit of UHC.

Management competence, bureaucratic efficiency, technological advancements, and governance mechanisms have been identified as critical determinants for the successful implementation of UHC (Derakhshani et al., 2021). Competent management is essential for the optimal utilization of resources and the provision of high-quality healthcare services. Meanwhile, bureaucratic barriers often manifest as rigid structures that impede efficient healthcare delivery, necessitating innovative solutions to streamline administrative processes. Pande (2019) affirms that the unique nature of hospital operations makes bureaucracy unsuitable for effective management.

The role of technology in healthcare, particularly through the adoption of digital health solutions, offers promising avenues for enhancing service delivery and improving health outcomes. Lygidakis, McLoughlin and Patel (2019) reported that digital technology brings efficiencies, controls and quality to areas of health finance, referrals, continuity of care and knowledge management

Governance, encompassing human resource management and accountability, plays a pivotal role in ensuring that healthcare systems operate transparently and effectively.

Zooming in from the global to the regional context, the African region, despite witnessing the fastest gains in the WHO's global UHC service coverage index, still faces significant challenges. This regional perspective brings into focus the specific case of Kenya, where efforts to achieve UHC are marked by the country's higher health expenditure as a percentage of GDP relative to its peers, yet still below the average for lower middle-income countries. Kenya's healthcare landscape is thus emblematic of the broader challenges faced by developing countries in their journey towards UHC. The country's experience underscores the multifaceted nature of the challenge, encompassing financial, managerial, technological, ethical, and social dimensions.

In South Africa, significant challenges to achieving Universal Health Coverage (UHC) include lack of experience, qualification concerns, and insufficient intersectoral coordination in governance, regulation, and management (Wilson et al., 2021). These constraints prevent the creation of integrated health services and interprofessional teams, crucial for universal access to health. Wilson et al. (2021) underline the constrained

intersectoral cooperation due to differing legal regimes, underscoring the need for comprehensive solutions.

Furthermore, the healthcare sector is not immune to conflicts of interest, where the primary goal of patient welfare may clash with personal or organizational financial interests. This, may impact policy implementation especially where there are strong connections between government officials and healthcare providers (Ayeni, 2017). This highlights the importance of ethical considerations in healthcare management and policy formulation. Social acceptability also emerges as a crucial factor, reflecting the perceived appropriateness of healthcare interventions among both providers and recipients. The successful implementation of UHC initiatives hinges on their acceptance and the quality of care delivered.

In conclusion, the pursuit of Universal Health Coverage is a complex, multifaceted endeavor that requires a comprehensive approach, integrating financial, managerial, technological, and ethical considerations. The global momentum towards UHC, exemplified by the UN's high-level meeting, sets the stage for a concerted effort to overcome the barriers to healthcare access and affordability. As the focus narrows from the global to the regional and then to the national level, as seen in Kenya, the specific challenges and strategies become clearer, underscoring the importance of tailored approaches to achieve the ambitious goal of health for all.

1.2.1 Sustainability of Universal Health Coverage

Sustainability in Universal Health Coverage (UHC) is a multidimensional concept that assures healthcare systems can satisfy current health requirements without sacrificing future generations' resources. This approach incorporates the integration of environmental, economic, and social issues into healthcare planning and delivery to serve today's demands while protecting resources for the future. Verguet & Jamison (2018) and Okech & Lelegwe (2018) note that sustainable healthcare integrates medical services to satisfy present health demands while saving resources for future needs. The World Health Organization (WHO) expands this definition, highlighting a healthcare system's role in boosting health, limiting negative environmental impacts, and seizing chances to better

environmental circumstances for present and future generations (Tambor, Klich & Domagała, 2021).

Key initiatives for attaining UHC sustainability include establishing sustainable finance mechanisms, fostering community collaborations, and increasing capability. Yuan, Jian, He, Wang, and Balabanova (2017), along with Russo, Bloom, and McCoy (2017), argue for sustainable funding through collaborations, community support, and diversified funding sources. This method assures program lifespan and financial resilience by involving multiple stakeholders in investment and organizational roles, vital for the development of UHC programs (Okech & Lelegwe, 2018; Tambor et al., 2021). Moreover, the literature underlines the necessity of creating strong community partnerships to boost program awareness and emphasis health messaging, as emphasized by Russo, Bloom, and McCoy (2017). Such partnerships not only boost program spending but also ensure that health initiatives are responsive to community needs.

Capacity building is another pillar for sustaining UHC, with Abdullahi (2018) prioritizing training for program staff to ensure they acquire the essential skills and expertise for efficient implementation. This ensures the program's ability to deliver on its health improvement objectives, so contributing considerably to the sustainability of UHC. In essence, the research examined underscores the crucial roles of sustainable funding, community participation, and capacity building in assuring the sustainability and efficacy of UHC initiatives. These features, supported by research, constitute the foundation for a comprehensive strategy to maintaining UHC systems that are resilient and responsive to both present and future health concerns.

1.2.2 Overview of Machakos County

Machakos County in Kenya offers a compelling case study for investigating factors influencing the sustainability of Universal Health Coverage (UHC). Situated in the Eastern area of Kenya, Machakos County has a unique blend of urban and rural dynamics, giving it a perfect environment to study the intricacies of healthcare access and delivery. As a cosmopolitan county, Machakos has a diversified population with varying healthcare demands, reflecting the greater issues encountered by Kenya's healthcare system.

Studying UHC sustainability in Machakos County provides for a complete investigation of aspects such as healthcare infrastructure, funding strategies, community engagement, and capacity building. The county's urban areas may exhibit concerns like healthcare access obstacles and resource allocation, while rural settings may highlight challenges linked to healthcare delivery in remote places.

Furthermore, Machakos County's proximity to Nairobi, Kenya's capital, offers insights into the relationship between urban and rural healthcare systems and their impact on UHC sustainability. By researching Machakos County, academics can obtain useful insights into designing solutions that address the different needs of populations in both urban and rural settings, ultimately contributing to the advancement of UHC countrywide.

1.3 Statement of the Problem

As a proportion of GDP, Kenya's healthcare spending is higher than that of its East African peers, but it is still below the global average for lower middle-income nations (Aizenman, 2018). The impact of these investments has not been felt equally across Kenya's 47 counties, despite significant increases in health financing over the past 20 years, from 27% of total health expenditure in 2009/2010 to approximately 52% in 2018/2019 and a doubling of public spending on Universal Health Coverage (UHC) from KSh 96 billion in FY 2014/2015 to KSh 228 billion in FY 2019/2020 (Abdullahi, 2018; Ochola, Elliott, & Karanja, 2021; Khanal & Regmi, 2020). The successful implementation of UHC has been found to be hampered by a number of variables, including management skills, bureaucratic inefficiencies, technical improvements, governance concerns, conflicts of interest, and societal acceptance (Dieleman, 2018). Many Kenyans are now seeking care from more expensive private institutions due to the deterioration of public health facilities (Bump, 2016).

In order to maintain UHC, it is imperative to address these systemic issues before healthcare accessibility and quality continue to decline. Similar issues, such as conflicts of interest, flaws in the information system, a lack of managerial assistance, and insufficient standard benefits, have been brought to light by comparative studies

conducted in other nations, such as Iran (Derakhshani et al., 2021). Studies like Lygidakis et al. (2019), underlines the significance of management expertise in UHC. The report reveals discrepancies in reform mechanisms among nations due to poor expertise in implementing UHC.

To identify and address the particular obstacles to UHC sustainability in Kenya, however, a customized inquiry is required due to the country's unique healthcare infrastructure and geopolitical backdrop. There is a significant void in the literature that currently exists when it comes to the analysis of elements like digital technology, governance, bureaucratic efficiency, and management competency in the Kenyan setting. While instructive, earlier research has mostly concentrated on external contexts or particular facets of UHC; as a result, a thorough examination pertinent to Kenya's healthcare system has been absent (Pande, 2019; Templin, 2021).

In addition to addressing the theoretical and empirical underpinnings of UHC sustainability, this study attempts to critically analyze the various obstacles to UHC in Kenya and offer empirical support for the gaps that have been found. It aims to comprehend the ways in which external (technology developments and public acceptance) and internal (management skill, conflict of interest and bureaucratic efficiency) factors interact to affect UHC's sustainability. In the context of healthcare delivery, sustainability refers to the system's ability to fulfill present health demands without endangering the ability of future generations to meet their own (Verguet & Jamison, 2018). This includes the social, environmental, and economic aspects of healthcare delivery. This study sought to fill this gap by critically assessing the numerous impediments to UHC in Kenya and presenting empirical data to substantiate observed gaps.

The study sought to understand how external elements (e.g., technical improvements and public acceptance) and internal ones (e.g., managerial abilities, conflict of interest and bureaucratic efficiency) interact to influence UHC sustainability. Within the field of healthcare delivery, sustainability means addressing present health demands without compromising the ability of future generations to meet their own, incorporating social, environmental, and economic components. By considering both theoretical frameworks

and empirical evidence, this study strives to completely understand the internal and external aspects determining UHC sustainability in Kenya. Through this, the research set to fill a substantial hole in the literature and offer insights for policy and practice, strengthening the resilience and efficacy of Kenya's healthcare system while adding to the global conversation on UHC and addressing local concerns and solutions.

1.4 Objectives of the Study

1.4.1 Broad Objective

To investigate the factors influencing the sustainability of Universal Health Coverage in Machakos County, Kenya.

1.4.2 Specific Objectives

i. To evaluate the effect of management competence on sustainable Universal Health Coverage in Machakos County, Kenya.
ii. To determine the extent to which digital technology affects sustainable Universal Health Coverage in Machakos County, Kenya.
iii. To establish the effects of conflict of interest on sustainable Universal Health Coverage in Machakos County, Kenya.
iv. To assess the effect of bureaucratic obstacles on sustainable Universal Health Coverage in Machakos County, Kenya.

1.5 Research Questions

The study sought to answer the following questions:

i. What is the effect of management competence on sustainable Universal Health Coverage in Machakos County, Kenya?
ii. To what extent does digital technology affect sustainable Universal Health Coverage in Machakos County, Kenya?
iii. Does conflict of interest affect sustainable Universal Health Coverage in Machakos County, Kenya?
iv. What is the effect of bureaucratic obstacles on sustainable Universal Health Coverage in Machakos County, Kenya?

1.6 Scope of the Study

The study covered Machakos County Referral Hospital which is a Level 5 facility in the County. The choice of the county is informed by the fact that Machakos County has a unique blend of urban and rural dynamics, giving it a perfect environment to study the intricacies of healthcare access and delivery. As a cosmopolitan county, Machakos has a diversified population with varying healthcare demands, reflecting the greater issues encountered by Kenya's healthcare system. It was also one of the counties chosen to pilot the universal health coverage in the country.

1.7 Significance of the Study

The study may be expected to determine the factors influencing the implementation of universal health coverage to realize sustainability. The study would benefit the county health executives, practitioners in the health sectors and the government to have a better understanding of the factors influencing universal health sustainability hence come up with intervention strategies that may see the provision and expansion of medical services by leveraging on technological advancement in the heath sector and recruiting and retaining competent health workforce.

To the various stakeholders and the academia, the study would build a body of knowledge on health and medical services that can facilitate further research in both the private and public health sectors in the country.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This section presents empirical evidence on the impact of management competence, digital technology, conflict of interest and bureaucratic obstacles on the sustainability of universal health coverage. The chapter begins with the theoretical review, followed by an empirical review section based on the research objectives and a summary of the existing knowledge gaps and conceptual framework.

2.2 Theoretical Literature Review

The core theories for comprehending the sustainability of Universal Health Coverage (UHC) are Resource Dependence Theory (RDT) and Dynamic Sustainability Theory (DST). According to the RDT, organizations cannot exist without the assistance of outside resources (Mulyanti, 2023). This emphasizes the significance of managing resources including people, money, and technology effectively in order to achieve UHC sustainability. This idea emphasizes how important management competency is and how good resource dependency navigation requires competent and experienced leadership. The DST, on the other hand, sees sustainability as a dynamic process that calls for ongoing learning and adaptation in order to meet the ever-changing issues that healthcare systems face (Faggini et al., 2018).

This hypothesis is in favor of including technology as a variable because it recognizes that technological advancements can greatly improve healthcare access and service delivery, which will help UHC remain sustainable. Both theories are comparable to other fields, such environmental sustainability, where flexibility and resource management are essential. These theories, when combined, offer a thorough framework for examining how management proficiency, technology, conflicts of interest, and bureaucratic roadblocks affect UHC's sustainability. They also show how internal and external factors interact to affect healthcare systems' capacity to offer everyone access to high-quality care.

2.2.1 Resource Dependence Theory

Pfeffer and Salancik (1978) devised the resource dependence theory to explain how organizations' behavior is affected by the external resources they possess. Resource dependence theory (RDT) is based upon how the external resources of organizations affect the behavior of the organization. The theory is based upon the following six tenets: first, organizations are dependent on resources. Second, these resources ultimately originate from the environment of organizations. Third, the environment to a considerable extent contains other organizations,

The fourth tenet posits that the resources one organization needs are thus often in the hand of the organizations. The fifth one states that resources are a basis of power and the sixth tenet states that legally independent organizations can therefore be dependent on each other (Pfeffer and Salancik, 1978). As indicated by this hypothesis, associations rely upon assets for their endurance; hence, for any association to accomplish maintainability, assets are essential. These assets will come as human asset, abilities and innovation, among others and in this manner the need to include every one of the partners in the undertaking for maintainability (Russo, Blossom and McCoy, 2017).

This theory will be applicable in the study as it will explain all the predictor variables of sustainable UHC and how resources are used to implement and ensure sustainability of UHC. The resource dependence theory will be used to explain how management competence, technology, conflict of interest and bureaucratic obstacles affect sustainability of the universal health coverage project (Carrin & James (2018). The sustainability of universal health coverage project is affected by the resources available to the delivery of healthcare (Tambor, Klich & Domagała (2021). These resources come in the form of both human resources or financial among others and therefore the need to involve all the stakeholders in the project for sustainability.

2.2.2 Dynamic Sustainability Theory

The Dynamic sustainability theory was introduced by Chambers, Glasgow and Stange (2013) to address counter the thinking about sustainability as the endgame and to see it as an ongoing dynamic process. The notion of dynamic sustainability theory is a new scientific approach which describes the interconnectivity between core dimensions of

sustainability and their related internal systems with the system of value creation solutions (Calhoun & Moreland-Russell, 2014). Placing this into the viewpoint of UHC, dynamic maintainability hypothesis recognizes the dynamism and intricacy inside the medical care framework and doesn't expect a static help conveyance framework wherein manageability must be surveyed at central issues in time (Chambers, Glasgow and Stange, 2013).

The hypothesis rejects the presumptions of "voltage drop" (i.e., intercessions are supposed to yield lower benefits as they move towards maintainability) and program float (i.e., benefits are supposed to diminish while straying from severe conventions) (Bossert, 2016). The DST suggests instead that interventions should not be considered optimized until they have been implemented, tested, and refined in the settings in which they will be ultimately delivered (Amazigo, Okeibunor & Seketeli, 2017). The theory challenges scholars in the field to scrutinize their assumptions about which elements are indeed core elements of the intervention and to consider data-driven adaptation and evolution as essential aspects of sustainability.

Hence, DST centers around kept learning and assessment, critical thinking, and continuous variation of the mediations to improve their fit with settings and populaces that contrast from those wherein the intercessions were initially tried (Schell, Luke and Bunger, 2013). Such measures, rather than diluting the interventions, may ultimately improve them and increase the likelihood of sustainability. The theory is important to this study as it help to explain whether strategies to address the dynamic contexts into which interventions are implemented can lead to sustainment of UHC. Specifically, the theory will be used to support all the predictor variables of sustainable UHC; management competence (through continuous training and capacity building), digital technology (continuous improvements and update of systems with emerging trends), conflict of interest (continuous training and reviewing of ethical standards in daily work) and bureaucratic obstacles (learning and adopting to best practices to minimize bureaucracy in service delivery).

Limitation of the RDT and the DST

The limitation of the RDT lies in its assertion of dependence as thus for sustainability to be attained then resources are indispensable yet many organizations within the same environment are fighting for the same resources. It therefore goes that strong organizations are likely to benefit more than the rest of the players in the same ecosystem.

On the other hand, limitations of the DST lie in the continuous testing and retesting of strategies in every environment and reviewing it before implementing it thus resulting in a lot of time lapse before the actual take off of any given project.

2.3 Empirical Literature Review

According to Alireza Darrudi et al., (2022), the empirical analysis identifies key research showing the intricate connections among digital technologies, conflict of interest, management expertise, bureaucratic roadblocks, and the long-term viability of universal health coverage (UHC). Each of these interrelated elements is essential to the effective execution and long-term viability of UHC initiatives. For example, management competency directly affects the operational effectiveness and quality of healthcare services because it is essential for strategic decision-making and successful leadership. Digital advances such as telemedicine, electronic health records, and data analytics provide up new avenues for improving healthcare access, cutting costs, and delivering better services. Conflicts of interest, however, can erode efficiency and trust, making it difficult to implement policies and jeopardizing the standard of healthcare (Zajac et al., 2021). In the context of developing countries, particularly Kenya, identifying and mitigating the challenges associated with these variables is essential for achieving comprehensive, equitable, and sustainable healthcare coverage. This empirical evidence highlights the importance of addressing these factors collectively to foster a conducive environment for UHC sustainability. Bureaucratic obstacles further complicate the landscape by stifling innovation and preventing the smooth operation of UHC initiatives.

2.3.1 Effect of Management Competence on Sustainable Universal Health Coverage

The goal of achieving sustainable universal health coverage (UHC) is a difficult undertaking that is impacted by a number of research variables, including background

knowledge, educational background, managerial skill, political will, and dedication. The purpose of this synthesis is to examine the results of multiple research projects carried out in various African nations, highlighting the obstacles to UHC and suggesting possible ways to overcome them (Valéry Ridde, 2019).

Michel, Datay and Motsohi (2020) assessed the influence of healthcare provider competency on Universal Health Coverage utilization in sub-Saharan Africa. The study targeted community households and health facility managers. The health facilities were stratified according to their tiers and randomly sampled. The catchment population was stratified by locations and a proportionate sampling technique applied in each stratum giving a computed sample of 377 participants. The descriptive statistics were summarized using tables and charts, while logistic regression was used to determine relationship between variables. The results revealed that quite a number of health service providers are not competent enough in their departments of operation and there is no periodic training on new guidelines. This study further revealed a statistical effect on competency of health service provider on UHC. Healthcare service provider competency levels have direct significant influence on utilization of UHC services by community members.

Governments and leaders in Africa have been conveying a constant message, that those leading and managing health systems are not sufficiently prepared to succeed in leadership roles they now occupy. Africa has had different leaders with the same results for decades. In South Africa, significant challenges to achieving Universal Health Coverage (UHC) include lack of experience, qualification concerns, and insufficient intersectoral coordination in governance, regulation, and management (Wilson et al., 2021). These constraints prevent the creation of integrated health services and interprofessional teams, crucial for universal access to health. Wilson et al. (2021) underline the constrained intersectoral cooperation due to differing legal regimes, underscoring the need for comprehensive solutions.

Research in Ghana, undertaken by Lygidakis et al. (2019), underlines the significance of management expertise in UHC. The report reveals discrepancies in reform mechanisms among nations due to poor expertise in implementing UHC. Political and administrative constraints, with resource restrictions, severely effect UHC decision-making. The

findings underscore the important significance of competent management in overcoming these challenges. In Kenya, issues associated to UHC include the requirement for qualified healthcare providers, accessibility of pharmaceuticals, and availability of critical equipment (Ochola, Elliott, & Karanja, 2021). Inadequate execution of sophisticated health programs exacerbates these difficulties. Ochola et al. (2021) offer solutions such as competent and skilled medical practitioners to increase UHC.

Kimani et al. (2018) investigated the role of managerial talent in establishing UHC sustainability in Kenya. Recommendations include expanding professional abilities, adding new professional profiles, and adjusting regulatory frameworks to promote coverage growth and care quality improvement. The study underlines the complex nature of management competencies in improving UHC. The global crisis in health-related human resources, as noted in the World Health Organization's (WHO) 2018 World Health Report, highlights the necessity of political commitment and will in promoting UHC (WHO, 2018). Recommendations include developing interministerial committees on UHC and investing in ICT in health to enhance expertise and peer sharing.

Ayeni et al. (2017) explored how management proficiency influences sustainable UHC in South Africa, emphasizing the requirement for political commitment and leadership. The study underlines the requirement of multisectoral, regulated, and legally-mandated governance systems for consistent policy throughout election cycles. The synthesis of these research findings illustrates the interdependent nature of study factors in creating sustainable UHC. The highlighted challenges, such as lack of experience, qualification concerns, insufficient management competency, and political will, demand comprehensive and integrated solutions. Addressing these difficulties entails tactics beyond increasing healthcare professionals' skills, including navigating legal and governance frameworks, creating political commitment, and leveraging international collaboration. Closing the gaps in research and implementation is critical for promoting universal health coverage in a sustainable manner.

2.3.2 Effect of Digital Technology on Sustainable Universal Health Coverage

The application of digital technology in the achievement of UHC is enabled by key digital technologies which include: Health Information Systems to automate the process

of generating, accessing, sharing and storage medical records; Blockchain technology (Ospina, Cunill-Grau & Maldonado, 2021) used for secure distribution of medical records; Internet of Things (Lygidakis, McLoughlin & Patel, 2019) used for connection of medical devices; and Artificial Intelligence (Nturibi, 2019) used for prediction and prevention of diseases. Others digital health technologies include Cloud Computing (Rudin, 2020) used for online storage and sharing of medical records; Telemedicine (Lygidakis, McLoughlin & Patel, 2019) used for provision of remote health care services; mobile health for personalized delivery of health information and services; E-Learning and M-Learning for provision of health knowledge management and distance learning for health workers and Big Data tools and techniques for data capturing and analysis of large health datasets to optimize health processes (Okech & Lelegwe, 2018).

As per Lygidakis, McLoughlin and Patel (2019) the advanced advances are key points of support and address regions where computerized wellbeing mediation measures can be embraced as drivers in the accomplishment of UHC. This uncovers that wellbeing data frameworks and blockchain are the most applied to accomplish UHC, while different innovations are acquiring fame. Bundi, Kirongo and Thiga (2020) studied the efficacy of digital technology and performance of UHC in Rwanda. Using a questionnaire, the study collected quantitative data and the findings showed that digital technology is a key pillar to enhancing fulfilment of a solid healthcare delivery plan which also play a critical role in strengthening healthcare delivery. Based on the findings, digital technology brings efficiencies, controls and quality to areas of: Health finance (mobilemoney gateways), Referrals (e-referrals), Continuity of care (electronics health records) and Knowledge Management (e-learning and m-learning).

Different jobs incorporate admittance to-mind (telemedicine), Nature of-care (Wellbeing Data Frameworks), Medical services cost decrease, Man-made brainpower and advanced mechanics, Exploration and Improvement and Legitimate structure for medical services innovation. The review reasoned that advanced technologies are useful in the accomplishment of UHC, by further developing medical care quality since they support wellbeing experts to get to great quality confirmations and computerized information required for decision making to convey thorough wellbeing administrations for all.

A qualitative study by Faujdar, Sahay, Singh, Jindal and Kumar (2019) investigated the function of ICT on sustainable UHC in Uganda and found that collaboration between primary, secondary and tertiary health facilities and professionals can be achieved via use of digital health applications and technologies to improve the quality of healthcare in promoting the agenda of UHC. The study reported that digital health applications and solutions may have high initial development and implementation cost, however, this reduces over time with more usage and hence balances the economies of scale (Bloom et al., 2019). The review reasoned that the utilization of computerized advances brings down the immediate and aberrant expense of admittance to UHC thus guarantee moderateness of wellbeing administrations. Further, computerized advances defeat the issue of access and separation to UHC by empowering access, stockpiling and sharing of clinical records among wellbeing experts and patients coming about to undisrupted medical care administrations.

Agustina (2019) stated that when countries do not harness the benefits of information technology, inefficiencies proliferate and some of the most basic building blocks of UHC become extremely difficult to put in place, at both the individual and population level. A powerful advanced innovation technique can guarantee that the right arrangements are conveyed to dispose of failures in UHC. Contacting more individuals extending admittance to want to additional individuals is crucial to any all-inclusive wellbeing inclusion plan that intends to be sure be widespread (Agustina, 2019). A longitudinal study by Khanal and Regmi (2020) investigated the role of digital technology in sustainable universal health coverage in Pakistan. The findings showed that, in order to reach underserved communities with quality care, Pakistan UHC program use an app and web portal to provide online telecare, connecting over 40 000 patients in remote areas to qualified home-based female doctors who were not practicing. The review show that artificial intelligence (AI) can make these forecasts with a serious level of certainty, albeit further advancement has been eased back because of information access issues.

Further, a similar investigation of Brazil and Vietnam by Muhia, Waithera and Songole (2017), show critical upgrades in the quantity of individuals covered under UHC and the quantity of individuals getting treatment, with 82% after execution of computerized

innovation contrasted with just 13.6% inclusion before execution of computerized innovation. A quantitative study by Verguet and Jamison (2018) examined the impact of technology on sustainability of UHC in Estonia. The study found a positive and significant correlation between digital technology and sustainable UHC in Estonia. The study concluded that leveraging on technology is needed to improve progress toward UHC. Creating quality digital technology is a strategic investment in improving healthcare systems' long-term resilience and facilitate achieving UHC. According to the study, through adequate ICT infrastructure, it was possible to increase Estonian universal health coverage to 90% and minimize delays in health care. The outcomes showed that the geological provokes of offering particular types of assistance to patients in precipitous and distant towns in Nepal could never have been conceivable without admittance to the internet and solid power for telemedicine.

Using panel data for over fifteen years, Yuan, Jian, He, Wang and Balabanova (2017) analysed the benefits of technology on sustainable UHC in Thailand and found that the administrative burden on health care workers has been dramatically reduced; and more routine information is available to health policy makers after implementation of digital technology in the UHC program. Further, the study noted that digital technology supports health care providers in better decision making for treatment, reinforces quality and safety in care and enables hospitals to provide an effective, efficient, and equitable service. The review inferred that without Data innovation gap examination, it is difficult to understand what strategy and vital changes should be made on the UHC plan. The review suggested that benchmarking the ongoing circumstance against territorial experience is useful, and legitimate arranging devices accessible should be carried out efficiently.

A descriptive study by Tambor, Klich and Domagała (2021) examined the effect of technology on UHC in Ghana and found that digital technology enhances access to complete and timely collection and reporting of reliable data and dramatically improves evidence-based decision-making and even in limited-resource settings. Dashboards that draw this monitoring and evaluation data together in one place enable health policy makers to visualize and communicate progress towards UHC more effectively. The

review reasoned that utilizing an observing dashboard approach can be a powerful method for figuring out the information with regards to populace (who is to be covered), suppliers and customer facing interactions (which administrations are covered), and payers and strategy creators (what extent of the expense is to be covered).

Okech and Lelegwe (2018) studied the effectiveness of digital technologies on sustainable UHC IN Kenya. The study applied descriptive research design and collected quantitative data across three counties: Nairobi, Wajir and Machakos. The study shows that digital technology enhances capacity building and exchange programs by health professionals through eLearning & m-learning and trainings to improve service delivery and health education in the achievement of UHC. This study shows that computerized innovations upgrade idealness, proficiency and viability in the conveyance of wellbeing administrations consequently a solid support point in the accomplishment of UHC. The review reasoned that this will result to extension of the primary components of UHC which are the size of populace covered, nature of wellbeing administrations conveyed and the expense of getting to wellbeing administrations for all.

2.3.3 Effect of Conflict of Interest on Sustainable Universal Health Coverage

Conflicts of interest (COI) remain a global issue that is neglected, underestimated, and overlooked by health policy makers and researchers (Tambor et al., 2021). Conflicts of interest connect with many wider issues within health policy and systems (Khan, Ahmed & Evans, 2017). At present, there is a growing body of evidence and concern surrounding corruption in health systems (Abdullahi, 2018). A descriptive study by Takura and Miura (2022) studied the impact of conflict of interest on sustainable UHC in Tanzania and found that that when COI involved healthcare providers, it tended to impact most directly on policy implementation whereas in situations when COI involved policymakers, such as senior government officials, it could have a more direct influence on agenda-setting and policy formation, as well as on policy implementation and evaluation. This finding is significant while considering systems and answers for address COI affecting doctor-initiated request, superfluous utilization of drugs and the more extensive results of these issues.

Russo, Bloom and McCoy (2017) examined the impact of conflict of interest on achievement of sustainable UHC in Ethiopia and the results showed that COI occurs when policy makers or regulators have multiple or dual roles. According to the study, professional decisions are open to influence from other relationships that create financial, social, or familial ties with the institutions or industries that they are responsible for regulating. As per the examination, proprietors of drug organizations or their relatives frequently hold dynamic power in drug administrative offices liable for making and executing arrangements on drug quality and moral showcasing rehearses. Subsequently, key decision makers are boosted to impact the plan of new arrangements or the assets apportioned to execute strategies, with the end goal that deals of drugs are not impacted. At last, this interaction safeguards their monetary advantages or those of their loved ones.

Similarly, an empirical research by Nygren-Krug, (2019) assessed the influence of conflict of interest on performance of UHC in Mukono, Uganda and noted that conflict of interest occurs because of hidden financial relationships between formal (licenced) and informal (unlicenced) health-care providers owing to financial flows from informal to formal providers, where the latter might publicly support stronger regulation of the informal health-care sector while covertly using their power to obstruct policies that curtail informal practice. The study argued that in many countries, doctors and pharmacists illegally rent their professional licenses to set up drug shops and clinics where lower paid attendants, typically without the desired or prescribed qualifications, can provide services. The review concluded that strategies to address improper conveyance of medical care by unfit suppliers in such medication shops and facilities would, consequently, diminish a type of revenue for specialists and drug specialists, bringing about their frequently implicit resistance.

Anarwat, Assan, Gaumer, Canterbury and Shepard (2021) studied the challenges facing sustainable UHC in Nigeria and found a negative significant correlation between conflict of interest and achievement of UHC in Nigeria. The study found that conflict of interest occurs when policy makers are influenced into taking a course of action that is more likely to win political support, rather than following public health evidence. The study argued that policy makers are cognizant that introducing or enforcing rules to regulate

private health-care provision could be unpopular because of dependencies on the sector's contributions. Ultimately, such policies could be detrimental to their careers. For instance, the review expressed that dependence on unlicensed medication venders to give admittance to fundamental prescriptions to populaces in under-resourced regions is immensely trying for strategy producers. The review reasoned those approaches to lessen administration arrangement by confidential suppliers, including those that are undeveloped and giving unacceptable consideration, are frequently stayed away from because of worries that they will uncover holes in medical services that the public area ought to give.

A comparative study of Uganda and Rwanda by Ayeni (2017) examined the risk of conflict of interest on universal health coverage and found strong evidence that the connections between government officials and healthcare providers impact policy implementation. For instance, in Uganda, majority of some interviewees suggested that healthcare providers with social, familial or financial connections to government officials may experience an easier license approval process to set up pharmacies and clinics. The review inferred that the two nations featured the implied hesitance of controllers to authorize decisions on those that they had social or familial associations with. For instance, in Rwanda, a few the outcomes underscored that social associations, for example, those in view of a common place of graduation, can be sufficient to mellow the execution of rules by controllers. One more regularly cited effect of COI among the two nations, connects with the intentional under-resourcing of the offices or government divisions answerable for execution of arrangements to control medication deals, particularly of those approaches that compelling partners don't uphold. This under-resourcing was associated with agencies being hindered from effectively implementing policies and making regulators more susceptible to different forms of bribery and intimidation.

A cross-sectional study by Ergo, Htoo, Badiani-Magnusson and Royono (2019) examined the impact of COI on UHC in Cambodia and Pakistan and established familial connections in which licensed providers would rely on family members to run their clinic or pharmacy in their absence, or would train family members to run a separate unlicensed

practice. Owing to these mainly financial connections between licensed and unlicensed providers, the study found that licensed providers were motivated to use their power to (covertly) influence agenda setting and policy implementation to impede policies that might impact informal practices. Further, a meta-analysis by Carrin and James (2018) found that COI was a fundamental component of the functioning of the political and health systems. The investigation showed that associations between policy actors, medical services suppliers (authorized and unlicensed) and drug organizations can major areas of strength for COI that effect on all phases of the arrangement cycle. As per the examination, COI can forestall issues connected with deals of prescriptions from including noticeably on the arrangement plan; impact strategy definition, to such an extent that gentler or uncertain measures are presented, driving the approach into the representative quadrant of Matland's vagueness struggle grid that describes execution processes; influence the degree to which formed arrangements are embraced, decide asset accessibility for, and resistance to, strategy execution; and shape how precisely the outcome of challenged arrangements is assessed and revealed.

A qualitative study by Mwangi (2019) illuminates the role of familial, social and political connections in driving COI. Reflecting on the types of connections leading to COI identified through the analysis across three countries (Kenya, Ethiopia and Nigeria) the study noted that some connections are more pervasive globally than others. According to the study, COI arising from the reliance of healthcare providers on pharmaceutical companies to provide educational and professional development opportunities is a challenge in many higher-income and lower-income countries as is funding from pharmaceutical companies to politicians. Resounding with the discoveries, an examination by Khan et al. (2017) in the USA viewed that as the drug and wellbeing item industry burned through US$4.7 billion somewhere in the range of 1999 and 2018 on campaigning the national government, with commitments focusing on senior administrators in Congress associated with drafting medical care regulations as well as panels engaged with drug estimating and guideline.

According to, Carrin and James (2018) financial ties between pharmaceutical companies and independent policy advisors or government officials is also widespread. For example,

in the UK, where the health system is not dominated by private healthcare provision, members of the Vaccine Taskforce were found to have financial interests in pharmaceutical companies from which the government purchased COVID-19 diagnostic tests and treatment. In contrast to these the study by Lozano et al. (2020) concluded that more widespread connections leading to COI, connections between licensed and unlicensed healthcare providers, and the power of unlicensed providers to hinder stronger regulation of informal healthcare practice, is more widely documented in low-income and middle-income countries. The review has shown that the part of autonomous expert clinical affiliations is generally undermined by COI. For instance, as per Lozano et al. (2020) before their choice to dismiss financing from equation milk organizations in 2019, the Illustrious School of Pediatrics and Youngster Wellbeing in the UK acknowledged around £40 000 every year from recipe milk organizations toward occasion sponsorship and promoting. While this kind of COI is an issue all over the planet, extreme under-resourcing and reliance on gifts in LMIC makes it maybe more articulated in such settings.

2.3.4 Effect of Bureaucratic Obstacles on Sustainable Universal Health Coverage

The extent to which health care programs can effectively advance progress toward UHC will depend on governments' ability to contract with a sufficient number of health care providers and create a pool of quality service delivery options that are geographically and financially accessible (Derakhshani, 2021). In sub-Saharan Africa, where private facilities provide almost half of the outpatient health services offered, ensuring that private providers are accredited with local social health insurance (SHI) systems is vital to achieving UHC (Bump, 2016). Nonetheless, with UHC programs confronting such difficulties as low re-enlistment rates (Agyepong et al., 2016) and an absence of straightforwardness from government (Abuya et al., 2015) there might be not many motivators for private suppliers to join.

A descriptive study by Tambor, Klich and Domagała (2021) examined the risk of bureaucratic obstacles on achieving a sustainable UHC in Nigeria and found that one of the key barriers to private provider participation in UHC relates to the accreditation process itself; while public facilities are automatically enrolled into UHC programs,

private providers must go through a cumbersome formal accreditation process that often discourages providers from applying at all. The review concluded that recognizing the key road obstructions private suppliers' face in the license cycle and tracking down ways of facilitating the weights of regulatory capabilities is probably going to be a vital determinant of growing reasonable and open medical care administrations on the side of UHC.

Pande (2019) studied the impact of regulatory complexity on sustainable UHC program in sub-Saharan Africa and pointed out that bureaucracy can open the door for both government officials and citizens trying to navigate regulatory systems to exploit situations where rules are conflicting or unclear. The study noted that a common theme in many African countries is that policies exist, often many of them, but the legislation and regulatory guidance that clarify how policies are to be implemented and enforced are lacking. As Bump (2016) noted, unauthorized or hidden payments flourish in the absence of accountability, and complexity makes accountability more difficult. For sure, a concentrate by Folayan (2021) has shown higher paces of unapproved installments in nations with additional levels of government. Further, Moon and Shin (2017) have shown that the huge data deviation among suppliers and patients, and the intricacies that emerge when payers' motivating forces wander from the two suppliers and clients, all plot to make medical services frameworks especially defenseless to installment abnormalities and failures.

A case study by Derakhshani (2021) assessed the effect of bureaucratic obstacles on sustainable universal health coverage in South Sudan and found that it is notoriously difficult to determine what counts as unauthorized or irregular in a complex system where opportunities to request payments can exist from the systemic and institutional levels down to the level of the individual, making it notoriously difficult to define. The study noted that such payments often are a two-way street in the context of regulatory complexity. As per the review, not exclusively could low-level bureaucrats who have customary direct contact with the public make a move to demand pay-offs to make particular sorts of work worth their time, yet residents themselves may proactively offer

pay-offs on the off chance that they have motivation to accept the framework will be excessively challenging to explore in any case.

A recent study by Folayan (2021) examined policy levers and priority-setting in universal health coverage: a qualitative analysis of healthcare financing agenda setting in Kenya. The study reported that given the intrinsically participative nature of health priority-setting, the inclusion of a broad range of stakeholders is essential for the success of UHC in the Kenyan context. The study concluded that it is imperative to identify and consider the ideological positions of key policy stakeholders when considering Kenya's ideal path towards UHC. According to the study, not only can this make healthcare expensive in a country known for its cost effectivity - which makes it a hub for medical tourism; but it also weakens the existing public health system because of the greater likelihood of people opting for private healthcare. The investigation showed that should such a model persevere, the confidential medical care will expand their benefits by taking more financially savvy cases and pushing the constant, muddled, and cost-insufficient ones to the generally troubled general wellbeing framework. Besides, notwithstanding the force and progress around the UHC, it is probably the case that the proceeded with disregard of the components of essential medical services as framed in the Alma-Ata will remain something very similar.

Drawing on Ayeni (2017) horizontal (between elite factions) and vertical (between the elite and the population) distribution of power can be distinguished. As hypothesized by Carrin and James (2018), in a competitive political settlement where elite factions excluded from the ruling coalition are powerful and where the ruling coalition has little autonomy from its supporters and the population in general, social protection programmed such as UHC are more likely to derail. Rulers have an incentive to turn them into clientelist channels of redistribution and sites of rent capture to accommodate the powerful opposition or reinforce the loyalty of their supporters. Ergo (2019) concluded that implementation of social programmed might also suffer because the more powerful lower-level factions become, the greater the number of points at which the enforcement of particular rules can be blocked. On the other hand, in a predominant settlement where power is concentrated both evenly and in an upward direction, social projects are bound

to be utilitarian and fairly executed. Moreover, hence (2019) called attention to that execution benefits from the higher implementation limits of the alliance. Subsequently, in a prevailing settlement, rulers are probably going to have a good sense of reassurance, reason in a more drawn-out term viewpoint and grow social security for the purpose of legitimation to forestall the rise of political resistance.

2.4 Summary of Literature Review and Research Gaps

In the context of the study topic, there is a general consensus within the reviewed literature that management competence, technology, conflict of interest as well as bureaucratic obstacles have significant effects on sustainability of Universal Health Coverage. From the reviewed literature, most of the studies such as Wilson, Sheikh, Gorgens, and Bank (2021); Faujdar, Sahay, Singh, Jindal and Kumar (2019); and Lygidakis, McLoughlin and Patel (2019) present contextual gaps and therefore their findings cannot be entirely used to support the present study which majorly is conducted in a Kenyan setup.

Studies such as Lygidakis, McLoughlin and Patel (2019) done on management competence presents conceptual gaps because they gave little attention to the indicators such as qualification and experience of the UHC administration officers. There is also a general agreement within the reviewed literature that conflict of interest as well as technology are a great risk in achieving a sustainable UHC not elsewhere but Kenya as well (Russo, Bloom & McCoy, 2017; Carrin and James (2018). Further, it is clear from the existing empirical evidence that studies on bureaucratic obstacles are limited or lacking and those that are available such as Derakhshani (2021); by Tambor, Klich and Domagała (2021); and Folayan (2021) focused more on a single subsector within the healthcare industry as opposed to looking at the entire value chain of the healthcare ecosystem.

Finally, studies done in the Kenyan context such as Ochola, Elliott and Karanja (2021); and Mwangi (2019) took a one-dimensional approach by looking at either management competence, technology, conflict of interest or bureaucratic obstacles separately and not looking at four variables collectively and this could have presented a conceptual gap. To fill the existing gaps, the study aimed to assess investigate the factors influencing the

sustainability of Universal Health Coverage in Machakos County, Kenya focusing on four variables management competence, technology, conflict of interest and bureaucratic obstacles separately. The research gaps are summarized in Table 2.1.

Table 2.1 Summary of Research Gaps

Author	**Title**	**Gap**	**Focus of the current study**
Wilson, Sheikh, Gorgens, and Bank (2021)	Challenges affecting sustainable universal health coverage in South Africa.	The review presents a contextual gap as the setting of the review is not the same as Kenya and consequently the UHC in South Africa can't be completely applied to Kenyan setting.	This study will assess the factors influencing the sustainability of Universal Health Coverage in Machakos County, Kenya.
Lygidakis, McLoughlin and Patel (2019)	The impact of management competence on UHC in the Ghana	The review presents a conceptual as well as contextual gaps. Conceptual gap in light of the fact that the review significantly centered on asset and monetary limitations and concentrated entirely on capability and. Experience. The review was finished in Ghana which has an alternate UHC approach	This study will look at management competence as a variable under two indicators: qualification and experience in Kenyan set-up.

		and hence the discoveries can't completely hold to Kenyan setting.	
Ochola, Elliott and Karanja (2021).	The challenges facing UHC in Kenya.	The review presents a conceptual gap since it just centered on difficulties particularly observing and assessment and concentrated completely on administration capability.	The current study will focus on management competence, technology, conflict of interest as well as bureaucratic obstacles for conclusive analysis.
Bundi, Kirongo and Thiga (2020)	Efficacy of digital technology and performance of UHC in Rwanda	The review presents a methodological gap since it took a gander at the overall medical care area and focused completely on UHC program.	The focus of this study is on UHC program in Kenya.
Faujdar, Sahay, Singh, Jindal and Kumar (2019)	The function of ICT on sustainable UHC in Uganda	The review introduced contextual gap on the grounds that the medical services guidelines in Uganda are unique in relation to Kenya and consequently the discoveries may not completely hold in a	This study will be conducted in Kenya.

		Kenyan setting.	
Khanal and Regmi (2020)	Investigated the role of digital technology in sustainable universal health coverage in Pakistan.	The review presents a methodological gap as the objective populace was the underserved networks in far off regions and this might have prompted examining predisposition.	The purpose of this research is to assess factors influencing the sustainability of Universal Health Coverage in Machakos County, Kenya.
Verguet and Jamison (2018)	Examined the impact of technology on sustainability of UHC in Estonia.	The discoveries can be utilized to help the current concentrate nonetheless; the context limits its application on the grounds that the medical services status in Estonia is unique in relation to that of Kenya.	The focus of this study is UHC program in Kenyan context.
Russo, Bloom and McCoy (2017)	The impact of conflict of interest on achievement of sustainable UHC in Ethiopia.	Methodological gap is available because of the way that the review target populace was the drug organizations and not the whole medical care ecosystem.	This study will be focused on the entire value chain of healthcare in Kenya especially UHC program.

Derakhshani (2021)	Assessed the effect of bureaucratic obstacles on sustainable universal health coverage in South Sudan.	Methodological gap is present due to the fact that it was a case study and therefore it is difficult to generalize the findings across the UHC program.	This study will be focused on UHC program in Kenya.

2.5 Conceptual Framework

The conceptual framework outlines how the sustainability of Universal Health Coverage (UHC), as determined by insurance coverage and service utilization as dependent variables, relates to the independent variables—management competence, technology, conflict of interest, and bureaucratic obstacles. Higher levels of management competency are thought to favorably impact UHC sustainability; this is demonstrated by operationalizing it through measures like experience and qualifications (Wilson et al., 2021; Lygidakis et al., 2019). Technology's ability to improve accessibility and efficiency is demonstrated by the number of people it reaches and the extent of its service coverage (Bundi et al., 2020; Faujdar et al., 2019). Conflicts of Interest are evaluated according to the responsibilities and actions that could have a detrimental impact on the implementation of policies and UHC goals (Russo et al., 2017; Carrin & James, 2018).

Division of labor and response times are indicators of bureaucratic obstacles, which are administrative difficulties that can impede UHC procedures (Folayan, 2021; Pande, 2019). It is imperative to accurately articulate and quantify these elements in order to comprehend their influence on UHC's sustainability. Figure 2.1 below are the factors influencing sustainability of Universal Health Coverage. The study used the number of insurance coverage as well as service utilization to gauge sustainable universal health coverage as the dependent variable.

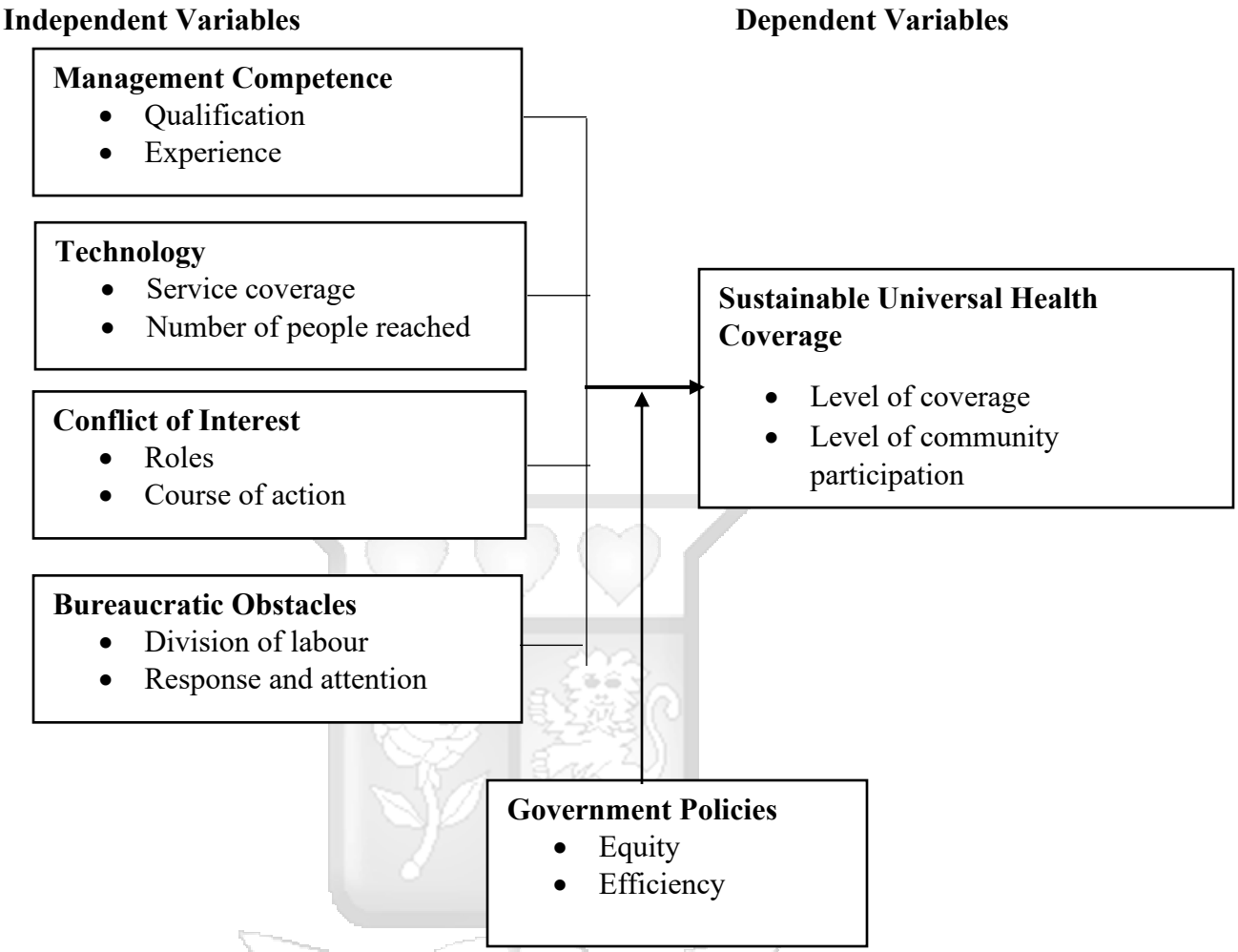

Figure 2.1 Conceptual Framework

To quantify sustainability, Likert scales can be applied to analyze respondents' perspectives and experiences about insurance coverage and service utilization. For example, participants could assess their agreement with statements such as "I am satisfied with my insurance coverage" or "I regularly access healthcare services." Operationalization entails converting abstract ideas like management competency or bureaucratic impediments into measurable variables that can be defined and examined.

In the background portions of the study, it is vital to articulate and describe the specific measures and operationalization procedures employed for each variable indicated in the conceptual framework. This ensures clarity and coherence in understanding how each

variable is conceptualized and quantified in the study design. By aligning the metrics with the conceptual framework, researchers may accurately examine the influence of independent factors on the sustainability of UHC, as evidenced in insurance coverage and service utilization.

2.6 Operationalization of Variables

This section details the operationalization of variables based on the study's objectives, including the type of variable, data needed, research tool, participant, scale of measurement, and methods for data analysis.

Table 2.2 Operationalization of Variables

Variable	Measure/ Indicator	Measurement scale	Supporting literature
Sustainable Universal Health Coverage	• Level of coverage • Level of community participation	Ratio/Ordinal	Mwangi (2019); Wilson, Sheikh, Gorgens, and Bank (2021)
Management Competence	• Qualification • Experience	Ordinal (5-point Likert Scale)	Wilson, Sheikh, Gorgens, and Bank (2021); Lygidakis, McLoughlin and Patel (2019).
Technology	• Service coverage • Number of people reached	Ordinal (5-point Likert Scale)	Bundi, Kirongo and Thiga (2020); Faujdar, Sahay, Singh, Jindal and Kumar (2019); Khanal and Regmi (2020).

Conflict of Interest	• Roles • Course of action	Ordinal (5-point Likert Scale)	Russo, Bloom and McCoy (2017); Carrin and James (2018).
Bureaucratic Obstacles	• Division of labour • Response and attention	Ordinal (5-point Likert Scale)	Folayan (2021); Pande (2019); Tambor, Klich and Domagała (2021).
Control Variables	• Equity • Efficiency	Ratio/Ordinal	Asamani, J.A.; Alugsi, S.A.; Ismaila, H.; Nabyonga-Orem (2021)

2.7 Chapter summary

Chapter Two has identified a significant gap in the literature review regarding the limited information available on factors influencing the sustainability of Universal Health Coverage in Machakos County, Kenya. It has been found that management competence, technology, conflict of interest, and bureaucratic obstacles impact the UHC sustainability. Based on these findings, the conceptual framework and questionnaire have been developed. In Chapter Three, the focus was shifted to the necessary research philosophy and methodology for conducting the empirical study.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter details the methodology that was used for conducting the study including study design, target population, sampling design, sample size, data collection methods and analysis as well as quality control measures and ethical considerations.

3.2 Research Philosophy and Design

A research philosophy represents the beliefs of the researcher regarding how information about a particular issue should be gathered, analyzed, and applied to achieve the goals of a study (Bajpai, 2011). The four main types of research philosophies are pragmatism, positivism, realism, and interpretivism. Pragmatism emphasizes the importance of concepts that support action by utilizing both quantitative and qualitative data. Positivists claim there is a single, objective reality that can be observed and measured without bias using standardized instruments (Tsoukas et al., 2001). Interpretivists accept that there is a reality but argue that it cannot be measured directly, but perceived by people differently through the lens based on their prior experience, knowledge, and expectations (Afsar et al., 2017). This study was informed by positivist philosophy to ensure objectivity and measurability. Positivist is a paradigm that relies on measurement and reason, that knowledge is revealed from a neutral and measurable (quantifiable) observation of activity, action or reaction (Afsar et al., 2017). Positivists states that if something is not quantifiable, it cannot be known for certain (Afsar et al., 2017). The positivist concept underpinned this study, thus quantifiable data was used to assess the factors influencing universal health coverage in Machakos county.

3.3 Research Design

Research design is an outline that shows the procedures and techniques for data analysis and collection to get specific information. A research design enables setting up of an action plan for the research (Mugenda & Mugenda, 2012). It is a comprehensive research plan of how a researcher answers the research questions which consequently provides a defined answer to the research question. This study used the descriptive research design, which is an organized method that entails seeing and characterizing a subject's activity

without intervening (Cooper & Schindler, 2014). This approach was appropriate for the study because it sought to reduce bias ensuring objectivity and increasing reliability of the data collected. Based on this, the study used a quantitative research design to illustrate how study variables (management competence, digital technology, conflict of interest and bureaucratic obstacles) influence the sustainability of universal health coverage in Machakos county.

3.4 Population and Sampling

3.4.1 Population

Population refers to all items or peoples (Unit of Analysis) with the characteristics that one wishes to study. The population contains all the subjects with different qualities and characteristics that a study tries to investigate in its assessment and examination Kumekpor (2002). The study's target population was all the 1,678 healthcare workers in Machakos County (County Government of Machakos, 2022).

3.4.2 Sampling and Sample Size

Stratified random sampling was utilized to choose the sample for the study. As per Battaglia et al. (2016) stratified random sampling is a factual strategy that involves the categorization of a populace into numerous layers in light of explicit shared attributes. The subject of this study was the public health workers of Machakos County and hence, stratification was coordinated in five strata as follows: physicians, nurses, IT technicians, human resource officers and locum workers. This were determined through health staffing records (County Government of Machakos, 2022). Moreover, random sampling was utilized to ensure that every part in the layers is genuinely addressed. This limited sampling inclination and make it more straightforward to break down the results.

The sample size was drawn from the Machakos County Referral Hospital on account of being the only level 5 hospital in the County. Stratified sampling was used to ensure equivalent representation of the social-demographic attributes. Mugenda (2013) proposed a sample size of between 10% - 30% of the objective populace as a decent representation. In view of this, the study utilized Yamane formula to get a sample size of 97 or 30% of the target staff populace as displayed:

$$n = \frac{N}{1 + N\ (\alpha)^{\wedge}2}$$

Where

n = sample size

N = Population

α = margin of error

$$n = \frac{1678}{1+1678\,(0.05)^{\wedge}2} = 323$$

n = 323 x 30%

n =97+15 (KIs)

n=112

The goal of the study was to identify 15 Key Informants (KIs) to add to the survey data. These KIs were made up of healthcare officials, administrators, public health professionals, and community leaders who are actively involved in developing policies, offering educational programs, and carrying out other efforts meant to improve the general health of the Machakos County populace. Through in-depth interviews, they provided qualitative insights that enhanced the data collection process.

3.5 Data Collection Methods

The study employed a dual-method approach to data collecting, blending structured questionnaires with in-depth interviews to ensure thorough insights into the factors influencing the sustainability of Universal Health Coverage (UHC) in Machakos County, Kenya. Structured questionnaires were disseminated via Google Forms, chosen for their compatibility with respondents who predominantly use smartphones and have internet connectivity (McDaniel et al., 2012). This web platform improved data compilation and survey management, boosting efficiency. The questionnaire featured closed-ended questions analyzing several elements impacting UHC sustainability, along with gathering pertinent demographic facts.

Responses were statistically quantified on a five-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"). To supplement quantitative data gathering with qualitative insights, a subset of significant informants were interviewed. These

informants possessed relevant expertise or hold jobs associated to UHC in Machakos County. They shared perspectives on issues impacting UHC sustainability using a professionally crafted interview guide. Key informants included healthcare officials, administrators, public health professionals, and community leaders involved in healthcare delivery and policy formation in Machakos County.

3.6 Data Analysis

3.6.1 Data analysis Procedure and Technique

Raw data was coded as per each variable to enhance speedy analysis. Descriptive and inferential statistics delivered by the help of Statistical Package for the Social Sciences (SPSS 28) was utilized in this review. As per McDaniel et al. (2012), descriptive measurement is a course of transforming a heap of raw information into tables and outlines, with frequency distribution and percentages, which are fundamental for figuring out the information. To expedite the analysis procedure, each variable's raw data was first coded. The raw data was combined into understandable tables and figures using descriptive statistical approaches, such as frequency distributions and percentages. This stage is essential for giving a concise summary of the research population's demographics and a comprehensive picture of the information gathered.

As indicated by Branco (2013), multiple regression examination is a factual strategy for deciding the connections between factors. To explore the relationships between the sustainability of Universal Health Coverage (UHC) and various influencing factors, the study employed multiple regression analysis. This advanced statistical method was chosen for its effectiveness in identifying and quantifying the relationships between multiple independent variables and a single dependent variable.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta n \sum Zn + \varepsilon$$

Dependent variables (Y) – sustainability of Universal Health Coverage

Independent variables:

X_1 (management competence),

X_2 (technology),

X_3 (conflict of interest),

X_4 (bureaucratic obstacles),

Zn (set of sustainable UHC controls: Government policy (Equity & Efficiency)

B_0- β_4 = Coefficients of determination,

The coefficients of determination (β0-β4) measured the strength and direction of these relationships, while the error term (ε) accounts for any discrepancies, ensuring a comprehensive understanding of the factors impacting UHC sustainability. This analytical technique was supported by its precision in dissecting complicated, multivariate interactions, providing unique insights into the dynamics impacting UHC in Machakos County. Through multivariate regression analysis, the study sought to identify the particular contributions of each independent variable to the sustainability of UHC, thus informing evidence-based decision and program execution in the healthcare sector.

3.6.2 Regression Model Diagnostics Tests

There are assumptions that must be measured and ascertained for the multiple regression model to be considered fit for the study. The four assumptions of linear regression model included linearity, multicollinearity, homoscedasticity, and normality.

Normality: Normality refers to the extent to which the distribution of the sample data corresponds to the normal distribution (Hair, 2010). The researcher used the rule of thumb that a variable is reasonably close to normal if its skewness and kurtosis have values between -0.1 and + 0.1. If the probability is greater than 0.05, then the data is normally distributed (Saunders & Thornhill, 2012). There are several consequences linked with abuse of the assumption of normality, since it doesn't result to inefficiency or bias in the models of regression. It's solely significant for computation of the p values for testing significance, but that is solely considered where the size of the sample is quite small.

Linearity: Linearity means that the relationship between the explanatory variables and the outcome variable is linear. In other words, each increase by one unit in an explanatory variable is associated with a fixed increase in the outcome variable. The Pearson's correlation coefficient was used to test the linearity of the relationship between the variables.

Multicollinearity: Multicollinearity refers to the linear correlation among variables. To check for correlated variables, Multicollinearity was tested using variance inflation factor (VIF). A VIF value of above 10 and a tolerance of less than 0.1 indicate presence of multicollinearity. Violation of the assumption increases the standard errors. Multicollinearity decreases the estimate coefficient's accuracy which declines regression model's statistical capacity or power.

Homoscedasticity: Homoscedasticity refers to the assumption that the dependent variable exhibits similar amounts of variance across the range of values for an independent variable (Hair *et al.,* 2010). To test for the homogeneity of variance the Breush-Pagan test was conducted as recommended. Where the Breusch-Pagan null hypothesis states that there is constant of error term. After specifying these tests, the multiple linear model was used.

3.7 Research Quality

To guarantee objectivity of the research data quality, the data collection tool was subjected to validity and reliability checks before research. This section presents two key research qualities: validity as well as reliability.

3.7.1 Research Validity

Bridget and Lewin (2013) characterized legitimacy as the level by which the sample of the subjects tested addresses the substance the test is intended to quantify. Both face legitimacy and content legitimacy were utilized in this study. To evaluate face and content legitimacy, meetings were held with the supervisor and public health officers to guarantee the appropriateness of the inquiries in estimating and tending to the study objectives and eliminating any ambiguities in the inquiries.

3.7.2 Reliability of the Research Tool

To assess the internal consistency and precision of the survey questions, a reliability test was conducted using Cronbach's equation (Blanchard, 2018). To accomplish this, a pilot test was directed with 5 inquiries regarding the study variables on a 5-point Likert scale going from 1 (firmly disapprove) to 5 (emphatically concur) to decide whether the poll's inquiries precisely gauged a similar dormant variable. 10 participants (in other words, 10% of the sample size) from the selected County government of Machakos healthcare

workers partook in the pilot testing. This is in accordance with Mugenda and Mugenda (2003) recommendation that a sample size of somewhere in the range of 10% and 30% of the objective populace is a decent portrayal. The sample to be chosen for the pilot testing did not undertake the primary review. The minimum reliable Cronbach's alpha value considered acceptable is 0.7 (Mugenda & Mugenda, 2013).

Cronbach's alpha statistic: $\alpha = (N*r/1+ (N-1)*r)$

Where; N = number of items; and r = average inter-item correlation among the items.

Table 3.1 and Table 3.2 below presents results of the reliability tests computed using SPSS (V28):

Table 3.1 Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
0.849	0.552	4

From Table 3.1, the Cronbach's alpha is 0.849, which indicates a high level of internal consistency for the study variables.

The Item-Total Statistics Table 3.2 presents the "Cronbach's Alpha if Item Deleted" in the final column, as shown below:

Table 3.2 Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Management Competence	60.50	13.833	0.413	0.899	0.788
Technology	62.50	33.389	0.064	0.007	0.777

Conflict of Interest	60.50	34.278	0.265	0.751	0.826
Bureaucratic Obstacles	59.20	21.733	0.765	0.929	0.928

Results in Table 3.2, shows that the average Cronbach's alpha (Cronbach's alpha if item deleted), for the variables was 0.7829 which signified a high dependability of the research instrument and a high degree of internal consistency for the research variables used in this study. Further, the findings in Table 3.2 shows that the lowest corrected correlation was for variable two (Technology) which was 0.777 and which could have contributed to a decline in general reliability. The outcomes showed that removal of any variable, with the exception of Technology, would have brought about a lower Cronbach's alpha. Removal of Technology in the list of variables would have prompted a little improvement in Cronbach's alpha (0.777).

3.8 Ethical Considerations

This study maintained the necessary moral standards to guarantee the analyst's genuineness and respectability. In the first place, the researcher sought for authorization to gather information from Strathmore University as well as assent from County government of Machakos to get to the members. Respondents were permitted to partake on their own will without being pressured, and they were allowed to pull out from the interest whenever without repercussion. Likewise, references and citations were utilized to recognize the utilization of recently published and unpublished work, data, and ideas in this study. Respondents' assent was gotten preceding their cooperation in the concentrate by giving them adequate information about the ramifications of support. Classification, protection, and secrecy of the members was ensured, and the researcher did not in any way hurt any members during information assortment.

CHAPTER FOUR
PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

The results from the study have been corroborated with the literature reviewed and inferences have been drawn. Summary tables, descriptive statistics and inferential analysis are presented for each study variable, together with the fitted model. This chapter comprises the response rate, descriptive statistics on every specific study variable, and inferential analysis results and discussions. The purpose of the study was to investigate the factors influencing the sustainability of Universal Health Coverage in Machakos County, Kenya.

4.2 Response Rate

Response rate encapsulates the magnificence of all conceivable responses from a given study. As unveiled in the third chapter, the research questionnaire was meticulously administered to the sampled population. The research questionnaire was administered to 112 healthcare workers and key informants in Machakos County. As such, the sample comprised of 97 healthcare workers (doctors, nurses and community health workers) in County Referral Hospital and 15 Key Informants (healthcare officials, administrators, public health professionals, and community leaders).

Table 4.1 Response Rate

Category	Healthcare workers		Key Informants		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Responded	80	82.5	8	53.3	88	78.6
Not Responded	17	17.5	7	46.7	24	21.4
Total	**97**	**86.6**	**15**	**13.4**	**112**	**100.0**

The study's sample size was 112 respondents including healthcare workers and key informants in Machakos County. Table 4.1 shows the frequency which is the number of participants who provided or failed to provide their responses. These resulted to 78.6% response rate. The response rate was considered satisfactory to investigate the factors influencing the sustainability of Universal Health Coverage in Machakos County, Kenya.

According to Mugenda and Mugenda (2013) a response rate greater than or equal to 50 percent is considered adequate to conduct research. A response rate beyond 70 percent is considered effective and reliable to conduct research. The high response rate of 78.6% can be attributed to sufficient amount of time given to respondents to provide their responses. Additionally, the researcher explained to all respondents the objectives of the research and tackled any emergent issues that would adversely affect the response rate.

4.3 Respondents' Demographics

Age, gender, level of education, number of years the business has been in existence, business sector, annual turnover of the business and type of business were all included while assessing respondents' demographics, as presented below;

Table 4.2 Respondents Demographics

Category	**Frequency**	**Percent**
Age		
23 - 27 years	6	6.30
28 - 32 years	18	20
33 - 37 years	27	31.1
38 - 42 years	30	33.8
above 43 years	8	8.8
Total	88	100.00
Gender		
Male	54	61.4
Female	34	38.6

Total	88	100.0
Level of Education		
Diploma	14.0	15.9
Bachelors	39.0	44.3
Masters	29.0	33
PhD	6.0	6.8
Total	88	100
Designation		
Physician	13	15
Nurse	24	27.5
IT Technician	9	10
HR	13	15
Pharmacist	11	12.5
Locum workers	18	20
Total	88	100
Job Tenure		
Less than 5 years	9	10
5-7 years	24	27.5

8-10 years	35	40
11-15 years	13	15
Above 15 years	7	7.5
Total	88	100

The findings as reported in Table 4.2 reveal that 33.8% of the respondents were aged between 38 and 42 years and 31.3% of the respondents were aged between 33 and 37 years. In addition, 20.0% of the respondents were aged between 28 and 32 years, 8.8% of the responses were obtained from participants aged above 43 years while a small proportion occupied by 6.3% the respondents comprised of respondents aged between 23 and 27 years. These results demonstrated that the respondents were well distributed in terms of age. These results imply that the healthcare workers and key informants in Machakos County are mainly aged between 28 years and 42 years. However, few members are below 27 years and above 42 years implying that the County has adopted a medium age bracket in placement of healthcare staff in the facility.

Further findings as presented in Table 4.2 revealed that more than half of the respondents (61.4%) in the study area were males while females accounted for 38.6%. The gender distribution showed that opinions provided by participants were mainly obtained from the male gender.

Education levels on the other hand as presented in Table 4.2, were divided into five groups: diploma, bachelor's degree, master's degree and PhD. According to the findings, the majority of respondents in the research area (44.3%) had earned a Bachelor's degree, followed by a Master's degree (33%). A Diploma was held by 15.9% of the respondents while PhD was held by 6.8%. Education level was important as it informed that all respondents had acquired tertiary education with prerequisite skills and knowledge to execute their functions in the hospital.

The findings as presented Table 4.2 revealed that 27.5% of the responses were obtained from nurses, 20.0% from locum workers, 15% from physicians, 15% from human resource officers, 12.5% of the respondents were pharmacists whereas 10% of them were IT technicians in Machakos County Referral Hospital. From these responses, all these respondents were involved in sustainable universal health coverage in Machakos County. All the crucial designations responsible for sustainable universal health coverage in Machakos County were included in the research showing that the information is wide reaching and inclusive.

Findings on job tenure as presented in Table 4.2 reveal that; respondents with job tenures of 8-10 years occupied a proportion of 40.0%, job tenures of between 5 and 7 years were 27.5%, and employees with job tenures of between 11 and 15 years were 15.0%. The responses of staffs with tenures of less than 5 years comprise 10.0% of participants while tenures of above 15 years were 7.5% of the study population. The results shows that majority of the respondents had job tenures of between 5 and 15 years. This implies that they are in better position because of exposure and experience to understand sustainability of universal health coverage in Machakos County.

4.4 Descriptive Statistics

Descriptive analysis seeks to describe the findings as observed during the analysis. The study adopted descriptive statistics aimed at describing the distribution of measures obtained from responses from items contained in each of the variable in the questionnaire. This descriptive statistics section focuses on synthesizing the results on the factors influencing the sustainability of Universal Health Coverage in Machakos County, Kenya. To explain the distribution of measures of questions addressing each variable, the researcher utilized descriptive statistics in the study. The researcher first formulated items addressing each variable in the questionnaire and requested that respondents rate the statements on a scale of 1 to 5, with 1 denoting strong disagreement, 2 implied disagreement, 3 implied neutrality/impartiality, 4 implied agreement and 5 implied strong agreement with the statements.

4.4.1 Management Competence

One of the objectives of the study sought to evaluate how UHC's sustainability is affected by the quality of healthcare management, with a focus on the significance of strategic decision-making and leadership. In relation to this objective, respondents were tasked with rating their level of agreement with various statements concerning the effect of management competence on sustainable UHC.

Table 4.3 Effects of Management Competence on Sustainable UHC

Management Competence and Sustainable UHC	Mean	Std. Dev.
Establishes structures and processes that allow management to work together to improve teaching and learning.	3.60	0.92
Supports individuality of healthcare providers approaches to implementation of the UHC.	3.53	0.80
Supports all staff in integrating into UHC program roles as workers, citizens, and family and community members.	3.50	0.91
Coordinates procedures for assessment and placement of technicians in appropriate UHC programs at appropriate functioning levels.	3.51	0.87
Researches and/or conducts community needs assessments to determine healthcare needs.	3.54	0.74
Assesses and/or reviews management needs on an individual basis through observations, meetings, written goals and plans, and assessment instruments.	3.48	0.68
Assists the UHC program in incorporating technology into instructional practices.	3.58	0.73

As per the findings presented in Table 4.3, it is evident that the respondents overwhelmingly agreed that management competence establishes structures and processes that allow management to work together to improve teaching and learning as

shown by a mean score of 3.60. They further affirmed that it assists the UHC program in incorporating technology into instructional practices as shown by a mean score of 3.58. There was also agreement on that management competence researches and/or conducts community needs assessments to determine healthcare needs substantiated by an impressive mean score of 3.54. Additionally, the respondents acknowledged that management competence supports individuality of healthcare providers approaches to implementation of the UHC as demonstrated by a mean score of 3.53, it coordinates procedures for assessment and placement of technicians in appropriate UHC programs at appropriate functioning levels as reflected by a mean score of 3.51 and that it supports all staff in integrating into UHC program roles as workers, citizens, and family and community members. However, there was impartiality on that management competence assesses and/or reviews management needs on an individual basis through observations, meetings, written goals and plans, and assessment instruments. This was evidenced by a mean score of 3.48. These results are in agreement with Michel, Datay and Motsohi (2020) who assessed the influence of healthcare provider competency on Universal Health Coverage utilization in sub-Saharan Africa and established that management competency levels have direct significant influence on utilization of UHC services by community members. However, quite a number of health service providers are not competent enough in their departments of operation and there is no periodic training on new guidelines. As such, management competence has been crucial in the establishment of structures and processes, incorporation of technology into instructional practices, research and conducting of community needs assessments, support of individuality of healthcare providers approaches to implementation of the UHC, coordination of procedures for assessment and placement of technicians and support of staff in integrating into UHC program roles.

The study sought to establish the respondents' view on the percentage of sustainable UHC that can be attributed to management competence. According to Figure 4.1, 40% of the respondents attributed 61-80% of sustainable UHC to management competence. 27.5% of the respondents opined that 41-60% of UHC that can be attributed to management competence and 13.8% of them indicated that management competence 81-

100% of UHC in the County. A small proportion (11.3%) of the respondents attributed 21-40% of UHC to management competence while the smallest proportion (7.5%) of the participants attributed 0-20% of UHC to management competence. The results concur with Lygidakis et al. (2019) who found that management competence is crucial on political directions, administrative decisions and resource allocation procedures which bear a great effect on UHC decision-making. This is evidence that a great deal of UHC can be as a result of management competence.

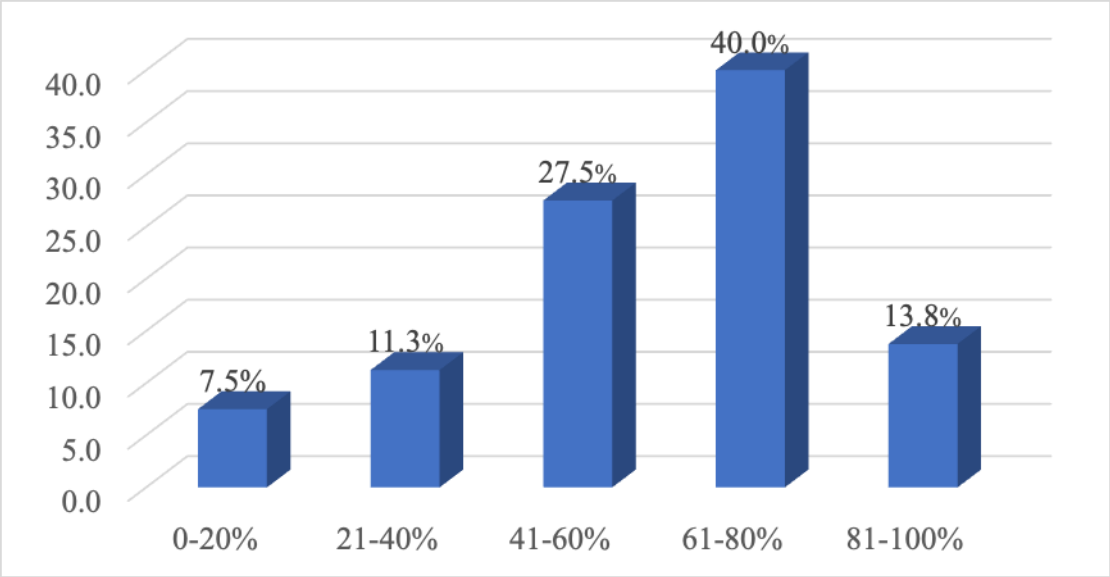

Figure 4.1 Percentage Contribution of Management Competence towards UHC

4.4.2 Digital Technology

The study sought to analyze how digital technologies can improve UHC-accountable healthcare services' effectiveness, accessibility, and quality. The inquiry delved deeper into determining the respondents' level of concordance with the various statements pertaining to the effect of digital technology on sustainable UHC.

Table 4.4 Effect of Digital Technology on Sustainable UHC

Indicators of Digital Technology	Mean	Std. Dev.
Digital technology has enhanced access to care in remote areas through telemedicine	3.55	0.84
The technology has improved efficiency through electronic health records and mHealth applications	3.69	0.95
Digital technology has enhanced extensive collection, storage, and analysis of sensitive health data necessitate robust protection measures to prevent unauthorized access.	3.51	0.94
The technology has brought a better patient-doctor relationships.	3.59	0.94
Using digital health technologies, patients can actively manage their own health and monitor any irregularities that they may experience.	3.58	0.98
Through digital technology, the management of UHC has efficiently and equitably allocated resources.	3.54	0.95
Digital health technology has the potential to reduce the cost of health care services.	3.55	0.98

The majority of the respondents in Table 4.4 expressed their affirmation that the technology has improved efficiency through electronic health records and mHealth applications as showcased by a mean score of 3.69, the technology has brought a better patient-doctor relationships as demonstrated by a mean score of 3.59, using digital health technologies, patients can actively manage their own health and monitor any irregularities that they may experience as evidenced by a mean score of 3.58, digital technology has enhanced access to care in remote areas through telemedicine as shown by a mean score

of 3.55 and that digital health technology has the potential to reduce the cost of health care services as shown by a mean score of 3.55. Furthermore, it was observed that through digital technology, the management of UHC has efficiently and equitably allocated resources as reflected by a mean score of 3.54 and that digital technology has enhanced extensive collection, storage, and analysis of sensitive health data necessitate robust protection measures to prevent unauthorized access as evidenced by a mean score of 3.51. These findings reveal that technology has improved efficiency in patient-doctor relationships, managing and monitoring health as well as enhancing access to healthcare in the County. In the same view, Bundi, Kirongo and Thiga (2020) studied the efficacy of digital technology and performance of UHC in Rwanda and revealed that digital technology brings efficiencies, controls and quality to areas of: Health finance (mobilemoney gateways), Referrals (e-referrals), Continuity of care (electronics health records) and Knowledge Management (e-learning and m-learning).

The respondents were further required to indicate the percentage of sustainable UHC that can be attributed to digital technology. As indicated in Figure 4.2, 42.5% of the responses showed that 61-80% of sustainable UHC can be attributed to digital technology. This was followed by 28.8% of the responses that pointed that 41-60% of sustainable UHC can be attributed to digital technology. 15.0% of the respondents indicated that 81-100% of sustainable UHC can be attributed to digital technology, 8.8% indicated that digital technology contributed 21-40% of sustainable UHC in the County, while 5% of them opined that 0-20% of sustainable UHC can be attributed to digital technology. Emanating from these results, digital technology has contributed immensely towards sustainable UHC in the County. The same results were established by Faujdar, Sahay, Singh, Jindal and Kumar (2019) who investigated the function of ICT on sustainable UHC in Uganda and found that collaboration between primary, secondary and tertiary health facilities and professionals can be achieved via use of digital health applications and technologies to improve the quality of healthcare in promoting the agenda of UHC. In their quantitative study Verguet and Jamison (2018) examined the impact of technology on sustainability of UHC in Estonia and found a positive and significant correlation between digital technology and sustainable UHC in Estonia.

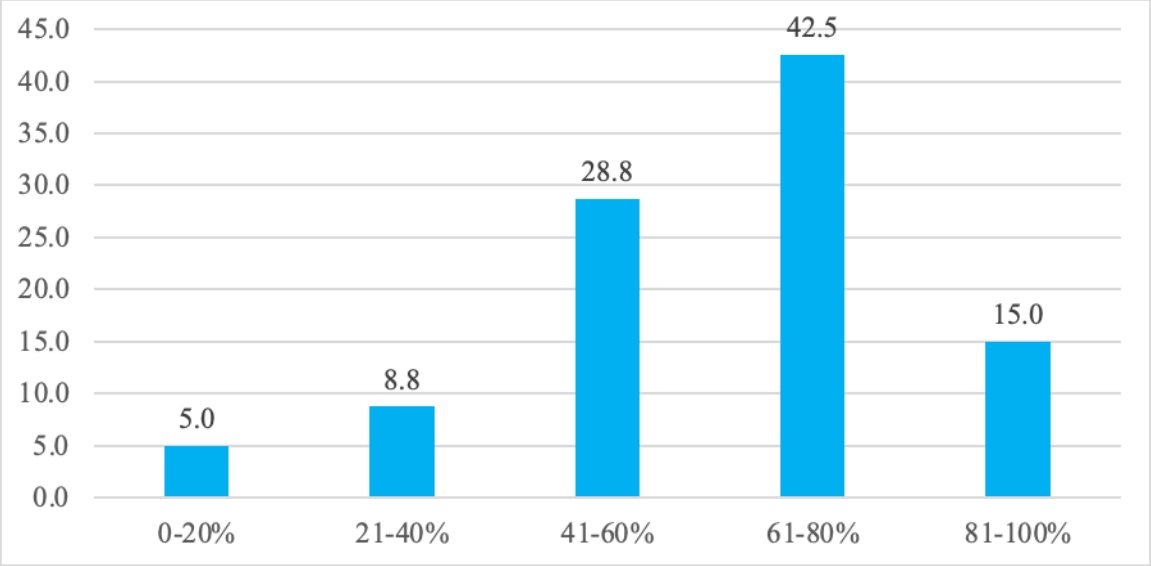

Figure 4.2 Percentage Contribution of Digital Technology to Sustainable UHC

4.4.3 Conflict of Interest

In order to examine the effects of conflicts of interest on the healthcare system and how they can jeopardize UHC's commitment to equitable care delivery, the respondents were graciously requested to indicate their level of agreement with statements concerning the effect of conflict of interest on sustainable UHC. The results are presented in Table 4.5

Table 4.5 Effects of Conflict of Interest on Sustainable UHC

Indicators of Conflict of Interest	Mean	Std. Dev.
Conflict of interest has a more direct influence on agenda-setting and policy formation.	3.53	0.98
Conflict of interest can prevent issues related to sales of medicines from featuring prominently on the policy agenda.	3.51	0.98
Conflict of interest has presented opposition to policy implementation of UHC program.	3.55	0.91
Conflict of interest shape how accurately the success of contested policies is evaluated and reported.	3.58	1.00
Conflict of interest create a hub that impede policies that prioritise public health.	3.58	1.02

There is minimal progress and development of the UHC program due to conflict of interest within the healthcare.	3.49	1.02
Conflict of interest is costly and adds more unnecessary expenses to the UHC program.	3.48	1.02

The findings from Table 4.5 clearly demonstrate that the majority of respondents support the idea that conflict of interest shape how accurately the success of contested policies is evaluated and reported with an overall mean of 3.58. another majority of the respondents agreed that conflict of interest create a hub that impede policies that prioritise public health at a mean score of 3.58. The respondents further recapped that conflict of interest has presented opposition to policy implementation of UHC program as indicated by the findings mean of 3.55, conflict of interest has a more direct influence on agenda-setting and policy formation with a mean of 3.53 and that conflict of interest can prevent issues related to sales of medicines from featuring prominently on the policy agenda at a mean score of 3.51. On the other hand, there was neutrality on that there is minimal progress and development of the UHC program due to conflict of interest within the healthcare with a mean score of 3.49 and that conflict of interest is costly and adds more unnecessary expenses to the UHC program with a mean score of 3.48. These results imply that conflict of interest affects the success of UHC policies, it creates a hub that impede UHC policies in public health. As such, conflict of interest presents opposition to policy implementation of UHC program which has influence on agenda-setting and policy formation and prevents inventory of medicines and drugs. These findings are in concurrence with Takura and Miura (2022) who revealed that conflict of interest occurs because of hidden financial relationships between formal (licenced) and informal (unlicenced) health-care providers owing to financial flows from informal to formal providers, where the latter might publicly support stronger regulation of the informal health-care sector while covertly using their power to obstruct policies that curtail informal practice. When COI involved healthcare providers, it tended to impact most directly on policy implementation whereas in situations when COI involved policymakers, such as senior government officials, it could have a more direct influence

on agenda-setting and policy formation, as well as on policy implementation and evaluation.

The study to analyze the percentage of sustainable UHC that can be attributed to conflict of interest. 46.3% of the respondents reiterated that 21-40% of sustainable UHC can be attributed to conflict of interest. 31.3% of them indicated that conflict of interest contributed to 41-60% of sustainable UHC, 17.5% of the respondents opined that conflict of interest contributed 0-20% sustainable UHC. Only 5.0% of the respondents felt that conflict of interest contributed 61-80% of sustainable UHC in the County. These findings denote that conflict of interest contributed negatively toward realization of sustainable UHC in the County. Anarwat, Assan, Gaumer, Canterbury and Shepard (2021) also argued that conflict of interest occurs when policy makers are influenced into taking a course of action that is more likely to win political support, rather than following public health evidence.

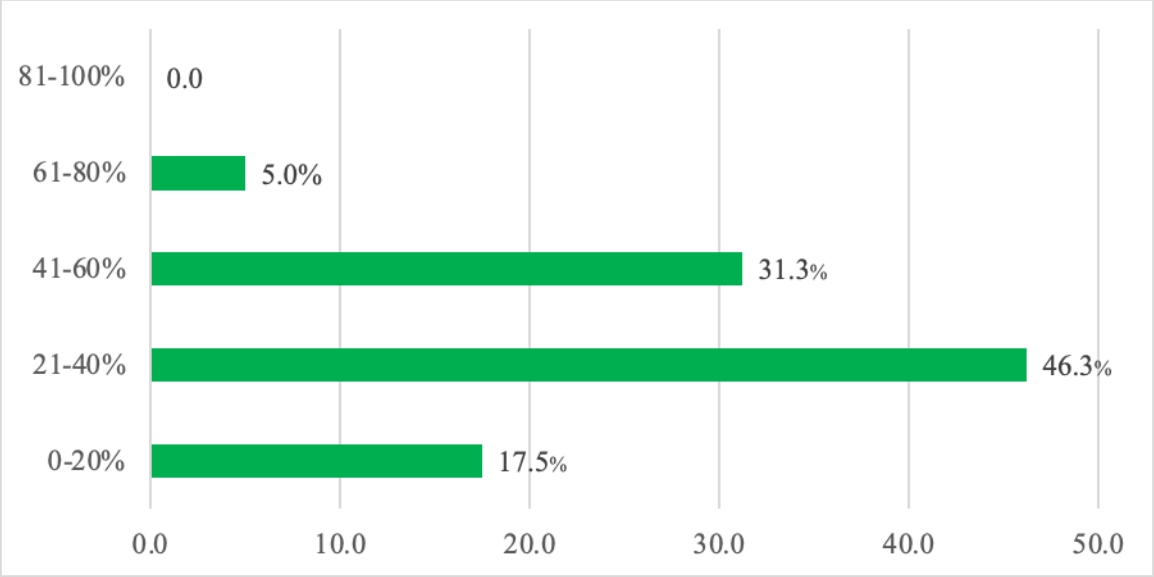

Figure 4.3 Contribution of Conflict of Interest to Sustainable UHC

4.4.4 Bureaucratic Obstacles

Within the realm of this comprehensive study, the fourth objective aimed to examine the degree to which red tape and bureaucratic procedures obstruct the successful execution

and running of UHC. The respondents were required to indicate their level of agreement with various statements provided on the effect of bureaucratic obstacles on sustainable UHC Machakos County.

Table 4.6 Effect of Bureaucratic Obstacles on sustainable UHC

Indicators Bureaucratic Obstacles	Mean	Std. Dev.
UHC programs, private providers must go through a cumbersome formal accreditation process.	3.55	0.99
Both government officials and citizens try to navigate regulatory systems to exploit situations where rules are conflicting or unclear.	3.51	0.98
Unauthorized or hidden payments have flourished in the absence of accountability.	3.59	1.02
There is huge data deviation among suppliers and patients	3.43	0.94
Bureaucracy weakens the existing public health system because of the greater likelihood of people opting for private healthcare	3.50	0.99
Blocks the inclusion of all relevant stakeholders	3.50	0.97
National and county politics surrounding healthcare inhibit policy implantation of UHC.	3.54	0.94

The findings from Table 4.6 indicated that majority of the respondents affirmed that unauthorized or hidden payments have flourished in the absence of accountability with a mean of 3.59. Second in line were those affirming that UHC programs, private providers must go through a cumbersome formal accreditation process with a mean of 3.55. The findings from the respondents indicated that national and county politics surrounding healthcare inhibit policy implantation of UHC with a mean of 3.54. Both government officials and citizens try to navigate regulatory systems to exploit situations where rules are conflicting or unclear with a mean of 3.51, bureaucracy weakens the existing public health system because of the greater likelihood of people opting for private healthcare with a mean of 3.50 and bureaucracy blocks the inclusion of all relevant stakeholders

with a mean of 3.50. The respondents however showed neutraIity on that there is huge data deviation among suppliers and patients with a mean of 3.43. These findings show that bureaucracy blocks the inclusion of stakeholders, it weakens the existing public health system and the processes used in UHC create room for non- accountability in the County. In the same view Tambor, Klich and Domagała (2021) found that one of the key barriers to private provider participation in UHC relates to the accreditation process itself; while public facilities are automatically enrolled into UHC programs, private providers must go through a cumbersome formal accreditation process that often discourages providers from applying at all.

The study further sought to determine the percentage of sustainable UHC that can be attributed to bureaucratic obstacles. According to 43.8% of the respondents, bureaucratic obstacles were responsible for 21-40% of sustainable UHC in the County. 33.8% of the respondents rated the influence of bureaucratic obstacles towards sustainable UHC in the County to be between 41% and 60%. Another proportion (15.0%) of the respondents felt that bureaucratic obstacles were responsible for 0-20% of sustainable UHC in the County while 7.5% of them indicated that 61-80% of sustainable UHC in the County could be attributed to bureaucratic obstacles. As such, bureaucratic obstacles have contributed to sustainable UHC in small magnitudes. This is clear evidence that the complicated processes involved in the implementation of UHC policies have had a negative. The results are in in agreement with Derakhshani (2021) who assessed the effect of bureaucratic obstacles on sustainable universal health coverage in South Sudan and found that it is notoriously difficult to determine what counts as unauthorized or irregular in a complex system where opportunities to request payments can exist from the systemic and institutional levels down to the level of the individual, making it notoriously difficult to define.

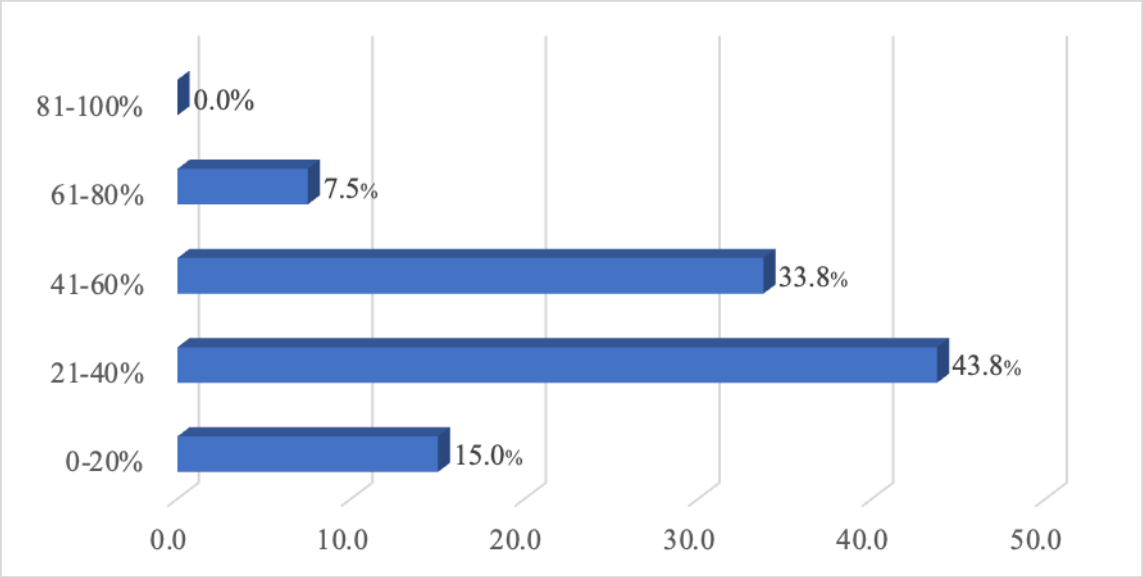

Figure 4.4 Percentage of Sustainable UHC Attributed to Bureaucratic Obstacles

4.4.5 Public Perception

The study was also interested in understanding the public perception of sustainable UHC in the County. As such the respondents were required to indicate their rating on the current state of UHC in Machakos County. From the study, 50.0% of the respondents rated the current state of UHC in Machakos County to be good, 22.5% rated the current state of UHC in Machakos County to be fair, 16.3% of them indicated that the current state of UHC in Machakos County was excellent. On the flip side, 7.5% of them indicated that current state of UHC in Machakos County was perceived to be poor, whIe 3.8% of the responses showed that UHC in Machakos County scored very poorly in pubic rating. These responses imply that sustainable UHC in the County has been viewed by the general public to be relatively favourable and impressive in the recent era. This couId be attributed to the enhancement of services offered to the public in an attempt to meet the social pillar of Kenya's Vision 2030. Ochola, Elliott and Karanja (2021) also established that the successful implementation of UHC is hampered by a number of variables, including management skills, bureaucratic inefficiencies, technical improvements, governance concerns, conflicts of interest, and societal acceptance.

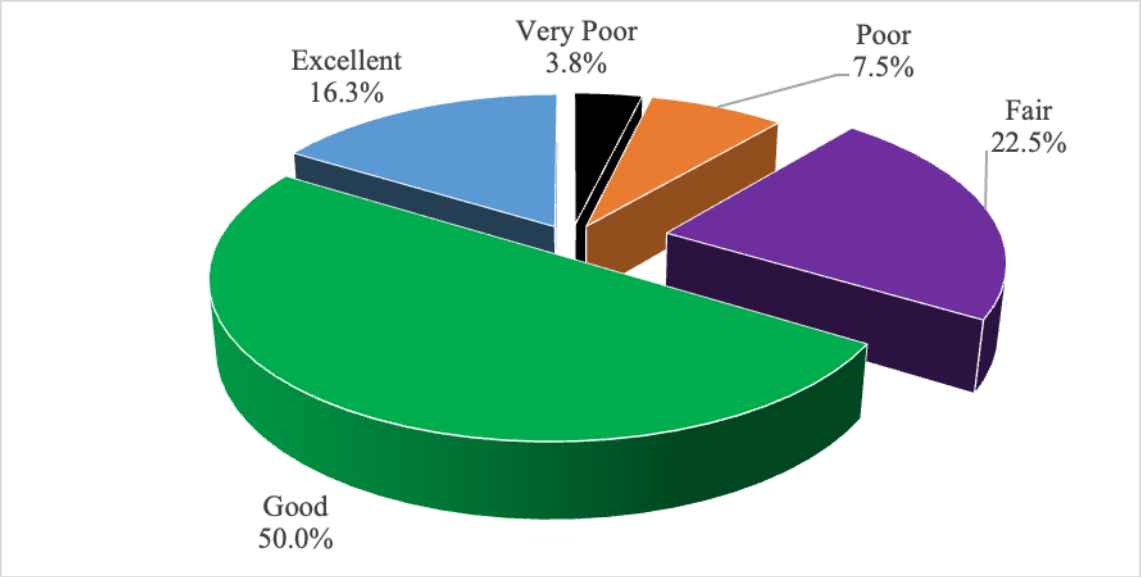

Figure 4.5 Rating the Public Perception of Sustainable UHC

The study enquired the respondents' views on the improvements needed to enhance UHC in Machakos County. From the responses obtained, unwavering political benevolence is imperative to uphold Universal Health Coverage. Exquisite management systems typically bolster the functionality, efficiency, and accountability of healthcare. Astute leadership and governance must ensure the presence of a strategic policy framework, harmoniously intertwined with effective oversight, consensus building, regulation, meticulous system-design, and unwavering accountability. It necessitates vigilant supervision and guidance of the healthcare system to safeguard the public interest, transcending the mere enhancement of individual health statuses. This is in accordance to Derakhshani *et al.,* (2021) who found that Universal Health is an essential component in promoting public health and the involvement of various parties in public health programs is associated with such as management competence, conflict of interest, technology, and bureaucracies which increases improved public health outcomes.

4.4.6 Sustainability of UHC

The main focus of the study was to gather information on the factors influencing the sustainability of Universal Health Coverage (UHC) in Machakos County, Kenya Sustainability of Universal Health Coverage in Machakos County, Kenya. The

respondents were therefore required to rate the overall sustainability of Universal Health Coverage in Machakos County. From the responses UHC received good rating from 57.5% of the respondents. 23.8% of the respondents rated the UHC to be excellent, 5.0% of the respondents indicated that UHC was poor, 3.8% of them indicated that UHC was fair. From these insights, the study participants were of the opinion that UHC is relatively good. These results confirm the same views by Tambor, Klich and Domagała (2021) who found that sustainability of universal health initiative is as a result of comprehensive strategy to maintaining UHC systems that are resilient and responsive to both present and future health concerns. As such, special efforts are made to emphasize public shared responsibility and promote their active involvement in family health; prenatal, maternal and child health and prevention of sexually transmitted diseases.

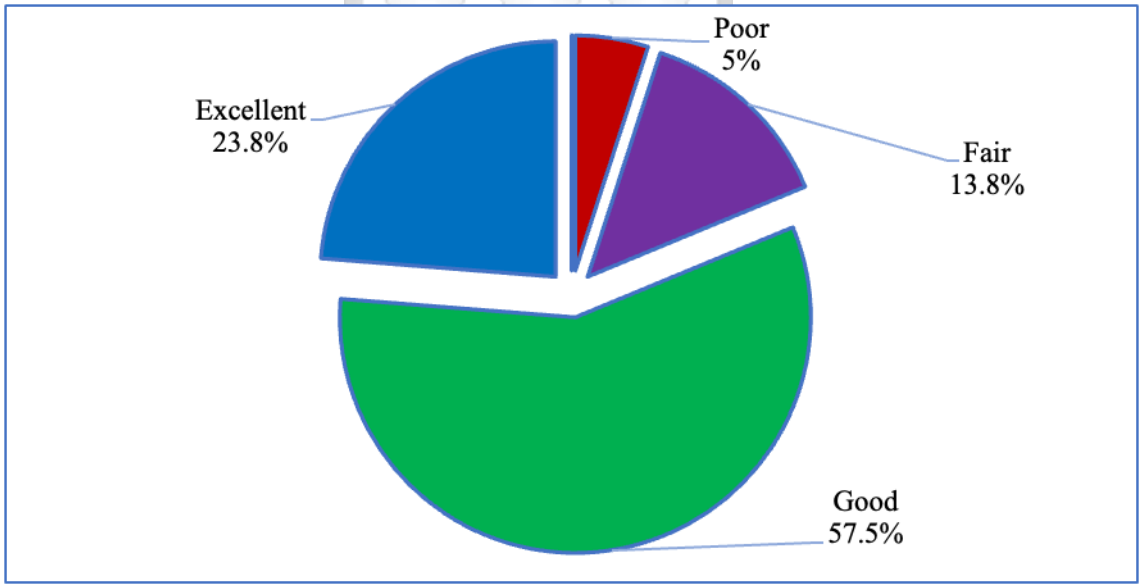

Figure 4.6 Rating the overall Sustainability of UHC in Machakos County

The key informants indicated that they contribute to the advancement of Machakos County's Universal Health Coverage (UHC) initiatives by actively engaging in the meticulous process of identifying the comprehensive range of health services that the esteemed population is entitled to. Others indicated that they exercise discernment and select the most esteemed health providers from whom these invaluable services are procured. In another forum, there was evidence that stakeholders deliberate upon the

optimal means of acquiring these services, encompassing contractual arrangements and mechanisms of remunerating the providers, all in the noble pursuit of advancing towards the attainment of Universal Health Coverage. Folayan (2021) affirmed that the overall inefficiency and ineffectiveness in public service can be attributed to excessive bureaucratic procedures, political interference, subpar working conditions, and weak work ethics.

In addition, the present state of community involvement in UHC initiatives such as procurement, coordination, assessment and utilization of UHC services ensure an unwavering commitment to continuous quality improvement, thereby fostering superior health outcomes. This shall be achieved through the implementation of a harmonized quality framework, meticulously overseeing the registration, licensing, gazettement, inspection, and certification of health services. The findings are in agreement with Pande (2019) who established that the community involvement in UHC initiatives and the unique nature of hospital operations are as a result of effective management, digital technology, conflict of interest and processes.

4.7 Inferential Statistics

Having carried out the descriptive statistics the study employed inferential statistics so as to draw conclusions and recommendations. This probed the presumption that the independent variables have an influence on the dependent variable. Inferential analysis was used to determine the relationship between independent variables (management competence, digital technology, conflict of interest and bureaucratic obstacles) and dependent variable (sustainability of UHC). The main inferential measures that were used included the R-squared (R2), the P-value, and Beta coefficients. For the overall fit of the model, the F-statistic and t-statistic were utilized to conduct significance tests. A 95% confidence level was utilized to conduct the regression analysis.

4.7.1 Model Summary

Table 4.7 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.854[a]	0.729	0.718	0.26089

a. Predictors: (Constant), Management competence, digital technology, conflict of interest and bureaucratic obstacles

The R squared value of 0.729 unveils the profound interplay between various factors and the sustainability of UHC in Machakos County. This extraordinary statistic unveils that a remarkable 72.9% of the variation in the dependent variable, the sustainability of UHC in Machakos County, can be attributed to the independent variables of management competence, digital technology, conflict of interest, and bureaucratic obstacles. These findings elegantly affirm the existence of a moderate relationship between the independent variables and the dependent variable.

4.7.2 Analysis of Variance

The study also included an analysis of variance (ANOVA) to assess if the model linking independent variables to the dependent variable was statistically significant.

Table 4.8 ANOVA (Model Significance)

	Sum of Squares	df	Mean Square	F	Sig.
Regression	2.753	4	0.6882	3.517	0.0245[b]
Residual	4.043	75	0.0539		
Total	6.795	79			
Dependent Variable: Sustainability of UHC in Machakos County					
Predictors: (Constant), Management competence, digital technology, conflict of interest and bureaucratic obstacles					

According to the results in Table 4.8, the significance value was 0.0245 which is less than 0.05. As shown in Table 4.8, the F calculated was 3.517 and the F-critical from F-distribution table was 2.446. Since the F calculated was greater than the F critical and the p-value (0.000) was less than the significance level (0.05), the model was considered as a good fit for the data. From these results, the model was statistically significant in assessing the relationship between the independent and dependent variable thus a good fit for the study.

4.7.3 Regression Coefficients

The study incorporated the regression coefficient outcomes to demonstrate how alterations in the independent variable can impact the variation observed in the dependent variable. The regression results are meticulously detailed in Table 4.9

Table 4.9 Model Coefficients

	Unstandardized Coefficients		**Standardized Coefficients**		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	0.415	0.084		4.9405	0.011
Management competence	0.589	0.096	0.555	6.1354	0.000
Digital technology	0.327	0.101	0.201	3.2376	0.001
Conflict of interest	-0.412	0.174	-0.286	2.3678	0.000
Bureaucratic obstacles	-0.112	0.105	-0.941	1.0667	0.087
Dependent Variable: Sustainability of UHC in Machakos County					

The study had adopted a regression model in the form of:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta n \sum Zn + \varepsilon$$

Where;

Y = Sustainability of UHC in Machakos County

$\mathbf{X_1}$ = Management competence

$\mathbf{X_2}$= Digital technology

$\mathbf{X_3}$= Conflict of interest

$\mathbf{X_4}$ = Bureaucratic obstacles

Zn (set of sustainable UHC controls: Government policy (Equity & Efficiency)

ε = Error term

$\boldsymbol{\beta_0}$= Regression constant or intercept,

$\boldsymbol{\beta_1}$, $\boldsymbol{\beta_2}$, $\boldsymbol{\beta_3}$ and $\boldsymbol{\beta_4}$ are the unknown coefficients of independent variables.

The optimal model of the study becomes

Y = 0.415 + 0.589(Management competence) + 0.327(Digital technology) - 0.412(Conflict of interest)-0.112(Bureaucratic obstacles) + 0.084

According to the analysis, management competence plays a pivotal role in influencing the sustainability of UHC in Machakos County, Kenya. This is exemplified by a Beta value of 0.589 and a sig value of 0.000<0.05. The outcomes suggest that a one-unit increase in management competence leads to a substantial 0.589-unit enhancement in the sustainability of UHC in Machakos County. These results align with the assertions of Estin (2018), who highlighted the advantages of efficient management competence as it bolsters operational capacity within organizations. The results tallies with Ruiters (2019) who noted that digital technology aim to introduce advanced management approaches that improve performance of organizations.

The results further shows that conflict of interest bears a positive and significant effect on sustainability of UHC in Machakos County, Kenya. The data reveals a Beta value of -0.412 and a significant value of 0.000<0.05. This suggests that increasing conflict of interest practices by one unit leads to a 0.412 unit decrease in the sustainability of UHC in Machakos County. These findings align with Tsai and Shih (2019), emphasizing the critical consideration of conflict of interest's potential impact due to its possible adverse

consequences on the organization. The results are in tandem with Simamora and Nugraha (2021) who established that greater coordination and less flexibility are associated with high centralization rates, while greater flexibility and less coordination are associated with high centralization rates.

4.8 Content Analysis

The study interviewed a set of key informants at the county referral hospital who shared insights, experience, and knowledge on factors influencing the sustainability of universal health coverage (UHC) in Kenya. For purposes of anonymity in the study, the key informant's responses are analyzed on codes (KI01-KI08). The findings are discussed below:

In an interview on 14th May 2024, when asked how they contributed to the advancement of Machakos County's Universal Health Coverage (UHC) initiatives, a key informant, KI07 (a public health worker) expressed that *"the advancement of Machakos County's Universal Health Coverage (UHC) initiatives was significantly impacted by the strengthening of community health programs and empowering communities to take charge of their health"*.

In a follow-up question, the study sought to identify potential challenges hindering UHC policies and its implementation. Respondents were asked to elaborate any difficulties they have encountered putting UHC policies into practice. During the interview on 13th, May 2024, KI04 stated that "*Implementing Universal Health Coverage (UHC) policies faces various challenges, including weak health systems, resource constraints, and difficulties in reaching vulnerable populations, as well as issues with coordination and accountability"*.

Same sentiments were echoed by KI08, who was interviewed on 15th, May 2024 and was of the view that *"delays in the flow of funds from the national government to healthcare facilities and KEMSA (Kenya Medical Supplies Agency) has disrupted operations and procurement"*

This could suggest that the county referral hospital under study was struggling to handle increased demand resulting from UHC initiatives, leading to overcrowding and shortages of resources.

When asked to paint a picture on the present state of community involvement in UHC initiatives, an Interview with KI08 and KI02 who were interviewed on 14th, May 2024 and 13th, May 2024 respectively agreed unanimously that "*inadequate infrastructure, lack of qualified personnel, and poor management can hinder the effective delivery of UHC services in the county referral facility"*

Same sentiments were echoed by KI03, who was interviewed on 15th, May 2024 and stated that *"insufficient funding is a major hurdle, impacting the ability to scale up services and cover the costs of UHC".*

Interview with the staff from the county referral hospital shared the same perspective. The key informant, KI06 interviewed on 14th, May 2024 narrated that "*many countries, especially low and middle-income nations, face significant challenges in adequately funding their health systems. The World Bank estimates that 41 countries, many of them low- and middle-income, will face stagnation or contraction of government spending on health over the next five years. Governments in low-income countries spend less than 2% of GDP on health, and governments in lower middle-income countries spend less than 3%".*

This goes to mean that lack of clarity on the UHC benefit package and how it relates to existing health financing arrangements had led to confusion and poor understanding among stakeholders.

Interview with first female public health worker (KI05) interviewed on 15th, May 2024 at the county referral hospital collaborates the same views that *"financial hardship due to out-of-pocket health spending is more prevalent among people living in poorer households, rural areas, and in households with older family members"*

The study sought to find out the elements that are most important to UHC's sustainability in the county referral hospital. In an interview with KI03 interviewed on 15th, May2024

was of the view that "*for sustainable Universal Health Coverage (UHC) in our county, strong financial planning, robust healthcare infrastructure, and a focus on primary healthcare are crucial, alongside community engagement and effective governance".*

The same sentiments were upheld by KI04 and KI01 interviewed on 15th, May 2024 and 13th, May 2024 respectively. KI04 stated that *"reliance on a single funding source can be precarious. We need to explore multiple avenues, including government allocations, user fees (where appropriate and affordable), and community-based financing schemes".*

KI01 explained that *"by fostering a strong partnership between government agencies, healthcare providers, and other stakeholders the county healthcare facility can ensure a coordinated approach to UHC implementation"*

Further, in an interview with KI06 interviewed on 14th, May 2024 opined that *"by involving communities in planning and decision-making processes related to healthcare, this alone will ensure that services are responsive to their needs".*

Lastly, the study sought to understand the future of UHC in the county referral hospital. Respondents were asked to give opinions on how they envisioned the future of UHC in Machakos County, and what strategies they believed were necessary for its continued success.

In an interview with KI04 on 13th, October 2024, the key informant stated *"to achieve a successful Universal Health Coverage (UHC) in Machakos County, a focus on strengthening community health initiatives, ensuring financial stability, and improving healthcare infrastructure and workforce is crucial".*

In addition, KI08 interviewed on 14th, October 2024 argued that *"the county government must retain and motivate healthcare workers by addressing issues such as low salaries and lack of training opportunities".*

CHAPTER FIVE
DISCUSSION, CONCLUSIONS AND RECOMMENDATION

5.1 Introduction

In this section lies an intricate portrayal of the study's concise findings, conclusions, and recommendations on factors influencing the sustainability of Universal Health Coverage in Machakos County, Kenya. The study was meticulously crafted to assess the effect of management competence, digital technology, conflict of interest and bureaucratic obstacles on sustainability of UHC in Machakos County. Additionally, the study's specific objectives encompassed evaluating the effect management competence, digital technologies, conflicts of interest and bureaucratic procedures on UHC in Machakos County, Kenya.

5.2 Discussion of the Findings

In this particular section, a comprehensive synthesis is presented, encapsulating the factors influencing the sustainability of Universal Health Coverage in Machakos County, Kenya. Through a meticulous amalgamation of descriptive and inferential analyses, a myriad of compelling findings has been unveiled, as outlined below.

5.2.1 Management Competence and Sustainable Universal Health Coverage

Based on the descriptive statistics the highest mean = 3.6 (SD = 0.92) revealed that management competence establishes structures and processes that allow management to work together to improve teaching and learning. This is exemplified by a Beta value of 0.589 and a sig value of 0.000<0.05. The outcomes suggest that a one-unit increase in management competence leads to a substantial 0.589-unit enhancement in the sustainability of UHC in Machakos County. These results align with the assertions of Estin (2018), who highlighted the advantages of efficient management competence as it bolsters operational capacity within organizations.

According to Wilson et al. (2021) the implementation process is often disrupted by political and administrative obstacles, as well as limitations in resources and finances. Moreover, the political context in which decisions regarding UHC are made also plays a significant role. Ochola, Elliott and Karanja (2021) concur that issues associated to UHC include the requirement for qualified healthcare providers, accessibility of

pharmaceuticals, and availability of critical equipment. In the Kenyan context lack of experience, qualification concerns, insufficient management competency, and political will, demand comprehensive and integrated solutions.

5.2.2 Digital Technology affects and Sustainable Universal Health Coverage

The study has revealed that the highest number of the respondents, mean = 3.69 (SD=0.95) were of the view that technology has improved efficiency through electronic health records and mHealth applications. This is exemplified by a Beta value of 0.327 and a sig value of 0.001<0.05. The outcomes suggest that a one-unit increase in digital technology leads to a substantial 0.327-unit enhancement in the sustainability of UHC in Machakos County. The results tallies with Ruiter's (2019) who noted that digital technology aim to introduce advanced management approaches that improve performance of organizations.

From the study, the utilization of digital technologies has proven to be advantageous in the attainment of Universal Health Coverage. By facilitating access to reliable evidence and digital data, these technologies empower healthcare professionals to make well-informed decisions and provide comprehensive health services of superior quality to all individuals. The same sentiments were echoed by Lygidakis, McLoughlin and Patel (2019) who reported that digital technology brings efficiencies, controls and quality to areas of health finance, referrals, continuity of care and knowledge management. To achieve the ambitious goal of universal health coverage, the integration of digital technology is imperative. However, the continent faces several challenges in effectively implementing these technologies on a larger scale.

The utilization of digital technologies in healthcare brings forth numerous potential benefits, including improved accessibility to healthcare services, especially for individuals residing in remote and underserved areas. According to Rudin (2020), the adoption of suitable digital health technologies is a vital aspect of a national strategy, although it may present difficulties, particularly in low- and middle-income countries. An interoperable digital health infrastructure should support the seamless and secure transfer of health information among users, healthcare providers, healthcare system managers,

and health data services. Furthermore, it enhances the safety and quality of healthcare services and products, provides health workers and communities with better knowledge and access to health information, thereby increasing the productivity of the healthcare workforce. Additionally, it encourages a higher uptake of health services.

5.2.3 Conflict of Interest and Sustainable Universal Health Coverage

The study found that majority of the respondents, mean =3.58 (SD= 1) supported the idea that conflict of interest shape how accurately the success of contested policies is evaluated and reported. This is exemplified by a Beta value of -0.412 and a sig value of 0.000<0.05. The outcomes suggest that a one-unit increase in conflict of interest leads to a substantial 0.412-unit decrease in the sustainability of UHC in Machakos County.

Numerous authors have supported that conflict of interest in the formulation of public policy, particularly in the realm of health and nutrition, such as vaccine policies, disease control, and health-related research, can have detrimental effects on the well-being of countless individuals. According to Takura and Miura (2022) conflicts of interest arise from either institutional or personal factors, and can be influenced by financial considerations or other interests, such as post-employment opportunities or public-private partnerships. The diverse nature of healthcare systems and intricate care pathways are further complicated by inadequate governance mechanisms, which heighten the likelihood of conflicts of interest and pose challenges in addressing them within existing regulatory and policy frameworks. This includes measures like self-disclosure requirements or malpractice procedures.

Nygren-Krug, (2019) pointed that one type of conflict of interest arises when policy makers or regulators assume multiple or dual roles. In such cases, their professional decisions can be influenced by other relationships that involve financial, social, or familial ties with the institutions or industries they are responsible for regulating. For instance, individuals who own pharmaceutical companies or have family members in such positions often hold decision-making power in drug regulatory agencies. These agencies are tasked with formulating and implementing policies related to drug quality and ethical marketing practices. As a result, decision makers may have an incentive to

shape new policies or allocate resources in a way that protects the sales of medicines, thereby safeguarding their own financial interests or those of their close associates.

Ergo, Htoo, Badiani-Magnusson and Royono (2019 reiterated that hidden financial relationships between licensed and unlicensed health-care providers can lead to conflicts of interest. These conflicts arise when informal providers financially support formal providers, who then publicly advocate for stricter regulations on the informal health-care sector. However, behind the scenes, these formal providers use their influence to hinder policies that restrict informal practice. In certain countries, doctors and pharmacists unlawfully lease their professional licenses to establish drug shops and clinics. These establishments are staffed by lower-paid attendants who often lack the necessary qualifications. Implementing policies to address the inappropriate delivery of health care by unqualified providers in these drug shops and clinics would diminish a source of income for doctors and pharmacists, resulting in their implicit opposition.

5.2.4 Bureaucratic Obstacles and Sustainable Universal Health Coverage

The study found that majority of the respondents, mean =3.59 (SD= 1.02) affirmed that unauthorized or hidden payments have flourished in the absence of accountability. This is exemplified by a Beta value of -0.112 and a sig value of 0.087<0.05. The outcomes suggest that a one-unit increase in bureaucratic obstacles leads to a substantial 0.112-unit decrease in the sustainability of UHC in Machakos County.

The findings are in agreement with Pande (2019) who established that the unique nature of hospital operations makes bureaucracy unsuitable for effective management. Bureaucratic processes and negative work attitudes have plagued the public sector, leading to a decline in service quality. In the healthcare sector, inefficiencies are widespread, with various factors such as patient-related issues, health worker behavior, and employer practices contributing to substandard service delivery. Government hospitals and healthcare facilities face challenges such as poor responsiveness and attention, resulting in detrimental effects on citizens' health. Folayan (2021) affirmed that the overall inefficiency and ineffectiveness in public service can be attributed to excessive bureaucratic procedures, political interference, subpar working conditions, and

weak work ethics. Despite the principle of impersonality in public bureaucracy, there remains a disconnect between bureaucratic organizations and the general population.

5.3 Conclusions

The study concludes that a great deal of UHC can be as a result of management competence. The study established that management competence coordinates procedures for assessment and placement of technicians in appropriate UHC programs at appropriate functioning levels and that it supports all staff in integrating into UHC program roles as workers, citizens, and family and community members.

The study deduces that through digital technology, the management of UHC has efficiently and equitably allocated resources. Digital technology has enhanced extensive collection, storage, and analysis of sensitive health data necessitate robust protection measures to prevent unauthorized access. From the study, technology has improved efficiency in patient-doctor relationships, managing and monitoring health as well as enhancing access to healthcare in the County. Digital technology has contributed immensely towards sustainable UHC in the County.

The study further concludes that there is minimal progress and development of the UHC program due to conflict of interest within the healthcare and conflict of interest is costly and adds more unnecessary expenses to the UHC program. Conflict of interest affects the success of UHC policies, it creates a hub that impede UHC policies in public health. This is evidence that conflict of interest presents opposition to policy implementation of UHC program which has influence on agenda-setting and policy formation and prevents inventory of medicines and drugs. From the study findings, conflict of interest contributed negatively toward realization of sustainable UHC in the County.

The study further deduces that bureaucracy weakens the existing public health system because of the greater likelihood of people opting for private healthcare, bureaucracy blocks the inclusion of all relevant stakeholders and there is huge data deviation among suppliers and patients. Bureaucracy blocks the inclusion of stakeholders; it weakens the existing public health system and the processes used in UHC create room for non-accountability in the County. According to the results, bureaucratic obstacles have

contributed to sustainable UHC in small magnitudes. The complicated processes involved in the implementation of UHC policies have had a negative.

5.4 Recommendations

Based on the study findings the following recommendations were made;

Management of human resources for health should be strengthened to ensure that healthcare workers are motivated and responsive. This can be achieved through the development of comprehensive job descriptions and schemes of service, providing opportunities for professional development, creating conducive work environments, and implementing effective supervision and administration practices.

To enhance efficiency of quality care and equitable distribution of resources; management should invest, upgrade and leverage on technology available in the health sector.

To minimize conflict of interest; management should adopt best management where staff declare conflict of interest on any assignment given. This ensures all health policies, directions and guidelines are done for the general good of the public.

Further, the study recommends the streamlining of the bureaucratic process involved in the accreditation process of health service providers and registration of citizens. This ensures ease of access of services covered and that all relevant stakeholders are on-boarded and enlisted in the delivery of universal health.

5.5 Areas for Further Studies

This study was limited to the county referral hospital; it will be therefore interesting to compare findings to lower-level facilities at the sub-county and at the ward levels that are the first line of defense on matters health.

Despite health function being decentralized; further studies at the national level can be undertaken to inform policy decision and budgetary allocation to devolved functions in the country and facilitate better health initiatives including universal health coverage.

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APPENDICES

APPENDIX A: INTRODUCTION LETTER TO THE PARTICIPANTS

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: REQUESTING FOR PERMISSION TO CONDUCT ACADEMIC RESEARCH

I am Hawa Yusuf Billow, pursuing a postgraduate degree in Development Finance at Strathmore Business School (SBS), Nairobi. As part of the requirements of my degree, I am supposed to conduct a research study related to Development Finance in order to qualify for the award of Masters of Science degree in Development Finance. Therefore, this research study seeks to investigate the **Factors influencing the sustainability of Universal Health Coverage in Machakos County, Kenya**. I am writing to kindly request you to fill this questionnaire appropriately with any relevant information you may possess. Any information you will provide will be regarded as confidential. Thank you for your support.

Sincerely

Hawa Billow
Strathmore Business School

APPENDIX B: RESEARCH QUESTIONNAIRE

This questionnaire aims to gather information on the factors influencing the sustainability of Universal Health Coverage (UHC) in Machakos County, Kenya. The survey is organized into three sections, and your responses are crucial for academic purposes. Rest assured, all provided information will be treated with strict confidentiality and anonymity.

Dependent Variable: Sustainability of Universal Health Coverage in Machakos County, Kenya

SECTION A: PERSONAL INFORMATION

1. Age:

18-22 years	[ ]	23-27 years	[ ]
28-32 years	[ ]	33-37 years	[ ]
38-42 years	[ ]	Over 43 years	[ ]

2. Gender:

Male	[ ]	Female	[ ]

3. Education Level:

Primary school certificate	[ ]	Secondary school certificate	[ ]
Diploma	[ ]	Bachelor's Degree	[ ]
Masters	[ ]	PhD	[ ]

4. Profession/Position in the Institution:

Physician	[ ]	Nurse	[ ]
IT technician	[ ]	Human resource officer	[ ]
Pharmacist	[ ]	Casual laborer	[ ]

5. Job Tenure:

Less than 5 years	[ ]	5-7 years	[ ]
8-10 years	[ ]	11-15 years	[ ]
Above 15 years	[ ]		

SECTION B: MANAGEMENT COMPETENCE

8. Kindly indicate your level of agreement or disagreement on the following statements concerning the effect of management competence on sustainable UHC on a scale of 1-5: (where: 5- Strongly Agree; 4-Agree; 3-Neutral; 2- Disagree; 1- Strongly Disagree).

No.	***Indicator***	***1***	***2***	***3***	***4***	***5***
1.	Establishes structures and processes that allow management to work together to improve teaching and learning.					
2.	Supports individuality of healthcare providers approaches to implementation of the UHC.					
3.	Supports all staff in integrating into UHC program roles as workers, citizens, and family and community members.					
4.	Coordinates procedures for assessment and placement of technicians in appropriate UHC programs at appropriate functioning levels.					
5.	Researches and/or conducts community needs assessments to determine healthcare needs.					
6.	Assesses and/or reviews management needs on an individual basis through observations, meetings, written goals and plans, and assessment instruments.					
7.	Assists the UHC program in incorporating technology into instructional practices.					

9. What percentage of sustainable UHC can be attributed to management competence?

0-20% [ ] 21-40% [ ]

41-60% [ ] 61-80% [ ]

81-100% [ ]

SECTION C: DIGITAL TECHNOLOGY

10. Kindly indicate your level of agreement or disagreement on the following statements concerning the effect of digital technology on sustainable UHC on a scale of 1-5: (where: 5- Strongly Agree; 4-Agree; 3-Neutral; 2- Disagree; 1- Strongly Disagree).

No.	***Indicator***	***1***	***2***	***3***	***4***	***5***
1.	Digital technology has enhanced access to care in remote areas through telemedicine					
2.	The technology has improved efficiency through electronic health records and mHealth applications					
3.	Digital technology has enhanced extensive collection, storage, and analysis of sensitive health data necessitate robust protection measures to prevent unauthorized access.					
4.	The technology has brought a better patient-doctor relationships.					
5.	Using digital health technologies, patients can actively manage their own health and monitor any irregularities that they may experience.					
6.	Through digital technology, the management of UHC has efficiently and equitably allocated resources.					
7.	Digital health technology has the potential to reduce the cost of health care services.					

11. What percentage of sustainable UHC can be attributed to digital technology?

0-20% [ ] 21-40% [ ]

41-60% [ ] 61-80% [ ]

81-100% [ ]

SECTION D: CONFLICT OF INTEREST

12. Kindly indicate your level of agreement or disagreement on the following statements concerning the effect of conflict of interest on sustainable UHC on a scale of 1-5: (where: 5- Strongly Agree; 4-Agree; 3-Neutral; 2- Disagree; 1- Strongly Disagree).

No.	*Indicator*	*1*	*2*	*3*	*4*	*5*
1.	Conflict of interest has a more direct influence on agenda-setting and policy formation.					
2.	Conflict of interest can prevent issues related to sales of medicines from featuring prominently on the policy agenda.					
3.	Conflict of interest has presented opposition to policy implementation of UHC program.					
4.	Conflict of interest shape how accurately the success of contested policies is evaluated and reported.					
5.	Conflict of interest create a hub that impede policies that prioritise public health.					
6.	There is minimal progress and development of the UHC program due to conflict of interest within the healthcare.					
7.	Conflict of interest is costly and adds more unnecessary expenses to the UHC program.					

13. What percentage of sustainable UHC can be attributed to conflict of interest?

0-20% [ ] 21-40% [ ]

41-60% [ ] 61-80% [ ]

81-100% [ ]

SECTION E: BUREAUCRATIC OBSTACLES

14. Kindly indicate your level of agreement or disagreement on the following statements concerning the effect of bureaucratic obstacles on sustainable UHC on a scale of 1-5: (where: 5- Strongly Agree; 4-Agree; 3-Neutral; 2- Disagree; 1- Strongly Disagree).

No.	***Indicator***	***1***	***2***	***3***	***4***	***5***
1.	UHC programs, private providers must go through a cumbersome formal accreditation process.					
2.	Both government officials and citizens try to navigate regulatory systems to exploit situations where rules are conflicting or unclear.					
3.	Unauthorized or hidden payments have flourished in the absence of accountability.					
4.	There is huge data deviation among suppliers and patients					
5.	Bureaucracy weakens the existing public health system because of the greater likelihood of people opting for private healthcare					
6.	Blocks the inclusion of all relevant stakeholders					
7.	National and county politics surrounding healthcare inhibit policy implantation of UHC.					

15. What percentage of sustainable UHC can be attributed to bureaucratic obstacles?

0-20%	[ ]	21-40%	[ ]
41-60%	[ ]	61-80%	[ ]
81-100%	[ ]		

16. Sustainability of Universal Health Coverage in Machakos County, Kenya (Ratio/Ordinal Scale): Please rate the overall sustainability of Universal Health Coverage in Machakos County, Kenya based on your perception:

Very Unsustainable	[ ]	Unsustainable	[ ]
Neutral	[ ]	Sustainable	[ ]

Very Sustainable [ ]

SECTION F: PUBLIC PERCEPTION

17. How would you rate the current state of UHC in Machakos County?

a) Very Poor	[ ]	b) Poor	[ ]
c) Fair	[ ]	d) Good	[ ]
e) Excellent	[ ]		

18.What improvements do you think are needed to enhance UHC in Machakos County?

SECTION G: SUSTAINABILITY OF UHC

19. Sustainability of Universal Health Coverage in Machakos County, Kenya (Likert Scale): Please grade the overall sustainability of Universal Health Coverage in Machakos County, Kenya based on your perception

Very Unsustainable	[ ]	Unsustainable	[ ]
Neutral	[ ]	Sustainable	[ ]
Very Sustainable	[ ]		

THANK YOU FOR PARTICIPATING

APPENDIX C: KEY INFORMANTS' INTERVIEW GUIDE

1. How do you contribute to the advancement of Machakos County's Universal Health Coverage (UHC) initiatives?
2. Could you elaborate on any difficulties you have had putting UHC policies into practice?
3. What is your opinion of the present state of community involvement in UHC initiatives?
4. What elements, in your opinion, are most important to UHC's sustainability in our county?
5. How do you envision the future of UHC in Machakos County, and what strategies do you believe are necessary for its continued success?

These questions guided discussions with the key informants, allowing them to share their expertise and insights on the factors influencing UHC sustainability

APPENDIX D: UNIVERSITY INTRODUCTION LETTER

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Cell: +254 703 034 414/617. Twitter: @SBSKenya
Facebook/LinkedIn: Strathmore Business School

Email: info@sbs.ac.ke or visit www.sbs.strathmore.edu

Strathmore UNIVERSITY BUSINESS SCHOOL

Tuesday, April 2, 2024

To Whom It May Concern,

RE: FACILITATION OF RESEARCH – HAWA BILLOW

This is to introduce Hawa Billow, a Master of Science in Development Finance (MDF) student at Strathmore University Business School, admission number MDF/124285/19. As part of our MDF Programme, Hawa is expected to do applied research and undertake a project. This is in partial fulfilment of the requirements of the MDF course. To this effect, she would like to request appropriate data from your organization.

Hawa is undertaking a research paper on *"Factors Influencing Sustainability of Universal Health Coverage in Kenya: A Case of Machakos County"* The information obtained shall be treated confidentially and shall be used for academic purposes only.

Our MDF Programme seeks to establish links with industry, and one of the ways of doing so is directing our research to areas that would be of direct use to industry. We would be glad to share our findings with you after the research, and we trust that you will find them of great interest and of practical value to your organization.

We appreciate your support and shall be willing to provide any further information if required.

Yours sincerely,

Alois Njenga,
Manager – Graduate Programmes,
Strathmore University Business School.

Strathmore University Business School is a Proud member of:

Association of African Business Schools AABS EFMD AACSB

APPENDIX E: UNIVERSITY ETHICAL APPROVAL LETTER

Strathmore UNIVERSITY

25th March 2024

Mrs Billow Hawa,
hawa.billow@strathmore.edu

Dear Mrs Billow,

RE: Factors Influencing Sustainability of Universal Health Coverage in Kenya: A Case of Machakos County

This is to inform you that SU-ISERC has reviewed and **approved** your above SU-masters research proposal. Your application reference number is **SU-ISERC2131/24.** The approval period is from **25th March 2024 to 24th March 2025.**

This approval is subject to compliance with the following requirements:

i. Only approved documents including (informed consents, study instruments, MTA) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by SU-ISERC.
iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to SU-ISERC within 72 hours of notification.
iv. Any changes anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to SU-ISERC within 72 hours.
v. Clearance for the export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to the expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days of completion of the study to SU-ISERC.

Before commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) https://research-portal.nacosti.go.ke/ and obtain other clearances needed.

Yours sincerely,

Mr Ambrose Rachier,
Chairperson; SU-ISERC

STRATHMORE UNIVERSITY INSTITUTIONAL SCIENTIFIC AND ETHICAL REVIEW COMMITTEE
(SU-ISERC)
25-Mar-2024
Email:ethicsreview@strathmore.edu
P.O BOX 59857-00200
NAIROBI-KENYA

APPENDIX F: NACOSTI RESEARCH PERMIT

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 482708

Date of Issue: 08/April/2024

RESEARCH LICENSE

This is to Certify that Ms.. Hawa Yusuf Billow of Strathmore University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Machakos on the topic: Factors Influencing Sustainability of Universal Health Coverage in Kenya: A Case of Machakos County for the period ending : 08/April/2025.

License No: NACOSTI/P/24/34389

482708

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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