

**THE ROLE OF HEALTH SERVICES INTEGRATION IN
HEALTHCARE SYSTEM PERFORMANCE: A CASE OF HIV/AIDS
AND NCD SERVICES IN NAKURU COUNTY, KENYA.**

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METHODIST UNIVERSITY.**

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“This thesis is my original work and has not been presented for a degree or any other award in any other University.”

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DEDICATION

I dedicate this piece of work to those who lost lives as a result of fragmented Health Systems.

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I wish to express my deep gratitude to all who assisted me in undertaking this research work. A great deal of time and effort was put into this work, and it could not have been completed without the support of many individuals. This list is not all-inclusive but has only included those that were instrumental in the technical guidance to complete this thesis promptly.

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ABSTRACT

The intersection of Non-Communicable Diseases and Human Immuno deficiency Virus exacerbates morbidity and mortality, in low-and-middle-income countries. While progress has been made in raising awareness globally, challenges persist in effectively combating the rising burden of NCDs. This study aimed to develop an optimal approach for integrating HIV/NCD services to enhance population health by providing more equitable, sustainable, and cost-effective healthcare. The study objectives focused on assessing the impact of pooled resources, institutional support, health information processes, and collaborative guidelines on the integration of HIV/NCD services, while exploring the influence of organizational culture on the relationship between integrated services and healthcare system performance. Employing a mixed-method research design, the study targeted 212 healthcare workers in 146 public health facilities offering Comprehensive Care Clinic services in Nakuru County. Data collection utilized a structured questionnaire and Key Informant Interview guide with pretesting conducted to ensure tool reliability and validity. NVivo 12 software was used to analyse the qualitative data from the key informant interviews. Thematic analysis was employed for the qualitative data analysis. Statistical analyses included Chi-square tests to examine relationships between variables, and binary logistic regression to predict healthcare system performance outcomes, with rejection of null hypotheses for **P values ≥ 0.05** . The study outcomes highlight that in the setting of institutional support, the monitoring of HIV/NCD services emerged as a robust predictor of health system performance. The statistical examination unveiled notable associations: a Pearson's chi-square statistic of $\chi^2 = 3.578$, $n = 198$, **p = 0.044** for Health Information Process; $\chi^2 = 9.955$, $n = 198$, **p = 0.001** for the accessibility of information systems; and $\chi^2 = 12.285$, $n = 198$, **p = 0.001** for information sharing. Information security was also identified as a significant determinant of health system performance, with a chi-square value of $\chi^2 = 6.486$, $n = 198$, **p = 0.001**. These outcomes indicate that all facets of information processes play a critical role in forecasting health system performance. Concerning pooled resources, the analysis demonstrated that human resources significantly impacted health system performance, with a Pearson's chi-square value of $\chi^2 = 4.122$, $n = 198$, **p = 0.049**. Similarly, financing models were recognized as a significant predictor, with a chi-square value of $\chi^2 = 12.203$, $n = 198$, **p = 0.001**. These results underscore the significance of resource distribution and administration in determining health system performance. Furthermore, a multivariate analysis illustrated that the five independent factors explained 36.9% of the variance in health system performance. The study results also proved that (20% or 30% or 50%) cost would be saved and patients waiting time would be reduced if HIV and NCD services are integrated. In conclusion, a multisector approach would ensure that the study findings can have a meaningful impact across different levels of healthcare delivery and policymaking. The study recommends a team oriented organisational culture, it would lead to full integration of HIV/NCD services that would ultimately improving the overall quality and sustainability of healthcare system.

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ABBREVIATIONS AND ACRONYMS

ART	Antiretroviral Therapy
ASCUS	Atypical Squamous Cells of Undetermined Significance
CBHI	Community Based Health Insurance
CCC	Comprehensive Care Clinics
CHE	Current Health Expenditure
CIN	Cervical Intraepithelial Neoplasia
CMBS	Civil Servant Medical Benefit Scheme
DALYs	Disability-Adjusted Life Years
GBD	Global Burden of Disease
GDP	Gross Domestic Product
HAART	Highly Active Antiretroviral Therapy
HCS	Health Card Scheme
HIV	Human Immunodeficiency Virus
HPV	Human Papilloma Virus
HSIL	High-Grade Squamous Intraepithelial Lesions
HTN	Hypertension
ICD	International Classification of Diseases
LICS	Low Income Card Scheme
LMICs	Low And Middle-Income Countries
LSIL	Low-Grade Squamous Intraepithelial Lesions
NCDs	Non-Communicable Diseases
NHIF	National Hospital Insurance Fund
OOP	Out of Pocket Payment
PLWHIV	People Living With HIV
SDG	Sustainable Development Goal
SSA	Sub-Saharan Africa
THE	Total Health Expenditure
UHC	Universal Health Coverage
WHO	World Health Organization
YLD	Years Lived with Disability

CHAPTER ONE: INTRODUCTION

1.1 Background

Healthcare plays a critical role in the global landscape, and every country strives to strengthen its health system. To strengthen the health system, attention must be paid to all six pillars of the health system including healthcare professionals, service delivery, financing, health information, medical products and technologies, and stewardship and governance. Each pillar contributes significantly to strengthening the health system (World Health Organization [WHO], 2013).

Governance functions ensure tactical policy structures exist and coupled with functional oversight, making people charge their lives and fund to all healthcare systems. The government performs administrative roles by developing and implementing policies that affect the functioning of other health systems. Healthcare practitioner interventions address workforce issues such as inequity, low motivation, and diminished ability. Health products and technologies solve the problem of access to essential medicines and supplies. This is essential for the exceptional performance of health systems. Health care data and information help in decision making, inform and guides decisions in the entire health system (WHO, 2013). Healthcare financing involves how the money will be raised, who will pay for care, how will the payment be done and when the money raised will be spent. This, therefore, emphasises the need to raise sufficient healthcare finances to provide people access to healthcare services they need and to protect them from

the financial strain and impoverishment. It, therefore, calls for the efficient use of available resources.

Efficiency and Effectiveness in service delivery are key contributors to the desired performance and reaching goals of an organization. This study focus was on efficiency considering economic performance where wastage of scarce resources should be minimized or eliminated. Effectiveness on the other hand was considering the operational performance that should lead to a satisfied client. The aim is to give healthcare organizations a competitive edge derived from the organization's capabilities and resources. An organisation is termed to perform well if it has established an organizational structure and procedures, that involve and incentivise workers to provide high-quality services that fulfil the requirements of clients by maximizing the utilization of resources within the company. The World Health Organization (WHO) and other institutions have endorsed integration as the best strategy to address the interrelated health issues in high-risk groups as a means of driving towards achieving efficiency and effectiveness (WHO, 2013).

Health care funding remains an important element of a county's social and economic growth and ensures access to quality and reasonably priced health care. The goal to achieve the criteria of healthcare is set out in the Constitution of Kenya 2010 (Kenya Law, 2013) hence the need to better coordinate operations in the health system. Integration of services helps cope with these inefficiencies. The integration of Human Immunodeficiency Virus/ Non-communicable diseases (HIV/NCD) services employing a model of integrated care can optimise health

outcomes of HIV and NCD patients and enhance service delivery, especially in resource-poor healthcare systems. Integration of these services implies coordination of supplies, health services and client processes that requires the comprehensive and factual information flow depending on the different patient needs. This study explores the role of integration of HIV/NCD services on health system performance in service delivery. The integration aims to address the practical barriers including leveraging on available resources, interaction, collaboration and teamwork (Srivastava & Singh, 2020).

Chronic conditions such as diabetes, cancers, cardiovascular diseases, and mental health disorders are widespread among HIV positive people, posing challenges to advancement of HIV treatment initiatives. They increase impairment and death among HIV positive people in Sub-Saharan Africa (SSA) (Kemp et al., 2018). HIV infection increases the susceptibility to non-communicable diseases (NCDs) as a result of elevated inflammatory markers and negative effects associated with antiretroviral therapy. Factors such as tobacco smoking, alcohol misuse, inadequate dietary habits, and sedentary lifestyle contribute to the higher risk of NCD development (The Joint United Nations Programme on HIV/AIDS, 2019). Achieving high viral suppression and longer life expectancy in People living with HIV (PLWHIV), along with improved access to care, extend the timeframe during which NCDs can advance as PLWHIV grow older (Negin et al., 2012). The high prevalence of hypertension in PLWHIV is linked to chronic inflammation, increased microbial translocation and kidney disease, vascular impairment due to prolonged antiretroviral therapy (ART) exposure, and behavioural risk factors

associated with PLWHIV (Marcus et al., 2020). Women living with HIV are more susceptible to human papillomavirus (HPV) infection, pre-cancerous conditions, and invasive cervical cancer, partly because HIV alters the progression of HPV-related diseases (Gui et al., 2018). These compounding issues lead to a higher cost incurred by both the patient and healthcare facility in managing and treating them.

The integration approach envisioned in this study factored institutional backing, information systems, partnership and professional alignment to strengthen the operational efficiency of HIV/NCD care (Small et al., 2013). There is also a need to improve the health, citizen's welfare and economic goals including cost reduction, coherent use of resources and more satisfactory performance of healthcare organisations. The patient-centred approach is driven by information exchange.

The efficiency of HIV/NCD integration is complex and depends on how the information channelled will be utilised and processed. Decisions regarding cost and quality healthcare made by healthcare managers rely on seamless flow of information to facilitate the successful delivery of healthcare (Dubey et al., 2019). Thus, taking this into account, the study has developed a model to improve HIV/NCD integration for operational efficiency by focusing on internal exchanges between the health system stakeholders. Thus, the primary drive for HIV/NCD service integration is executing integrated program management leveraging available resources for purposes of improved health system performance.

Masupe et al. (2019) report that worldwide the re-engineering of healthcare delivery systems is actively transitioning to cater for dual burden effects due to chronic diseases and NCDs. Therefore, it is crucial to understand how available resources can be utilised for the management of HIV and NCDs conditions since it's a suggestion of a prospective channel for health system sustainability. HIV clinics can be used for NCDs treatment. HIV/NCD services integration sustains the health system by sharing resources, increasing demand by improving general perception of quality of services offered.

More than half of the in-patients and 40% of hospital deaths occur within hospitals. In Kenya the deaths were due to NCDs as reported in DHIS2 in MoH Kenya (Ministry of Health [MoH], 2021). HIV services are independent, delivered vertically, decentralised and implemented via task shifting, with the aim of treating numerous patients (Masupe et al., 2019). The effects of HIV NCD comorbidity are recognized globally, are complex to manage and challenging for the health system, patients, and caregivers. Guidelines developed when a single disease frame was dominant are inclined to isolate diseases instead of the needs and situations of individuals with compounded health needs. Understanding burden of HIV and the most common NCDs, identifying changing needs and investigating how responsive the health system is to this conflicting epidemic will shape the management and strengthen integrated care. Therefore, the study has established that the best framework for integration of HIV/NCD services, should embrace an organisation culture that is team oriented and innovative, and all available resources should be utilised from a pool.

1.2 Statement of the Problem

The transition from external aid is no longer a distant outlook, but a reality (Cheboi, 2014). Workforce shortages, persisting cost inflation, and the need for health services have heightened the need for improved utilization of scarce resources through health services integration. Kenya is experiencing an epidemiological transition, with NCDs becoming a public health concern. Forty one percent (41%) of all mortalities in the Kenya are attributed to NCDs while over 40% of the hospital admissions are due to NCDs (MoH, 2021).

According to the NHA (2021); HIV/AIDS and NCDs resource allocation for 2018/2019 was as follows: for NCDs the government funded 58.7%, Households 23.8%, Corporations 13.4%, partners 4.1% while for HIV/AIDs partners fund 69.1%, government 23.6%, households 4.5% and corporations 2.7%. Once the partners completely withdraw their support it means the government, which is already the highest funder of the NCD at 58.7% have to take the burden the partners who fund HIV/AIDs at 69.1% and the 4.1% funding for NCDs. This will have a negative impact on the government resource allocation or lead to having to transfer the burden to households. Therefore, the need to strategize best way of managing the additional costs that the partners were bearing.

More recently, many donors have adjusted their allocations to most countries Kenya included. They aim to encourage minimal dependence on external resources, especially in countries where the national economy has the potential to raise more healthcare resources. With external funding for Kenya's health programs

declining significantly, the Ministry of Health (MoH) needs to ensure the long-term sustainability of Kenya's health programs either through further efforts to mobilize domestic resources or utilize the available resources efficiently. Comprehensive strategies need to be developed to guide the gradual transition from donor-funded to government-funded health programs and systems. One approach could involve integrating HIV services with NCD prevention and management programs to create synergies and maximize impact. By demonstrating the interconnectedness of these health issues and advocating for integrated approaches, organizations can attract funding for comprehensive health programs that address both HIV and NCDs. Collaboration with stakeholders, prioritizing cost-effective interventions, and advocating for sustainable funding models are also essential strategies to ensure continued support for combating both HIV and NCDs in a changing funding environment.

NCDs are on the rise as shown by Abubakar et al. (2015) and 2016 Global Burden of Disease (GBD) studies. HIV/AIDS a communicable is also a major concern worldwide. Moreover, NCDs are closely interconnected to infectious diseases, worsening sickness and mortality. NCDs have a significant global impact among PLWHIV has increased sharply with low-and-middle-income countries (LMICs) most heavily affected by this (Kintu et al., 2020). In spite of the growing eagerness for HIV/NCD service integration, there is a dearth of information on implementing and evaluating integrated care services. There is little guidance for planners and decision-makers on how to implement integrated care services. This study aims to provide that information as well strengthen both health service delivery and health

financing pillars concerning integrating the HIV and NCD services through health systems thinking approach intervention, with a goal to improve the health system performance.

1.3 Purpose of the Study

To develop an approach that informs HIV/NCD services integration as a key component of healthcare system sustainability in Kenya for improved healthcare system performance.

1.4 Study Objectives

1.4.1 Specific Objectives

- i.To determine the influence of institutional support for HIV/NCD integrated services on healthcare system performance in Nakuru County
- ii.To examine the influence of health information processes for HIV/NCD integrated services on healthcare system performance in Nakuru County
- iii.To investigate the influence of pooled resources for HIV/NCD integrated services on healthcare system performance in Nakuru County
- iv.To establish the influence of HIV/NCD integrated collaboration guidelines on healthcare system performance in Nakuru County
- v.To determine the moderating effect of organizational culture on the relationship between integration of HIV/NCD services and healthcare system performance in Nakuru County

- vi. To develop an HIV/NCD integration model for healthcare providers that will improve healthcare system performance in Nakuru County

1.5 Study Hypotheses

A hypothesis derives predictions about the findings of prospective experiments and confirms if the findings support the predictions made. Scientific hypotheses are defended or renounced through well-thought analysis. The study sought to test the following hypotheses;

H₀₁. Institutional support of HIV/NCD integrated services has no significant influence on Healthcare System Performance

H₁. HIV/NCD integrated services institutional support significantly influences Healthcare system performance.

H₀₂. HIV/NCD integrated health information processes have no significant influence on Healthcare System Performance.

H₂. HIV/NCD integrated health information processes significantly influence the performance of Healthcare System.

H₀₃. There is no significant influence of HIV/NCD integrated pooled resources on Healthcare System Performance.

H₃. There is a significant influence of HIV/NCD integrated pooled resources on Healthcare System Performance.

H₀₄. HIV/NCD integrated collaboration guidelines have no significant influence on Healthcare System Performance.

H₄. HIV/NCD integrated collaboration guidelines significantly influence Healthcare System performance.

H₀₅. The relationship between integration of HIV/NCD services and performance of healthcare system has no significant influence on Health system performance.

H₅. The relationship between integration of HIV/NCD services and performance of healthcare system has significant influence on Healthcare System performance.

1.6 Justification of the Study

In Kenya, efforts to integrate HIV and non-communicable diseases (NCDs) services focus on healthcare worker training. Globally, the importance of integrating HIV and NCD services is recognized through WHO guidelines, research, advocacy, and international partnerships. Progress is evident in both contexts, but challenges persist in scaling up integrated care, addressing health system gaps, and ensuring sustainable funding for healthcare requirements of those with HIV and NCDs effectively. NCDs have significant negative impacts on human and social development with their impacts being experienced at a younger age as it has been demonstrated that 53% of all disability-adjusted life years (DALYs) occur among persons aged less than 40 years in the country. Furthermore, NCDs are responsible for negatively impacting household incomes by causing a significant decrease in household income (28.6%) and exposing families to

catastrophic expenditures exposing them into impoverishment. This calls for further inquiry and application of the current knowledge on healthcare systems integration to advance health service delivery.

1.7 Limitations of the Study

There was no known literature reporting the existence of a standardized conceptual model for HIV/NCD services integration in Kenya. While there were several strategies for healthcare systems integration, this study associated several principles with a successful integration process and model. The study sampled only health facilities with Comprehensive Care Clinics (CCC) from the study area instead of a census of all the facilities. Interruption of the clinic workflow to conduct interviews with key informants posed a challenge to the researcher. To overcome this challenge, the researcher notified the clinic staff and key informants about the research activities well in advance.

The researcher cooperated closely with the clinic to identify mutually convenient time slots for the interviews. The study was flexible and accommodated the availability of key informants to ensure their participation. The study examined facilities where integration has been rolled out to get a deeper understanding. The study standardized data collection procedures, instructions, and participant interactions to ensure consistency and reduce the potential for biased interactions by the researcher and respondents. Some respondents did not provide information freely however they were assured of privacy and confidentiality. The targeted respondents were quite busy; therefore, the feedback was predetermined in a

structured questionnaire hence made it easy to answer the questions. Prior arrangements were made on best time to engage the respondents to mitigate against any difficulties with availability.

1.8 Delimitation of the Study

This section highlights the focus and boundaries of the study and what the study did not address or investigate and provides transparency about the limitations and scope of the research findings. The study delimitations included focusing only on Nakuru county in Kenya. The study's findings and conclusions have been interpreted within the context of Nakuru County's specific circumstances and may not be generalizable to other regions or populations.

Various methods were employed to enhance the trustworthiness of the study, including implementing a set of criteria to ensure credibility, dependability, confirmability, and transferability. Credibility was reinforced by utilizing multiple data collection methods. Furthermore, by delineating a systematic approach to data collection and analysis, the researchers established dependability and facilitated the replicability of their work. Transferability was ensured by sampling participants with diverse characteristics.

Within the healthcare provider context, the study aimed to delineate their roles and investigate how assuming the responsibility of integrated care impacts patients seeking primary healthcare services. The specific areas to focus included institutional support, resource pooling, health information processes, policy and collaboration guidelines and how this will lead to cost-saving gains in operations.

1.9 Significance of the Study

This study model has established that an organisation culture driven by innovation and that is team and outcome-oriented supports pooling resources into an integrated care model which leads to an improved health system performance.

The study findings can be used to guide the planning and decision-making during the execution of integrated healthcare services in Kenya. The results of the HIV/NCD services integration in this study will provide valuable insights for policy makers. They will benefit by acquiring a deeper grasp of the effectiveness of healthcare services integration in Nakuru County. The findings can inform policy decisions and strategies to improve health system performance, enhance sustainability of HIV/AIDS and NCD services, and optimize resource allocation. Policy makers can use this information to develop evidence-based policies and interventions that address the specific needs of the population, leading to more efficient and accessible healthcare services.

Health facility managers serve a pivotal role in the provision of integrated healthcare services. The study results will be beneficial to them as they can gain insights into best practices and strategies for integrating HIV/AIDS and NCD services. The findings can guide health facility managers in developing effective service integration models, improving coordination between different departments and healthcare providers, and enhancing the overall performance of their facilities. This knowledge can contribute to enhanced patient outcomes, satisfaction, and improved resource utilization within the facilities.

Researchers in the field of healthcare systems and services integration will gain from the study results that increase knowledge base by offering empirical evidence regarding the role of healthcare services integration in health system performance. Researchers can use these results as a foundation for further studies, exploring different aspects of integration, identifying gaps, and proposing innovative solutions. The study outcomes can also stimulate discussions and collaborations among researchers working on similar topics, fostering the exchange of ideas and advancing the field of healthcare integration research.

Finally, academicians, including educators and students, can benefit from the study results in various ways. The findings can be incorporated into academic curricula, allowing students to learn about the importance of healthcare services integration and its impact on healthcare system performance. Academicians can utilize the study results to develop case studies, research projects, or teaching materials related to healthcare integration. The outcomes can also serve as a basis for academic discussions and debates, contributing to a deeper understanding of the subject matter and advancing evidence-based learning in the realm of healthcare management and policy.

The study informs health facilities that integration of healthcare services contributes to cost-effectiveness in service delivery, therefore ensures sustainability of the services and enhances access to healthcare by populations. Integrated health services are responsive to individual, and populations needs and provide extensive and quality services. The study results have generated new

knowledge on the predicted cost savings in financing health and a framework for HIV/NCD services integrated care model.

1.10 Assumptions of the Study

Initially, we presumed that health facility managers would be interested in integrating HIV/AIDS and NCD services. This assumption was based on the belief that integration would enhance efficiency and save costs by effectively utilizing available resources. Secondly, the study assumed that integrating services would alleviate the burden on patients. Currently, patients often have to visit multiple clinics to access the necessary healthcare services. The assumption was that integrating these services would streamline the patient's experience and make it more convenient. Thirdly, the study assumed that patients seeking NCD services would not face stigma or invasion of privacy due to their HIV status. It was assumed that healthcare providers and the community would have an understanding of chronic diseases and would treat patients with respect and sensitivity. Fourth, the study assumed that respondents would provide truthful information. This assumption was crucial for the reliability and validity of the study's findings, as accurate information from the respondents was necessary to draw meaningful conclusions.

Fifth, the study also assumed that Nakuru County had a good mix of urban and rural settings. The study focused on the rural and urban settings due to the variation in the social-economic status of populations which influences how populations access health care services. Lastly, it was also assumed that with healthcare being

decentralized, the county government is effectively fulfilling its supervisory responsibilities to guarantee the provision of HIV/NCD services, and that the county management team is well-versed in the strategy for integrating healthcare services. It is presumed that the policy directives guiding the county health department in facilitating the delivery of integrated health services are being implemented, and the county is actively addressing healthcare facility infrastructure deficiencies to facilitate service provision.

1.11 Operational Definition of Terms

Term	Operational definition
Collaboration guidelines	Different teams develop a shared vision for work with an open and transparent process to assist in building trust.
Health information processes	Seamless flow in the acquisition, recording, organization, retrieval, display and dissemination of information.
HIV/NCD integration	Simultaneous deliver HIV and NCD services
HIV/NCD integration model	Planning and concurrent treatment of HIV and NCD cases
Improved performance	Improving the way of working that will lead to better health outcomes
Institutional support	Provision of policies, practises, physical facilities, software, or process are made available by the organisation which enable the success of an activity
Integration	Communication and coordination of resources, processes, methods and tools among healthcare departments to benefit communities and patients
Mortality	It refers to deaths in a population.

Non-communicable diseases	These are conditions caused by non-infectious agents and are not transmissible from person to person.
Organisation Culture	Enhancing efficiency Merging/ sharing of expenses to minimise the cost of operation
Pooled resources	Merged resources used to maximize advantage and spread risks

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section summarizes the theoretical, conceptual frameworks and empirical literature on HIV and NCD service integration strategies. UNAIDS (2019) reported that 36.9 million people were HIV positive globally, with 70% reported in sub-Saharan Africa (The Joint United Nations Programme on HIV/AIDS, 2019). Moreover, the ageing population comprising HIV positive people is affected by the co-occurrence of HIV with NCDs. The increased NCD prevalence is due to inflammation caused by HIV, ageing of PLWHIV, antiretroviral medicines, epidemiologic and demographic transitions, tobacco smoking and alcohol use (Edwards et al., 2015). Consequently, the progress made against HIV/AIDS is compromised by NCDs which are on the rise among the HIV positive people. NCDs are prevalent among PLWHIV in LMIC affecting cost associated with care, diagnosis and health outcomes of PLWHIV (Armstrong & Charland, 2004). Consequently, health systems in developing countries are overwhelmed. Without considering the NCDs, donor funded HIV/AIDS services only avert death from HIV.

2.2 Theoretical Framework

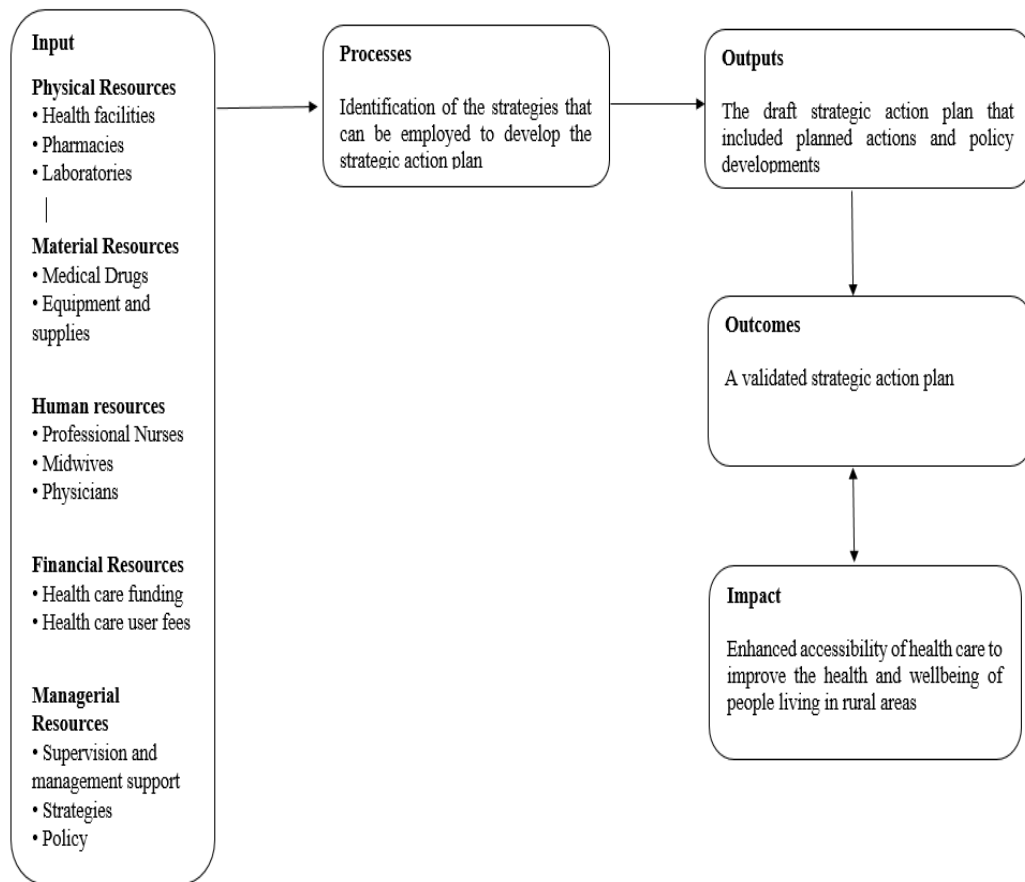
2.2.1 Systems Theory

A system constitutes different components that give results which can't be achieved in isolation by the relevant individual elements (Ravitz et al., 2013). The health systems thinking theory postulates that patient safety and healthcare quality

are developing features of the healthcare system (Leveson, 2004). It further asserts that improved health outcomes are dependent on a systematic appreciation of the entire system. Healthcare managers utilize it to attain a more profound insight of how inputs interact, the processes involved in producing outputs, and ultimately achieving positive health outcomes (Cordon, 2013). An effective healthcare system includes well-organized inputs such as physical, material, human, financial, and managerial resources. These inputs are converted into outputs through processes, and the components of the Systems Model align well with the health system building blocks. This study applies the systems thinking theory to develop an HIV/NCD integration model that will improve the use of HIV/NCD health care services in Kenya.

Figure 2.1

System Theory Model



Source: Systems Model (Forrester, 2010)

2.3 Institutional Support of Integrated HIV/NCD services and Healthcare System Performance

It includes investments in resources, creating an enabling work environment and commitment of the top management to ensure efficient use of available resources. This study focuses on institutional support mechanisms to include training of healthcare workers, monitoring of outcomes and coordination with external entities.

2.3.1 Training for Integrated Services and Healthcare System Performance

Professional development should be a continuous adventure to keep up with the developments in a profession and train on emerging challenges in the industry. Studies done recommend that institution provide continuous training to enable employees to acquire new skills in order to respond to changes in the workplace and job description (Mooko et al., 2021).

A 2019 study done in Germany enforced curriculum developers to include patient access as part of student-centric medical education (Balzer et al., 2015). They proposed a four-step algorithm that improves patients' access via existing digitalised medical data throughout curriculum development. First, a mapping exercise of the learning aims to the suitable ICD-11 codes was done. Second step involved determination of the learning prospects. Third step includes the assessment and selection of hospital departments leading with expertise on the learning objectives. Finally, patients are assigned with best match and allowed to participate. Trainees need an adequate skill set for their work. Learning chances and assessment methods should be realistic and integrate knowledge, skilfulness, attitudes and soft skills in an interdisciplinary team-based environment and enhance clinical reasoning and decision-making abilities (Balzer et al., 2015).

2.3.2 Monitoring Outcomes for Integrated Services and Healthcare System Performance

Measuring and monitoring integrated care outcomes has long been a challenge, but research suggests a variety of tools that can be adequately used to inform if integrated care outcomes are as expected. There are gaps in the sustainable

implementation of integrated care, but patience produces good results. Some of the measures that can be used in understanding better results and patient satisfaction use the following domains: coordination of care, continuity, patient-centeredness, user friendliness, community-based services, access and leadership. There are also domains identified in literature taking into account the manager and professionals' perception of the integrated care as well as caregivers (Guezennec et al., 2016). These measures can be assessed on a frequent basis to inform any corrective measure needed by identifying what is working or not working so that service provision can be enhanced and continuously improved.

2.3.3 Coordination with External Entities to Support Integrated Services and Healthcare System Performance

According to Alderwick et al. (2021) policy makers in many countries encourage cooperation between healthcare institutions and other sectors as a way to improve health outcomes. After all, a variety of factors, including structural, socio-economic, public education policies, social security, living and working conditions influence health. Multiple organizations and groups, influence these activities. Partnerships between departments are one of the best proposed ways to coordinate these activities to improve people's health. Inter-sectoral collaboration for better health is very important. Global, regional and local partnerships have been established to improve the care deployed. Cooperation can be developed voluntarily, obligatory, or in response to national policy. If external coordination works, improving health and reducing health inequality work very well if the organization can achieve better results by combining skills and abilities. In terms

of resource dependencies, partnerships provide organizations with the opportunity to manage their dependencies and risks.

2.4 Health Information Processes for Integrated HIV/NCD Services and Healthcare System Performance

When providing health services, staff efficiency is needed in sound decision making therefore, timely dissemination of information is critical. Health system analysts need to work harder to provide real-time data so that healthcare institutions can focus on patients at the appropriate time. Numerous studies have indicated that a key barrier to enhancing patients' health is the challenge faced by doctors and nurses in communicating and coordinating care effectively. A survey by Drozdowicz (2015) indicates that 95% of survey participants acknowledge that successful care integration can result in reduced readmissions, while 96% identify inefficient communication as a hindrance to effective patient health management. Delays in patient care often occur when crucial patient information is awaited.

2.4.1 Availability of Health Information Systems and Healthcare System Performance

Studies show that most health facilities have parallel information systems that are not fully functional hence hinders availability of information when needed (Kyalo et al., 2018). A health information system combines information from individual medical records, facility services, and organizational documents to support policymaking and the management of healthcare services (Nengomasha et al., 2018). Studies emphasis on the need for an information system to aim at producing quality evidence for decision-making and facilitating timely delivery of

interventions. However, fragmented data sources create a challenge when you need a seamless system. Fragmented systems lead to a lack of documentation and incomplete records, this has a negative impact on patients care and overall performance of the health system. Therefore, there is a need for improved communication on healthcare quality, and strengthened information systems, and data use for a better quality of integrated care. For information to be shared there has to be data collection tools available as well as systems. A lack of information systems can hinder communication. Inadequate information technologies, discordant IT systems and poor staff capacity affect data sharing. However, a study by Duffy et al. (2017) noted that healthcare providers were feeling inundated by the volume of required information in a single integrated patient encounter form, leading to the eventual separation of forms by disease-specific categories. Therefore, the study proposed using simple systems tools for the successful integration of health services.

2.4.2 Information Sharing in the Integration of Health Services and Healthcare System Performance

Research proves that colleagues in teams must communicate and share information to succeed. Communication is important in areas of assessing patients' requests, understanding utilisation of resources and cost of operations in making a determination and keeping track on an organisations progress. Without sharing information, it is difficult to work together. Therefore, information systems become key enablers to facilitate data sharing for informed and timely decision making (Kyalo et al., 2018).

2.4.3 Health Data Security/Privacy of Integrated Health Services and Healthcare System Performance

Privacy laws regarding patient and administrative data are a concern in literature when it comes to data sharing in a good performing health system. As reported by Rolf von den Baumen et al. (2020), the protection of health data played a crucial role coordinated healthcare. However, some enablers reported for mitigating privacy considerations included patient-provider relationship and joint access to information sharing media such as electronic medical records.

2.5 Pooling Resources for HIV/NCD Service Integration and Healthcare System Performance

Resource constraints bring about burden on managing long term illness. Therefore, leveraging on the available required resources and their efficient utilization is key in the integration of care.

2.5.1 Human Resources for Health for Integrated Health Services and Healthcare System Performance

Pooled resources from all participating integrating organisations are important for health systems to succeed. Human resources targeted to perform integrating functions are key in this process. Technical ability and efficiency are also crucial in integrating health services for improved health system performance. A study done in Tanzania shows that most of the physicians taking care of HIV patients had varying levels of knowledge in managing an NCD like hypertension, some reported to have learned about it on the job, others studied on their own hence a gap in

training was identified (Manavalan et al., 2021). Insufficient staffing levels were identified as a barrier to integrated care in Tanzania and Thailand (Manavalan et al., 2021; Moise et al., 2020). In Thailand majority of providers reported having no training in treating patients with HIV and NCD but expressed interest to learn how to treat these patient (Moise et al., 2020). Studies by Duffy et al. (2017) and Kupfer et al. (2020) show that for HIV/NCD integration to be successful staff training, follow up mentorship was important, however, staff turnover was a challenge. The shift in healthcare system planning and staff attitudes were also needed to increase patient motivation, autonomy and adherence.

2.5.2 Funding Models for Integrated Health Services and Healthcare System Performance

Funding arrangements for healthcare services are different. For example, in Kenya HIV services are donor funded while NCDs are funded either by the patient or the government through the national scheme. The different models of investments in the healthcare services influence access to care (Mwai et al., 2023). Despite the identified model's out-of-pocket expenditure still the dominant mode of funding which is a challenge to integrating these services (Njuguna et al., 2022). There are two dominant healthcare financing models. The Beveridge Model constitutes funding by government revenues to cover the entire population entitled to access publicly funded health services. The Bismarck Model constitutes funding by mandatory contributions that are a per cent of wages imposed on both employers and employees in the form of payroll taxes. Entitlements to health services for the Bismarck model are dependent on specific contributions made (Lasser et al., 2006). Nigora (2019) rightly observed that a good health system model promotes efficient

use of resources and improves service quality and access. Most countries finance their health systems through the state budget, health insurance, special funds for the health protection of citizens, health facilities funds, out-of-pocket expenditure, charity, and other sources legal sources. However, it would be crucial to develop a model that can help improve access to healthcare for the citizens.

In 2005 healthcare in South Africa was funded by allocations from general tax accounting for about 40%, private sources accounting for about 45%, and out of pocket payments accounting for about 14% of total healthcare spending. The burden of these funding mechanisms on households differed considerably (Reeves et al., 2015).

UHC has three interrelated components including the population access, the range of services provided and financial risk protection (Michel et al., 2020). Private funding is one of the stabling blocks to achieving UHC in South Africa. Citizens continue to be sensitized to know that UHC was not meant to destroy private medical schemes but to make it possible for all citizens to access care. The concern however is private medical insurances have a lot of resources that are not accessible to everyone. However, the bad state of multiple public health services is another downfall to achieving UHC in most countries.

It is evident that Thailand has progressed with UHC considering the increase in care access from 71% in 2001 to 99.9% in 2012 (Nonkhuntod & Yu, 2018). The country has used a combination of schemes to cover their population for example they have the workmen compensation fund that covers occupational injuries for private company employees. They also have a Social Security Scheme (SSS) that

covers staff sicknesses and injuries that are not work related. Public health insurance is Civil Servant Medical Benefit Scheme (CMBS) to cover civil servants and their family members. In 1975, the low-income card scheme (LICS) for the financially disadvantaged was created by the government followed by the community-based health insurance scheme (CBHI). The CBHI initiative, centered around maternal and child health, was implemented utilizing community-based financing from village-level funds. Subsequently, a vast majority of Thai citizens were covered through the Health Card Scheme (HCS), which was government-funded and incorporated voluntary health insurance. Afterwards, the Traffic Accident Protection Scheme that covered exclusively accident illnesses or injuries was established (Nonkhuntod & Yu, 2018). Universal Coverage Scheme (UHS) followed in 2001 for those who qualify for both LICS and HCS.

The Kenya Healthcare Federation (2016) highlights different financing mechanisms including taxes covering free services offered in public health facilities. These include free maternity and free treatment for under-fives (Kenya Healthcare Federation, 2016). The National Hospital Insurance Fund (NHIF) finances accredited facilities. Mandatory membership for workers in the formal sector is at 20% and provides inpatient and outpatient services. In contrast, 2% of the Kenyan population has private health insurance. Employers offer health insurance to employees and manage funds through the company or a third party. On the other hand, community-based health financing schemes serve indigents who can neither afford private health insurance nor NHIF. Out-of-pocket (OOP) spending requires the patients to pay for services at the facilities from their pockets and hinders access to health services by driving patients to impoverishment.

Developmental partners and Non-Governmental Organizations also finance healthcare.

2.5.3 Geographic Setting of Health Facilities with Integrated Health Services and Healthcare System Performance

Rural and urban settings still are at different levels in terms of resources and infrastructure available. Geographical settings can impact integration among stakeholders. Small rural settings are more united and more familiar with the environment as compared to large communities in urban settings. This makes collaboration and partnership easier. There is also evidence that remote settings have more aged, poor health and need transport, infrastructure and support (Cheng & Catallo, 2020).

2.6 Collaboration Guidelines for Integrated Health Services and Healthcare System Performance

Strong, stable and shared leadership is an enabler of integrated care. With harmonised leadership, there is better decision making in integrated care. Often if the leadership is fully facilitating the integration and the responsibility is shared, there will be a shared vision, drive and action plans for integration initiatives among stakeholders. Leadership involvement and management to implement the initiative are critical for better health system performance (Cheng & Catallo, 2020).

Due to the increasing demand for improved healthcare quality, governments are hard-pressed to enhance the efficiency and efficacy of healthcare services. As one of the solutions is to increase efficiency, which has led to partnerships into larger

units, also known as mergers/integration of services. Integration is meant to introduce approaches to improve the capacity of organisations for the efficient provision of public services by achieving economies of scale (Kenk & Haldma, 2019). This calls for leaders to work together for better integration.

2.6.1 Governance Structure of an Integrated Health Services and Healthcare System Performance

In a study done in Australia, governance structure creates an influencing effect on health system performance. Fragmentation in the healthcare system is caused when governance systems have different mandates. Differentiation as reported by Cheng and Catallo (2020) is done to avoid confusion in decision making, funding and governance. This is because each organisation is pursuing limited resources hence creating competitive conditions that hinder integration. In the health sector, different services are governed differently. The Governance model in HIV services is donor-driven while NCD services are facility driven. The administration of the two programs is different. However, governance frameworks impact decisions, approvals, methodologies, accountability, reporting, and power. While mandated constitutionally as a medical necessity and essential for patients' access to healthcare services, programs may interpret integrated services in varying ways (Cheng & Catallo, 2020).

For institutions to be successful, they must assure legitimacy by following the established guidelines, regulations, and ethical principles within their setting. If this perspective is successful there will be no many healthcare organisations shying off from this kind of arrangement (Roussy et al., 2021).

2.6.2 Policy on Integration of Health Services and Healthcare System Performance

Health policies as drivers of the integration of care can support or hinder health system performance. A study done in Sweden identified skewed national and regional policies as a challenge to the integration of care. Policies at both national and regional levels can create disorder and weariness for the parties involved (Cheng & Catallo, 2020). The health sector has developed policy and legal instruments to operationalize the health issues outlined in the Constitution. Aligned with Vision 2030 and the Sustainable Development Goals (SDGs), various initiatives have been put in place. These initiatives include the implementation of the Health Act, 2017, Sessional Paper No. 2 of 2017 on the Kenya Health Policy, 2014–2030, and the UHC Roadmap, among others. The overarching goal of the policy is to achieve the highest achievable level of health inclusively. The healthcare sector aims to achieve this goal by providing fair, equitable, and high-quality healthcare services to all Kenyan citizens at a level commensurate with that of a middle-income country, as outlined in Vision 2030.

The Government targets 100% Universal Health Coverage (UHC) for all Kenyans by 2022. This has therefore necessitated the Ministry of Health to expeditiously develop a roadmap that provides a blueprint that ensures each Kenyan access to an explicitly defined package of quality health services that is responsive to their needs following a life cycle approach and is financially sustainable. The health sector has identified three key priority areas namely: access to quality health services, insurance coverage and financial risk protection. Of the three key priority areas, the insurance coverage and financial protection Pillar seeks to safeguard the

population from financial catastrophe due to health-related expenses, the health sector is mobilizing more resources from the national budget, Development Partners and the Private sector through Public-Private Partnerships.

The Kenya health policy is prioritizing the flagship projects in Vision 2030. It aims to attain UHC and access to essential health services. It specifies six objectives as eliminating communicable diseases, lowering the incidence of infectious diseases and mental disorders, lessening the prevalence of violence and injuries, delivering important healthcare, decreasing risk, and supporting multi-sector alliances. It also describes the four levels of care including level one to level six. Level one accomplishes demand creation while the other levels respond to this demand. They also promote healthy behavior among individuals, households and communities and facilitate community diagnosis, management & referral.

2.6.3 Accountability of Leadership in an Integrated Care Model and Healthcare System Performance

Accountability refers to agreements identified to aid the integration success. The agreements outline obligations of stakeholders, shared responsibilities and anticipated outcomes. Formal agreements should be done outlining the different roles and obligations of each partner (Cheng & Catallo, 2020). Most sectors are integrating their services due to increasing client demands, declining to fund, tightening regulations and more discerning and demanding stakeholders amongst others. These kinds of reforms have brought concerns over management through internal governance, general accountability, transparency, and execution. Therefore, it is important to have a naturalistic ground to examine these elements

(Ntim et al., 2017). The perception is that managers are inherently committed to accountability and thus they will be accountable to the public, because it improves the institution's image, gives the organisation a positive institutional reputation, and public goodwill. Lastly, accountability is critical in getting the buy-in of influential stakeholders, the government and the clients who contribute to the never-ending viability of HIV/NCD integration.

2.7 Culture of Health Organisation and Healthcare System Performance

Culture is looked at in this study as those values, thoughts, and beliefs upheld within an organisation to keep it together. In reviewed literature, a shared culture is crucial for successfully integrated care models. In an Australian study, 90 per cent of respondents acknowledged that integrated projects had common values and norms. Organisation culture that supports changes has integrated care as a key towards successful integration. The steps towards integration require the creation of new cultures from existing cultural practices are taken. Maintaining an existing culture is based on value and power issues and can be limiting. Shared culture leads to learning and knowledge management. Being open to learning helps to promote knowledge exchange of the new practices, policies and processes among workers (Cheng & Catallo, 2020).

2.7.1 Innovative Oriented Culture in an Organisation and Health System Performance

Innovations start with evaluating problems and is the basis of solutions and choices. Innovation processes facilitate and enhance service quality and performance. Service integration strategy is integral in the creation process. Prioritizing

efficiency promotes adaptive and values-based services since more resources are invested in learning. In contrast, organisations that lose resources during innovation may get exhausted and fail to strengthen their innovation capacities (Ahmad et al., 2022). An organisation that has innovative teams benefit by merging exploitation and investigation. Leaders should promote innovation, change existing systems and create resources for autonomous thinking. Leaders must also be open to innovation to achieve integration of HIV/NCD services.

2.7.2 Outcome-Oriented Culture in an Organisation and Health System Performance

As reported by Cheng and Catallo (2020), performance reviews to ensure expected outcomes are achieved are important during integration, they help support learning and continuous improvement of integrated initiatives. Progress should be monitored by all integrating partners who should also permit discussion and be involved in planning and future research. When this is done, providers can make informed decisions regarding patient care and service delivery. The use of a performance measurement system (PMS) is generally recommended to facilitate strategy implementation and improve work performance (Pirozzi & Ferulano, 2016). Healthcare managers and teams around the world, especially public health systems, face increasingly complex challenges in ensuring effectiveness and efficiency in service delivery (Mesabbah & Arisha, 2016).

Various studies have highlighted challenges in increasing patient demands and increased costs, yet the health sector is constrained in terms of resources. In the Kenyan population, the need for NCD services is increasing as well as the HIV

services however funding is reducing by the day making it difficult to offer quality services. Therefore, leaders should enhance the level of communication among managers and inspire teamwork to upgrade the health sector. To address these challenges, there is a need to continue implementing innovations in the health sector. The performance management (PM) approach is required to develop a reliable method (Mesabbah & Arisha, 2016). Performance management has moved from only focussing on the financial focused system to integration issues like quality of services, efficiency of processes and other areas of interest to stakeholders. There is a need for an extensive PM framework for guiding and monitoring the effectiveness the strategy implemented and the effect of system transformations on the application. It is inevitable to appraise the performance of integration of healthcare services because poorly designed services could alter integration outcomes. It can also be challenging to implement integration since poorly set targets can produce unexpected effects (Kumpunen et al., 2020). These unexpected results can restrict stakeholders, the progress achieved, and the "success" of the program. However, as much as measuring progress is important it can be a hindrance as reported by Wankah et al. (2020) if measuring structures, and processes are not clear.

2.7.3 Team-Oriented Culture in an Organisation and Healthcare System Performance

Collaboration between members of different medical professionals is promotes quality patient outcomes. Previously, health providers worked in teams to provide individualized and parallel patient care in effective silos. However, there is emphasis is on adopting comprehensive patient care, thus hospitals need to develop

a culture of creating functionally diverse patient care teams. This can be built more and more through inviting members from different backgrounds to bring together health professionals. These practically varied teams can optimize the capabilities and proficiency and better the integration, consistency, and quality of treatment of patients with multifaceted needs (Johnson et al., 2018). Team diversity can have positive or negative consequences. Positive results include innovation and increased team effectiveness, while negative results include increased conflict and poor performance.

2.8 Healthcare System Performance Under Integrated Care Model

Performance is a factor of the efficiency and effectiveness of actions (Sharma & Kumar, 2021). Other parameters that define performance include confidence, employees training and participation, corporate social responsibility, adoption of information technology, compliance to the rule of law, responsiveness and lead-time reduction and so on. Integrated care is best suited for managing chronic care disease management to enhance clinical decision making and the quality of care. Research further shows that integration of care increases access and reduces fragmentation for patients with co-morbidities (Martinez et al., 2019). If all this is achieved health system performance improves.

2.8.1 Cost-Saving Approaches and Gains and Healthcare System Performance

Cost saving approaches include pooling health care costs in one pool (insurance schemes) and also have a national organized health scheme to finance care in a population. Some of the factors that secure the sustainability of health care services are elimination of user fees, efficient resource use and employment opportunities.

Countries cannot meet healthcare needs through public funds exclusively. They also rely on personal insurance or more payments (Nigora, 2019). There is a global consensus on strengthening health financing systems for sustainable policies. However, in LMICs, OOPs dominate, creating access barriers that raise the burden of preventable deaths. Besides, nearly 800 million individuals use approximately 10% of their wages to out-of-pocket expenses. In order to receive healthcare services, leading to impoverishment. Strengthening domestic financing reduces OOPs. Governments should raise the allocation for primary health care by a minimum of 1% of their gross domestic product (GDP) to attain the 2030 Agenda for Sustainable Development (Ifeagwu et al., 2021).

Properly organized health care financing (HCF) enables countries to rally sufficient financial resources for health, reasonably allocate, and spend them fairly and productively. Just healthcare funding policies facilitate universal access to essential healthcare, provide social protection and bolster social safety nets across various socioeconomic environments (WHO, 2005). Health care is costly globally due to the delivery of services using high technological input. User fees and poor resource management also exacerbate healthcare costs in developing countries. Cost recovery attributed to lack of public financing has led to charging user fees at public health facilities. In other settings, user fee strengthens health sector market forces. There is also advocacy for financing via the private sector through the privatization of public health facilities.

The UNDP collaborates to aid investment approaches, nationwide policies and regulatory frameworks to reinforce financing and public financial management for health. This consequently creates resilient and sustainable health systems (WHO,

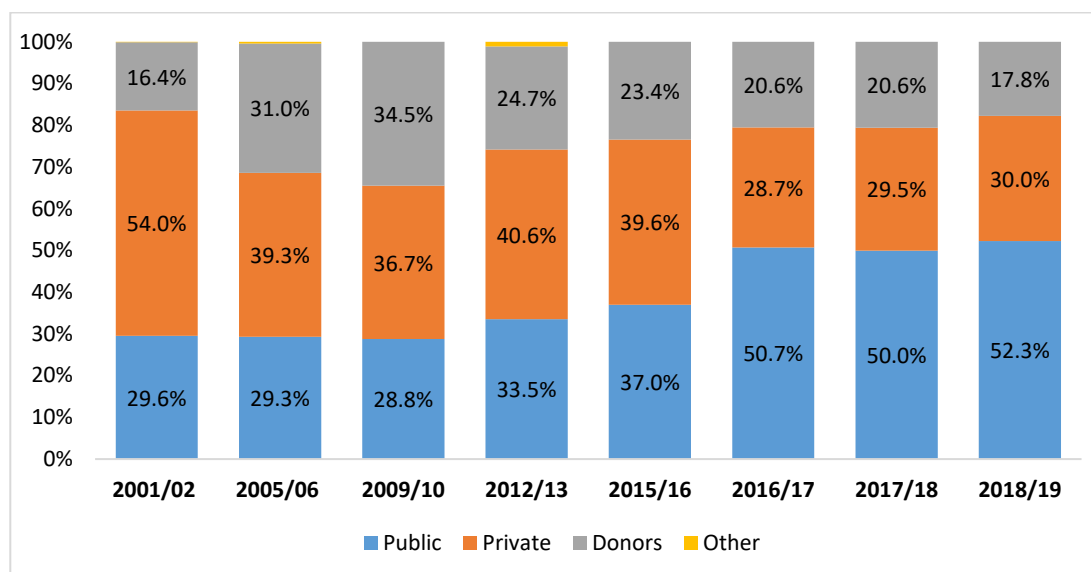
2005). Taxation on all incomes is sustainable in the long term. However, there are concerns that it may lead to increased personalized disbursements, especially during recessions. Corruption may also constrain collection of taxes. Furthermore, economic recession cause individuals be more price sensitive. In Canada, healthcare is funded mainly through taxation, and it has demonstrated satisfactory services, facility performance and better outcomes notwithstanding financial strain. Social Health Insurance also hurts competitiveness due to higher labor costs (Liaropoulos & Goranitis, 2015).

The Total Health Expenditure (THE) in Kenya was KSh 497.7 billion (USD 4,920 million) in 2018/19, from KSh 442 billion (USD 4,315 million) in 2016/17 comprising a 13 per cent increase. Total health spending in 2018/19 accounted for 5.6% of GDP from 5.5% in 2016/17 against the target of at least 5 per cent. The domestic health expenditure as a per cent of total government expenditure rose from 10.8 % in 2016/17 to 11.7 % in 2018/19. Per capita spending was \$97.4 in 2016/17 and \$105.8 in 2018/19.

Healthcare funding comes from the government, households and donors. Government funding for the health sector has been increasing over time from 29.6% of the Total Health Expenditure in 2001/02 to 52.3 per cent in 2018/19. The second-largest financier is the private sector (including household payments) who have been contributing 54% in 2001/02 to the current 30% in 2018/19. On the other hand, the role of development partners reduced over the same period financing to the current 17.8% in 2018/19. See figure 2.2.

Figure 2.2

Sources of Health Financing, Kenya



Source:(“Ministry of Health. KENYA NATIONAL HEALTH ACCOUNTS FY 2016/17 – 2018/19,” 2021)

Health expenditures related to HIV/AIDs have reduced by 11% per cent, from KSh. 92 billion in 2016/17 to KSh 82 billion in 2018/19. As a per cent of THE, Total Health Expenditure on HIV/AIDS (THE_{HIV}) declined from 20.9% per cent in 2016/17 to 16.5 per cent in 2018/19. THE_{HIV} was estimated to be at 0.9 per cent of GDP in 2018/19, down from 1.2 per cent in 2016/17. On the other hand, the Total Health Expenditure for NCDs in FY 2018/19 was KSh. 57.9 billion up from KSh. 52 billion spent in FY 2016/17. This represents an 11% increase. THE NCDs were around 12% of THE in the period FY 2016/17 and 2018/19 and about 0.7% of GDP. The two disease areas consumed KSh 140 billion in 2018/19 down from KSH 144 billion in 2016/17 which is around a third of all resources spent on healthcare use in Kenya.

Table 2.1***Summary of HIV/AIDS and NCDs Health-Related Funding for 2016/17 to 2018/19***

Indicators	2016/17	2017/18	2018/19
Total GDP at current prices (KSh Millions)	8,033,533.1	8,748,155.4	8,904,983.9
Total Health Expenditure (THE) (KSh Millions)	442,094.7	464,333.3	497,695.0
Total Health Expenditure of HIV/AIDS (THE _{HIV}) (KSh Millions)	92,246.8	94,520.5	82,108.0
THE _{HIV} as a % of THE	20.87%	20.36%	16.50%
THE _{HIV} as a % of nominal GDP	1.15%	1.08%	0.92%
Total Health Expenditure on Non-Communicable Diseases (THE _{NCDs}) (KSh Millions)	52,025.6	52,340.6	57,873.7
THE _{NCDs} as a % of THE	11.77%	11.27%	11.63%
THE _{NCDs} as a % of nominal GDP	0.65%	0.60%	0.65%
Total Health Expenditure of THE _{HIV} and THE _{NCDs} (KSh Millions)	144,272.4	146,861.2	139,981.8
THE _{HIV} and THE _{NCDs} as a % of THE	32.63%	31.63%	28.13%
THE _{HIV} and THE _{NCDs} as a % of nominal GDP	1.80%	1.68%	1.57%

Source: NHA, 2021

The table below provides a breakdown of the Total Health Expenditures on Non-Communicable Diseases by type. A considerable number of resources is spent on Cancer management, diabetes, heart conditions as well as mental disorder management.

Table 2.2***Breakdown of the NCDS Funding by NCD Select Type (KSh. Millions)***

NCD Type	2016/17	2017/18	2018/19	% Change
Neoplasms (Cancer)	12,229.3	8,920.3	4,542.0	-62.9%
Diabetes	4,571.6	4,319.1	4,579.6	0.2%
Cardiovascular diseases	6,012.8	6,447.0	9,130.9	51.9%
Mental & behavioural disorders, and Neurological conditions	4,550.6	5,044.0	5,164.8	13.5%
Respiratory diseases	500.4	466.4	1,426.4	185.0%
Other NCDs	24,160.7	27,143.7	33,030.1	36.7%
Total	52,025.6	52,340.6	57,873.7	11.20%

Source: NHA, 2021

2.8.2 Linked Needs and Objectives of an Integrated Health Service and Healthcare System Performance

Clearly linked requirements and goals in the front-end work analysis can save money and time during the implementation of an integrated care model. The specific healthcare needs identified during a needs analysis will drive the objectives and identify those actions that will have an impact on caregiving. The performance gap analysis will reveal current and target measurements. This will determine specific application objectives and assist in identifying the skill, knowledge and other resources required (Burkett, 2005a).

2.8.3 Shared Responsibilities in an Integrated Care Model of Health Services and Healthcare System Performance

Defining distinct duties for all stakeholder's result in a cost-effective integration process. In resource-limited settings, the healthcare workers play important roles in defining shared resources process experts, administrators and patients. Shared duties help align solutions to healthcare needs to demonstrate how the interventions

affect individual and organizational performance; determine how institutional support affects performance improvement; and establish the intervention's relevance to patients and if the performance gaps are closed.

2.8.4 Merged Patient's Processes and Integration of Health Services and Healthcare System Performance

One key strategy to minimize operational costs for an organization is to develop products, processes, and use of technology. This can be done by acquiring another organization to acquire new resources (Kailasam & Wongsurawat, 2016). The acquisition is useful, creative, innovative, and leads to efficient use of resources. Most CCC are donor-funded but because they are housed in public hospitals, the hospitals should acquire the CCC together with the existing resources and formulate a strategy to utilise those resources for the benefit of the general public. This leverages the use of these resources and reduces operating costs. Innovation needs to come from several sources, including in-house, external and entrepreneurial actions. Some aid companies develop resilience to financial turmoil and the capacity to self-replicate over time. The integrated model streamlines pre-emptive organizational processes and assesses the suitability of commonly used turnaround practices (Gotteiner et al., 2019).

2.8.5 Sustainability of services

Effective and sustainable interventions are needed to address the challenges of healthcare. Solving health care problems requires a system thinking mind-set (WHO, 2018). Health care is a multifaceted system of clinical practice that carries high risks to patients and other stakeholders. A health system consists of

interrelated and interdependent elements that work concurrently to achieve a shared goal. The result of not integrating the components may be fragmented. Therefore, health interventions should include systems thinking approach that integrates all components of health care. Systems thinking is based on process, dynamic synchronization of people and technology, interaction and integration. Systems thinking helps us recognize how to successfully intervene in the health system through a deep understanding of processes, and dynamics between people and technology.

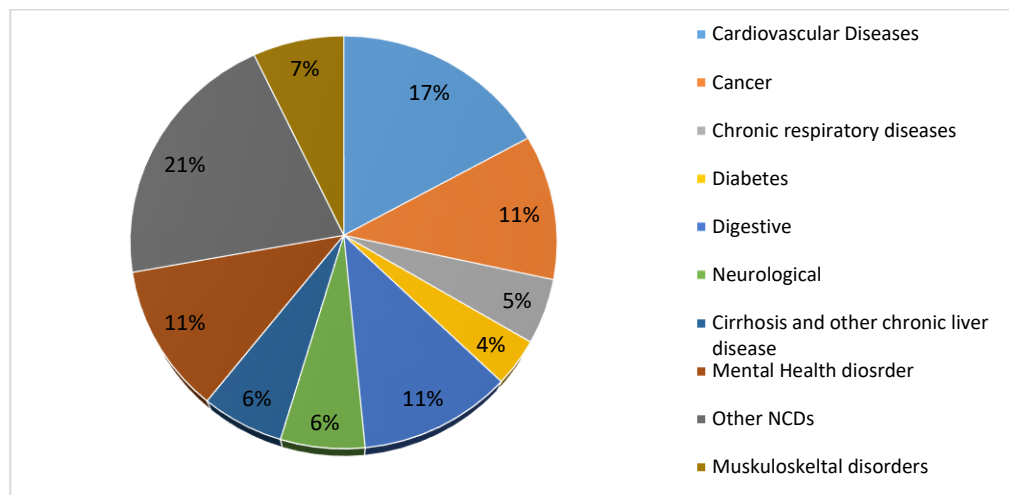
It also highlights the relationship between the implementation of interventions and the essential connections that guarantee its success. If the healthcare industry can focus on improved system thinking applications for interventions, it can reduce the unexplained changes and execution complexity. Therefore, the health industry integrates system thinking to ensure a holistic approach to problem resolution, understands the impact of the entire system, and uses a pre-emptive approach to identify leverage points. The Health Systems Thinking Approach acknowledges that health problems are difficult to solve because they are not isolated but rather interrelated. However, many studies have investigated these issues individually. Therefore, the absence of a system approach to solving health problems is not productive, leading to fragmented solutions that cause unintended problems. Applying systems thinking helps identify all the components of the system, capture interdependencies, and identify work procedures, synchronization and coordination methods. In essence, system thinking involves access to health care as a whole, not part of it. Many studies tend to solve health issues, but the lack of a systematic strategy to the problem makes the solution unsustainable. Systems

thinking helps healthcare facilities understand interactions between healthcare organization components instead of functioning independently. Therefore, a systems approach is essential for conducting ongoing interventions in health care (Trbovich, 2014).

Non-communicable diseases lead to 71% of mortalities Globally. Each year, more than 15 million individuals aged 30 to 69 succumb to NCDs, with a significant 85% of these untimely fatalities occurring within this age group in developing nations (WHO, 2021). The disease rates for communicable diseases has been declining while NCD rates are rising as shown in 2013 (Naghavi et al., 2015) and 2016 Global Burden of Disease (GBD) findings. Furthermore, GBD analyses attribute substantial portion of disabilities to NCDs since estimates of the Years Lived with Disability (YLD) shot up from 537.6 to 764.8 million between 1990 to 2013 (Vos et al., 2017). The four main NCD conditions include cardiovascular diseases, diabetes, chronic respiratory diseases, and neoplasms. The majority of global NCD-related deaths are due to cardiovascular diseases (17.9 million), followed by cancers (9.3 million), respiratory diseases (4.1 million), and diabetes (1.5 million) each year (WHO, 2021). The disability-adjusted life year (DALY) burden from NCDs was 37% in developing countries in 2015(Palma et al., 2016). The situation in Kenya is highlighted in Figure 2.3.

Figure 2.3

The Proportion of NCD DALYs



Source: Global Burden of Disease (2021)

Mortalities attributed to NCDs in Kenya are predicted to surpass mortalities from communicable diseases by 2030 because of population growth and ageing. There is no standardised approach to integrating health care services. However, it calls for a system thinking approach. More emphasis is needed on how we can sustain the model, and enhance coordination and integration within the health sector. Prudent management of healthcare service integration is necessary to ensure healthcare sustainability. Integration of HIV/NCD services involves a shift from parallel and coordinated services to integrated care.

Scenario 1: Parallel Services.

Treatment for chronic conditions is offered at parallel length for HIV and NCDs services. Despite the existence of linkages and referrals in some cases, the parallel programs don't share resources.

Scenario 2: Coordinated Services

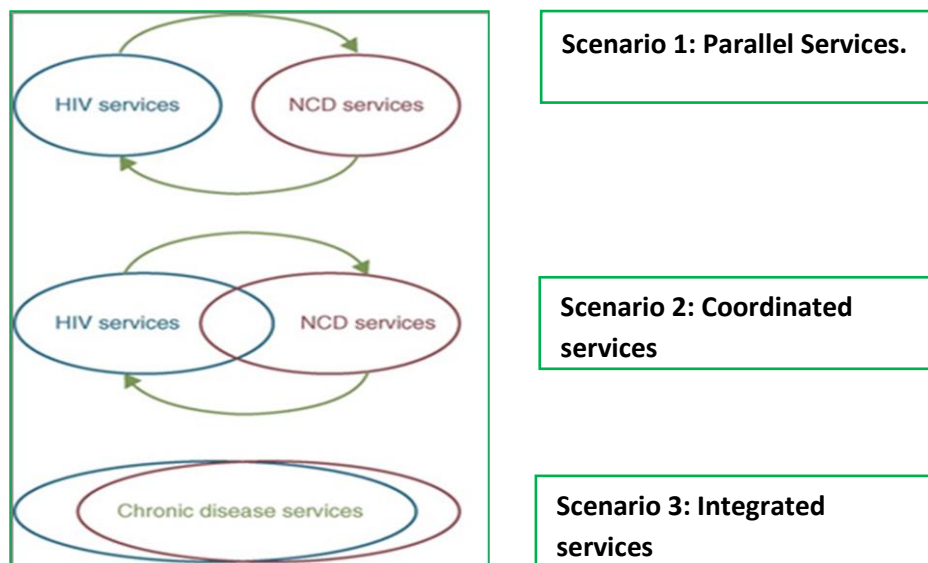
There are no co-located services but there may share strategic planning, systems and tools. Case management guidelines, laboratory systems, and monitoring and evaluation strategies are not integrated at the clinic level.

Scenario 3: Integrated Services

It offers integrated chronic and NCDs services at the point of care for PLWHIV and HIV negative patients using shared resources. As shown in figure 2.4.

Figure 2.4

HIV/NCD Integration Model Visualization



However, health integration alone cannot solve the healthcare crisis if it is conceptualized as a goal without aiming to improve health system performance. The operation of an integrative health system with over-specialized medical staff is not sustainable in terms of personnel and funding and is unlikely to help patients with multiple illnesses. The best approach is for healthcare leaders to go beyond

integrative health and instead drive the transformation of healthcare professionals. To succeed, physicians need to be encouraged and assisted in adapting their skills to present-day and future disease burdens. Consequently, there will be more adaptable physicians with the capacity to manage patients. Integrated care is potential tool for transforming the health system, not an outcome (Plochg et al., 2017).

Individual models of integrated care allow for the management of high-risk patients with several health conditions by facilitating service delivery and overcoming fragmentation between healthcare providers (Bodenheimer, 2008). Case management employs a case manager who evaluates the patient's and care giver's desires, customizes treatment plans, schedules and modifies treatment processes, keeps track of standard of treatment and keeps communication with patient and care giver. Case managers are mostly mono-disciplinary nurses, but it also employs multi-disciplinary teams such as nurses, social workers, psychologists, and occupational therapists (Bloch et al., 2011; Maslin-Prothero & Bennion, 2010). It currently promotes clinical integration by marrying population and individual approaches and coordinating evidence-based management programs and services (Weiss, 1998). Husbands et al. (2007) found that severely depressed PLHAs exhibited a 45% improvement in social function when undergoing case management, while those who managed their service uptake experienced a 27% decrease in social function (Husbands et al., 2007).

Disease-specific integrated models are used to manage chronic conditions (De Bruin et al., 2011; Kruis et al., 2014) and aim to reduce fragmentation, and improve health outcomes at an affordable cost (Kesteloot, 1999). The chronic care model

provides care for people with chronic illnesses and has a framework with which health services are organized to improve health outcomes. It recommends longitudinal, prophylactic, community-based and integrated approaches (Wagner et al., 2001). The integration of decision support and clinical information systems within the chronic care model has resulted in modest enhancements to care provided for PLWHIV (Pasricha et al., 2013). Besides, the chronic care model has improved the health of people with diabetes in primary care settings by monitoring behavioural and clinical goals through clinical information systems. Community-level partnerships have also pooled human and financial resources for diabetes management (Stellefson et al., 2013).

Population-based models focus on improving the health outcomes of the population (Cohen et al., 2014). For example, Kaiser Permanente (KP) stratifies the population and provides services based on need. It offers promotion and prevention services and supports chronic care patients to self-manage their illnesses. The high-risk patients also self-manage and get professional care (Jones & Smith, 2000). They increase health services utilization and employ active case finding to flag the high burden of undiagnosed diseases. There are different integration models that combine HIV and NCD services hold promise to improve health outcomes and service delivery when implemented appropriately (Chamie et al., 2012; Govindasamy et al., 2013).

2.9 The Research Model

2.9.1 Theoretical Models

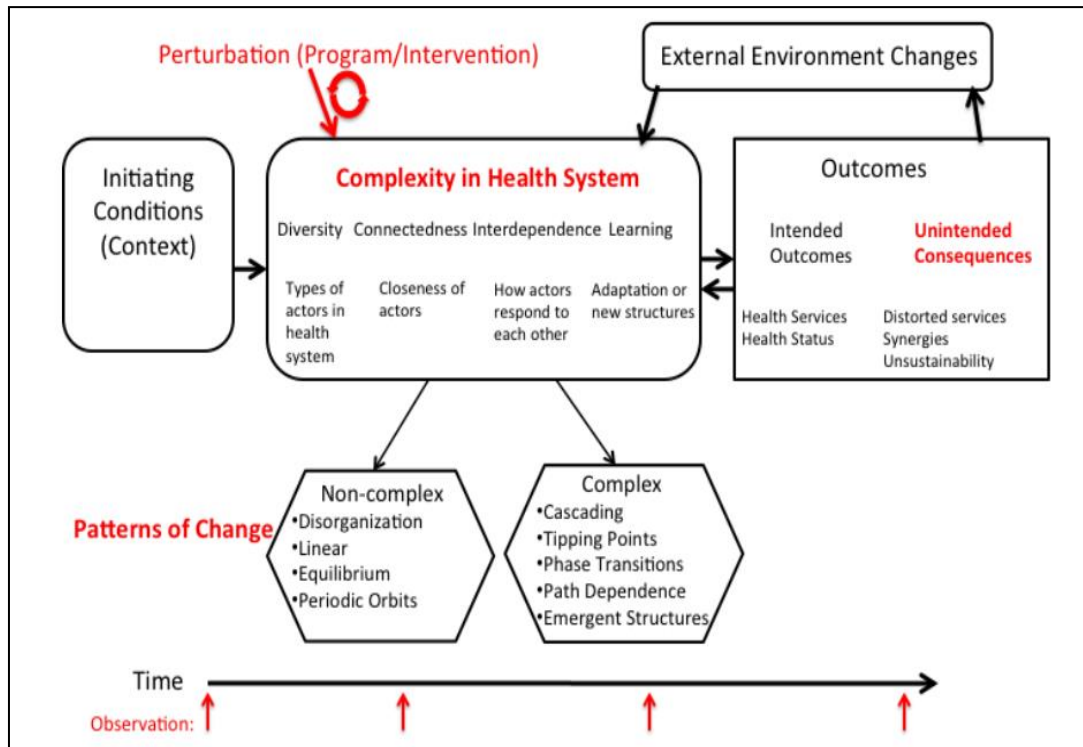
This study has employed diverse theoretical frameworks including the complex adaptive system model, chronic care model and integrated chronic disease management model.

2.9.2 Complex Adaptive System Model

It originated from the research conducted by scientists at the Santa Fe Institute in California during the 1980sp. It conceptualizes integrated care by acknowledging the complexity, patterns and interrelationships rather than cause and effect. It focuses on the system components, relationships and interconnections instead of individual components themselves (Chandler et al., 2016). The complex adaptive system comprises interconnected agents, each functioning according to their knowledge base, semi-autonomously, and with the ability to instigate change (Moore et al., 2019). Healthcare is regarded as a complex adaptive system (Plsek & Greenhalgh, 2001). It exhibits most characteristics of a complex adaptive system. First, healthcare is difficult to comprehend and predict. Second, it is always adapting. Third, it has many interconnected parts that interact based on their perspectives leading to new patterns and norms over time. The UHC presents an opportunity to integrate HIV/NCD service delivery and requires sustainable approaches. Comprehending the health system as a complex adaptive system is essential for promoting HIV/NCD integration agenda. See figure 2.5.

Figure 2.5

Components of Complex Adaptive Systems



Source: (Paina & Peters, 2012)

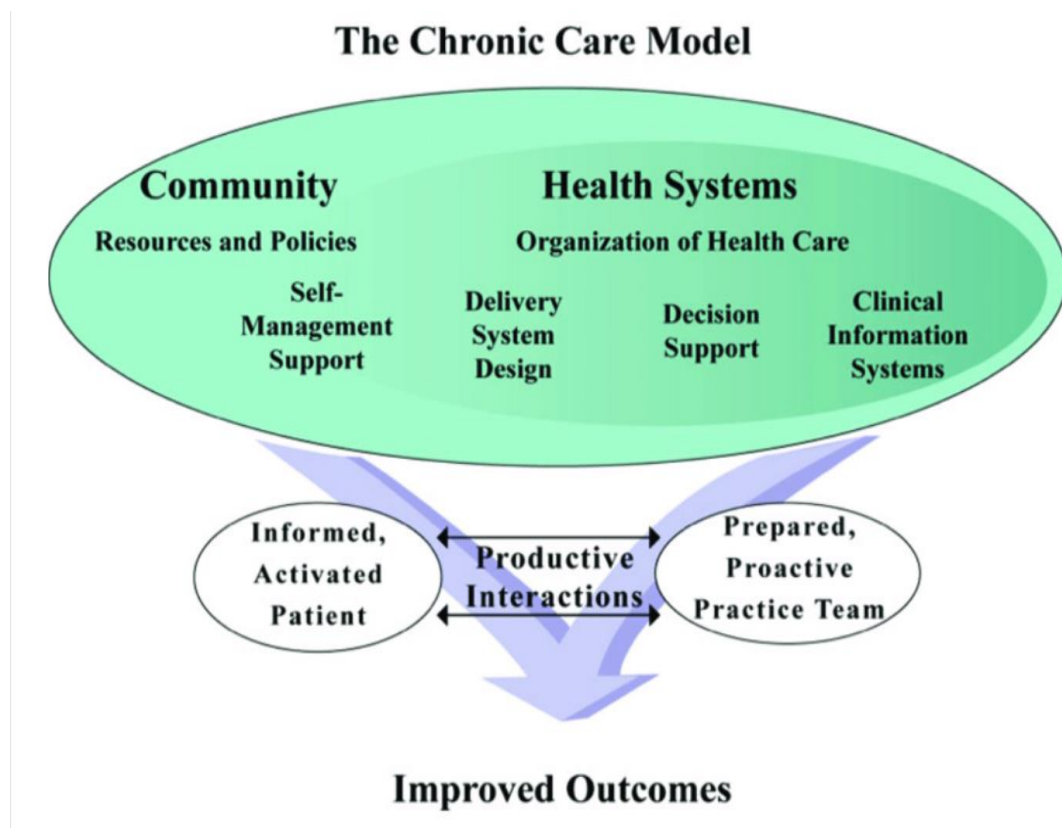
2.9.3 Chronic Care Model

It highlights the importance of collaboration when providing healthcare services. It has six main domains including the Community involvement, self-care assistance, healthcare system, delivery system structure, clinical information systems, and decision support (Wagner et al., 2001). It promotes partnerships among health staff to provide adequate care for patients' co-morbidities rather than single diseases (Rush, 2014). It also proposes aligned empowerment of the patient and the community over a reactive approach that relies on an acute event expectation, as in-hospital care. Aligning health systems with this model stresses the central role of patients and their interactions with an organized team of providers to improve health outcomes. It prioritizes patients' long-term health goals, needs, and

competencies. It also embraces a broader approach where each team member including the patient, brings their skills to the table. See figure 2.6.

Figure 2.6

The Chronic Care Model



Source: (Wagner, 2004)

2.9.4 The Integrated Chronic Disease Management (ICDM) Model

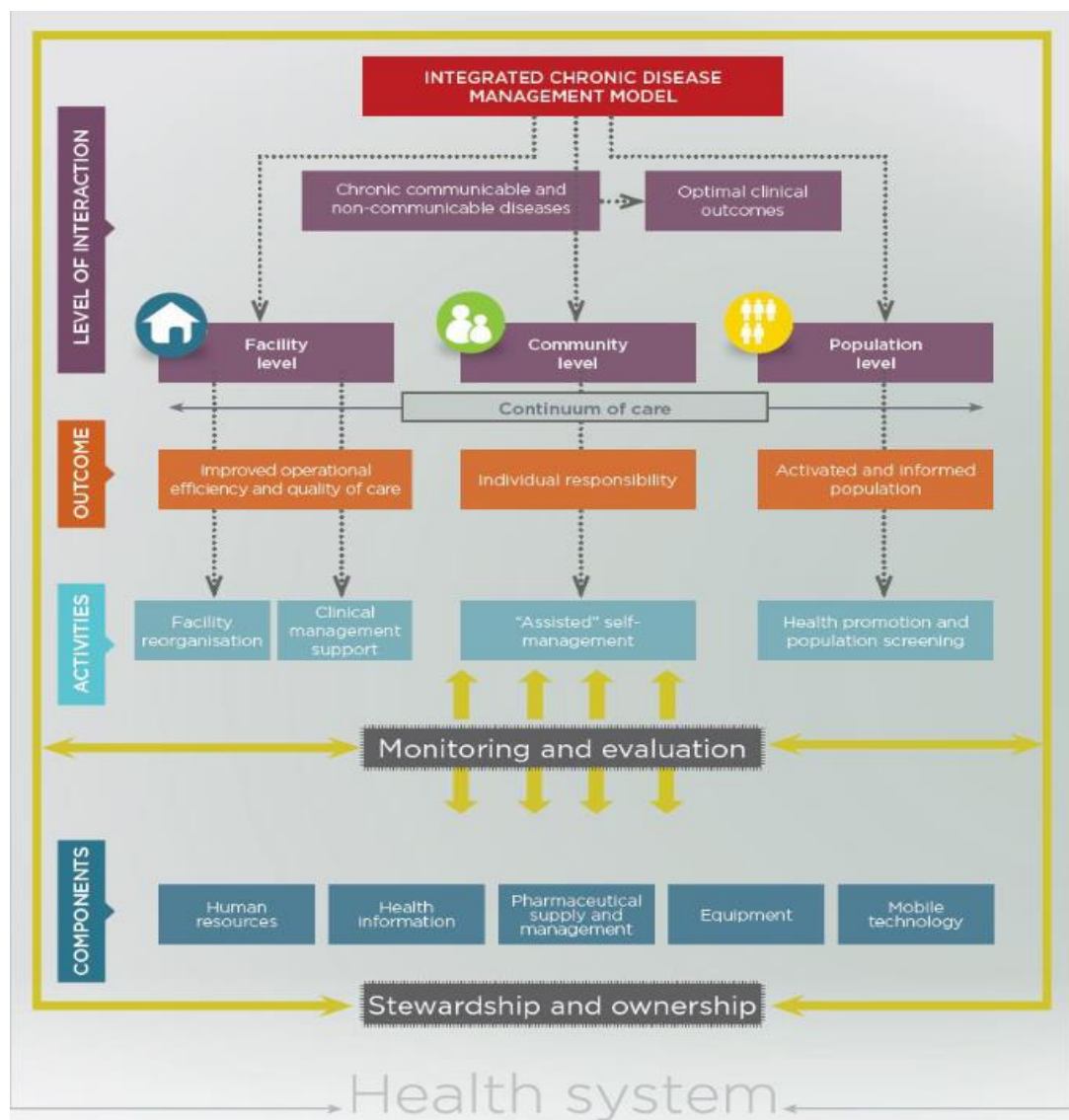
This model facilitates the integrated prevention, care, and treatment of patients with chronic conditions across levels 2, 3, 4, and 5. It facilitates a seamless shift towards supported self-care and improves the standard of care for chronic conditions to attain superior results through the utilization of the health system building blocks strategy. This hybrid model, originating from the Chronic Care Model (CCM), is designed to tackle gaps in various aspects of the health system building blocks that

were not addressed by the CCM. It allows for facility restructuring, encouraging clinical management support, aiding self-care assistance, and strengthening support systems and structures both within and outside the facility (Mahomed et al., 2014).

See figure 2.7.

Figure 2.7

The Integrated Chronic Disease Management (ICDM) Model



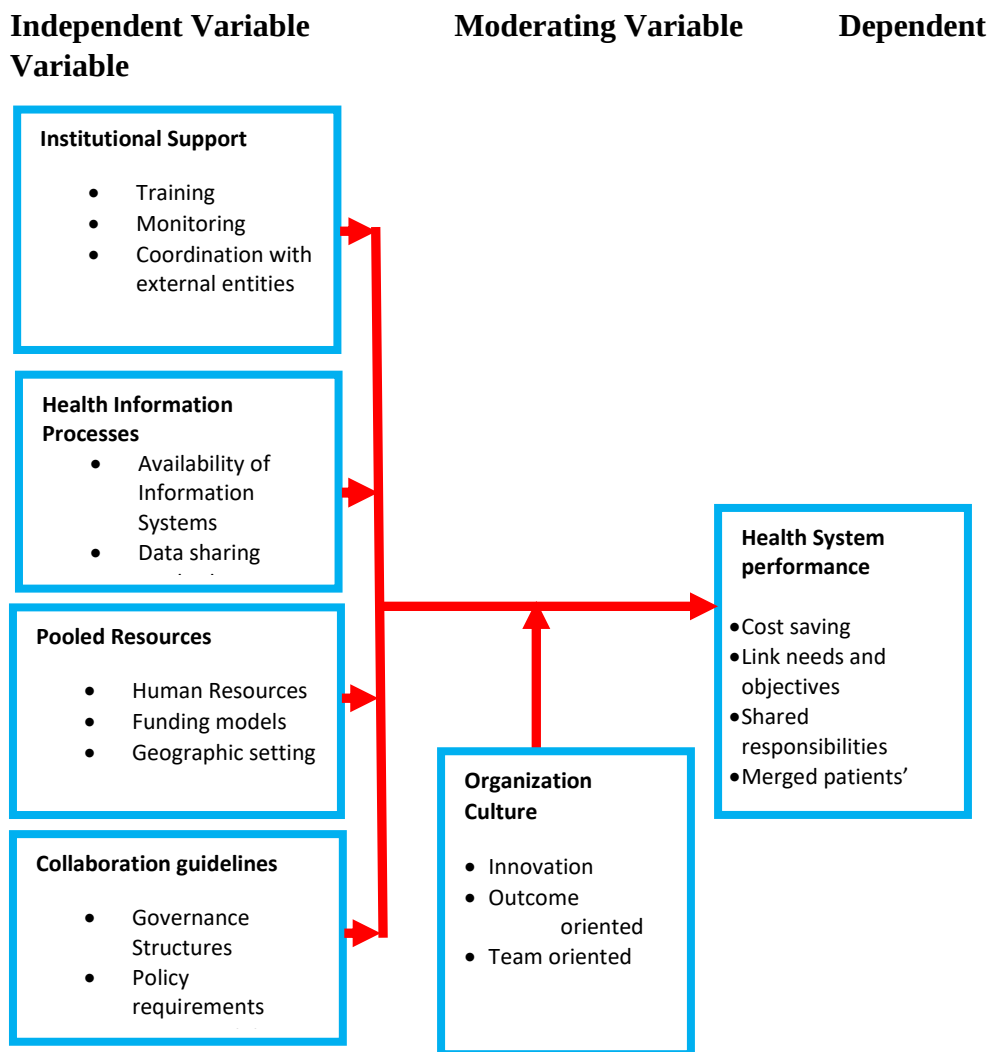
Source: Mahomed et al. (2014)

2.10 Conceptual Framework

It breaks down the possible basic building blocks that enable successful integration of health services through coordinated efforts among different health institutions. From the foregoing literature review, the conceptual framework was represented in the diagram. See figure 2.8.

Figure 2.8

Conceptual Framework



Source: Researcher (2022)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This section highlights the procedures and models used when collecting, analysing, presenting data and testing hypotheses on HIV/NCD integration on health system performance. The research employed a mixed-methods and modelling techniques following a constructivist approach. To examine connections between HIV/AIDS and NCDs, the study conducted correlational and cluster analysis to understand convergence. The study has developed a framework for linkage using thematic research synthesis. Systematic and critical reviews were employed for co-occurrence, while qualitative content analyses were applied. An action model was developed through integrative, configurative and interpretive evidence syntheses and validate it via literature review and expert consultations.

3.2 Study Design

A cross-sectional design with a mixed-methods approach was employed. The study integrated positivism and interpretivism philosophies to thoroughly evaluate health system performance and investigate the influence of independent variables on the dependent variable. An exploratory design was utilized to assess formulated hypotheses, while a descriptive design was implemented to quantify results. Correlations were examined to ascertain the connection between the independent and dependent variables (Harwell, 2011). Descriptive studies provide an accurate depiction of a research topic (Isaac & Michael, 1995). Hence, the study design offered a chance to assess correlation between the independent and dependent variables. The objective was to predict which variable to prioritize for enhanced

health system performance. The chosen study design presented a comprehensive and precise analysis by identifying the what, why, and how of potential improvements, while also ensuring minimal bias in data collection. See the summary of methods per objective in Table 3.1.

Table 3.1

Summary of Methods

<i>Specific objectives</i>	Research strategy	Data Collection tool	Sampling technique and sample size	Data Analysis tool and technique	Study measures
Institutional Support	Quantitative	Questionnaire (Appendix 3)	Probability sampling using Cochran formula	SPSS v24 Frequencies and percentages	Training Monitoring Coordination with external entities
Health Information Processes.	Quantitative Qualitative	A key Informant interview guide (Appendix 3)	Probability sampling using Cochran formula	SPSS v24 Thematic analysis method	Availability of Types of Information Systems Data sharing Methods Information Security/Privacy
Pooled Resources	Quantitative	Questionnaire (Appendix 1)	Probability sampling using Cochran formula	SPSS v24 Frequencies and percentages	Human Resources Funding Models Geographic Setting
Collaboration guideline	Quantitative	Questionnaire (Appendix 1)	Probability sampling using Cochran formula	SPSS v24 Frequencies and percentages	Governance Structure Policy Accountability
Organisation Culture	Quantitative	Questionnaire (Appendix 1)	Probability sampling using Cochran formula	SPSS v24 Frequencies and percentages	Innovations Outcome oriented Team oriented

<i>Specific objectives</i>	Research strategy	Data Collection tool	Sampling technique and sample size	Data Analysis tool and technique	Study measures
Healthcare System performance	Quantitative	N/A	N/A	Bivariate logistic regression model	Cost saving Link needs and objectives Shared responsibilities Merged patients' processes

3.3 Target Population

The research centered on a target group of 146 healthcare facilities offering HIV/NCD care services with CCCs in Nakuru County. These facilities exhibit similar observable characteristics. Nakuru County was selected due to its high prevalence of HIV/NCD comorbidities.

3.3.1 Study Population

This comprised health facility in-Charges, Comprehensive Care Clinic (CCC) supervisors, and healthcare providers within Nakuru County. A total of 212 respondents were included in the study. These individuals play critical roles in the delivery and coordination of integrated HIV/NCD services, making their perspectives and insights valuable for the study's objectives. By including these diverse roles within the healthcare system, the research aimed to capture a comprehensive understanding of the challenges and opportunities associated with integrating HIV/NCD services in the region.

3.3.1 Inclusion Criteria

- i. Healthcare practitioners who are licensed and work at various facility levels delivering HIV and NCD services at each site.

3.3.2 Exclusion Criteria

- i. Participants who did not give informed consent.

They were not replaced with other sampled individuals, and no preselected participants was swapped in the study.

3.4 Sample Size Determination

The study was conducted at healthcare institutions in Nakuru County, which consisted of 146 facilities hosting an HIV clinic. The sample size (n) for the health facilities was calculated using the Cochran formula as detailed below.

$$Z^2 * p * (1-p) / e^2$$

In the formula:

n represents the sample size

N stands for the population size

p denotes the average proportion of records anticipated to meet the criteria, often set at 50% or 0.5 when the prevalence is unknown.

e indicates the acceptable margin of error, which we set at 5%.

Z is a mathematical constant determined by the confidence interval. For a 95% confidence level, we utilized 1.96.

Calculations:

- i. Initial estimation when the population size is unknown.

$$n = \frac{Z^2 \cdot p \cdot (1-p)}{e^2}$$

$$((1.96)^2 (0.5) (0.5)) / (0.05)^2 = 384.16.$$

Finite population correction (for known population size)

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

$$= 384.16 / (1 + (383.84 / 146))$$

$$= 105.81$$

Accounting for the design effect (DEFF):

DEFF signifies the extent to which the sampling error differs from what is observed in simple random sampling. For simple random or stratified random samples, the DEFF value is 1.0 as DEFF is not factored in. When it comes to cluster samples, a value of 2.0 is suggested for cases where the cluster samples are numerous and small.

$$= n \cdot D$$

$$= 105.81 \cdot 1$$

$$\text{Thus, } n = 105.81$$

Anticipated response rate:

The expected response rate for this research was predicted to be 100%. Therefore, following the adjustment for the response rate, the sample size was calculated as follows:

$$= n / 1$$

$$= 105.81 / 1$$

$$= 105.81$$

By applying the formula above, a total of 106 out of 146 facilities were selected for inclusion in the study.

Table 3.2 below shows the specific study sites.

From the 106 facilities, two respondents with the most extensive years of experience at each facility, two respondents completed the structured questionnaire including the individuals responsible for the facility, healthcare staff working at the CCC, and/or healthcare workers at the institution. A total of 212 healthcare providers were anticipated to fill out the structured questionnaires for the study. A KII was conducted in purposively chosen facilities where a total of 27 key informant interviews were implemented.

Table 3.2

Selected Study Sites

Sub County	Ward	No. of health facilities	Sub County	Ward	No. of health facilities
Gilgil Sub County	Elementaita Ward	4	Nakuru East Sub County	Biashara Ward	11
	Gilgil Ward	5		Flamingo Ward	1
	Malewa West Ward	2		Kivumbuni Ward	1
	Mbaruk/Eburu Ward	2		Menengai Ward	2
	Murindati Ward	2		Nakuru East Ward	3
	Kamara Ward	2		Bahati Ward	2
Kuresoi North Sub County	Kiptororo Ward	1	Nakuru North Sub County	Dundori Ward	2
	Nyota Ward	2		Kabatini Ward	1
	Sirikwa Ward	1		Kiamaina Ward	2
	Amalo Ward	1		Lanet/Umoja Ward	1
Kuresoi South Sub County	Keringet Ward	1	Nakuru West Sub County	Kapkures Ward	1
	Kiptagich Ward	1		Kaptembwo Ward	1
	Elburgon Ward	3		London Ward	6
Molo Sub County	Molo Ward	3		Rhoda Ward	1
	Turi Ward	1		Shaabab Ward	3
Naivasha Sub County	Biashara Ward	1	Njoro Sub County	Kihingo Ward	2
	Hellsgate Ward	3		Lare Ward	1
	Lake View Ward	1		Mau Narok Ward	1

Sub County	Ward	No. of health facilities	Sub County	Ward	No. of health facilities
Subukia Sub County	Maeilla Ward	4	Rongai Sub County	Nessuit Ward	1
	Mai Mahiu Ward	4		Njoro Ward	2
	Olkaria Ward	3		Menengai West Ward	1
	Viwandani Ward	3		Soin Ward	2
	Kabazi Ward	2		Solai Ward	1
	Subukia Ward	1		Visoi Ward	2
	Waseges Ward	2	Grand Total		106

For all objectives the study adopted a total population of 212 healthcare providers sampled from the selected health facilities in Nakuru County. This is a type of purposive sampling where the population of interest is studied. The study chose this method to capture the specific characteristic of the population that would inform the study (Martínez-Mesa et al., 2016). To gain deeper insights into the objectives, the research focused exclusively on the facility managers operating at the chosen healthcare facilities with significant workloads. Additionally, a total of 27 facility managers were interviewed to assess the necessary institutional support, information procedures, resources, and collaborative directives essential for the effective implementation of integrated care for HIV/NCD in these healthcare facilities.

3.5 Data Collection Tools

Primary data collection involved three tools, structured questionnaire (Appendix 1) with questions on demographic characteristics, independent and dependent

variables. To estimate the costs, the study identified cost items/drivers including staff, recurrent goods, recurrent services, infrastructure/capital items and facility space but exclude off-site costs, such as program leadership. Quantification of the amounts of each resource used was undertaken. The quantities of resources used, the number of items used, and their allocation across different functions and times frames was estimated. Cost allocation was done for the resources consumed by extracting costs from expenditure records including invoices and itemized expense reports. Personnel costs were estimated using the salaries records and time and motion data to estimate the effort specifically dedicated to providing services for HIV and NCD integration. Market wages was used in cases where salaries data were missing for certain cadres. The researcher calculated the facility costs by multiplying the percentage of space at the government health clinic allocated to HIV/NCD integration by the health facility construction costs, spread out over a 15-year period. To account for shared costs among various projects, allocation across different purposes was evaluated to indicate the level of utilization for HIV/NCD treatment activities. Recurrent goods and services costs were estimated based on expenditure records, supplemented by interviews with staff to confirm the consumption of recurrent items and services. Costs of capital goods was amortized assuming five years of useful life and included in relevant cost periods. Finally, costs per patient treated were calculated by dividing the total cost of treatment cost by the total number of patients receiving HIV/NCD treatment. The total costs were calculated by multiplying the quantities of each input by its market value. The costs are initially presented in Kenyan shillings and later converted to international dollars using the purchasing power parity rate. This covers objective five (Appendix 2). Finally, the Key Informant interview guide (Appendix 3) was

utilized to guide the process of building an integration model. To collect this data, the researcher reviewed the Key Informant interview guide and the informed consent form. The location of the interview and establish the language for communication to be used during the interview were established.

3.6 Pre-test

Pretesting of the data collection tool was done in the selected eight out of ten sampled health facilities in Nakuru county. These facilities were not part of the study sites but had similar characteristics to the study sites. This was done to evaluate the correctness and the understanding of the study tools to assess validity, practicability, sensitivity, consistency, and reliability of the tool. Pre-test was also done to ensure the study instructions are adequate and the technology used i.e., the mobile phone for data collection was well understood. Any problems or limitations identified was corrected to refine the questionnaire before being administered in the actual study site. According to Mugenda (2008) and Mugenda and Mugenda (2003), a sample of 1% to 10% is representative for pre-test purposes. The study targeted to interview a total of 30 healthcare providers after sampling two per health facility i.e., the facility in charge and the CCC in charge and or 2 other care providers in the facility. A Cronbach's alpha threshold of 0.70 was applied to evaluate the internal consistency and reliability of the measures, with validity serving to confirm whether the constructs effectively captured their intended concepts.

3.7 Methods of Data Collection

After informed written consent (appendix 6) was obtained, those who agreed to participate were taken through the questions. The researcher outlined the study's goals and emphasized the importance of information confidentiality while reassuring the participants about the use of the data. The researcher had phrased questions carefully to ensure clarity. In-depth interviews were implemented with key informant respondents, allowing probing for more information and seeking clarification.

To expedite data entry, integration, and processing for immediate use, a digital data collection method utilizing the Open Data Kit (ODK) mobile phone platform was adopted. This approach enabled streamlined analysis with reduced requirements for additional data cleaning and swift adjustments based on real-time feedback. Data gathering occurred from February to May 2023.

During the study, interviews were recorded, and notes were taken by the researcher. We administered the questionnaire, filling out and completing a form for each respondent after logging into the app. Questionnaire completion via ODK occurred both online and offline. Completed forms were uploaded when a secure internet connection was available.

The completed questionnaires were then securely sent to SPSS for archiving and analysis. The data underwent thorough editing, error and omission examination, and cleaning processes. Statistical and descriptive analyses were conducted using SPSS. Qualitative data was organised, coded and analysed as per the emerging themes and content. The recorded key informant interviews were downloaded and

transcribed verbatim then subjected to verification for accuracy and authenticity. Content analysis was carried through coding of the transcribed data which was categorised into themes in line with the questions asked and indicators. Common themes were arranged into categories, subcategories and themes. We used NVivo software for analysing the qualitative data.

The qualitative analysis delved deeply into the performance of the health system, offering comprehensive insights. Utilizing NVivo software, standard methodologies were employed to uphold the credibility, consistency, and robustness of the findings. The condensed data was effectively contextualized to facilitate triangulation, allowing for the identification of convergence and agreement within the data. Furthermore, quantitative data was statistically juxtaposed with the qualitative data gathered during the analysis process.

The findings are organised by research objectives using statistics to demonstrate the significance of the variables. Qualitative findings are organised in themes and quotations provided to illustrate the themes identified in the study. Quantitative findings are summarised and presented through tables, figures, charts and graphs.

3.8 Operational Definition of Variables

Table 3.3

Definition and Measurement of Variables

Variable Type	Name	Operationalized indicator of the variable
Dependent Variable	Healthcare System Performance	Includes efficiency and effectiveness of actions. Measured using a Likert scale.
Independent Variables	Institutional Support	Institutional support includes investments in resources, creating an enabling work environment and commitment of the top management. Measured using a Likert scale
	Health Information processes	Provision of real-time data so that healthcare institutions can focus on patients at the appropriate time. Measured using a Likert scale
	Pooled resources	Resource constraints bring about burden on managing long term illness. Therefore, leveraging on the available required resources and their efficient utilization is key in the integration of care. Measured using a Likert scale
	Collaboration Guidelines	Responsibility is shared, shared vision, drive and action plans for integration initiatives among stakeholders. Leadership involvement and management to

Variable Type	Name	Operationalized indicator of the variable
		implement the initiative are critical. Measured using a Likert scale
Moderating variables	Organisation Culture	Culture and commitment and Leadership and performance measurements. Measured using a Likert scale

3.9 Ethical Considerations

Ethical standards were maintained in every phase of implementation. Formal approval was diligently sought from various entities including the KeMU Science and Ethics Review Committee (SERC) with approval number KEMU/SERC/HSM/27/2022, the National Council of Science, Technology, and Innovation (NACOSTI) with License number NACOSTI/P/23/22899, the County Department of Health with reference NCG/CDPH/RES/VOL.1/2023/667, and the pertinent healthcare institutions. Prior to data collection, informed consent (refer to Appendix 4) was obtained from all participants to ensure confidentiality and ethical treatment of their feedback. The collected data was securely maintained and accessible only to the researcher. The study findings will be disseminated through Kenya Methodist University with a commitment to transparency, avoiding any falsification, manipulation, or misrepresentation of the results.

3.10 Data Processing and Analysis

Qualitative data was analysed using NVIVO 12, employing a thematic analysis approach. The first phase entailed reviewing the English transcripts repeatedly to

become acquainted with the raw data. Subsequently, open coding was employed to recognize the factors influencing HIV/NCD integration, followed by axial coding to link and categorize codes according to common concepts, dimensions, and characteristics. Selective coding was then used to concentrate on the fundamental concepts identified in the data. During the initial analysis stage, the data was coded independently by the researchers. This was followed by collaborative dialogues between two coders to compare developing codes and formulate a definitive coding structure, which was employed to code and analyze the data using NVIVO 12.

Concerning the quantitative data, the questionnaires underwent thorough review and editing to ensure completeness and coherence before processing the responses for the study. SPSS Version 24 was employed for analyzing the quantitative data post-coding. Total scores were computed for each item within the variable constructs and factors to determine frequencies, percentages, measures of central tendency, and measures of dispersion. Furthermore, demographic variables such as age, education level, work experience, professional training, and facility level were examined in the research.

To investigate the relationship between variables influencing the integration of HIV/NCD services, a Chi-square test was conducted. Additionally, bivariate logistic regression was carried out to evaluate the variability in the identified variables. A significance level of 0.05 was set for the analysis.

For hypothesis evaluation, two criteria were established based on the null hypothesis (H_0) and alternative hypothesis (H_1), with a significance level of $\alpha = 0.05$. According to the guideline, the null hypothesis should be rejected if the p-

value is less than α ; otherwise, the null hypothesis should be retained. The hypotheses are delineated as follows:

1. Null Hypothesis (H_0): $H_{0i}: \beta_i = 0$, where i ranges from 1 to 5.
2. Alternative Hypothesis (H_1): $H_{1i}: \beta_i \neq 0$, where i takes values from 1 to 5.

In binary logistic regression analysis, when the p-value exceeds 0.05, the null hypothesis H_0 is dismissed in favor of the alternative hypothesis H_1 . Conversely, if the p-value is equal to or less than 0.05, the null hypothesis H_0 is retained. The regression results provide the relevant p-values, and the Nagelkerke R-squared measure was employed to assess the significance of each independent variable statistically. See table 3.4.

Table 3.4***Study Hypotheses***

Variable	Null Hypothesis	Type of Analysis	Interpretation
Institutional Support	H ₀₁	Chi-square test	P < 0.05 reject null
	No significant influence	Binary logistic Regression	P > 0.05 fail to reject null
Health Information Process	H ₀₁	Chi square test	P < 0.05 reject null
	No significant influence	Binary logistic Regression	P > 0.05 fail to reject null
Pooled Resources	H ₀₁	Chi square test	P < 0.05 reject null
	No significant influence	Binary logistic Regression	P > 0.05 fail to reject null
Collaboration guidelines	H ₀₁	Chi square test	P < 0.05 reject null
	No significant influence	Binary logistic Regression	P > 0.05 fail to reject null
Organisational Culture	H ₀₂	Chi square test	P < 0.05 reject null
	No significant influence	Binary	P > 0.05 fail to reject null
Moderation	H ₀₃	Chi square test	P < 0.05 reject null

3.12 Empirical Models

In examining the impact of healthcare services integration on enhancing health system performance in Nakuru County, a binary logistic regression model was employed. The evaluation of health system performance focused on sustainability, where sustainability scores were coded as 0 for non-sustainable systems and 1 for sustainable systems. The theoretical relationship posited in this study can be depicted as follows:

$$P(Y_i) = \frac{1}{1 + e^{-(b_0 + b_1X_{1i} + b_2X_{2i} + \dots + b_kX_{ki})}} \dots \text{Eqn 1}$$

Where:

- $P(Y_i)$ represents the projected odds that Y is true for case i
- e is a mathematical constant approximately 2.72
- b_o is a constant estimated from the data
- $b_1, b_2, \dots, b_k$ is a b-coefficient estimated from the predictors 1, 2, 3..... k .
- $X_{1i}, X_{2i}, \dots, X_{ki}$ are the observed score on predictors $X_i, X_2, \dots, X_k$ for case i

Equation 1 was used to model both the direct and moderated effects, where:

3.12.1 Evaluation of Direct Effect.

To assess the direct impact within the framework delineated in equation 1, all independent variables were incorporated into SPSS version 24 and subjected to regression analysis against the target variable. The procedure unfolded in the subsequent manner:

- ii. Conversion of variables via the compute function: Likert scale responses for each variable were transformed into binary format to generate the requisite variables.
- iii. Incorporation of the dataset into a binary logistic regression model.
- iv. Definition of the reference groups.
- v. Production of the results.

The results stemming from the logistic regression examination pertinent to this research encompassed:

- vi. The Hosmer and Lemeshow test statistic.
- vii. Nagelkerke R-Squared value.

viii.-2 log-likelihood figures.

ix.Odds ratios.

3.12.2 Evaluation of the Moderating Influence

To examine the moderating impact of organizational culture, the binary logistic regression model was conducted for all independent variables and the moderator. The dependent variable in this analysis was health system performance, assessed through sustainability indices, while organizational culture was considered the moderator. The disparities in the -2log-likelihood statistics and odds ratios were utilized to discern the more concise model. The procedural steps in this analysis were delineated as follows:

- i.Conversion of variables through the compute function: Likert scale items for each variable were transformed into binary responses to establish the corresponding variables.
- ii.Inclusion of the data in the binary logistic regression model.
- iii.Specification of the reference groups.
- iv.Generation of the outcomes.

The results derived from the logistic regression analysis relevant to this investigation included:

- i.Hosmer and Lemeshow test statistic.
- ii.Nagelkerke R-Squared value.
- iii.-2log-likelihood statistics.
- v.Odds ratios.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

The study results indicate that integrated care for NCDs and HIV improves health outcomes, better patient satisfaction, and efficient resource use. It also highlights the need for a sustainable funding model that leverages on the cost savings associated with integration.

The data collected comprised quantitative and qualitative data. The convergent mixed methods approach was utilized to interpret the findings, integrating quantitative results with qualitative findings to provide a comprehensive understanding of the results. Following this integration, a discussion was conducted, and the results were reported in accordance with the research objectives.

Descriptive statistics, focusing on frequencies and percentages, were used to analyse quantitative data. Significance between variables was assessed using Pearson Chi-square tests. Inferential statistics, specifically binary logistic regression, were done to establish the impact of the independent variable on the dependent variable.

For each objective, a descriptive analysis was carried out and discussed, followed by an examination of inferential statistics. The chapter concluded with a summary of the findings.

The primary objective aimed to assess how institutional support for HIV/NCD influenced integrated services within the healthcare system in Nakuru County. This

involved evaluating the level of support provided by healthcare institutions in terms of policies, resources, and infrastructure to facilitate the integration of HIV and NCD services.

The second objective investigated the impact of health information processes concerning HIV/NCD integration on the healthcare system's performance in Nakuru County. This objective entailed assessing the efficacy of information systems, data collection, and sharing mechanisms in supporting the integration of HIV and NCD services and their influence on overall system performance.

The third objective aimed to elucidate the impact of pooled resources on integration of HIV/NCD services on the healthcare system's performance in Nakuru County. This objective involved examining how the consolidation and allocation of resources, including funding, personnel, and equipment, contributed to the effectiveness and efficiency of integrated services and their impact on health system performance.

The fourth objective established the impact of collaboration guidelines for HIV/NCD integration on the healthcare system's performance in Nakuru County. This objective focused on evaluating the presence and effectiveness of guidelines, protocols, and mechanisms for collaboration and coordination among various healthcare providers and stakeholders engaged in delivering integrated HIV and NCD services.

Lastly, the fifth objective aimed to determine the moderating effect of organizational culture on integration of HIV/NCD and healthcare system performance.

The study aimed to create a comprehensive HIV/NCD integration model tailored for staff in Nakuru County to enhance the quality of healthcare services. It sought to offer valuable perspectives on the critical factors influencing the integration of HIV/NCD services and their effects on the health system performance. Through the pursuit of these defined objectives, the research strived to provide evidence-based approaches for fortifying the healthcare system and enhancing the provision of integrated HIV/NCD services.

4.2 Reliability Test

In assessing the internal consistency of the study tool, a Cronbach's alpha test was performed. It had a coefficient of 0.826, signifying a strong level of internal consistency and reliability for the collected data. See Table 4.1

Table 4.1

Cronbach's Alpha test

Item-Total Statistics	Cronbach's Alpha
Institutional Support	.729
Health Information Processes	.800
Pooled Resources	.755
Collaboration guidelines	.738
Organization Culture	.702
Health System performance	.717
Overall index	.826

4.2 Study Characteristics for Facilities Visited

The study response rates are categorized by facility level (2, 3, 4, and 5) and respondent type (FBO, GOK, Private). Overall, the response rates for the different facility levels and respondent types are relatively high, ranging from 71% to 100%.

The highest response rates were observed for Level 4 facilities, while Level 2 facilities had slightly lower response rates. The overall response rate was 93% (198). See Table 4.2

Table 4.2

Study Characteristics for Facilities Visited

Facilities	Response Rate	FBO	GOK	Private	Grand Total
Level 2		7 (78%)	30 (100%)	3 (75%)	40 (93 %)
Level 3		5 (71%)	24 (96%)	6 (100%)	35 (92%)
Level 4		2 (100%)	14 (100%)	7 (88%)	23 (96%)
Level 5			1 (100%)		1 (100%)
Grand Total		14 (78%)	69 (99%)	16 (89%)	99 (93%)
Respondents	Response Rate	FBO	GOK	Private	Grand Total
Level 2		14 (78%)	60 (100%)	6 (75%)	80 (93 %)
Level 3		10 (71%)	48 (96%)	12 (100%)	70 (92%)
Level 4		4 (100%)	28 (100%)	14 (88%)	46 (96%)
Level 5			2 (100%)		2 (100%)
Grand Total		28 (78%)	138 (99%)	32 (89%)	198 (93%)

4.3 Study Demographic Characteristics for Key Informants

A total of 27 respondents participated in Key informant interviews. The respondents were healthcare professionals working in different facilities. In terms of facility level, n (44%) of the respondents worked at Level 3 facilities, followed by n (26%) at Level 4 and Level 2 facilities each, and only 4% at Level 5 facilities. In terms of ownership, the majority of the facilities (67%) were Government of Kenya (GOK) facilities, while n (26%) were private and 7% were faith-based organizations (FBOs). Regarding the respondents' designation, the largest group was nurses, accounting for 52% of the respondents. Clinical officers made up 33% of the respondents, while medical officers, laboratory technologists, link desk personnel, and adherence counsellors each represented 4% of the participants.

Regarding sex, 67% were female, while 33% were male. When considering years of professional experience, the largest group (48%) had professional experience of 3-5 years, followed by 33% with 5-10 years professional experience, and 19% with 1-3 years of experience. Table 4.3 below shows the study's demographic characteristics.

Table 4.3

Study Demographic Characteristics for Key Informants

		N	(%)
Facility level	Level 5	1	4%
	Level 4	7	26%
	Level 3	12	44%
	Level 2	7	26%
Ownership	GOK	18	67%
	Private	7	26%
	FBO	2	7%
Respondents' designation	Clinical Officers	9	33%
	Nurses	14	52%
	Medical officers	1	4%
	Laboratory technologist	1	4%
	Link desk personnel	1	4%
	Adherence counsellor	1	4%
Sex	Female	18	67%
	Male	9	33%
Years of professional experience	1-3 Years	5	19%
	3-5 Years	13	48%
	5-10 Years	9	33%

4.4 Healthcare System Performance

Health systems performance was evaluated by assessing the sustainability of healthcare institutions through various strategies such as cost reduction, alignment of needs and objectives, sharing responsibilities, and optimizing patient flow processes. As part of the study, the focus was on the integration of HIV and NCD services to address needs of individuals with these health conditions effectively.

This integration bridged the gap between the requirements of patients and the services provided, aiming to create a comprehensive and coordinated approach to managing both HIV and NCDs. By integration of these services, the aim was to potentially enhance patient outcomes and ensure that appropriate services are accessible and available to those in need.

The results indicate a strong agreement among respondents regarding the prospective gains of integrating HIV and NCD (non-communicable disease) services. A significant majority, 88.9%, strongly agree that identifying HIV/NCD needs would help minimize operational costs for the organization. These results agree with those of Mesabbah and Arisha (2016) who agree that cost will be minimised in the constrained health sector when services are integrated. This suggests that a comprehensive approach to healthcare can potentially optimize resource allocation and operational efficiency and hence lead to a sustainable health system. Similarly, 89.9% of respondents express full awareness that combining HIV and NCD services would reduce patients' waiting time, which is aligned to Kumpunen et al. (2020) who agrees integration will not only be good to reducing cost but also improves efficiency in the healthcare processes. The acknowledgment that combining HIV and NCD services would reduce waiting times indicates the importance of streamlining healthcare delivery and improving patient experience. Consolidation can lead to more efficient workflows and better utilization of resources (WHO, 2018). Furthermore, 80.8% of respondents believe that building capacity would be easier if HIV and NCD services were consolidated under one roof, with 14.1% in agreement and 8% expressing neutrality. The belief that building capacity would be easier with integrated services highlights the potential

synergies and shared resources that can be realized. Combining HIV and NCD services can facilitate the development of a robust healthcare system that addresses multiple health issues effectively. These study findings are in agreement with Burkett (2005b) who found that shared resources and patients accessing services at one stop facilitates better patients experience and saves time in an organisation. Study findings also prove that demand for HIV/NCD services is on the rise with 94.9% strongly agreeing and 5.1% agreed. Trbovich (2014) reports that for sustainability of health care intervention there is a need to apply the system thinking approach. Integration of this services would enhance their management. A chronic care model by Rush (2014) demonstrates how aligning the health system with this model stresses the central role of patients and their interactions with an organized team of providers to improve health outcomes. Mahomed et al. (2014) though emphasis that an integrated care model ensures a seamless transition to assisted self-care and enhances the standard of care for chronic diseases to achieve improved outcomes through the health system building blocks approach.

Table 4.4

Health System Performance

Link needs and Objectives	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. I believe if HIV/NCD needs are identified it will assist our organisation to minimise the cost of operations	176 (88.9%)	22 (11.1%)	(0%)	(0%)	(0%)
2. I am fully aware that if HIV and NCD services are put together patients waiting time would be less	178 (89.9%)	20 (10.1%)	(0%)	(0%)	(0%)
3. It would be easy to build capacity if HIV and NCD services are put under one roof	160 (80.8%)	28 (14.1%)	8 (4%)	2 (1%)	(0%)
Shared responsibilities					
1. HIV and NCD clinics both have a separate HR data for their staff	72 (36.4%)	12 (6.1%)	(0%)	56 (28.3%)	58 (29.3%)
2. HIV and NCD clinics both pay for their overhead expenses separately (water, electricity, general maintenance, vehicle maintenance)	(0%)	(0%)	2 (1%)	36 (18.2%)	160 (80.8%)

Link needs and Objectives	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
3. HIV and NCD clinics share one HR data for the staff	90 (45.5%)	22 (11.1%)	2 (1%)	24 (12.1%)	60 (30.3%)
4. HIV and NCD clinics have a combined overhead cost Centre (utility bill)	190 (96%)	8 (4%)	(0%)	(0%)	(0%)
Merged patients flow processes					
1. Our registry captures both HIV and NCD data during patient registration	136 (68.7%)	20 (10.1%)	2 (1%)	20 (10.1%)	20 (10.1%)
10. The introduction of a common HIV/NCD examination room supports a flexible assessment organizational work process and reduces the time staff spent searching for available space.	138 (69.7%)	54 (27.3%)	4 (2%)	2 (1%)	(0%)
11. Streamlined point of care testing, laboratory and pharmacy services facilitates flow by providing HIV/NCD services on-time and reducing dependency on external departments	136 (68.7%)	62 (31.3%)	(0%)	(0%)	(0%)
12. Dependency on external departments (laboratory and radiology departments) delays decision-making and patient outflow for HIV/NCD services.	134 (67.7%)	64 (32.3%)	(0%)	(0%)	(0%)
2. We have one cash collection office in the facility where HIV and NCD services are paid for	102 (51.5%)	10 (5.1%)	72 (36.4%)	4 (2%)	10 (5.1%)
3. HIV and NCD clinics can comfortably manage patients from one access point	150 (75.8%)	18 (9.1%)	6 (3%)	20 (10.1%)	4 (2%)
4. HIV and NCD clinics can comfortably use the main pharmacy to issue drugs to patients	180 (90.9%)	14 (7.1%)	(0%)	4 (2%)	(0%)
5. Our registry only captures HIV patients' data	90 (45.5%)	10 (5.1%)	(0%)	74 (37.4%)	24 (12.1%)
6. Our registry only captures NCD patient's data	82 (41.4%)	14 (7.1%)	4 (2%)	72 (36.4%)	26 (13.1%)
7. HIV and NCD services are managed from different access points	90 (45.5%)	4 (2%)	4 (2%)	28 (14.1%)	72 (36.4%)
8. The combined streaming and triage process facilitates patient flow, prioritising HIV/NCD services	160 (80.8%)	30 (15.2%)	8 (4%)	(0%)	(0%)
9. Requesting basic investigations (ECGs, urine tests, X-rays) during the triage process at the integrated HIV/NCD clinics improves flow by reducing the number of steps after the main clinical assessment.	130 (65.7%)	62 (31.3%)	6 (3%)	(0%)	(0%)
Sustainability of services					
1. NCD/HIV services are supported by NHIF in our facility	48 (24.2%)	18(9.1%)	20(10.1%)	30 (15.2%)	82(41.4%)
2.NCD/HIV services are partially supported by insurance companies	4 (2%)	40 (20.2%)	10 (5.1%)	44 (22.2%)	92 (46.5%)
3.NCD/HIV services are fully paid for by the patients (Out of pocket)	4 (2%)	6 (3%)	32 (16.2%)	44 (22.2%)	112 (56.6%)
4. There is increasing demand for HIV/NCD services	188 (94.9%)	10(5.1%)	(0%)	(0%)	(0%)

The study results highlight the current situation regarding shared responsibilities between HIV and NCD clinics. Regarding HR data, a significant portion of respondents, 36.4%, strongly agree that both clinics have separate HR data for their staff. The separate HR data for staff in HIV and NCD clinics suggests a siloed approach to human resource management. This finding is in line with a study that found that, in resource-limited settings, the healthcare workers play important roles in defining shared resources process therefore this may result in inefficiencies, duplication of efforts, and potential challenges in coordinating staff-related matters.

Similarly, for overhead expenses such as water, electricity, maintenance, and vehicle costs, the majority of respondents, 80.8%, strongly disagree that the clinics pay for these expenses separately. The lack of shared responsibility for overhead expenses indicates a fragmented approach to resource allocation. Consolidating these expenses can lead to cost savings, improved financial management, and better utilization of resources.

In terms of HR data, 45.5% of respondents strongly agree that HIV and NCD clinics share one HR data for staff, indicating some level of integration. Lastly, an overwhelming majority, 96%, strongly agree that the clinics have a combined overhead cost center for utility bills. The presence of shared HR data and a combined overhead cost center for utility bills demonstrates the potential benefits of integration. This can promote collaboration, streamline administrative processes, and enhance overall efficiency. Overall, the findings suggest a need for greater integration and shared responsibilities between HIV and NCD clinics. Consolidating HR data, overhead expenses, and other resources can lead to

improved coordination, cost efficiencies, and better utilization of staff and facilities. These findings call for organizational efforts to foster collaboration and explore opportunities for integration to enhance service delivery and optimize resource allocation. This is supported by a report by (WHO, 2021) that proved that in resource strained settings sharing of resources result to cost effectiveness.

The introduction of a common examination room for HIV/NCD services can foster efficiency and flexibility in the assessment process. This can lead to reduced waiting times, improved staff productivity, and better overall patient experience. Streamlining point-of-care testing, laboratory, and pharmacy services is also favored by 68.7% of respondents, as it facilitates timely delivery of HIV/NCD services and reduces dependency on external departments. Streamlining point-of-care testing, laboratory, and pharmacy services can improve access to timely HIV/NCD services, resulting in better patient management and reduced reliance on external departments. This holds promise for enhancing the overall operational efficiency and effectiveness of service provision.

Additionally, 67.7% of respondents strongly agree that dependency on external departments (e.g., laboratory and radiology) can cause delays in decision-making and patient outflow for HIV/NCD services. The dependency on external departments for services such as laboratory and radiology can cause delays in decision-making and patient outflow. Addressing this issue through improved coordination and communication between departments can help expedite delivery of HIV/NCD services. However, the presence of a single cash collection office where HIV and NCD services are paid for receives less support, with only 51.5% of respondents strongly agreeing. The presence of a single cash collection office

for HIV and NCD services may not be widely supported. This suggests the need for further examination of the financial processes and potential improvements to ensure convenience and accessibility for patients.

A significant majority of respondents, 75.8%, strongly agree that HIV and NCD clinics can comfortably manage patients from one access point. The potential for HIV and NCD clinics to manage patients from one access point presents an opportunity for integrated care. Consolidating access points can improve patient experience, reduce waiting times, and optimize resource utilization. Similarly, 90.9% of respondents strongly agree that the main pharmacy can issue drugs to patients from both clinics. The ability to issue drugs to patients from the main pharmacy can also enhance the efficiency of HIV and NCD services. This can reduce costs and improve the availability of drugs for patients. However, the findings suggest that the registry has limitations in capturing complete patient data, with 45.5% of respondents indicating that the registry only captures HIV patients' data, and 41.4% indicating it only captures NCD patients' data. The limitations of the registry in capturing complete patient data suggest the need for improved data management systems. Ensuring complete and accurate patient data is crucial for effective healthcare delivery and care continuity.

The management of HIV and NCD from different access points is also a concern, with 45.5% of respondents indicating that these services are managed separately. However, the combined streaming and triage process is strongly supported by 80.8% of respondents, suggesting that it facilitates patient flow and prioritizes HIV and NCD services. The management of HIV and NCD services from different access points can hinder the effectiveness of service delivery. Addressing this issue

through improved coordination and communication can help facilitate integrated care. The combined streaming and triage process is strongly supported and can enhance patient flow and prioritize HIV and NCD services. The introduction of basic investigations during the triage stage at integrated HIV/NCD clinics is viewed as a strategy to streamline operations, improve the patient experience, and maximize resource utilization. The findings suggest that this approach can lead to a substantial 65.7% reduction in post-assessment procedures, showcasing its capacity to enhance workflow efficiency. Integrating basic investigations into the triage process can streamline operations, resulting in a more effective and efficient provision of HIV and NCD services.

To ensure patient satisfaction and enhance the performance of health systems under the HIV/NCD integrated care model, it is crucial to implement work plans, conduct performance evaluations, and provide feedback. This holistic approach ensures that the needs and expectations of patients are met while maintaining a focus on quality, efficiency, and patient-centered care. Kruk et al. (2018) acknowledges that customer feedback and endorsements play a pivotal role in ensuring accountability and driving enhancements, actively influencing the real-time evolution of service delivery.

In the qualitative analysis, the health facilities acknowledged that the health system performed commendably under the integrated care model. The evaluation of health systems revealed positive outcomes and achievements within the integrated care framework. All 27 facilities confirmed that they actively receive feedback regarding the satisfaction of patients who have utilized their services. Furthermore, these facilities reported that they effectively provide HIV/NCD care management,

and their patients express satisfaction with the quality of these services. Each facility operated according to a comprehensive work plan, incorporating specific goals to be achieved on a monthly, quarterly, bi-annual, and annual basis. Regular meetings are conducted to assess performance within these designated timeframes. In instances where organizational goals are not met, a thorough analysis is conducted to identify the underlying causes, followed by a re-evaluation of objectives through a SWOT analysis.

"When faced with challenges, we take a step back, re-evaluate our goals, and make necessary adjustments. Some goals may need to be temporarily shelved, while others are reintroduced with renewed determination and revised timelines. We understand the importance of providing the right support when needed, ensuring that our goals remain within reach."-Clinical officer 1.

Finally, to optimize operational costs and ensure long-term sustainability within the facility, a series of innovative measures have been implemented in some facilities. These measures aim to consolidate HIV and NCD cases, enabling the organization to maximize the utilization of its available resources. Key initiatives include the digitization of facility operations and the integration of HIV and NCD clinics, which addresses staff shortages effectively. By adopting these strategies, the facilities can streamline processes, enhance efficiency, and achieve cost savings without compromising the quality of care provided to our patients.

4.4 Institutional Support of HIV/NCD Integration and health system performance

Institutional support for HIV/NCD integration is of immense value in health system performance when addressing the complex health challenges posed by both diseases. It is essential for strengthening health systems, improving access to care, promoting cost-effectiveness, enhancing collaboration, and addressing the comprehensive health needs of individuals.

The provision of training on emerging health issues by organizations is commendable, but there are notable gaps when it comes to fully sponsored degree programs and the availability of trainers in local colleges. This finding is in line with a study done in Germany that found out if they need to achieve their goals the government ensured that curriculum developers enforced learning of necessary aspects emerging from patient's needs by providing some of the specifications in the curriculums developed (Balzer et al., 2015). This suggests a need for increased investment and support to ensure comprehensive education and training opportunities in the healthcare sector. However, it is encouraging to see that outcomes are well monitored and there is evidence of coordination with external entities. This highlights the importance of collaboration and partnerships to address the challenges in healthcare training. By addressing these gaps and strengthening coordination, organizations can enhance standard and effectiveness of training programs, ultimately bettering healthcare results and addressing emerging health issues more effectively (Balzer et al., 2015; Mooko & Oladokun, 2021). See Table

Table 4.5***Institutional Support***

Training	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Our organisation has continuous improvement trainings on emerging health issues	114 (57.6%)	70 (35.4%)	8 (4%)	6 (3%)	(0%)
2. Our organisation fully supports staff workshops, conference participation, seminars to help improve workers knowledge	120 (60.6%)	72 (36.4%)	6 (3%)	(0%)	(0%)
3. I have enjoyed a fully sponsored degree programme paid for by our organisation	10 (5.1%)	4 (2%)	(0%)	58 (29.3%)	126 (63.6%)
4. Our organisation works closely with learning institutions to inform them on the health sector needs	110 (55.6%)	84 (42.4%)	4 (2%)	(0%)	(0%)
5. I am a trainer in one of the local colleges/institutions in the area of my expertise	8 (4%)	2 (1%)	(0%)	74 (37.4%)	114 (57.6%)
Monitoring outcomes					
1. Our organisation conducts customer satisfaction surveys frequently	62 (31.3%)	72 (36.4%)	44 (22.2%)	20 (10.1%)	(0%)
2. Our organisation uses customer satisfactions surveys results to make improvements	62 (31.3%)	78 (39.4%)	44 (22.2%)	14 (7.1%)	(0%)
3. Our organisation involves staff in problem identification on issues concerning service delivery	90 (45.5%)	94 (47.5%)	10 (5.1%)	4 (2%)	(0%)
4. Our organisation takes corrective actions on gap/problems identified	106 (53.5%)	86 (43.4%)	6 (3%)	(0%)	(0%)
Coordination with external entities					
1. We work closely with other sector coming up with initiatives that can improve the care to our patients	146 (73.7%)	52 (26.3%)	(0%)	(0%)	(0%)
2. Our organisation works closely with the national government to improve service delivery	156 (78.8%)	40 (20.2%)	2 (1%)	(0%)	(0%)
3. Our facility works closely with the local government to improve service delivery	158 (79.8%)	38 (19.2%)	2 (1%)	(0%)	(0%)
4. Community participation is embraced in our facility	178 (89.9%)	16 (8.1%)	2 (1%)	(0%)	2 (1%)

The results underscore a notable deficiency in trainers. Bridging the connection between HIV and NCDs, trainers can empower upcoming healthcare practitioners with essential expertise and proficiencies to deliver holistic care and assistance to individuals managing HIV and NCDs. This forward-looking strategy can lead to

enhanced patient results, more efficient treatment approaches, and a general decline in the prevalence of NCDs within the HIV-positive community (See Table 4.5).

The findings reveal that facilities that prioritize training, monitoring outcomes and proper coordination with external entities have a high likelihood of having better performance. The highest agreement scores of 79.8 percent is observed indicating a strong collaboration between the facilities and the local government in improving service delivery. A study done by Guezennec et al. (2016) emphasised the need to consistently monitor progress and outcomes.

Respondents generally agree that their organizations frequently conduct customer satisfaction surveys to monitor outcomes and enhance the standard of care delivered to patients.

Additionally, the findings indicate that respondents recognize the use of customer satisfaction survey data by organizations to improve services for patients. In conclusion, coordination with external entities reported an overall result highlighting a positive trend of community involvement, with some room for improvement in certain areas. Similarly, Alderwick et al. (2021) made significant advancement in coordinating entities with external stakeholders.

Overall, a significant number of facilities had taken initiatives to enhance the skills and knowledge of healthcare care providers in managing the streamlined care of HIV and NCDs. The majority (17) revealed their facility had conducted training and held workshops to build capacity for care providers in handling HIV/NCD services. Ten facilities responded negatively, stating that they had not organized any such training sessions. Furthermore, the participants recognized the

significance of providing comprehensive training to employees, enabling them to acquire the necessary skills to effectively implement an integrated care model. This training would equip them with the ability to proficiently manage the complex needs of HIV patients with multiple diagnoses, ensuring appropriate and tailored care, enhancing job efficiency, fostering staff confidence, and promoting competency and efficiency.

"Training staff on HIV NCD integration guarantees effective management of patients by keeping staff members updated on the current changing health dynamics, ultimately enhancing the quality of care provided."-Clinical officer-2.

These findings are consistent with previous research by Rabkin et al. (2018), which emphasized the need for healthcare workers to enhance and diversify their skills for the effective integration of NCD services into HIV programs (Rabkin et al., 2018).

The majority of respondents recognized that to optimize service provision and ensure ongoing enhancement in service delivery, facilities implemented various strategies for monitoring performance outcomes. These included regular CQI meetings, comprehensive weekly and monthly reports, monthly and quarterly meetings, as well as continuous medical education initiatives. By utilizing these mechanisms, facilities were able to maintain a proactive approach to quality improvement and keep abreast of emerging trends and best practices in healthcare delivery.

Finally, several external stakeholders and institutions collaborated closely with these facilities to provide valuable support for the integrated care model, with a

particular focus on HIV/NCD services. Notable partners included LVCT, Marie Stopes, USAID TUJENGE JAMII, UTJ through the Ministry of Health (MOH), KEMSA, MEDS, PEPFAR, TB ARC, Centre for Health Solutions, and the Government of Kenya. These collaborative efforts fostered a comprehensive and holistic approach to healthcare, ensuring the availability of resources, expertise, and funding necessary to deliver high-quality, integrated care to individuals in need.

These institutions predominantly extended support to health facilities in various critical areas, including human resources and financial assistance. The close collaboration between healthcare facilities and learning institutions is a strategic approach to ensure that educational programs align with the needs of the health sector as it could assist organizations in pooling their expertise and resources to more effectively address community requirements (Alderwick et al., 2021). Additionally, they provided valuable contributions such as family planning services, provision of antiretroviral medications (ARVs), as well as essential commodities and equipment necessary for effective healthcare delivery. In a recent study, collaborative governance was found to empower the community, influence healthcare services, enhance the capacity for improved health outcomes, foster positive relationships among healthcare personnel, and enhance responsiveness to the needs of users and their communities (Pyone et al., 2017). Their multifaceted support played a vital role in strengthening the capacity and resources of the health facilities, empowering them to deliver thorough and top-tier care to their patients.

4.5 Health Information Processes in Integration of HIV/NCDs and health system performance

Seamless integration of health information processes is essential for the successful integration of HIV and NCD care. Streamlined data collection, sharing, and analysis enable healthcare providers to gain comprehensive insights into patients' health status, track treatment progress, and make informed decisions for optimal care coordination.

Overall, these findings highlight both positive and areas for improvement in the HMIS. The majority agreement on customization and effectiveness in triaging NCD needs demonstrates the system's overall value. By addressing these concerns, the HMIS can better support healthcare providers in collecting and utilizing data for improved patient care and health outcomes. This finding is in line with a study finding that shows 95% respondents agree that communication can be a barrier to effective patient management. Drozdowicz (2015) and Nengomasha et al. (2018) emphasize that a HIS should integrate records from individual, facility, and organizational. There were mixed responses among the respondents regarding the CCC's ability to detect and serve the non-communicable disease (NCD) needs of patients visiting the facilities. 44% of respondents were neutral when asked if information sharing was easy within the institution. This implies that sharing of information was not as good as the users would have wanted it to. This hinders timeliness and quick decision making. Atun et al. (2011) recommended that the amalgamation of HIV and NCD monitoring and evaluation (M&E) systems boosts the capacity for comprehensive data gathering and analysis concerning NCDs,

paving the way for substantial advancements in healthcare policies at a larger scope (Atun et al., 2011). See table 4.6.

Table 4.6

Health Information Processes

Availability of information systems	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. I have full access to our Health Information System	122 (61.6%)	32 (16.2%)	34 (17.2%)	8 (4%)	2 (1%)
2. The current HMIS fully integrates data from individual records, service records and administrative records	122 (61.6%)	38 (19.2%)	34 (17.2%)	4 (2%)	(0%)
3. Our HMIS always provides me with all the data I need to make decisions	114 (57.6%)	38 (19.2%)	40 (20.2%)	6 (3%)	(0%)
4. I always document all the services I offer in our HMIS	136 (68.7%)	28 (14.1%)	34 (17.2%)	(0%)	(0%)
5. The data collection tools are customized in our HMIS to suit our needs	112 (56.6%)	38 (19.2%)	42 (21.2%)	6 (3%)	(0%)
6. The CCC information system triages the NCD needs of its patient	152 (76.8%)	34 (17.2%)	2 (1%)	10 (5.1%)	(0%)
7. The CCC can detect and serve the NCD needs of a patient	132 (66.7%)	18 (9.1%)	(0%)	38 (19.2%)	10 (5.1%)
8. The CCC tracks the progress of NCD management and treatment	172 (86.9%)	26 (13.1%)	(0%)	(0%)	(0%)
Information sharing					
1. My colleagues can access data that I key in, promptly	102 (51.5%)	40 (20.2%)	38 (19.2%)	18 (9.1%)	(0%)
2. It is easy to transmit information to my colleagues using our HMIS	106 (53.5%)	40 (20.2%)	44 (22.2%)	8 (4%)	(0%)
Data Security					
1. I have to use a username and a password to enable me to access our HMIS	144 (72.7%)	10 (5.1%)	38 (19.2%)	2 (1%)	4 (2%)
2. Hospital Reports are always available to us whenever we need them	132 (66.7%)	58 (29.3%)	8 (4%)	(0%)	(0%)
3. I have access to all patients' medical reports	106 (53.5%)	58 (29.3%)	12 (6.1%)	22 (11.1%)	(0%)

Similarly, the KII respondents acknowledged the presence of a health records department within their facilities, utilizing either manual or electronic data storage methods. Strict protocols were followed to ensure privacy and confidentiality, with files securely stored. This commitment to high standards safeguarded patient information, fostering trust in the healthcare system. This finding is in agreement

with a report by (Rolf von den Baumen et al., 2020) who in his study said privacy of an individual's health information is key.

However, challenges with health information systems were identified. These included limited computer literacy among staff, difficulties in sharing patient data for integrated HIV/NCD care, unreliable network connectivity, and inconsistent power supply. Delays in server response and the burden of manual paperwork further hindered healthcare delivery.

"Occasionally, we encounter server buffering issues, leading to delays that can extend beyond three hours. Moreover, our facility management faces challenges in terms of cost when relying on generators as backup electricity sources during blackouts."-Lab technologist 1.

The majority of respondents acknowledged that they received timely information to support effective decision-making. This valuable information was disseminated during patient file reporting and handover processes, as well as in data review meetings held on a weekly or monthly basis. Access to this data was strictly restricted to authorized personnel only. Confidentiality and privacy were diligently maintained through the secure storage of paper-based records under lock and key, as well as the implementation of usernames and passwords for electronic records, ensuring that only authorized individuals could access sensitive information.

"Following established protocols, the Health Records Information Officer safeguards and manages valuable data within their department. With utmost care, they ensure its security and confidentiality. Only through proper channels,

authorized personnel can access the information they need, guaranteeing its dissemination is controlled and protected."-Clinical Officer-3.

Finally, all participants acknowledged the presence of a well-defined data handling policy within their respective facilities. This policy served as a guiding framework for ensuring proper management and protection of data throughout its lifecycle. Conversely, in another study, it was found that even though 50% of the clinics were treating NCD cases, a notable percentage of these healthcare facilities handled NCDs without having protocols or training in place for managing the conditions (Leung et al., 2016).

4.6 Pooling of Resources and health system performance

Pooling resources is vital for the successful integration of HIV and NCD care which would lead to a better performing health system. It strengthens the healthcare systems through leveraging on available resources, and improves prevention, diagnosis, treatment, and support services for individuals with HIV and NCDs. This collaborative approach fosters innovation, synergy, and holistic care, ultimately resulting in improved health outcomes and enhanced quality of life. Pooling resources like staffing becomes easier when healthcare providers have the capacity to manage both HIV and NCDs. This ultimately leads to improved access to care, better patient outcomes, and more efficient use of staff. Similarly, Van Hout et al. (2023) reported that the ability to receive comprehensive treatment and medication for multiple conditions in a single visit offers numerous advantages, significantly reducing the time, financial burden, and physical exertion that patients

previously endured while seeking medical assistance for their ailments (Van Hout et al., 2023).

The findings also suggest that the training provided has been effective. Some respondents (21.2%) perceive that the department has sufficient numbers and a suitable mix of skills, indicating effective resource allocation. However, there are areas for improvement. Many respondents (41.4%) believe that additional staff members are needed in the department, indicating a potential workload issue and the need for additional resources. Furthermore, there is a need to address training needs, as expressed by a significant number of respondents (42.4%) who feel they require training to manage HIV patients with NCD conditions. Over a span of three years, a clinic in Cambodia successfully showcased the effectiveness of healthcare worker (HCW) training in managing chronic diseases, specifically in the realms of HIV and diabetes care (Janssens et al., 2007). These findings have important implications for decision-making and resource allocation within the Human Resources team. It is crucial to address the identified training needs, ensure appropriate staffing levels, and maintain a balance of skills and expertise within the department. This finding is confirmed by Duffy et al. (2017), and Kupfer et al. (2020). By doing so, the standard of care delivered can be enhanced and the team better equipped to manage HIV patients with NCD conditions. See Table 4.7.

Table 4.7***Pooled Resources***

Human Recourses	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. I comfortably manage HIV patients with NCD	172 (86.9%)	18 (9.1%)		4 (2%)	4 (2%)
2. I have been well trained and equipped to manage HIV and NCD cases	100 (50.5%)	64 (32.3%)	10 (5.1%)	24 (12.1%)	
3. I can only manage HIV cases	26 (13.1%)	8 (4%)	2 (1%)	54 (27.3%)	108 (54.5%)
4. I can only manage NCD cases		2 (1%)	2 (1%)	66 (33.3%)	128 (64.6%)
5. We are sufficient (Numbers and skills mix) to manage our department	42 (21.2%)	36 (18.2%)	6 (3%)	88 (44.4%)	26 (13.1%)
6. We need more staff members in our department	52 (26.3%)	82 (41.4%)	4 (2%)	44 (22.2%)	16 (8.1%)
7. I need the training to be able to manage HIV patients with NCD conditions	48 (24.2%)	84 (42.4%)	32 (16.2%)	34 (17.2%)	
8. I regularly receive integrated care training	84 (42.4%)	66 (33.3%)	18 (9.1%)	22 (11.1%)	8 (4%)
Funding models					
1. HIV and NCD services are fully paid for by the government	88 (44.4%)	20 (10.1%)	24 (12.1%)	22 (11.1%)	44 (22.2%)
2. HIV services are fully paid for by donors	182 (91.9%)	6 (3%)	4 (2%)	6 (3%)	
3. NCD services are fully paid for by the government	114 (57.6%)		4 (2%)	28 (14.1%)	52 (26.3%)
4. HIV and NCD services are fully paid for by the patient	12 (6.1%)		28 (14.1%)	40 (20.2%)	118 (59.6%)
5. HIV and NCD services are always paid for through health insurance	22 (11.1%)	30 (15.2%)	30 (15.2%)	24 (12.1%)	92 (46.5%)
Geographic Setting					
1. Our facility is the only facility that serves all patients cases in this locality	116 (58.6%)	26 (13.1%)		42 (21.2%)	14 (7.1%)
2. Patients easily access our facility for services	160 (80.8%)	24 (12.1%)	6 (3%)	8 (4%)	
3. The roads are okay during the rainy seasons so patients can easily access our facility	132 (66.7%)	22 (11.1%)	4 (2%)	28 (14.1%)	12 (6.1%)
4. All services are offered in our facility - patients do not have to seek diagnostic services elsewhere	74 (37.4%)	16 (8.1%)	4 (2%)	62 (31.3%)	42 (21.2%)

The qualitative findings showed that the respondents' opinions varied significantly based on whether their staff exclusively handled HIV patients or if care providers managed both HIV and NCD patients at their facility. Among the surveyed facilities, a majority of 24 had staff members who possessed technical expertise in managing both HIV and NCD patients. This finding contradicts a study done in

Thailand where majority of healthcare workers reported that they had no training in treating patients with HIV and NCD but expressed interest to learn how to treat these patient (Moise et al., 2020). Conversely, only 15 facilities had recently undertaken training initiatives to enhance their staff's ability to effectively handle both communicable and non-communicable diseases.

Overall, these findings provide insights into the respondent's perceptions of funding models for HIV and NCD services, emphasizing the significance of government support, sustainable funding sources, and equitable access to healthcare. A small percentage of respondents (6.1%) strongly agree that patients should bear the full cost of HIV and NCD services, indicating a recognition that placing the financial burden on individuals is not ideal or equitable. Likewise, Njuguna et al. (2022) stated that despite other identified models of funding, out-of-pocket expenditure is still the dominant mode of funding which is a challenge to integrating these services. The rejection of the idea that patients should fully bear the cost of HIV and NCD services highlights the importance of ensuring affordability and equity in accessing healthcare. Additionally, NCD care receives less funding than HIV care (Katende et al., 2015). Policymakers should aim to implement funding models that alleviate financial burdens on patients. The survey results show mixed opinions regarding health insurance as the sole payment method for HIV and NCD services, with no strong agreement. This suggests that relying solely on insurance may not be favored by respondents, highlighting the need for alternative funding models. The mixed opinions regarding health insurance as the primary payment method for HIV and NCD services indicate the

need for complementary funding models. Policymakers should explore alternative approaches to supplement insurance coverage and address potential limitations.

The qualitative findings revealed that the Government of Kenya primarily funded HIV/NCD services in the majority of the surveyed facilities. However, in certain other facilities, CCC services, including staffing, drugs, and equipment, were funded by other partners including USAID TUJENGE JAMII, KEMSA, MEDS, PEPFAR, TB ARC, and the Centre for Health Solutions. Additionally, in all surveyed facilities, CCC services were provided free of charge. However, it was observed that some patients had to bear out-of-pocket expenses for NCD services.

"Patients in this facility are responsible for out-of-pocket payments for all medical management, with the exception of CCC services. The costs associated with NCDs can be covered either through out-of-pocket payments or by utilizing insurance coverage."-Adherence counsellor. "

Similarly, affordability is vital in making these clinics available to all individuals, regardless of their financial status. HIV and NCD clinics should strive to provide affordable or subsidized healthcare services, ensuring that cost does not become a barrier to accessing necessary care. This includes affordable consultation fees, diagnostic tests, medications, and follow-up visits. Additionally, facilitating access to health insurance or implementing government-funded programs can further enhance economic accessibility. All respondents unanimously acknowledged that the NCD/HIV services provided in their respective facilities were affordable.

"The affordability of HIV/NCD services in Nakuru County is truly remarkable. Our clients from this region can readily access top-notch care without facing financial

strain. This equitable access to essential HIV/NCD services guarantees that everyone, regardless of their economic background, can receive the vital care they need to promote their well-being and maintain good health."-Nursing officer.

The geographic accessibility of HIV/NCD clinics plays a crucial role in ensuring equitable healthcare services and improving health outcomes. Geographic accessibility ensures that individuals, regardless of their location, can easily access clinics for HIV and NCD-related care, diagnosis, treatment, and support services. This is particularly important for individuals residing in remote or underserved areas, where healthcare facilities may be limited.

Overall, the facility's strengths in comprehensive care provision, accessibility, and preparedness for adverse weather conditions should be maintained and further developed. Attention should be given to improving the range of diagnostic services offered to ensure patient satisfaction and retention. Most participants strongly agree that their facility is the only one serving all patients' cases in this locality, indicating a competitive advantage in providing comprehensive care giving it a competitive edge. A high percentage of respondents strongly agree that patients can easily access our facility, highlighting good accessibility and convenience. Respondents strongly agree that the roads are okay during rainy seasons, ensuring uninterrupted access to healthcare services. There is disagreement regarding all services being offered in our facility, suggesting potential gaps in diagnostic services. This may lead to patients seeking additional services elsewhere, which can impact patient satisfaction and the facility's reputation.

Our qualitative findings reveal that by having clinics strategically located and easily accessible, barriers to care, such as distance and transportation, can be reduced or eliminated. The facilities were regarded as easily accessible by the majority of respondents, with 25 individuals acknowledging its convenience. However, it was noted that only two respondents encountered difficulties reaching the facility, particularly during rainy seasons when the roads became impassable.

"The poor state of the road network in this region, particularly during the rainy seasons, poses significant challenges in accessing healthcare facilities for care. Our clients often encounter difficulties and occasionally miss their scheduled TCAs (Treatment and Care Appointments) due to these impassable roads."-Nursing officer\.

By addressing both geographic accessibility, HIV/NCD clinics can effectively reach a broader population, including marginalized communities and individuals with limited resources. This not only promotes early detection and timely treatment but also contributes to reducing health disparities and improving overall health status for individuals impacted by HIV and NCDs.

4.7 Collaborative Guidelines on HIV/NCD Integration and health system performance

The results suggest that most participants strongly agree that the Comprehensive Care Clinic (CCC) is fully managed by the program lead in the different facilities, this finding is supported by a finding in a study done in Australia (Cheng & Catallo, 2020). Similarly, respondents strongly agree that the Non-communicable Diseases (NCD) clinics are fully managed by the health board. However, on average, the

majority of respondents disagree that the CCC and NCD clinics are fully managed by the health facility board. Despite this, a significant number of respondents strongly agree that the CCC and NCD clinics are fully managed by the health facility board. Respondents strongly agree that the primary role of health facility boards is to manage the facilities. Moreover, respondents from different facilities strongly agree that the program lead of the Comprehensive Care Clinics works closely with the health facility board. The respondents also strongly agree that all activities within the health facilities are managed by the facilities' in-charge. Additionally, there is strong agreement that the approvals for purchasing medical products are fully handled by the health facility board, with response rates varying across different levels and types of facilities.

Cheng and Catallo (2020) emphasis on the need to have leadership involvement in the management and implementation of integrated care model. Kenk and Haldma (2019) agrees that collaboration is an enabler for organisations to be efficient and effective in-service provision.

Table 4.8:***Collaborative guidelines***

Governance Structure	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. The CCC is fully managed by the program lead	130 (65.7%)	30 (15.2%)	8 (4%)	28 (14.1%)	2 (1%)
2. The NCD clinic are fully managed by the health facility board	180 (90.9%)	14 (7.1%)	(0%)	4 (2%)	(0%)
3. The CCC and NCD clinic are fully managed by the health facility board	34 (17.2%)	30 (15.2%)	36 (18.2%)	76 (38.4%)	22 (11.1%)
4. The health facility board only manages the facility	110 (55.6%)	30 (15.2%)	8 (4%)	44 (22.2%)	6 (3%)
5. The CCC program lead works closely with the health facility board	172 (86.9%)	20 (10.1%)	4 (2%)	(0%)	2 (1%)
6. All the activities in the health facility are managed by the facility in-charge	152 (76.8%)	42 (21.2%)	2 (1%)	2 (1%)	(0%)
7. Approvals to buy medical products are fully done by the health facility board	122 (61.6%)	40 (20.2%)	12 (6.1%)	22 (11.1%)	2 (1%)
Policy					
1. Our organization has an operational policy (local level) in place	184 (92.9%)	14 (7.1%)	(0%)	(0%)	(0%)
2. I am knowledgeable about our organization's policy	188 (94.9%)	10 (5.1%)	(0%)	(0%)	(0%)
3. Our organization policy is aligned with the national policy	186 (93.9%)	12 (6.1%)	(0%)	(0%)	(0%)
4. I am aware of the Kenya Health policy and we are fully implementing it in our facility	166 (83.8%)	32 (16.2%)	(0%)	(0%)	(0%)
5. I am aware of the UHC policy and we are fully implementing it in our facility	180 (90.9%)	18 (9.1%)	(0%)	(0%)	(0%)
Accountability					
1. I am fully aware of my roles and responsibilities in the organization	186 (93.9%)	12 (6.1%)	(0%)	(0%)	(0%)
2. We work with partners both our/their roles and responsibilities are clear	182 (91.9%)	16 (8.1%)	(0%)	(0%)	(0%)
3. Financial records on how any funding is spent in our facility are accessible	156 (78.8%)	34 (17.2%)	4 (2%)	4 (2%)	(0%)
4. We (facility) operate with a budget	182 (91.9%)	16 (8.1%)	(0%)	(0%)	(0%)
5. Each department manages their budget	30 (15.2%)	32 (16.2%)	16 (8.1%)	64 (32.3%)	56 (28.3%)

Collaborative guidelines play a crucial role in promoting integrated and patient-centered care for individuals with HIV and non-communicable diseases. They guide coordinated service delivery, improved outcomes, and enhanced communication among healthcare providers, ultimately benefiting the overall health and well-being of patients. Cheng and Catallo (2020) disagree with this

finding stating that differentiation is done to avoid confusion in decision making in governance.

Our qualitative findings show that the majority (18) of facilities had collaborative guidelines aimed at supporting the fusion of HIV and NCD services. These guidelines primarily focused on achieving zero defaulters within the Comprehensive Care Clinic (CCC) department by emphasizing diligent follow-up and facilitating effective linkage to care.

“Our commitment to implementing a collaborative guideline has yielded tangible results in our efforts to reduce defaulters. We have a resilient patient population, characterized by their unwavering adherence to their respective antiretroviral (ARV) regimens. This demonstrates the transformative power of collaborative guidelines in fostering patient stability and maximizing treatment efficacy.”- Clinical officer-2.

Each of the 27 facilities had a comprehensive service charter that served as a valuable resource, outlining the expectations and provisions of the facility’s services. The service charter offered clear guidance to both clients and service providers, ensuring a mutual understanding of what can be anticipated regarding service provision and the duties of all parties engaged.

“We have implemented specific charters to regulate staff arrival and departure times, as well as service times, including consultation and the timely release of lab results. These charters serve as essential guidelines, ensuring accountability and efficiency in our facility’s operations. By adhering to these charters, we strive to

provide reliable and timely services that meet the expectations of our clients.”- Clinical officer-3.

All 27 facilities conducted regular meetings on a monthly or quarterly basis, with the primary objective of fostering accountability and soliciting valuable feedback. However, the findings regarding these meetings were mixed, as some facilities acknowledged the absence of budgetary allocations specifically dedicated to supporting these important gatherings.

“As a facility, we embrace open lines of communication and foster collaboration. Our monthly and quarterly meetings serve as a forum for stakeholders to remain informed and actively contribute to the strategic decisions that shape our path forward. With the unwavering support of the church and the dedicated hospital committee board, we are empowered to host these significant gatherings, nurturing an environment of positive transformation and progress within our facility.”- laboratory technologist-1.

4.8 Organization Culture and health system performance

The findings suggest that most respondents are encouraged to generate new ideas in an Innovative Oriented Culture. Nevertheless, a considerable number of respondents across different facilities agree that staff members are given the opportunity to implement new ideas. On average, respondents do not believe that staff members are adequately rewarded for introducing new ideas that enhance service efficiency in the various facilities. Conversely, Ahmad et al. (2022) reported that leaders who promote innovation create resources for autonomous thinking and rewards that through performance management approaches.

Mesabbah and Arisha (2016) also confirms that with a caution to have clear measuring structures and processes.

Moreover, the organizations prioritize investing in ideas that can enhance service delivery for HIV and NCD patients. Healthcare workers demonstrate a strong commitment to collaboration across departments while serving these patients. There is a shared set of values among staff members across different facilities. Most of the healthcare facilities provide integrated HIV/NCD services, which is seen as beneficial in terms of saving clinic time, energy, and resources. The respondents generally share similar beliefs with their colleagues regarding work-related matters. Furthermore, there is a willingness among respondents to learn from their colleagues and adopt new practices in providing primary care to HIV and NCD patients across various facilities. See Table 4.9.

Table 4.9
Organization Culture

Innovative oriented Culture	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Our organisation allows staff to come up with new ideas	132 (66.7%)	58 (29.3%)	4 (2%)	4 (2%)	0 (0%)
10. HIV/NCD integrated care is a superior form of patient care	168 (84.8%)	30 (15.2%)	0 (0%)	0 (0%)	0 (0%)
11. HIV/NCD integrated care saves clinic time, energy and resources	172 (86.9%)	26 (13.1%)	0 (0%)	0 (0%)	0 (0%)
12. I mostly have the same beliefs as my colleagues on work issues	150 (75.8%)	40 (20.2%)	8 (4%)	0 (0%)	0 (0%)
13. I am always ready to learn from my colleagues on new practices	160 (80.8%)	38 (19.2%)	0 (0%)	0 (0%)	0 (0%)
2. Our organisation allows staff members to implement new ideas	90 (45.5%)	62 (31.3%)	16 (8.1%)	30 (15.2%)	0 (0%)
3. Staff members are rewarded for the new ideas that improve efficiency in service delivery	30 (15.2%)	54 (27.3%)	40 (20.2%)	68 (34.3%)	6 (3%)
4. Staff members are promoted when they successfully implement new ideas	14 (7.1%)	4 (2%)	4 (2%)	70 (35.4%)	106 (53.5%)
5. Our organisation always invests in potential ideas that can improve service delivery	120 (60.6%)	62 (31.3%)	12 (6.1%)	4 (2%)	0 (0%)
6. Healthcare workers fully embrace working together with members from	142 (71.7%)	56 (28.3%)	0 (0%)	0 (0%)	0 (0%)

Innovative oriented Culture	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
different departments as they serve HIV and NCD clients					
7. I fully share common values with colleagues in my organization	158 (79.8%)	40 (20.2%)	(0%)	(0%)	(0%)
9. Our health facility currently provides HIV/NCD healthcare services under one roof	116 (58.6%)	26 (13.1%)	(0%)	20 (10.1%)	36 (18.2%)
Team Oriented Culture					
1. Our health facility leadership would like to see integrated health services	118 (59.6%)	46 (23.2%)	34 (17.2%)	(0%)	(0%)
2. My organization has strong dedicated leadership that supports HIV/NCD clinics to work together	138 (69.7%)	56 (28.3%)	2 (1%)	2 (1%)	(0%)
3. Our different departmental leaders always work in harmony as a team	164 (82.8%)	34 (17.2%)	(0%)	(0%)	(0%)
4. Each leader in our organization has specific responsibilities they handle	172 (86.9%)	26 (13.1%)	(0%)	(0%)	(0%)
5. I am fully aware of our organization's vision and direction	160 (80.8%)	38 (19.2%)	(0%)	(0%)	(0%)
6. Our Health facility has at least one HIV/NCD integrated care champion	114 (57.6%)	36 (18.2%)	(0%)	38 (19.2%)	10 (5.1%)
7. The administrators in the health facility value HIV/NCD integrated care	120 (60.6%)	30 (15.2%)	34 (17.2%)	14 (7.1%)	(0%)
Outcome oriented Culture					
1. This facility uses to pay for performance programs to improve the quality of HIV/NCD care	68 (34.3%)	52 (26.3%)	34 (17.2%)	42 (21.2%)	2 (1%)
2. 360-Degree Feedback, also known as Multisource Feedback (MSF), is a performance appraisal methodology used to assess HIV/NCD care in this facility	102 (51.5%)	86 (43.4%)	4 (2%)	6 (3%)	(0%)
3. This facility has a balanced scorecard that measures HIV/NCD integration performance	90 (45.5%)	36 (18.2%)	16 (8.1%)	48 (24.2%)	8 (4%)
4. This facility has a balanced scorecard that links the overall health sector strategies to measurable targets and actions	124 (62.6%)	70 (35.4%)	(0%)	2 (1%)	2 (1%)
5. This facility leadership facilitates a structured system for collecting information about the performance of healthcare workers engaged in HIV/NCD integrated services provision	108 (54.5%)	78 (39.4%)	2 (1%)	8 (4%)	2 (1%)

Similarly, the qualitative findings reveal that in all 27 key informants exhibited a remarkable openness to change and readily embraced new approaches to streamline operations. The staff members had the freedom to propose and implement innovative methods of accomplishing tasks, fostering a collaborative team environment. Furthermore, each facility diligently set goals for its staff, which were

conscientiously measured through regular performance evaluations conducted on a monthly, quarterly, and annual basis.

"At our facility, we set goals for our facility staff, and evaluate these goals through the diligent efforts of our management team. We are committed to fostering growth and improvement and provide feedback during our regular monthly, quarterly, and annual meetings. This feedback serves as a catalyst for continuous development, ensuring that our staff members are well-supported and aligned with our organizational objectives."-Nursing officer-1.

There is a positive team-oriented culture in the different facilities. The leadership across these facilities expresses a desire for integrated health services for HIV and NCD clinics. Respondents agree that the facilities have strong and dedicated leadership that supports collaboration between HIV and NCD clinics. There is a sense of teamwork within the facilities, particularly among departmental leaders who have specific responsibilities. The majority of respondents are well-informed about the facilities' vision and direction. Most facilities have at least one champion for HIV/NCD integrated care. Administrators in the different facilities value HIV/NCD integrated care. See table 4.9.

The findings suggest that there is an outcome-oriented culture in the different facilities. Respondents agree that pay-for-performance programs are implemented to improve the standard of care for HIV/NCD. Additionally, the findings suggest that performance evaluation methods are used to gauge the quality of HIV/NCD care at the facilities. On average, respondents indicate that the facilities have a balanced scorecard in place to measure the performance of HIV/NCD integration.

There is a strong agreement among respondents that the facilities have a balanced scorecard that aligns overall health sector strategies with measurable targets and actions. Additionally, survey participants generally agree that the administration within the facilities endorses a methodical process for collecting data on the performance of healthcare providers involved in delivering integrated services for HIV and NCDs. See Table 4.10.

Table 4.10

Outcome oriented culture

Outcome Oriented Culture	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. This facility uses to pay for performance programs to improve the quality of HIV/NCD care	68 (34.3%)	52 (26.3%)	34 (17.2%)	42 (21.2%)	2 (1%)
2. 360-Degree Feedback, also known as Multisource Feedback (MSF), is a performance appraisal methodology used to assess HIV/NCD care in this facility	102 (51.5%)	86 (43.4%)	4 (2%)	6 (3%)	(0%)
3. This facility has a balanced scorecard that measures HIV/NCD integration performance	90 (45.5%)	36 (18.2%)	16 (8.1%)	48 (24.2%)	8 (4%)
4. This facility has a balanced scorecard that links the overall health sector strategies to measurable targets and actions	124 (62.6%)	70 (35.4%)	(0%)	2 (1%)	2 (1%)
5. This facility leadership facilitates a structured system for collecting information about the performance of healthcare workers engaged in HIV/NCD integrated services provision	108 (54.5%)	78 (39.4%)	2 (1%)	8 (4%)	2 (1%)

In the context of integration of healthcare services, the findings indicate that, on average, respondents believe that most healthcare workers in the different facilities are competent to provide HIV and NCD services. There is a strong agreement among respondents that HIV services are exclusively offered by care providers in the Comprehensive Care Clinic, while NCD services are provided by care providers in the main health facilities. Majority of the respondents agree that patient management guidelines are in place for both HIV and NCD service provision. However, there is a notable percentage of respondents who disagree with the

assertion that HIV and NCD lab tests are conducted in the main facilities. Additionally, respondents at Level 5 express disagreement regarding the availability and accessibility of HIV drugs in the main pharmacy.

The findings also indicate that there is disagreement among the facilities regarding the availability and accessibility of drugs. Palma et al. (2016) also emphasised on this when their study found that out that in developing countries this was a major concern. While some facilities agree that the drugs are accessible, others do not. Additionally, there is a lack of consensus on whether patients, including those with HIV, are managed at a single point of care. There is agreement among respondents from other facilities that patients are indeed managed at a common place.

Furthermore, the majority of respondents strongly agree that HIV and NCD specialists regularly review each other's notes in Comprehensive Care Clinics, and they consult with each other about patient care. However, there is disagreement regarding the comprehensiveness of care provided in these clinics. The clinics have an adequate number of NCD specialists available who are treated equally within the clinics. Additionally, most respondents believe that the Comprehensive Care Clinics integrate HIV and NCD treatment plans. The scheduling systems in these clinics allow for same-day appointments for NCD cases along with HIV reviews. Most respondents feel comfortable multitasking and providing care for both HIV and NCD patients across the different facilities. Furthermore, the data collection systems maintain a patient database for individuals seeking care from various facilities. These findings imply that integration is slowly taking root in healthcare facilities in Nakuru county, hence if phase implementation is well managed then

integrated care will back the transformation of the health system and sustainability will be enhanced as demonstrated by (Plochg et al., 2017).

Respondents are capable of managing the care needs of both HIV and NCD patients across the facilities. However, in higher level facilities, staff members do not exclusively manage HIV patients, indicating a strong basis for integration. In lower-level health facilities, a significant percentage of respondents strongly agree that they only manage HIV patients. In terms of NCD management, respondents in lower levels facilities strongly disagreed with exclusively managing NCD patients.

See Table 4.11

Table 4.11

Integration of healthcare services

Integration of healthcare services	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Most healthcare workers are competent to provide HIV and NCD services	102 (51.5%)	44 (22.2%)	8 (4%)	40 (20.2%)	4 (2%)
2. HIV and NCD specialists regularly consult about patient care in the CCC	176 (88.9%)	20 (10.1%)	2 (1%)	0 (0%)	0 (0%)
3. The CCC has a sufficient number of NCD specialists on-site	38 (19.2%)	26 (13.1%)	6 (3%)	110 (55.6%)	18 (9.1%)
4. HIV and NCD specialists are treated as equals within the clinic	158 (79.8%)	36 (18.2%)	0 (0%)	4 (2%)	0 (0%)
5. The CCC and NCD care treatment plans are merged	162 (81.8%)	26 (13.1%)	2 (1%)	6 (3%)	2 (1%)
6. The CCC scheduling systems allow NCD cases to be scheduled for a same-day appointment with HIV reviews	146 (73.7%)	34 (17.2%)	6 (3%)	12 (6.1%)	0 (0%)
7. I comfortably multitask in providing care for HIV as well as NCD patients	128 (64.6%)	16 (8.1%)	26 (13.1%)	16 (8.1%)	12 (6.1%)
8. Our data collection systems have all patients who seek care from our facility	160 (80.8%)	38 (19.2%)	0 (0%)	0 (0%)	0 (0%)
9.. I manage care needs for all patients both HIV and NCD patients	126 (63.6%)	14 (7.1%)	0 (0%)	30 (15.2%)	28 (14.1%)
10. I only manage HIV patients	62 (31.3%)	6 (3%)	0 (0%)	34 (17.2%)	96 (48.5%)
11. HIV services are offered only by care providers in the CCC	108 (54.5%)	8 (4%)	2 (1%)	32 (16.2%)	48 (24.2%)
12. I only manage NCD patients	2 (1%)	4 (2%)	2 (1%)	48 (24.2%)	142 (71.7%)
13. NCD services are offered only by care providers in the main health facility	94 (47.5%)	14 (7.1%)	4 (2%)	28 (14.1%)	58 (29.3%)
14. This facility has patient management guidelines for HIV service provision	178 (89.9%)	20 (10.1%)	0 (0%)	0 (0%)	0 (0%)

Integration of healthcare services	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
15. This facility has patient management guidelines for NCD service provision	172 (86.9%)	26 (13.1%)	(0%)	(0%)	(0%)
16. All HIV and NCDs lab tests are done in the main health facility lab	70 (35.4%)	20 (10.1%)	(0%)	66 (33.3%)	42 (21.2%)
17. HIV drugs are available and accessible in the main pharmacy	116 (58.6%)	32 (16.2%)	6 (3%)	44 (22.2%)	(0%)
18. All our patients including the HIV patients are managed at one common point of care	82 (41.4%)	22 (11.1%)	(0%)	10 (5.1%)	84 (42.4%)
19. HIV and NCD specialists regularly review each other's notes in the CCC	164 (82.8%)	32 (16.2%)	(0%)	2 (1%)	(0%)

4.9 Hypothesis Testing

A total of five hypotheses were examined. The dependent variable was classified as either "sustainable" or "not sustainable" health system performance. This classification was based on the aggregation of responses related to health system performance and the subsequent computation of sustainability test scores. The survey included four items that assessed the sustainability of HIV/NCD integration using a five-point Likert scale. Scores between 4 and 12 indicated that integration was not sustainable, while scores exceeding 12 indicated their sustainability in Nakuru County. The initial analyses employed the chi-square test of significance, which is appropriate for assessing relationships between two categorical variables, as all variables in this study were categorical. Chi-square values were computed via cross tabulations performed using SPSS version 24. Following this, binary logistic regression was utilized to investigate the causal links among the variables under study. Binary logistic regression serves to forecast a binary outcome variable, and in this study, the outcome variable was binary in nature.

4.9.1 Hypothesis 1

The null hypothesis (H_0) postulates that the institutional support for integrated HIV and NCD services does not have a significant impact on healthcare system performance. The research involved investigating the association between institutional support for integrated HIV/NCD services and healthcare system performance, with institutional support assessed based on training, monitoring, and coordination with external entities. Healthcare system performance was gauged in terms of sustainability.

The statistical analysis utilizing Pearson's chi-square test yielded the following outcomes:

- For training and healthcare system performance: $\chi^2 = 0.125$, $n = 198$, **$p = 0.835$** .
- For monitoring and healthcare system performance: $\chi^2 = 3.578$, $n = 198$, **$p = 0.044$** .
- For coordination with external entities and healthcare system performance: $\chi^2 = 0.480$, $n = 198$, **$p = 0.652$** .

These results indicate that only the monitoring of HIV/AIDS and NCD services shows a correlation with the performance of healthcare systems in Nakuru County.

Training and Coordination with external entities according to Alderwick et al. (2021) and Balzer et al. (2015) on the contrary encourage policy makers to train their staff and to better manage coordination with external entities however our findings show that Healthcare professionals in Nakuru county receive comprehensive initial training and benefit from ongoing training opportunities, which are further bolstered by support from external collaborators. Therefore, the

greatest need is to monitor progress in order to ensure plans are implemented as they are set and corrective actions are taken in good time in case of need. Guezennec et al. (2016) supports that measures should be done frequently to inform any corrective measure needed by identifying what is working and what is not working.

4.9.2 Hypothesis 2

The study also sought to explore the influence of integrated HIV/NCD health information processes on the effectiveness of the healthcare system in Nakuru County. To align the study with this objective, the following hypothesis was formulated:

H₀: Integrated health information processes for HIV/NCDs do not significantly impact Healthcare System Performance.

The health information processes encompassed three key areas: availability of information systems, data sharing methods, and information security. The assessment of health system performance focused on sustainability. Each dimension of information system availability was assessed concerning health system sustainability. The relationship between the availability of information systems and health system performance was examined using Pearson's chi-square test, resulting in $\chi^2 = 9.955$, $n = 198$, $p = 0.001$. Similarly, for data sharing and health system performance, $\chi^2 = 12.285$, $n = 198$, $p = 0.001$, and for information security and health system performance, $\chi^2 = 6.486$, $n = 198$, $p = 0.001$. These findings suggest that all aspects of information processes are significant predictors of health system performance, aligning with prior research in the field

(Drozdowicz, 2015; Duffy et al., 2017; Kyalo et al., 2018) who revealed that the existence of fully operational Health Information Systems (HIS), smooth information flow within an integrated framework, and the security of HIS play crucial roles in enhancing the effective operation of healthcare establishments. These components facilitate the prompt execution of informed decision-making procedures, thereby fostering success of healthcare organizations.

4.9.3 Hypothesis 3

The study also aimed to investigate the impact of combined pooled resources for HIV/NCD on the operational effectiveness of the healthcare system in Nakuru County. To steer the achievement of this goal, the subsequent hypothesis was formulated and assessed at a 5% level of significance.

Null Hypothesis (Ho): There is no notable impact of HIV/NCD integrated pooled resources on Healthcare System Effectiveness.

The pooled resources were divided into three categories: personnel, financial structures, and location factors. Each category was scrutinized concerning healthcare system effectiveness, evaluated based on sustainability. The findings of the analysis were as follows: The Pearson's chi-square examination revealed $\chi^2 = 4.122$, $n = 198$, $p = 0.049$ for personnel and healthcare system effectiveness. In terms of financial structures, the test resulted in $\chi^2 = 12.203$, $n = 198$, $p = 0.001$, while for location factors, $\chi^2 = 4.122$, $n = 198$, $p = 0.049$. These outcomes imply that personnel and financial structures are significant predictors of healthcare system effectiveness in Nakuru County, whereas location factors do not

demonstrate a substantial correlation with healthcare system effectiveness in the same locality.

The outcomes concerning the presence of skilled and sufficient human resources, as documented by Manavalan et al. (2021) and Moise et al. (2020) enhanced organizational performance, thus aligning with the present findings. Financing, as documented by Njuguna et al. (2022) play a pivotal role in facilitating access and utilization of healthcare services. Therefore, establishing appropriate financial arrangements that shield patients from financial strains can significantly improve the sustainability of the healthcare system.

4.9.4 Hypothesis 4

The study aimed to investigate the effects of collaborative guidelines integrating HIV and NCDs on the healthcare system's performance in Nakuru County. The guidelines covered governance structures, policy mandates, and accountability measures. A hypothesis was formulated and tested at a 5% significance level.

Null Hypothesis (H_0): The impact of HIV/NCD integrated collaboration guidelines on Healthcare System performance is not significant.

The results of the Pearson's chi-square analysis were as follows: for governance structure, $\chi^2 = 0.783$, $n = 198$, $p = \mathbf{0.271}$; for policy requirements, $\chi^2 = 2.076$, $n = 198$, $p = \mathbf{0.118}$; and for accountability, $\chi^2 = 0.503$, $n = 198$, $p = \mathbf{0.742}$. These results indicate that there is no statistically significant association between any of the collaboration guidelines and the performance of the healthcare system in Nakuru County. This result does not align with the findings of the studies conducted by

Cheng and Catallo, (2020) and scale Kenk and Haldma, (2019) who reported organizations achieve success by ensuring legitimacy by adhering to recognized standards, regulations, and conscientious practices within their specific context.

4.9.5 Hypothesis 5

The research also aimed to assess the impact of combining HIV/NCD services on healthcare system performance and its substantial effect on the overall health system performance. The following hypothesis was constructed and scrutinized at a 5% significance level.

Null Hypothesis (H_0): There is no significant relationship between the integration of HIV/NCD services and healthcare system performance influencing Health system performance.

The analysis findings indicated a Pearson's chi-square value of $\chi^2 = 17.939$, with a sample size of 198 and a significance level of $p = 0.001$. These results imply a noteworthy correlation between the amalgamation of healthcare services and health system performance in Nakuru County. These findings align (Chandler et al., 2016; Mahomed et al., 2014; Rush, 2014) who presented various integration model. One model acknowledges the complex patterns and interrelations in an integrated care structure, regarding healthcare as a sophisticated adaptive system. A different model is the six-domain framework employed in chronic care management, encompassing community engagement, self-care assistance, clinical information systems within the healthcare system, and decision-making aid. Additionally, there

is an integrated chronic disease management model that promotes a seamless transition to assisted self-care and enhances care quality by leveraging the fundamental components of the healthcare system advocated in this study. These conclusions are reinforced by earlier research findings. Therefore, successful integration relies on a phased implementation strategy to enhance the performance and sustainability of the healthcare system.

4.10 Bivariate Regression Analysis

Bivariate regression analysis determined the impact of each predictor and the moderating variable on the outcome variable. The findings are outlined below:

4.10.1 The influence of Institutional support on Healthcare System Performance.

The study examined the influence of institutional support on healthcare system performance. The results are displayed in Table 4.12.

Table 4.12

The influence of Institutional support on Healthcare System Performance.

Factor	Variable	B	S.E.	Wald	df	P-Value	Odds Ratios
Institutional Support	Training						
	No Training (RC)						1.000
	There is Training	0.240	0.167	2.057	1	0.034	1.271
	Monitoring						1.000
	No Monitoring (RC)						1.000
	There is monitoring	0.569	0.357	2.541	1	0.003	1.766
	Coordination						1.659
	No coordination with external entities (RC)						1.000

There is coordination with external entities	0.506	0.297	2.901	1	0.007	1.659
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The findings revealed that institutional support significantly influences healthcare system performance in Nakuru County. See Table 1, institutional support comprised three variables, all of which emerged as significant predictors of healthcare system performance in the county. Specifically, training emerged as an important determinant of healthcare system effectiveness in Nakuru County. Organizations conducting regular staff training has 1.271 times chances of delivering superior services in comparison to those that didn't train. The outcomes indicated a statistically noteworthy correlation between the supervision of HIV/NCD services and the effectiveness of the healthcare system in Nakuru County.

Moreover, monitoring emerged as a noteworthy determinant of healthcare system performance in Nakuru County. Hospitals with well-defined monitoring systems were found to be 2.008 times more likely to maintain sustainability in delivering HIV/NCD services compared to those lacking clear monitoring systems. This relationship was statistically significant at a 5%.

Additionally, effective coordination with external entities was significantly linked to healthcare system performance in Nakuru County. Institutions that demonstrated strong coordination with external entities had 1.659 times possibility of achieving better performance than those that did not engage in effective coordination. These findings were also statistically significant at a 5% level of significance.

4.10.2 Influence of HIV/NCD integrated health information processes on Healthcare System Performance in Nakuru County.

The study assessed the impact of institutional support on healthcare system performance. See Table 4.13 below.

Table 4.13***Influence of HIV/NCD integrated health information processes on Healthcare System Performance in Nakuru County***

Factor	Variable	B	S.E.	Wald	df	P-Value	Odds Ratios
Health Information Processes	Availability of Information Systems						
	Not Available (RC)						1.000
	Available	0.250	0.128	3.834	1	0.022	1.284
	Information Sharing						
	No Information Sharing (RC)						1.000
	There is Information Sharing	1.123	0.701	2.566	1	0.003	3.074
	Data security						
	No Data Security (RC)						1.000
	There is data security	0.325	0.214	2.313	1	0.004	1.384

The findings indicated that effective health information management plays a crucial role in determining healthcare performance within Nakuru County. Healthcare establishments that integrated operational data systems while providing HIV/NCD services were 1.284 times more likely to sustain viability in comparison to those that did not have such systems. Additionally, the practice of sharing information was observed to significantly influence healthcare performance in Nakuru County. Hospitals equipped with operational information-sharing mechanisms were 3.074 times more inclined to demonstrate sustainability compared to those lacking such mechanisms. Furthermore, maintaining data security for patient information was linked to a 1.384 times higher likelihood of sustainability for healthcare facilities when compared to those lacking adequate data protection measures. These outcomes held statistical significance at the 5% level.

4.10.3 Influence of HIV/NCD integrated pooled resources on Healthcare System Performance in Nakuru County.

The study investigated the impact of resource pooling on the performance of the healthcare system. The outcomes of the study are presented in Table 4.14.

Table 4.14

Influence of HIV/NCD integrated pooled resources on Healthcare System Performance in Nakuru County.

Factor	Variable	B	S.E.	Wald	df	P-Value	Odds Ratios
Pooled Resources	Human Resources						
	Not Competent (RC)						1.000
	Competent	0.421	0.295	2.035	1	0.003	1.524
	Funding						
	Not Funded (RC)						1.000
	Funded	1.186	0.793	2.235	1	0.006	3.274
Pooled Resources	Geographic Setting						
	Not Localised (RC)						1.000
	Localised	0.611	0.506	1.456	1	0.094	1.842

The findings indicated a significant relationship between resource pooling in the delivery of HIV/NCD care at healthcare facilities in Nakuru County and the performance of healthcare systems. According to the data presented in Table 3, healthcare facilities that employed skilled personnel specializing in HIV/NCD treatment and care were 1.524 times inclined towards sustainability compared to those lacking such specialized personnel. Additionally, the source of funding emerged as a crucial determinant of healthcare performance in Nakuru County. Facilities receiving funding from governmental and donor sources were 3.274 times more likely to maintain sustainability in contrast to those relying on out-of-pocket payments from patients for HIV/NCD treatment and care services. This relationship was statistically significant at the 5% level. We did not identify any

significant impact of geographic location on healthcare performance in Nakuru County.

4.10.4 Influence of HIV/NCD Collaboration guidelines on Healthcare System Performance in Nakuru County.

The research aimed to investigate the impact of HIV/NCD Collaboration guidelines on the performance of the healthcare system. See Table 4.15.

Table 4.15

Influence of HIV/NCD Collaboration guidelines on Healthcare System Performance in Nakuru County.

Factor	Variable	B	S.E.	Wald	df	P-Value	Odds Ratios
Collaboration Guidelines	Governance						
	No Governance Structure (RC)						1
	There is Governance Structure	-0.512	0.46	1.238	1	0.671	0.599
	Policy						
	No Policy (RC)						1
	There is Policy	-1.028	0.844	1.482	1	0.375	0.358
	Accountability						
	No Accountability (RC)						1
	There is Accountability	0.344	1.01	0.116	1	0.24	1.411

As depicted in Table 4.15, there was no statistically significant relationship found between adherence to collaboration guidelines and the healthcare system performance in Nakuru County.

4.10.5 Influence of integration of HIV/NCD services on Healthcare System Performance in Nakuru County.

The study aimed to examine the impact of integrating HIV/NCD services on the performance of the healthcare system. The findings are presented in Table 4.16.

Table 4.16

Influence of integration of HIV/NCD services on Healthcare System Performance in Nakuru County.

Variable	B	S.E.	Wald	df	P-Value	Odds Ratios
Integration of Health Care Services						
Not Integrated (RC)						1.000
Fully Integrated	0.701	0.467	2.249	1	0.001	2.016

The data presented in table 5 indicates a significant correlation between the incorporation of healthcare services in the care and treatment of individuals with HIV/NCD and the effectiveness of healthcare systems in Nakuru County. Facilities that adopted integrated healthcare services for HIV/NCDs were 2.016 times more likely to demonstrate sustainability unlike those that did not integrate healthcare services for HIV/NCD treatment. These findings were statistically significant at the 5% level.

4.10.6 The influence of organizational culture on Healthcare System Performance in Nakuru County.

The study investigated the impact of organizational culture on healthcare system performance in Nakuru County. See Table 4.17.

Table 4.17

Influence of organizational culture on Healthcare System Performance in Nakuru County.

Factor	Variable	B	S.E.	Wald	df	P-Value	Odds Ratios
Organizational Culture	No Team Culture (RC)						1.000
	There is Team Culture	0.662	0.394	2.821	1	0.003	1.938

The data presented in table 4.17 illustrates that organizational culture serves as a determinant of healthcare performance in Nakuru County. Healthcare facilities that

embraced a team culture were 1.938 times more inclined to achieve enhanced performance. This relationship was statistically significant at the 5% level.

4.11 Multivariate Analysis

This section details the results of logistic regression analysis, which aimed to explore the causal connections between the outcome variable and the predictors. While the chi-square test previously discussed identified a relationship between the dependent and independent variables, it focused on assessing their interdependence and detecting associations rather than causality. Therefore, binary logistic regression was utilized to unveil the cause-and-effect relationships among the study variables. Logistic regression is applied when the dependent variable is binary, which was the scenario with the dependent variable in this study—health system performance assessed in terms of sustainability. The predictor variables comprised institutional support, health information processes, pooled resources, collaboration guidelines, and integration of health services, with organizational culture acting as the moderating factor. Logistic regression played a crucial role in assessing the influence of each independent variable on the dependent variable. See 4.11.1 below.

4.11.1 Relationship between integrated HIV/NCD services and performance of healthcare controlling for the effect of organisational culture;

Table 4.18

Omnibus Tests of Model Coefficients

	Chi-square	Df	Sig.
Step	51.889	12	0.000
Block	51.889	12	0.000
Model	51.889	12	0.000

This test serves as a crucial measure of the predictive capability of the model when all the study variables are collectively considered. This statistical test is utilized in regression analysis to ascertain if the existence of a significant relationship between the independent variables and the dependent variable. As depicted in Table 4.18, the p-value for the model as a whole was found to be **p<0.01**, indicating a strong predictive ability of the model. These results concurred with (WHO, 2021) report that health system performance can be improved when healthcare workers are given support by the institution, information process are seamless, policies are known and enforced and organization culture embraced is of integration in nature.

Table 4.19

The Model Summary without Moderator

Deviate Score	Cox & Snell R Square	Nagelkerke R Square
141.753	0.231	0.369

This statistic is tailored to binary outcomes (0 or 1) within logistic regression frameworks. As indicated in Table 4.19, the five independent variables elucidate approximately 36.9% of the variances in health system performance in Nakuru County. Consequently, it suggests that approximately 63.1% of the variations in healthcare performance remain unexplained in this study. This underscores the necessity for further research in this domain to uncover all the factors influencing healthcare performance, especially as the country endeavors to implement universal health care.

Table 4.20

Hosmer and Lemeshow Test

Chi-square	Df	Sig.
11.660	8	0.167

This test is an additional assessment of the adequacy of a binary logistic model for prediction purposes. Commonly employed to evaluate the goodness of fit of a logistic regression model to the observed data, the Hosmer-Lemeshow test contrasts the expected and actual event frequencies across various groups of predicted probabilities. The null hypothesis postulates that the model fits well, as opposed to the alternative hypothesis suggesting otherwise. As demonstrated in Table 4.20, the chi-square test yielded $\chi^2 = 11.660$, $p = 0.167$. Consequently, we fail to reject the null hypothesis. The study concluded that the model is fitting for the research at hand.

In practical terms, these findings suggest that these variables contribute significantly to explaining and predicting variations in health system performance under the integrated care model. The results provide evidence that the predictor variables play a meaningful role in improving the fit of the model and contribute to a better understanding of the factors influencing health system performance.

4.12 Multivariate logistic regression results

We aimed to examine the impact of each predictor variable on the outcome variable. The process entailed conducting multiple iterations through multivariate logistic regression. See Table 4.21. The rationale behind selecting multivariate logistic regression has been previously discussed.

Table 4.21

Multivariate logistic regression results without Moderator

Factor	Variable	β	S.E.	Wald	df	P-Value	Odds Ratios
Institutional support	Training						
	No Training (RC)						1.000
	There is Training	0.270	0.568	0.226	1	0.634	1.310
	Monitoring						1.000
	No Monitoring (RC)						1.000
	There is Monitoring	0.697	0.459	2.308	1	0.008	2.008
Health Information processes	Coordination						1.267
	No coordination with external entities (RC)						1.000
	There is coordination with external entities	0.236	0.999	0.056	1	0.900	1.267
	Availability of Information system						1.000
	Not Available (RC)						1.000
	Available	0.687	0.230	8.949	1	0.042	1.987
Pooled Resources	Information Sharing						1.000
	No information sharing (RC)						1.000
	There is information sharing	1.133	0.602	3.542	1	0.013	3.105
	Data Security						1.000
	No data security (RC)						1.000
	There is data security	0.521	0.177	8.668	1	0.008	1.684
Collaboration guidelines	Human resources						1.000
	Not Competent (RC)						1.000
	Competent	0.325	0.145	5.008	1	0.003	1.385
	Funding						1.000
	Not Funded (RC)						1.000
	Funded	1.186	0.434	7.484	1	0.006	3.274
Integration of Health services	Geographic setting						1.000
	Lot localised (RC)						1.000
	Localised	0.611	0.738	0.685	1	0.408	1.842
	Governance						1.000
	No governance structure (RC)						1.000
	There is governance structure	- 0.609	0.680	0.802	1	0.371	0.544
	Policy						1.000
	No Policy (RC)						1.000
	There is Policy	- 1.464	0.954	2.352	1	0.125	0.231
	Accountability						1.000
	No accountability (RC)						1.000
	There is accountability	0.444	1.080	0.169	1	0.681	1.559
	Integration of Health care services						1.000
	Not Integrated (RC)						1.000
	Fully Integrated	1.501	0.450	11.105	1	0.001	4.486

Source: Research Data (2023)

The results indicated a statistically significant relationship between the supervision of HIV/NCD services and healthcare system performance in Nakuru County.

Healthcare facilities with well-established monitoring systems were 2.008 times more likely to demonstrate sustainability compared to those without clear monitoring systems for HIV/NCD services. These findings were statistically significant at the 5% level.

Furthermore, the study highlighted the significance of health information processes as key determinants of healthcare performance in Nakuru County. Specifically, facilities that implemented operational information systems while delivering HIV/NCD services were 1.987 times more likely to sustain viability than those lacking functional information systems. Moreover, information sharing was identified as a crucial factor linked to healthcare performance in Nakuru County. Healthcare facilities with operational information sharing platforms were 3.105 times more likely to achieve sustainability compared to those without such platforms. Additionally, facilities that ensured the confidentiality of patient data were 1.684 times more likely to maintain sustainability than those lacking adequate data security measures. These results were statistically significant at the 5% level.

The results indicated a significant correlation between resource pooling in the delivery of HIV/NCD care at healthcare facilities in Nakuru County and the performance of health systems. According to the data presented in Table 4.21, healthcare facilities with proficient Personnel with specialized expertise in HIV/NCD treatment and care showed a 1.385 times higher likelihood of achieving sustainability compared to those without such specialized training during the provision of HIV/NCD treatment and care. Furthermore, the source of funding was identified as a significant factor influencing healthcare performance in Nakuru County. Facilities supported by government and donors had a 3.274 times greater

chance of maintaining sustainability compared to facilities where patients paid directly for HIV/NCD treatment and care. These results were statistically significant at the 5% confidence level.

Additionally, the study indicated that the integration of healthcare services in the treatment and care of HIV/NCD patients is strongly associated with healthcare system performance in Nakuru County. Healthcare facilities that integrated health services for HIV/NCD treatment were 4.486 times more likely to demonstrate sustainability compared to those that did not integrate such services. These findings were statistically significant at the 5% confidence level.

However, the research did not identify any significant correlations between training, coordination, geographical location, governance, policy mandates, accountability, and the performance of the healthcare system in Nakuru County. These results diverge from previous studies, suggesting that in Nakuru County, the prioritization of health worker training may be unnecessary due to the high level of skill and training already possessed by the workers. The coordination of external entities appears to be effectively managed, with facilities strategically located for easy access by patients who are actively utilizing the services provided. The governance structures and policy requirements are established and operational, with clear evidence of well-monitored policy implementation and enforcement, underscoring the non-negotiable nature of accountability within health facilities in Nakuru County.

4.12.2 Moderating influence of organizational culture in the relationship between integration of health care services and performance of health care system

This section delves into the possible moderating effect of organizational culture on the link between healthcare services and the performance of the healthcare system in Nakuru County. The research also evaluates the degree to which the incorporation of organizational culture in the connection between healthcare service integration and healthcare system performance can elucidate variations in performance. See table 4.22 below:

Table 4.22

The Summary of the Model with Moderator

Deviate Score	Cox & Snell R Square	Nagelkerke R Square
136.469 ^a	0.251	0.402

Source: Research Data (2023)

Upon conducting a comparison between the results displayed in table 4.21 and table 4.18, it is apparent that the deviation score in table 4.21 is less than that in table 4.18. The model integrating organizational culture is more succinct than the model without it. In table 4.18, the Nagelkerke R square is documented as 0.369. After the moderator's introduction, the R square rose to 0.402, signifying that organizational culture leads to a 0.033 increase in health system performance in Nakuru County.

Table 4.23

Parameter Estimates with moderator

Factor	Variable	B	S.E.	Wald	df	P-Value	Odds Ratios
Institutional support	Training						1
	No Training (RC)						1
	There is Training	0.29	0.528	0.261	1	0.524	1.337
	Monitoring						1
	No Monitoring (RC)						1
	There is Monitoring	0.797	0.559	2.035	1	0.006	2.219
Health Information processes	Coordination						1
	No coordination with external entities (RC)						1
	There is coordination with external entities	0.239	0.994	0.058	1	0.9	1.27
	Availability of Information system						1
	Not Available (RC)						1
	Available	0.795	0.24	11.005	1	0.002	2.214
Pooled Resources	Information Sharing						1
	No information sharing (RC)						1
	There is information sharing	1.361	0.906	2.256	1	0.003	3.9
	Data Security						1
	No data security (RC)						1
	There is data security	0.655	0.217	9.114	1	0.004	1.925
Collaboration guidelines	Human resources						1
	Not Competent (RC)						1
	Competent	0.39	0.155	6.311	1	0.005	1.478
	Funding						1
	Not Funded (RC)						1
	Funded	1.206	0.634	3.624	1	0.006	3.34
Integration of Health services	Geographic setting						1
	Lot localised (RC)						1
	Localised	0.501	0.638	0.616	1	0.08	1.65
	Governance						1
	No governance structure (RC)						1
	There is governance structure	-0.909	0.88	1.066	1	0.304	0.403
Integration of Health services	Policy						1
	No Policy (RC)						1
	There is Policy	-0.366	0.904	0.164	1	0.109	0.694
	Accountability						1
	No accountability (RC)						1
	There is accountability	0.413	1.801	0.052	1	0.938	1.511
Integration of Health services	Integration of Health care services						1
	Not Integrated (RC)						1
	Fully Integrated	1.509	0.441	11.731	1	0.001	4.524
	Organization culture						1
	No Team culture (RC)						1
	There is team culture	0.762	0.382	3.977	1	0.002	2.142

Source: Research Data (2023)

The results presented in table 4.23 illustrate that organizational culture plays a moderating role in the correlation between the integration of healthcare services and health system performance in Nakuru County. Noteworthy is the emergence of organizational culture as a key determinant of health system performance in Nakuru County, supported by a p-value below 0.05 as shown in table 4.23. Health facilities that fostered a collaborative culture in delivering HIV/NCD treatment and care were 2.142 times more likely to demonstrate sustainability compared to those that did not cultivate such a culture, with statistical significance at the 5% level.

Furthermore, the analysis indicates that organizational culture also functions as a moderator in the relationship between the integration of healthcare services and health system performance in Nakuru County. Upon scrutiny of the odds ratios, which serve as indicators of the effect size, and juxtaposing with the findings in table 4.21, it is evident that incorporating organizational culture into the model boosts the odds of health system sustainability. With the integration of organizational culture into the model, the odds ratios for all significant variables notably rise.

4.13 HIV/NCD Integration Model

The findings of this study underscore the importance of Organizational Culture and Resource Pooling in shaping health system performance within the context of the integrated care model. A culture within an organization that fosters collaboration, communication, and innovation in the healthcare system can greatly boost overall performance. Furthermore, the efficient pooling and allocation of resources can

enhance coordination, efficiency, and care quality, ultimately leading to improved health system performance.

It is important for healthcare organizations and policymakers to recognize the significance of these factors and prioritize their integration into the design and implementation of integrated care models. By fostering a positive organizational culture and ensuring adequate pooled resources, healthcare systems can optimize their performance and deliver more comprehensive and patient-centred care.

4.14 Costing of HIV/NCD Services

The importance of having information about the cost of healthcare services is increasing, especially considering the new Constitution that recognizes healthcare as a right for all Kenyans. Costing is a method that assigns costs of inputs to each intervention and activity with the goal of achieving specific objectives or outcomes. It aims to identify the factors that influence changes in costs (known as cost drivers). All costs related to activities are monitored and allocated to the particular intervention or service for which the activities are carried out. Costing can also be described as a quantitative process involving the estimation of both operational (recurrent) costs and capital costs of a program. This approach ensures that the resources required to deliver services are cost-effective and feasible.

4.14.1 Costing Design

Time-Driven Activity-Based Costing (TDABC) assigns costs to inputs and services, commonly used to plan and control healthcare service delivery. Assigning indirect costs directly to specific key result areas is more challenging when inputs

are shared across different activities hence weighting is done in the cost allocation process. This method involves allocating costs of inputs to each intervention and activity with the objective of achieving predetermined goals or outcomes, aiming to identify the factors influencing cost changes (known as cost drivers). All costs associated with activities are tracked and linked to the particular intervention or service for which the activities are carried out. We used TDABC to capture the costs at the facility level. Normative were applied in the analysis.

In this research, a blended costing approach was employed, combining elements of both top-down and ingredients approaches. This hybrid method is a common practice that leverages the strengths of each approach while mitigating their respective weaknesses. The top-down approach was utilized to quantify and assign shared costs to individual services, encompassing expenses such as health facility administration and overhead costs involving items like salaries of management and operations staff, as well as utilities such as electricity and water. Retrospective healthcare expenditure data was used in the top-down approach, dividing total expenditures by the services rendered during the specified period. On the other hand, the ingredients approach was employed to calculate the direct costs associated with specific health services, including expenses related to diagnostics, medications, and other consumables. While the ingredients approach allows for a more detailed breakdown of cost and yields more precise results, it typically requires a lot of time and effort to implement.

4.14.2 The Scope of the Costing

This costing analysis used a health system perspective to align it with the costing purpose. This entailed estimating all costs that are expected to be borne by the health system to deliver specific healthcare services. The time horizon for acute conditions was a patient care/case management episode.

The tasks necessitate inputs like labor, conference hall usage, and more. These inputs are needed in specific amounts and frequencies. The total input cost is determined by multiplying the unit cost by the quantity and frequency of the input. When all the input costs are added together, they form the Activity Cost.

Data collection from select health facilities was analyzed to obtain the cost of inputs and interventions. To conduct the study the study identified general data sources – e.g., treatment guidelines, policies, plans, norms and standards, service packages, incidence and prevalence rates, health information system, financial records and reports, medicines and supply records, staffing records.

4.14.3 Estimation Methods

The TD-ABC methodology, pioneered by Robert Kaplan and Michael Porter follows a seven-step process including

- i) Selection of HIV/NCD conditions and patients.
- ii) Definition of the care delivery value chain (CDVC): The CDVC outlines the essential activities involved in a patient's comprehensive care visit. Being both a descriptive and prescriptive, it charts the complete spectrum of activities carried out during the care visit, involving diverse providers and nonclinical environments.

It offers a systematic approach for analyzing, improving, and potentially introducing new care configurations. This marks the initial step in constructing a process map for each intervention. Patient treatment guidelines and expert insights were leveraged to craft a clear CDVC map that delineates the timing and locations of health services delivery, as well as the tasks performed for every stage and by whom.

iii) Create flowcharts for every task within the patient care appointment to map resources utilized and during each step: Flowcharts were crafted for every task. These flowcharts outline the resources (staff, facilities, and tools) engaged in each task that the patient utilizes or that are necessary to ensure the primary resources are accessible. This encompasses items like medications and medical supplies utilized in providing direct care services.

iv) Acquire time approximations for each task phase: Determine the duration that a healthcare provider interacts with a HIV/NCD patient or time spent when using a piece of equipment or other resources for each task phase. Time data was gathered from literature and expert viewpoints. Get workload benchmarks and standards projections for each step: It is crucial to quantify the utilization, investment, depreciation, and workload for equipment, human resources, and other resources involved in each process step by collecting data from appropriate sources and expert insights as needed.

v) Calculate the expenses of procuring patient care resources: The total costs associated with all resources utilized in delivering the necessary patient care were assessed. This encompassed both direct and indirect costs. Direct costs involve personnel remuneration, equipment depreciation or leasing, and supplies. This information was sourced from relevant references. Indirect costs encompass

support staff and additional operational expenses essential for service provision, such as utility and infrastructure expenses. To calculate the comprehensive cost of service provision, details on equipment, room dimensions, and administrative staffing are necessary. A tool for gathering data on equipment, furniture, and space was employed to collect information on capital and recurrent supplies.

vi) Determine the capacity cost rate for personnel, equipment, and space. Information on annual cost of all resources were acquired and divided by the annual utilization of the resource in minutes. This calculation provides an estimate of the cost if resources are utilized at their maximum capacity. TD-ABC was utilized to estimate expenses for (a) care and treatment rendered at the facility level, (b) diagnosis and treatment (c) routine outpatient services delivered. In general, TD-ABC identifies and quantifies the following: Activities: Tasks conducted during the care visit for a specific condition, the individuals responsible for each task, and the duration spent on each task. Staff, furnishings, machinery, and physical space: Cost per unit of time for each type of staff, furnishings, machinery, and physical space employed during the care visit (cost rate of utilization). Supplies: Consumables used during the care visit (such as supplies, medications, lab tests, reagents, test kits, etc.). On-site overhead costs: Additional expenditures accrued that are not directly utilized during the care visit. These are expenses that do not directly contribute to individual patient care but are essential for facilitating service delivery, including salaries of administrators, maintenance staff, security personnel, and utility costs like heating and electricity.

vii) Calculate the service cost per unit: The final step entails calculating the cost per unit of each healthcare service provided. A unit cost analysis was carried out for each health intervention utilizing a defined process map. This calculation

involved multiplying the cost rates of utilization for each resource used in each patient procedure by the duration of time the patient engaged with the resource (as identified in Step 4). Following this, the cumulative costs were summed across all procedures conducted during the patient's complete visit to the facility to determine the total estimated costs of the patient visit.

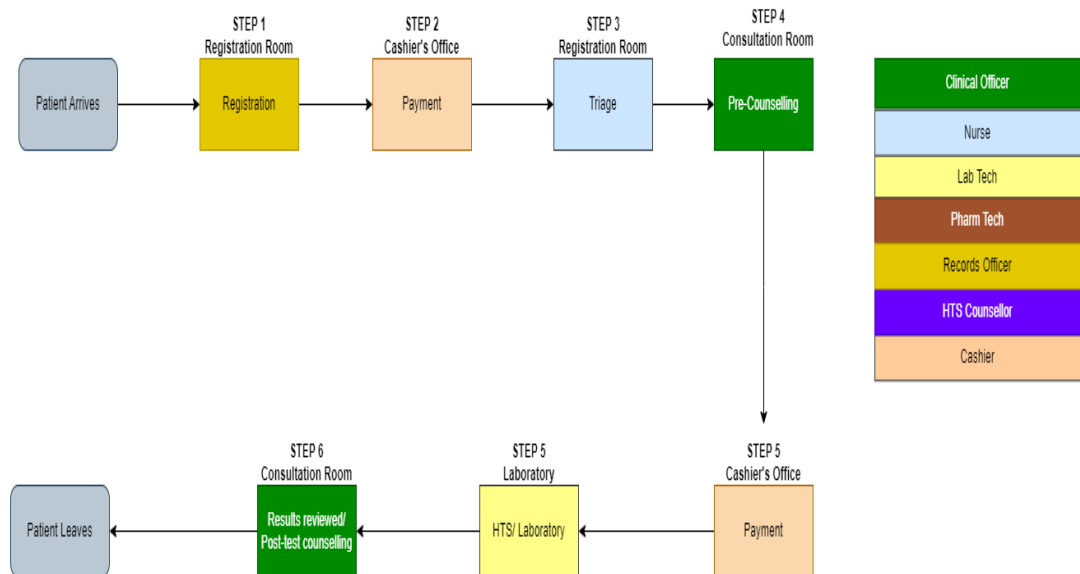
4.14.4 Study Results

Data were collected from 31 health facilities followed through care visits at the facility-level using the TDABC approach.

Examining the process maps for each of the health interventions reveals the sequence of care provision, how much time the provider is spending on each step in the care visit, what cadre is providing care, and the location of the service. In Kenya, process maps show variation in care across and within facilities. Process maps also suggest that healthcare providers often have interpretations of the care process that differ from the clinical protocol specified in Kenya's national guidelines.

Figure 4.1

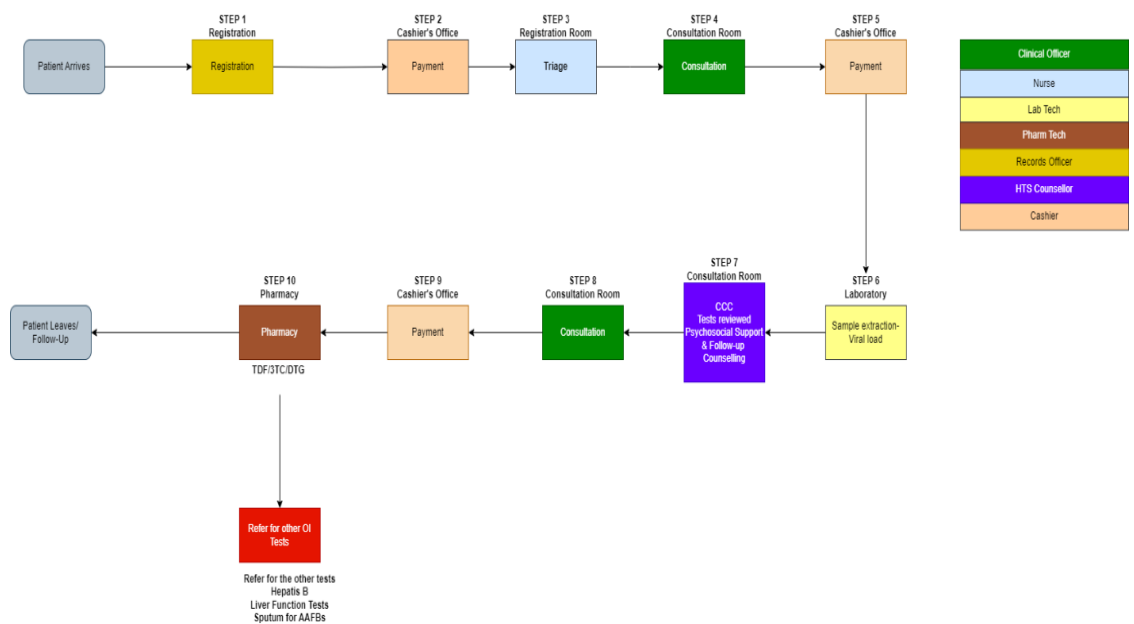
Process Map of HIV Screening



Source: Author calculations

Figure 4.2

Process Map of HIV Treatment for Stable Adult ART Client

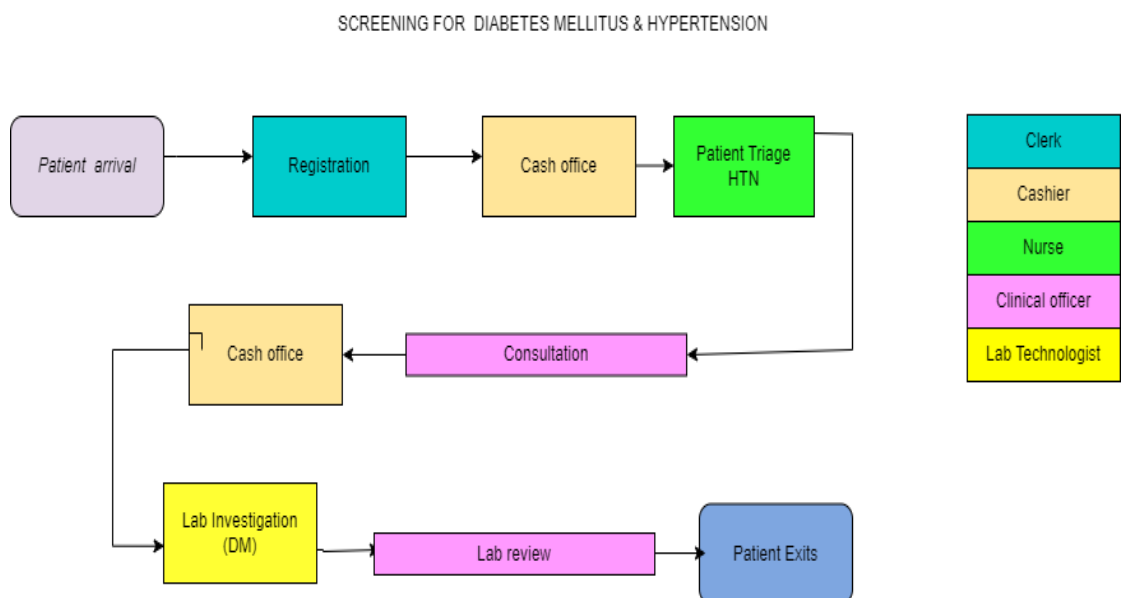


Source: Author calculations

Minimal variation is noted in the care procedures for stable and unstable patients, despite the fact that the average duration of provider-patient interactions for unstable adult patients is greater than that for stable adult patients in the research sample. In accordance with Kenya's HIV treatment protocols suggest additional adherence and nutritional counseling for unstable patients; nevertheless, these services are only provided to a portion of unstable patients.

Figure 4.3

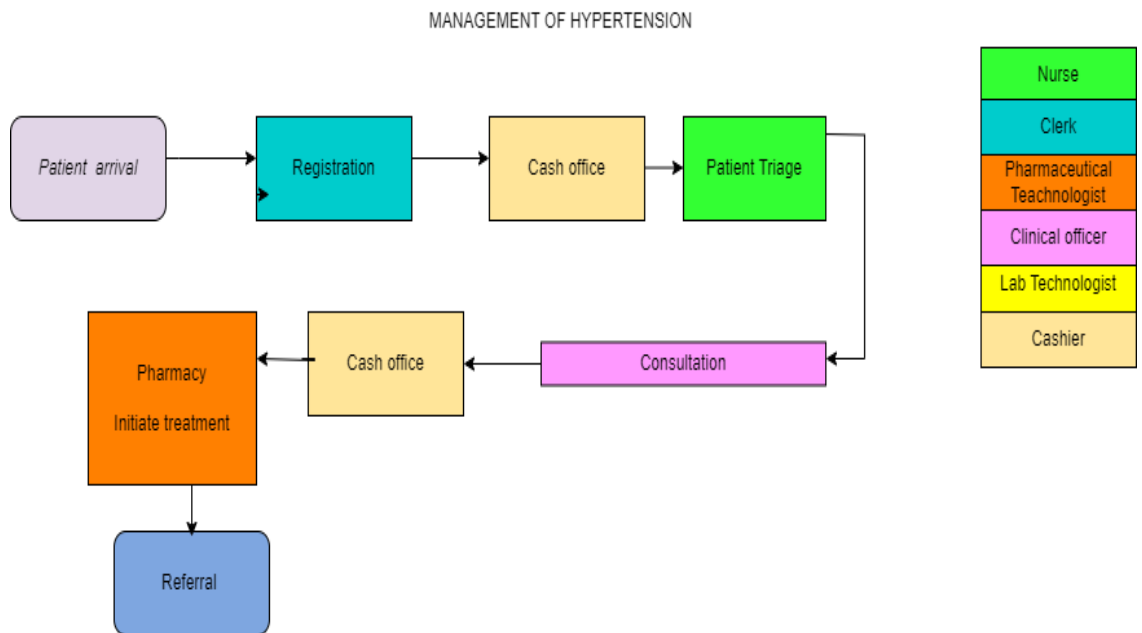
Process Map of Diabetes and Hypertension Screening



Source: Author calculations

Figure 4.4

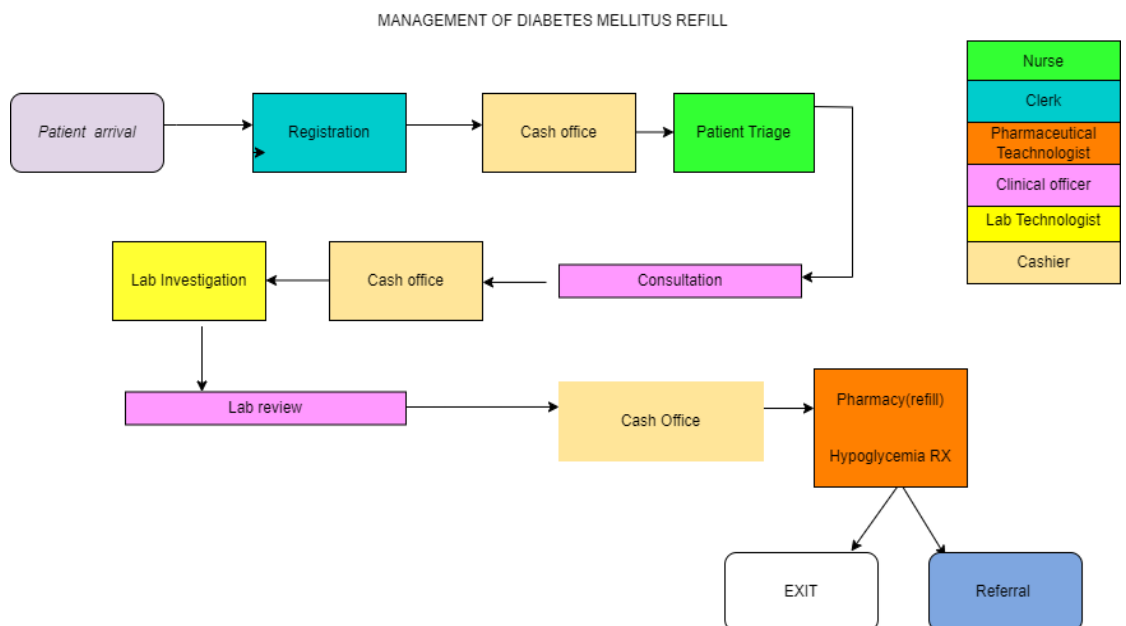
Process Map of Hypertension (HTN) Management



Source: Author calculations

Figure 4.5

Process Map of Diabetes Mellitus (DM) Management



Source: Author calculations

4.14.5 Unit Costs of Patient Care Visit and Cost Drivers

Figure below shows the average cost of a facility visit in Kenya, disaggregated by HIV and NCD intervention, and weighted by patient volume in the study sample. The unit cost stacks are further disaggregated by cost category.

Table 4.24

Average Unit Cost for HIV/AIDs per Facility Visit

HIV/AIDS		Level 2	Level 3	Level 4	Level 5
Unstable patients	Personnel (KSh)	7,812.5	8,050.0	8,172.8	8,736.0
	Drugs (KSh)	25,515.0	25,515.0	25,515.0	25,515.0
	Consumables (KSh)	48.6	66.2	71.1	99.8
	Overheads (KSh)	870.9	1,173.7	1,915.7	1,790.6
	Capital cost (KSh)	77.2	79.8	89.9	97.2
	Annualized cost (KSh)	34,324	34,885	35,765	36,239
	Annualized cost (USD)	245.2	249.2	255.5	258.8
New Treatment	Personnel (KSh)	6,562.5	6,593.8	8,377.1	8,906.3
	Drugs (KSh)	14,866.6	14,866.6	14,866.6	14,866.6
	Consumables (KSh)	48.6	66.2	71.1	99.8
	Overheads (KSh)	1,137.5	1,173.7	1,915.7	1,790.6
	Capital cost (KSh)	77.2	79.8	89.9	105.8
	Annualized cost (KSh)	22,692	22,780	25,320	25,769
	Annualized cost (USD)	162.1	162.7	180.9	184.1
Stable patients	Personnel (KSh)	1,500.0	3,000.0	4,489.6	7,437.5
	Drugs (KSh)	17,685.0	17,685.0	17,685.0	17,685.0
	Consumables (KSh)	48.6	66.2	71.1	99.8
	Overheads (KSh)	1,137.5	1,173.7	1,915.7	1,790.6
	Capital cost (KSh)	77.2	79.8	89.9	121.5
	Annualized cost (KSh)	20,448	22,005	24,251	27,134
	Annualized cost (USD)	146.1	157.2	173.2	193.8

Source: Author calculations

The unit cost estimates on an annualized basis are based on an assumption of seven clinic visits annually for a stable client and ten visits per year for another client. These visit frequencies correlate with the quantity of drugs dispensed to each client.

Table 4.25

Average Unit Cost for Diabetes Mellitus and Hypertension per Facility Visit

NCDs		Level 2	Level 3	Level 4	Level 5
Diabetes	Personnel (KSh)	2,812.0	3,125.0	4,353.1	4,792.7
	Drugs (KSh)	10,934.3	10,934.3	10,934.3	10,934.3
	Consumables (KSh)	48.6	66.2	62.3	99.8
	Overheads (KSh)	1,080.0	1,173.7	1,470.0	1,598.4
	Capital cost (KSh)	30.0	30.0	55.2	88.0
	Annualized cost (KSh)	14,905	15,329	16,875	17,513
	Annualized cost (USD)	106.5	109.5	120.5	125.1
Hypertension	Personnel (KSh)	3,329.0	3,624.0	4,281.3	4,678.0
	Drugs (KSh)	9,385.7	9,385.7	9,385.7	9,385.7
	Consumables (KSh)	48.6	66.2	62.3	84.0
	Overheads (KSh)	1,080.0	1,173.7	1,470.0	1,298.4
	Capital cost (KSh)	30.0	32.4	55.2	88.0
	Annualized cost (KSh)	13,873	14,282	15,254	15,534
	Annualized cost (USD)	99.1	102.0	109.0	111.0

Source: Author (2023) calculations

Consumables represent the largest proportion of the overall cost for service delivery at the facility level across interventions, with consumables and lab tests being the largest cost driver. Variations in consumable costs among facilities are mainly driven by the type and quantity of consumables recorded during the data collection process.

Table 4.26***Average Unit Cost for HIV/AIDs, Diabetes Mellitus and Hypertension per Facility Visit with Integration Approach***

INTEGRATION		Level 2	Level 3	Level 4	Level 5
HIV/Diabetes	Personnel (KSh)	3,000.0	6,452.1	6,875.6	5,937.5
	Drugs (KSh)	27,160.1	27,160.1	27,160.1	27,160.1
	Consumables (KSh)	23.3	56.7	66.2	106.9
	Overheads (KSh)	443.7	950.4	1,302.1	1,790.6
	Capital cost (KSh)	47.4	72.5	80.8	88.0
	Annualized cost (KSh)	30,675	34,692	35,485	35,083
	Annualized cost (USD)	219.1	247.8	253.5	250.6
HIV/HTN	Personnel (KSh)	3,000.0	6,452.1	6,875.6	5,937.5
	Drugs (KSh)	27,070.7	27,070.7	27,070.7	27,070.7
	Consumables (KSh)	23.3	56.7	66.2	106.9
	Overheads (KSh)	443.7	950.4	1,302.1	1,790.6
	Capital cost (KSh)	47.4	75.2	80.8	88.0
	Annualized cost (KSh)	30,585	34,605	35,395	34,994
	Annualized cost (USD)	218.5	247.2	252.8	250.0
HIV/DM/HTN	Personnel (KSh)	3,000.0	6,452.1	6,875.6	5,937.5
	Drugs (KSh)	36,545.9	36,545.9	36,545.9	36,545.9
	Consumables (KSh)	23.3	56.7	66.2	106.9
	Overheads (KSh)	443.7	950.4	1,302.1	1,790.6
	Capital cost (KSh)	47.4	75.2	80.8	88.0
	Annualized cost (KSh)	40,060	44,080	44,871	44,469
	Annualized cost (USD)	286.1	314.9	320.5	317.6

Source: Author (2023) calculations

4.14.6 The Cost Saved due to HIV/NCD Integration

We conducted an analysis to determine the potential cost savings per case achievable through the consolidation of patient procedures. This methodology, however, does not propose alterations to the treatment regimen and therefore excludes drug costs from the calculation of efficiency gains. The justification for integrating NCD and HIV care services is based on the idea of improving healthcare provision by capitalizing on economies of scale and scope. These efficiencies are assessed through the concept of "unit cost," representing the overall costs needed to generate a single unit of a product or service.

In summary, the integration of HIV and NCD healthcare services has exhibited yearly cost reductions of KSh 26,706 (USD 190.7), KSh 27,220 (USD 194.4), and KSh 48,106 (USD 343.6) per case in scenarios involving the integration of HIV/Diabetes, HIV/Hypertension, and HIV/Diabetes/Hypertension, respectively, as illustrated.

Table 4.27

Summary Annual Average Saving per Unit Cost with Integration Approach

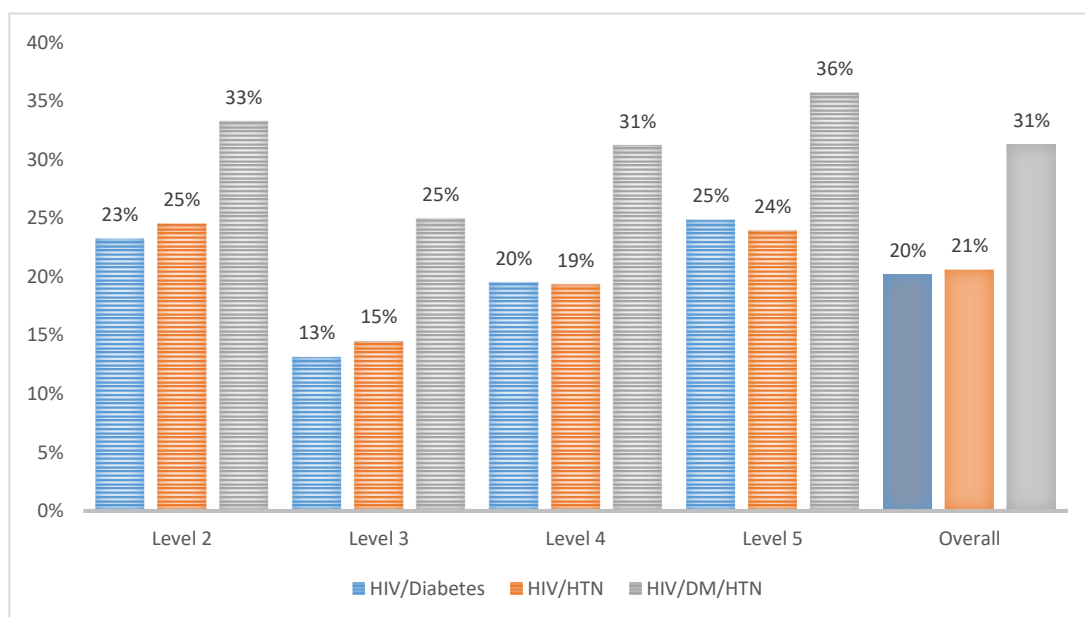
	Level 2	Level 3	Level 4	Level 5	Overall
HIV/Diabetes	KSh 6,922 (USD49.4)	KSh 4,064 (USD29)	KSh 6,706 (USD47.9)	KSh 9,014 (USD64.4)	KSh 26,706 (USD190.7)
HIV/HTN	KSh 7,439 (USD53.1)	KSh 4,563 (USD32.6)	KSh 6,634 (USD47.4)	KSh 8,584 (USD61.3)	KSh 27,220 (USD194.4)
HIV/DM/HTN	KSh 11,410 (USD81.5)	KSh 8,958 (USD64)	KSh 12,575 (USD89.8)	KSh 1,5163 (USD108.3)	KSh 48,106 (USD343.6)

Source: Author (2023) calculations

The merging of HIV and NCD service delivery has shown annual cost reductions of 20%, 21%, and 31% per case in situations where HIV/Diabetes, HIV/Hypertension, and HIV/Diabetes/Hypertension are integrated, respectively.

Figure 4.6

Summary Annual Average Saving per Unit Cost with Integration Approach



Source: Author (2023) calculations

The table presents the precise cost savings that can be realized through the integration of HIV and NCD service provision, categorized by input and level of care.

Table 4.28

Average Annual Saving per Unit Cost for HIV/AIDs, Diabetes Mellitus and Hypertension per Facility Visit with Integration Approach

Savings		Level 2	Level 3	Level 4	Level 5
HIV/Diabetes	Personnel (KSh)	5,103.7	2,554.1	4,490.7	7,215.1
	Consumables (KSh)	73.8	75.7	67.2	92.7
	Overheads (KSh)	1,684.9	1,396.9	2,083.6	1,598.4
	Capital cost (KSh)	59.8	37.3	64.3	108.2
	Annualized Saving (KSh)	6,922	4,064	6,706	9,014
	Annualized Saving (USD)	49.4	29.0	47.9	64.4
HIV/HTN	Personnel (KSh)	5,620.7	3,053.1	4,418.8	7,100.4
	Consumables (KSh)	73.8	75.7	67.2	76.9
	Overheads (KSh)	1,684.9	1,396.9	2,083.6	1,298.4
	Capital cost (KSh)	59.8	37.0	64.3	108.2
	Annualized Saving (KSh)	7,439	4,563	6,634	8,584
	Annualized Saving (USD)	53.1	32.6	47.4	61.3
HIV/DM/HTN	Personnel (KSh)	8,432.7	6,178.1	8,771.9	11,893.1
	Consumables (KSh)	122.4	142.0	129.6	176.7
	Overheads (KSh)	2,764.9	2,570.6	3,553.6	2,896.8
	Capital cost (KSh)	89.8	67.0	119.5	196.2
	Annualized Saving (KSh)	11,410	8,958	12,575	15,163
	Annualized Saving (USD)	81.5	64.0	89.8	108.3

Source: Author (2023) calculations

The cost analysis offers distinctive insights into the amalgamation of HIV and NCD services. The investigation into the integration of HIV and NCD service delivery has unveiled annual cost reductions of KSh 7,086 (21%), KSh 6,166 (19%), and KSh 10,653 (29%) per case for the integration of HIV/Diabetes, HIV/Hypertension, and HIV/Diabetes/Hypertension, respectively. The study's results underscore the notable cost savings achieved by combining HIV and non-communicable disease (NCD) services across different levels of care. The integration of HIV and NCD services has demonstrated cost savings across various

care tiers. The observed savings for each case highlights that the integration of these services can lead to effective resource management and decreased healthcare expenditures. Similarly, Golovaty et al. (2018) concludes that integrating HIV and NCD services enhances resource efficiency within the health system and aids patients in maintaining care by reducing costs and inconveniences for individuals with varying health conditions.

Moreover, the savings are enhanced by greater levels of integration. High level integration leads to high-cost savings due to the larger patient populations and wider service coverage typically found in higher-level healthcare facilities (Kintu et al., 2020). The significant volume of patients allows them to leverage economies of scale, leading to better pricing for medical supplies, medications, and equipment due to their increased purchasing power. This finding is consistent with the study by Shiri et al. (2021) indicating that integrating HIV and NCD services supports adherence and has the potential to improve economies of scale (Shiri et al., 2021). Moreover, a greater patient caseload facilitates the effective use of resources, like costly medical equipment or specialized personnel, leading to decreased costs per patient. Although higher-tier facilities may yield greater cost efficiencies, it is essential to recognize that a robust healthcare system necessitates a proper-coordinated network encompassing various levels of care, from primary to secondary facilities. Each tier plays a vital part in providing suitable and economical care tailored to the intricacy and seriousness of patients' ailments. Efficient referral mechanisms and collaboration among diverse care levels are crucial for guaranteeing ideal healthcare results and cost-effectiveness throughout the whole healthcare infrastructure.

The merging of HIV and NCD services can advance a holistic and patient-centric healthcare strategy. Likewise Singh, Sabine, et al., reported that integration can lead to resource savings and facilitate a more individualized healthcare approach (Singh et al., 2021). Through the incorporation of multiple conditions within a unified service delivery framework, patients receive more comprehensive care that takes into account their overall well-being. It has the potential to enhance patient health, improve disease management, and decrease expenses related to addressing complications stemming from uncontrolled HIV or NCDs.

The integration of HIV and NCD services streamlines healthcare provision and enhances resource utilization. The cost savings highlighted include a range of elements including personnel expenses, consumables, overheads, and capital outlays. Achwoka et al. (2019) noted that integration can minimize redundancies in resource-constrained environments from the supply side. Utilizing current infrastructure such as buildings, labs, and supply chains can lead to financial benefits, and collaborative oversight, education, and guidance have been shown to reduce the burden on the schedules of healthcare professionals (Achwoka et al., 2019). Through eliminating redundancies and optimizing the use of current resources, healthcare systems can reallocate saved resources to other critical areas, such as expanding care access, prioritizing preventive measures, and improving healthcare infrastructure.

The findings provide empirical backing for crafting and implementing policies and programs that support the merging of HIV and NCD services. Governments, healthcare organizations, and policymakers can leverage this information to promote unified care models, integrating them into national healthcare strategies

and standards. These strategies can guide resource distribution and nurture the sustainability of joined services. Additionally, merging HIV and NCD services contributes to the overall improvement of healthcare systems. Unified care models require collaboration among various healthcare providers, disciplines, and industries. This collaboration cultivates a more systematic and efficient healthcare system, ultimately benefiting the entire population, not just individuals impacted by HIV or NCDs. However, the successful execution of unified care will necessitate the mobilization of additional resources to expand HIV treatment initiatives to cover enhanced screening and management of NCDs. Despite the growing prevalence of NCDs, the current funding allocations for NCD interventions are insufficient. It is also crucial to consider the context in which these interventions are deployed, taking into consideration the unique needs and obstacles of each healthcare environment.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This section provides an overview of the results based on the defined objectives outlined in the initial chapter. Additionally, it includes conclusions and suggestions aimed at guiding future decisions and research pathways.

5.2 Summary of Findings

The aim of this research was to devise an approach that would guide the integration of HIV/NCD services as a crucial element of health system enhancement in Kenya, with the goal of enhancing health system efficacy. This study employed a cross-sectional research design, integrating aspects of positivism and interpretivism philosophies to comprehensively grasp health system performance and explore the impact of independent variables on dependent variables. A descriptive design was utilized for generating summary statistics, a correlational design for Chi Square correlation analysis, a quantitative design for predictive and inferential statistics, and a qualitative design for thematic analysis. The primary objective was to evaluate the impact of institutional backing for integrated HIV/NCD services on healthcare system performance in Nakuru County, involving an assessment of the support level offered by healthcare institutions in terms of policies, resources, and infrastructure to facilitate the integration of HIV and NCD services.

Support from institutions plays a vital role in the professional advancement and growth of healthcare practitioners, as highlighted by the findings of this study. The surveyed facilities are commended for providing continuous improvement training on emerging health issues. This investment demonstrates their commitment to excellence and adaptability in the face of evolving healthcare challenges. It fosters a culture of lifelong learning and professional growth among staff members, enabling them to deliver high-quality healthcare services. The full support provided by organizations for staff workshops, conference participation, and seminars is also a valuable finding as it allows healthcare professionals to engage with peers, share knowledge, and learn from experts. By encouraging staff members to participate in these events, healthcare facilities foster a dynamic learning environment and empower their employees to stay at the forefront of advancements in their respective fields.

The close collaboration between healthcare facilities and learning institutions is a strategic approach to ensure that educational programs align with the needs of the health sector as it assists organizations in pooling their expertise and resources to enhance their ability to effectively address the requirements of the community. The study highlights a potential opportunity for knowledge dissemination and collaboration through fully sponsored degree programs, as very few facility staff members have received such support. Engaging in teaching roles allows healthcare professionals to share expertise, contribute to education, and enhance their own professional development. Organizations should encourage and facilitate staff involvement in teaching to capitalize on this potential.

Monitoring outcomes is another crucial finding that points to institutional support in maintaining and improving the quality of healthcare services in the surveyed health facilities. These health facilities monitor outcomes by conducting customer satisfaction surveys on a frequent basis to identify patterns and trends, pinpoint specific areas for improvement, and make informed decisions. Client feedback and recommendations are essential for maintaining accountability, driving improvement, and shaping the real-time evolution of service delivery. Moreover, involving staff in problem identification is crucial for health facilities to utilize the collective knowledge and experience of their workforce. Empowering staff to voice concerns and suggestions allows facilities to tap into their expertise and gain deeper insights into factors affecting HIV/NCD service delivery. This collaborative approach fosters accountability, ownership, commitment, and motivation among staff members. Regular outcome monitoring and continuous staff involvement in problem-solving ensure that the facility remains responsive to patient needs and maintains a high standard of care. There was however a need to improve on monitoring outcomes in Nakuru County, because this would lead to improved performance of the health system.

Our results also emphasize the significance of coordination with external entities, collaboration with the local and national government, and community participation in ensuring institutional support within healthcare facilities. The surveyed facilities demonstrate a close working relationship with the local and national government to improve service delivery. This indicates a strong commitment to aligning their goals and strategies with the broader healthcare policies and initiatives of the government. Collaborating with government agencies can lead to improved access

to funding, regulatory support, and coordination of efforts to address healthcare challenges at a larger scale. The facilities' active engagement with the government signifies a proactive approach to ensuring the sustainability and effectiveness of their services. The finding also highlights the importance of community participation in these facilities. By embracing community involvement, healthcare institutions recognize that the communities they serve are valuable stakeholders who can contribute to the development, execution, and assessment of healthcare initiatives.

The second aim was to investigate the impact of healthcare information procedures concerning HIV/NCD integration on the operational efficiency of the healthcare system in Nakuru County. This objective encompassed assessing the efficiency of information systems, data collection methods, and sharing mechanisms in facilitating the integration of HIV and NCD services and their influence on the general system effectiveness. The research examined the accessibility of the health information system across various facility categories. The Health Management Information System (HMIS) efficiently amalgamated diverse data origins and tailored data gathering instruments to fulfil the demands of the facilities. Additionally, the CCC information system successfully triaged Non-Communicable Disease (NCD) patients. However, there was some disagreement among respondents from FBO and private facilities regarding the system's effectiveness, with a small percentage expressing strong disagreement. FBO and GoK facilities had better access to the health information system compared to private facilities. This discrepancy may impact the quality of care and data availability in private facilities. Moreover, the HMIS successfully integrated data

from individual records, service records, and administrative records, allowing for comprehensive health information management. This integration likely improved the efficiency and accuracy of data reporting and analysis. The data collection tools in the HMIS were tailored to suit the specific needs of the facilities, indicating a flexible and adaptable system. Customization likely enhanced data collection and reporting accuracy by aligning with the unique requirements of each facility. Additionally, the CCC information system effectively triaged NCD patients, suggesting a well-designed system for prioritizing and managing patient needs. This functionality likely improved patient care and resource allocation. In contrast, there were differing opinions among respondents from FBO and private facilities regarding the effectiveness of the information system. This discrepancy highlights the need for further investigation and potential improvements to address concerns and ensure the system's optimal performance in all facility types.

The objective also examined the effectiveness of the CCC in detecting and serving the NCD needs of patients at varying facility levels. The findings revealed mixed responses, with a majority agreeing that the CCC was effective, but notable disagreement rates among respondents. The CCC was found to efficiently track the progress of NCD management and treatment. Furthermore, respondents acknowledged that data accessibility by colleagues in government facilities was prompt, while this was not the case in private and FBOs. The mixed responses and notable disagreement rates among respondents from level 4 and 3 facilities suggest potential gaps or variations in the CCC's effectiveness. This may indicate the need for targeted interventions and improvements in these facility levels to ensure optimal detection and serving of NCD needs. Moreover, the CCC's ability to track

the progress of NCD management and treatment is a positive finding. This suggests that the system is effective in monitoring and supporting patients with NCDs, which can lead to improved health outcomes and better resource allocation for NCD management. The prompt accessibility of data by colleagues in government facilities compared to private and FBOs highlights potential disparities in data sharing and collaboration. This may impact the overall coordination and continuity of care and hinder the capacity to make informed choices based on comprehensive patient information.

This objective also found that safety measures are generally adhered to when accessing the Health Management Information System (HMIS) through the use of usernames and passwords. Staff members have moderate accessibility to patient records, with the majority of respondents agreeing. The transmission of information is timely, and access to data is restricted to authorized personnel, ensuring confidentiality and privacy. However, occasional server buffering issues were identified as a challenge. The occasional server buffering issues identified as a challenge may cause delays or disruptions in accessing and transmitting data. This could potentially impact the timeliness and efficiency of healthcare services, highlighting the need for technical improvements and reliable infrastructure to ensure uninterrupted access to the HMIS. The facilities have well-defined data handling policies that guide the proper management and protection of data throughout its lifecycle.

The third objective aimed to clarify the effect of pooled resources in integrating HIV/NCD services on the operational efficiency of the healthcare system in Nakuru County. This involved examining how the consolidation and distribution

of resources, such as funding, personnel, and equipment, contributed to the effectiveness and efficiency of integrated services and their impact on the performance of the health system. A significant number of respondents feel adequately trained to handle both HIV and non-communicable disease (NCD) cases. However, there is a consensus among respondents that more training is needed to effectively manage HIV patients with NCD conditions across various facilities. Respondents from level 2 and private facilities appear to be more satisfied with the regularity of integrated care training. This suggests that these facilities are prioritizing comprehensive training programs to ensure healthcare providers are equipped to deliver integrated care. Respondents from level 2 and government-owned facilities generally agree that the government fully covers the costs of HIV and NCD services. However, respondents from private and FBO facilities disagree with this notion. Additionally, the majority of respondents from different facilities strongly agree that HIV services are fully funded by donors. The disparities in perceived government funding between different types of facilities indicate potential inequalities in resource allocation. Addressing these disparities and ensuring equitable funding across different facility types is crucial for providing consistent and high-quality care. Moreover, reliance on donor funding for HIV services may pose challenges to the enduring viability of these programs. Health systems should explore strategies to diversify funding sources and reduce dependence on external funding to ensure the continued provision of essential services. The variations in funding models across facility types may impact the affordability and accessibility of HIV and NCD services for patients. Efforts should be made to ensure that services are affordable and accessible to all individuals, regardless of the type of facility they seek care from. These results highlight the

importance of evidence-based policy and planning in resource allocation and funding decisions. Health systems should consider the financial implications and potential disparities associated with different funding models when formulating policies and strategies.

Finally, in the CCCs, the program lead collaborates closely with the health facility board, while the facilities in-charge handle all activities within the health facilities. On the other hand, NCD clinics are fully managed by the health board. Another significant aspect is the procurement of medical products. The responsibility for approving purchases of medical products lies with the health facility board. These findings have several implications for the health system. First, the close collaboration between the program lead and the health facility board in CCCs suggests a coordinated approach to patient care and management. This can lead to more efficient and effective delivery of comprehensive care services. Second, the variation in response rates for purchasing medical products indicates potential differences in procurement processes and efficiency across facility types. Improving response rates, particularly in GoK facilities, could enhance timely access to essential medical supplies and equipment. Overall, the findings highlight the importance of effective management and coordination within healthcare facilities. Strengthening collaboration between program leads and health facility boards, as well as streamlining procurement processes, can positively enhance patient care to strengthen the healthcare system and ensuring the availability of necessary medical resources.

The fourth objective aimed to establish the influence of collaboration guidelines for HIV/NCD integration on the effectiveness of the healthcare system in Nakuru

County. This objective focused on assessing the presence and effectiveness of guidelines, protocols, and mechanisms for collaboration and coordination among different healthcare providers and stakeholders involved in the delivery of integrated HIV and NCD services. The findings imply that there are operational policies at the local level in various healthcare facilities, as reported by the respondents. The high response rate indicates that respondents possess a good understanding of their organization's policies. Moreover, there is a consensus among respondents that these policies are aligned with the national policy, indicating a cohesive approach across different facilities. The majority of respondents demonstrate full awareness of the Kenya Health policy and are actively implementing it within their facilities. This indicates a positive trend toward the adoption and integration of national health policies at the grassroots level. Additionally, respondents show awareness of the Universal Health Coverage (UHC) policy and are fully implementing it, further enhancing the accessibility and affordability of healthcare services. Overall, these findings have several implications for the health system. The strong presence of operational policies at the local level suggests that healthcare facilities are committed to adhering to guidelines and protocols, promoting consistency and quality of care. The alignment of local policies with national policy indicates a unified and coordinated approach toward achieving national health goals. The respondents' awareness and implementation of the Kenya Health Policy and UHC policy highlight the progress made in ensuring that healthcare services are in line with national objectives. This can have a positive impact on improving healthcare access, quality, and equity for the population.

The fifth objective aimed to assess how organizational culture moderates the relationship between the integration of HIV/NCD services and healthcare system performance. This objective involved exploring how the organizational culture within healthcare institutions influenced the success or failure of HIV/NCD integration efforts and its subsequent impact on health system performance. The findings suggest that respondents in various facilities are motivated to generate new ideas within an innovative-oriented culture. There is also an emphasis on outcome-oriented culture within these facilities. The existence of pay-for-performance initiatives, despite differing opinions, demonstrates initiatives to improve the quality of HIV/NCD care. Collaborative spirit among departmental leaders also enhances the overall health system efficiency. This could have a substantial impact on health system performance. A culture that values innovation and prioritizes outcomes may promote ongoing enhancements and the exploration of novel healthcare delivery methods. The implementation of pay-for-performance programs, if effectively carried out, can incentivize quality care and improve patient outcomes. The sense of teamwork can enhance coordination and collaboration, leading to more efficient and effective healthcare services.

Moreover, the findings suggest that respondents are generally well-informed about the vision and direction of the healthcare facilities. Regarding the integration of healthcare services, respondents believe that most healthcare workers in the facilities are competent to provide both HIV and NCD services. However, there is disagreement among the facilities regarding the availability and accessibility of drugs, which can impact the quality of care provided. There is also a collaborative approach among HIV and NCD specialists in the Comprehensive Care Clinics.

They regularly review each other's notes and consult with each other for patient care, indicating effective teamwork and coordination. Respondents also express comfort in multitasking and providing care for both HIV and NCD patients, reflecting flexibility and adaptability in their roles. The data collection systems in place maintain a patient database for individuals seeking care from various facilities. This centralized approach can contribute to better continuity of care and improved patient management. In conclusion, the findings highlight the importance of clear vision and direction within healthcare facilities. The integration of HIV and NCD services, along with the collaboration among specialists, can enhance the quality of care provided. However, the challenges related to the availability and accessibility of drugs need to be addressed to ensure optimal patient outcomes. The comfort and ability of healthcare workers to multitask and provide care for both HIV and NCD patients demonstrate their versatility and capacity to deliver comprehensive care. The data collection systems play a vital role in maintaining patient records and facilitating seamless care coordination. Overall, these findings have implications for the performance of the health system. By addressing the challenges related to drug availability and accessibility, improving coordination among healthcare specialists, and maintaining robust data collection systems, the health system can further enhance its performance and deliver high-quality care to patients with HIV and NCD conditions.

Finally, the sixth aim was to devise an HIV/NCD integration framework staff to enhance healthcare service delivery in Nakuru County. According to the chi-square analysis, only the monitoring of HIV/AIDS and NCD services correlates with health system performance in Nakuru County. Training and collaboration with

external entities do not exhibit a significant correlation with health system performance in this context. Furthermore, the outcomes suggest that all aspects of information processes (availability, sharing, and security) are crucial predictors of health system performance. These results highlight the importance of capitalizing in robust information systems, promoting efficient information-sharing practices, and ensuring adequate security measures to boost health system performance. By emphasizing these areas, policymakers and healthcare providers in Nakuru County can enhance the overall effectiveness, efficiency, and quality of their healthcare services.

The findings also indicate that workforce capacity and financial frameworks serve as substantial determinants of health system performance. These results underscore the significance of investing in and prioritizing the recruitment, training, and retention of healthcare professionals, alongside establishing sustainable funding mechanisms to uphold the provision of high-quality healthcare services. Although the geographical location does not seem to directly impact health system performance in this setting, it remains essential to account for local variables and customize interventions and strategies accordingly. By tackling these vital elements, policymakers and stakeholders in Nakuru County can aim to improve the overall effectiveness and results of their healthcare systems.

On the contrary, the research indicates that none of the partnership protocols (e.g., governance framework, policy prerequisites, and answerability) demonstrate significant links with healthcare system efficacy in Nakuru County. This implies that alternative factors or variables might exert a more substantial impact on healthcare system performance in this setting. Although partnership protocols may

not directly relate to efficacy, it is vital for policymakers and stakeholders to investigate other factors that can enhance healthcare system performance. These factors may include aspects like workforce capacity, financial structures, data systems, and quality enhancement initiatives.

To sum up, the results demonstrate a notable connection between the integration of healthcare services and the efficiency of the health system in Nakuru County. This indicates that when healthcare services are integrated and coordinated effectively, it positively influences the overall performance of the health system.

The outcomes of the multivariate analysis underscore the importance of these two elements in influencing the overall health system performance. Organizational culture assumes a pivotal role in moulding the conduct and methodologies within the healthcare system. A culture that advocates for collaboration, communication, and creativity nurtures a favourable workplace atmosphere and enables efficient teamwork among healthcare practitioners. Consequently, this can result in enhanced care coordination, streamlined procedures, and improved patient results. The findings highlight the importance of cultivating an organizational culture that values collaboration and innovation to enhance health system performance.

Pooled resources refer to the effective aggregation and allocation of resources within the healthcare system. When resources are pooled and utilized efficiently, it enables better coordination among different healthcare providers and facilities. This can result in improved efficiency, reduced duplication of services, and better utilization of available resources. Effective resource pooling and allocation contribute to enhanced coordination, streamlined workflows, and improved quality

of care, ultimately leading to better health system performance. The implications of these findings are significant for policymakers and healthcare leaders. They emphasize the importance of fostering a collaborative and innovative organizational culture within the healthcare system. This can be achieved through initiatives such as promoting interdisciplinary collaboration, fostering effective communication channels, and encouraging continuous learning and improvement. Additionally, it is crucial to establish mechanisms for pooling and allocating resources effectively, ensuring that resources are distributed based on the needs and priorities of the health system. By prioritizing organizational culture and pooled resources, health system stakeholders can work towards enhancing overall performance. This includes improving patient experiences, optimizing healthcare delivery processes, and achieving better health outcomes. The findings underscore the need for strategic investments and policies that support a positive organizational culture and enable effective resource pooling and allocation within the healthcare system.

The study on the integration of HIV and NCD service provision has illustrated potential annual cost savings of KSh 7,086 (21%), KSh 6,166 (19%), and KSh 10,653 (29%) per case through the integration of HIV/Diabetes, HIV/HTN, or HIV/DM/HTN, respectively.

Hypothesis testing was conducted on five objectives to assess the sustainability of health system performance. A sustainability test score ranging from 4 to 12 indicated the viability of HIV/NCD services. The study encompassed four variables: institutional support, health information processes, pooled resources, and collaborative guidelines. Institutional support comprised three components:

training, outcome monitoring, and coordination with external entities. Outcome monitoring emerged as the most significant predictor of enhanced health system performance in Nakuru County. Health Information Processes included three metrics: information system availability, information sharing, and information security, all of which were statistically significant predictors of improved health system performance. Pooled resources featured three domains: human resources, funding models, and geographic location, with only human resources and funding models identified as strong predictors of enhanced health system performance. The fourth variable, collaborative guidelines, included measures of governance structure, policy requirements, and accountability. None of these variables proved to be reliable predictors of health system performance in Nakuru County.

The statistical test of individual predictors' significance reveals that these predictor variables collectively contribute to the model. The Hosmer and Lemeshow test results, with a chi-square value of $\chi^2 = 11.660$ and a p-value of 0.167, suggest that the null hypothesis, positing that the coefficients for the predictor variables are collectively zero, can be refuted. This indicates that the predictor variables exert a notable and substantive impact on health system performance. These results carry significant implications for health system performance within the integrated care framework. The predictor variables identified encompass institutional support, health information processes, pooled resources, collaboration guidelines, and organizational culture, can be targeted and improved to enhance overall health system performance. Healthcare institutions can strive to provide adequate institutional support, ensuring that the necessary structures, policies, and resources are in place to support integrated care. Effective health information processes

should be implemented to facilitate the sharing and utilization of critical health information across different care settings. Pooled resources, such as financial and human resources, should be strategically allocated and coordinated to optimize the delivery of integrated care. Lastly, fostering a positive organizational culture that values collaboration, innovation, and patient-centered care can exert a notable influence on the healthcare system performance. By focusing on these predictor variables and implementing targeted interventions, health systems can improve their performance under the integrated care model. This can lead to enhanced care coordination, improved patient outcomes, increased efficiency, and a more sustainable healthcare system. Overall, the study highlights the importance of these predictor variables and provides evidence of their significant impact on health system performance. These findings can inform policy and practice decisions aimed at enhancing integrated care and ultimately improving the general quality and efficacy of healthcare delivery.

The study employed the Hosmer-Lemeshow test to assess the adequacy of a logistic regression model concerning observed data. This test compares anticipated and observed event frequencies among diverse groups based on predicted probabilities. With a P-value below 0.001, the null hypothesis was rejected, indicating that the model fit the data well. This indicates that the Binary logistic regression model utilized was a suitable match for the observed data, and the Hosmer-Lemeshow test results validate the accuracy of the model's forecasts. Furthermore, precise and dependable predictive models are crucial in healthcare decision-making processes. Additionally, the validated binary logistic regression model can aid in predicting health system outcomes and identifying potential risks or factors influencing

HIV/NCD integration. Lastly, the test revealed a high level of internal consistency and reliability for the utilized scale, implying that the scale items consistently gauge the intended construct. The implications of this finding are that the scale can be used in future studies or surveys to measure the same construct. Researchers can rely on the scale's internal consistency to ensure the reliability of their data. It also highlights the importance of using consistent and reliable measurement tools in research and decision-making processes, as they provide more accurate and trustworthy results.

5.3 Conclusion

The study gives valuable insights into the impact of integrating HIV/NCD on the performance of health systems. A crucial finding from our investigation underscores the significance of embracing a patient-centric approach that prioritizes comprehensive care for people coping with both HIV and NCDs. This strategy underscores the harmonization of services throughout the care continuum, encompassing prevention, diagnosis, treatment, and ongoing care. Our visual representation outlines the interplay between HIV and NCD healthcare, underscoring the necessity for collaborative actions involving healthcare professionals, policymakers, and community members to ensure thorough and efficient service provision. By integrating this patient-focused model into current policies and initiatives, Kenya can bolster the amalgamation of HIV and NCD services, leading to enhanced health outcomes and improved quality of life for those impacted.

The study findings show that Institutional support is crucial for the growth and development of healthcare professionals hence continuous training is important in supporting health institutions responsiveness to emerging issues. Health institutions in Nakuru county are quite supportive in provision of seminars and workshops that facilitate learning among healthcare professionals. There is need to improve on collaboration between learning institutions and health facilities to ensure educational programs align to the industry's needs. Monitoring outcomes is critical in improving the quality of services offered.

Coordination, collaboration between internal and external entities/stakeholders, local and national government, community participation is important in having improved health system performance, however it is not a real need in Nakuru County because this has been taken care of. Active engagement with all stakeholders will lead to sustainability and effectiveness of health service delivery and access to care.

Health information systems process in Nakuru county are impressive. There is availability of data collection tools, tools are customised to meet the needs of the users, different data sources are integrated which makes access to information timely. Some facilities however reported that their institutions have weak health information systems that are fragmented making seamless information flow for decision making a challenge. Data security and privacy was remarkably taken care of. All the measures were great predictors of performance of the health system.

The findings show that the need to pool resources is inevitable in the facilities studied because the donor funding has been diminishing over time. Hence

organisations are forced to restructure and reorganise how they operate in order to ensure the gap left by donors is taken care of. The study found out that most HIV programmes were still supported by donor funding through remuneration of personnel and provision of equipment. The study also concludes that health systems should explore strategies to diversify funding sources and reduce dependence on external funding to ensure continued provision of services. Therefore, the need of collaboration between program leads, health facility boards and facility in charges within the health institutions.

On collaboration of guidelines, there was consensus on the presence of operational policies in the facilities and a good level of understanding of the policies was exhibited. This was a great indication that health workers in Nakuru County were committed to adhering to guidelines in order to promote continuous care and quality care. This was however not a good predictor of performance of the health system in Nakuru County.

Study results indicated health workers in Nakuru County had already embraced a collaborative approach organisational culture. They were motivated to generate new ideas, had a sense of belonging in team, hence teamwork was quite good. The leadership had also shown a sense of providing direction to the team hence the teams had clear set goals that would guide them. This is a great plus in improving performance in organisations.

At the local level, there may be a lack of focus on how these factors impact healthcare delivery within specific communities. Understanding the local context, including socioeconomic factors, access to care, and community resources, is

crucial for tailoring interventions to meet the unique needs of the population. On a national scale, there is a weakness in addressing how these findings can be integrated into healthcare policies and strategies at the country level. It is critical to consider how national health systems can leverage institutional support, information processes, pooled resources, and organizational culture to enhance overall healthcare quality and accessibility for all citizens. From a global perspective, there is a gap in discussing how these factors can contribute to addressing broader health challenges on an international scale. Global health issues such as pandemics, infectious diseases, and health inequities require a coordinated approach that considers the interplay of various factors influencing health system performance globally. Regarding civic issues, there is a need to explore how community engagement and advocacy can drive improvements in health system performance. Empowering communities to participate in decision-making processes, raising awareness about health issues, and promoting health literacy are essential components of building resilient and responsive healthcare systems. In conclusion, while the study's findings offer valuable insights into enhancing health system performance in an integrated care model, there is a need to strengthen the connections to local, national, global, and civic issues to ensure that there is meaningful impact across different levels of healthcare delivery and policymaking.

5.4 Recommendations

a) Integrating HIV and Non-Communicable Diseases (NCDs) is essential given the diverse presentations of NCDs among individuals living with HIV. A patient-centered approach that considers the unique health needs and risk factors of each individual is crucial in this integration. Implementing comprehensive health

assessments to identify NCD risk factors early, providing tailored interventions that address both HIV and NCDs, fostering multidisciplinary care teams to coordinate treatment across specialties, and promoting health education and lifestyle interventions that can benefit both conditions simultaneously. By adopting a holistic and personalized approach to care, healthcare providers can effectively manage the complex health needs of individuals living with both HIV and NCDs, ultimately improving health outcomes and quality of life.

b) Regarding institutional support, senior management, middle managers, and operational managers should intensify their efforts to monitor outcomes, which is essential for Nakuru County to achieve improved results in sustaining the healthcare system. Institutions ought to capitalize on the expertise of well-trained healthcare professionals by ensuring clarity in their roles and setting transparent performance metrics for easier monitoring. Effective planning is a precursor to successful performance.

c) Health Information Processes - Health information managers must focus on enhancing and streamlining information processes, ideally supported by electronic data processing tools. It is imperative to maintain a centralized data repository with robust security and privacy measures to safeguard the data and information.

d) Pooled Resources - Program leaders, county management teams, hospital boards, and facility managers play crucial roles in ensuring the sharing and optimal utilization of human, information, financial, and physical resources across healthcare institutions. This collaborative effort is essential for continuous care and the sustainability of healthcare services.

e) Collaborative guidelines did not have a substantial impact on the sustainability and performance of the healthcare system. Nonetheless, it is recommended that

healthcare workers take the lead in raising awareness among all stakeholders regarding the existing governance structures and policies designed to facilitate patient access to care for multiple conditions. Health facilities should streamline patient access to care through a centralized point to improve efficiency, reduce time and costs, and enhance the overall client experience.

Health sector stakeholders are encouraged to promote a collaborative and team-oriented organizational culture when delivering and receiving healthcare services.

5.4 Areas of Further Research

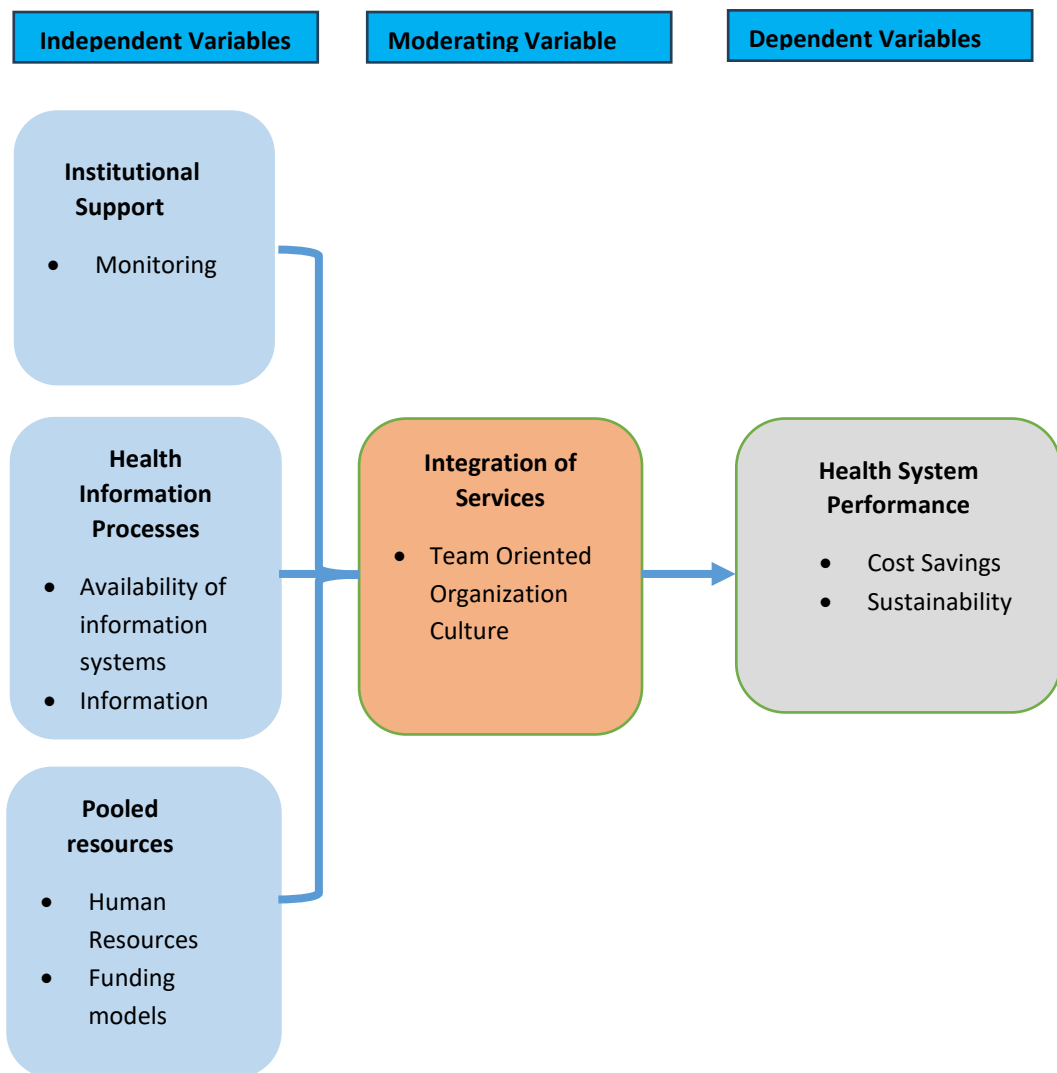
By leveraging the lessons learned from the successful integration of HIV/NCD services, such as streamlined service delivery, improved patient outcomes, and strengthened health systems, integrating TB services can lead to more efficient and effective healthcare provision. This integration can involve combining TB screening, diagnosis, and treatment with existing healthcare services, ensuring that individuals receive comprehensive care for multiple health conditions in a holistic manner. Additionally, training healthcare providers on the interconnectedness of TB and HIV/NCDs can help in early detection and management of TB cases, ultimately reducing the burden of TB on affected populations. By building on the success of HIV/NCD integration, integrating TB services can enhance overall healthcare delivery and contribute to better health status for individuals and communities.

5.5. Recommended HIV/NCD Service integration framework

From the study, the researcher proposes the following framework for integrating HIV and NCD services.

Figure 5.1

Recommended HIV/NCD Service integration framework



Source: Njuguna et al. (2023)

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APPENDICES

Appendix 1: Measuring HIV/NCD Healthcare Services Integration in Nakuru County, Kenya

	Domain and Questions	Response				
		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
	Institutional Support					
	Training					
a	Our organisation has continuous improvement trainings on emerging health issues					
b	Our organisation fully supports staff workshops, conference participation, seminars to help improve worker knowledge					
c	I have enjoyed a fully sponsored degree programme paid for by our organisation					
d	Our organisation works closely with learning institutions to inform them on the health sector needs					
e	I am a trainer in one of the local colleges in the area of my expertise					
	Monitoring outcomes					
a	Our organisation conducts customer satisfaction surveys frequently					
b	Our organisation uses customer satisfactions surveys results to make improvements					
c	Our organisation involves staff in problem identification on issues concerning service delivery					
d	Our organisation takes corrective actions on gap/problems identified					
	Coordination with external entities					
a	We work closely with other sector coming up with initiatives that can improve the care to our patients					
b	Our organisation works closely with the national government to improve service delivery					
c	Our facility works closely with the local government to improve service delivery					

	Domain and Questions	Response				
		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
d	Community participation is embraced in our facility					
	Health Information Processes					
	Availability of information systems					
a.	I have full access to our Health Information System					
b.	The current HMIS fully integrates data from individual records, service records and administrative records					
c.	Our HMIS always provides me with all the data I need to make decisions					
d.	I always document all the services I offer in our HMIS					
e.	The data collection tools are customized in our HMIS to suit our needs					
f.	The CCC information system triages the NCD needs of its patient					
g.	The CCC can detect and serve the NCD needs of a patient					
h.	The CCC tracks the progress of NCD management and treatment					
	Information Sharing					
a	My colleagues can access data that I key in, promptly					
b	It is easy to transmit information to my colleagues using our HMIS					
	Data Security					
a	I have to use a username and a password to enable me to access our HMIS					
b	Hospital Reports are always available to us whenever we need them					
c	I have access to all patients' medical reports					
	Pooled Resources					
	Human Recourses					
a	I comfortably manage HIV patients with NCD					
b	I have been well trained and equipped to manage HIV and NCD cases					
c	I can only manage HIV cases					
d	I can only manage NCD cases					

	Domain and Questions	Response				
		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
e	We are sufficient enough to manage our department					
f	We need more staff members in our department					
g	I need the training to be able to manage HIV patients with NCD conditions					
h	I regularly receive integrated care training					
	Funding Models					
a.	HIV and NCD cases are fully paid for by the government					
b.	HIV services are fully paid for by donors					
c.	NCD services are fully paid for by the government					
d.	HIV and NCD cases are fully paid for by the patient					
e.	HIV and NCD services are always paid for through private insurance					
	Geographic Setting					
a	Our facility is the only facility that serves all patients cases in this locality					
b	Patients easily access our facility for services					
c	The roads are okay during the rainy seasons so patients can always visit our facility					
d	All services are offered in our facility patients do not have to seek x-ray services elsewhere					
	Collaboration Guidelines					
	Governance Structure					
a	The CCC is fully managed by the program leader					
b	The NCDs are fully managed by the hospital board					
c	The CCC and NCD are fully managed by the hospital board					
d	The hospital board only manages the facility					
e	The CCC program lead works closely with the hospital board					
f	All the activities in the facility are managed by the medical superintendent.					
g	Approvals to buy medical products are fully done by the hospital board					
	Policy					

	Domain and Questions	Response				
		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
a	Our organization has a policy in place					
b	I am knowledgeable about our organization's policy					
c	Our organization policy is aligned with the national policy					
d	I am aware of the UHC policy, and we are fully implementing it in our facility					
	Accountability					
a	I am fully aware of my roles and responsibilities in the organization					
b	We work with partners both our/there roles and responsibilities are clear					
c	Accounts on how any funding is spent in our facility are accessible					
d	We operate on a budget					
e	Each department manages their budget					
	Organisation Culture					
	Innovative oriented Culture					
a	Our organisation allows staff to come up with new ideas					
b	Our organisation allows staff members implement new ideas					
c	Staff members are rewarded for their new ideas that improve efficiency in service delivery					
d	Staff members are promoted when they successfully implement new ideas					
e	Our organisation always invests in potential ideas that can improve service delivery					
f	Healthcare workers fully embrace working together with members from different departments as they serve HIV and NCD clients					
g	I fully share common values with colleagues in my organization					
h	Our health facility currently provides HIV/NCD healthcare services under one roof					
i	HIV/NCD integrated care is a superior form of patient care					

	Domain and Questions	Response				
		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
j	HIV/NCD integrated care is a saves clinic time, energy and resources					
k	I mostly have the same beliefs as my colleagues on work issues					
l	I am always ready to learn from my colleagues on new practices					
	Team Oriented Culture					
a	Our health facility leadership would like to see integrated health services					
b	My organization has strong dedicated leadership that supports HIV/NCD clinics to work together					
c	Our different departmental leaders always work in harmony as a team					
d	Each leader in our organization has specific responsibilities they handle					
e	I am fully aware of our organization's vision and direction					
f	Our Health facility has at least one HIV/NCD integrated care champion					
g	The administrators in the health facility value HIV/NCD integrated care					
	Outcome Oriented Culture					
a	This facility uses to pay for performance programs to improve the quality of HIV/NCD care					
b	360-Degree Feedback, also known as Multisource Feedback (MSF), is a performance appraisal methodology used to assess HIV/NCD care in this facility					
c	This facility has a balanced scorecard that measures HIV/NCD integration performance					
d	This facility has a balanced scorecard that links the overall health sector strategies to measurable targets and actions					
e	This facility leadership facilitates a structured system					

	Domain and Questions	Response				
		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
	for collecting information about the performance of healthcare workers engaged in HIV/NCD integrated services provision					
	Integration of healthcare services					
a	Most healthcare workers are competent to provide HIV and NCD services					
b	HIV services are offered only by care providers in the CCC					
c	NCD services are offered only by care providers in the main health facility					
d	This facility has patient management guidelines for HIV service provision					
e	This facility has patient management guidelines for NCD service provision					
f	All HIV and NCDs lab tests are done in the main health facility lab					
g	HIV drugs are available and accessible in the main pharmacy					
h	All our patients including the HIV patients are managed at one common point of care					
i	HIV and NCD specialists regularly review each other's notes in the CCC					
j	HIV and NCD specialists regularly consult about patient care in the CCC					
k	The CCC has a sufficient number of NCD specialists on-site					
l	HIV and NCD specialists are treated as equals within the clinic					
m	The CCC and NCD care treatment plans are merged					
n	The CCC scheduling systems allow NCD cases to be scheduled for a same-day appointment with HIV reviews					
o	I comfortably multitask in providing care for HIV as well as NCD patients					
p	Our data collection systems have all patients who seek care from our facility					

	Domain and Questions	Response				
		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
q	I manage care needs for all patients both HIV and NCD patients					
r	I only manage HIV patients					
s	I only manage NCD patients					
	Health Services Performance					
	Link needs and Objectives					
a.	I believe if HIV/NCD needs are identified it will assist our organisation to minimise the cost of operation					
b.	I am fully aware of HIV/NCD services are put together patients waiting time would be less					
c.	It would be easy to build capacity if HIV/NCD services are put under one roof					
	Shared Responsibilities					
a.	HIV and NCD clinics both have a separate payroll for their staff					
b.	HIV and NCD clinics both pay for their overhead expenses separately (water, electricity, general maintenance, vehicle maintenance)					
c.	HIV and NCD clinics have one payroll for the staff					
d.	HIV and NCD clinics have a combined overhead bill					
	Merged patients flow processes					
a.	Our registry captures both HIV and NCD data during patient registration					
b.	We have one cash collection office in the facility where HIV and NCD services are paid for.					
c.	HIV and NCD clinics can comfortably manage patients from one access point					
d.	HIV and NCD clinics can comfortably use the main pharmacy to issue drugs to patients					
e.	Our registry only captures HIV patients' data					
f.	Our registry only captures NCD patient's data					

	Domain and Questions	Response				
		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
g.	HIV and NCD services are managed from different access points					
h.	The combined streaming and triage process facilitates patient flow, prioritising HIV/NCD services					
i.	Requesting basic investigations (ECGs, urine tests, X-rays for minor injuries) during the triage process at the integrated HIV/NCD clinics improves flow by reducing the number of steps after the main clinical assessment					
j.	The introduction of a common HIV/NCD examination room supports a flexible assessment organizational work process and reduces the time staff spent searching for available space.					
k.	Streamlined point of care testing, laboratory and pharmacy services facilitates flow by providing HIV/NCD services on-time and reducing dependency on external departments.					
l.	Dependency on external departments (laboratory and radiology departments) delays decision-making and patient outflow for HIV/NCD services.					
	Sustainability Services					
a	NCD/HIV services are supported by NHIF in our facility					
b	NCD/HIV services are partially supported by insurance companies					
c	NCD/HIV services are fully paid for by the patients (Out of pocket)					
d	There is increasing demand for HIV/NCD services					

Appendix 2: Cost Analysis of HIV/NCD Integration in Nakuru County, Kenya

A. HEALTH FACILITY DETAILS

1	Date	
2	County	
3	Facility	
4	Ownership	
	Government	
	Private	
	Other (please specify)	
5	Facility level	
6	Interviewer name (last, first):	
7	Respondent name (last, first):	
8	Respondent job title:	

B. HIV/NCD CLINIC WORKLOAD DURING THE COSTING PERIOD

No.	Type of output	Number
1	Total attendance for HPV positive patients with NCDs	
2	Total patients receiving HIV services independently	
4	Total patients receiving NCD services independently	
5	Total patients receiving integrated HIV/NCD services	

C. PERSONNEL COSTS

No.	Item	No. Entire Facility
1.	Total number of medical staff offering HIV/NCD in the facility in FTE (full-time equivalent)	
a)	Consultants	
b)	Medical officers	
c)	Dentists	
d)	Clinical officers	
e)	Nurses	
f)	Pharmacist	
g)	Pharm technologist	
h)	Laboratory technologist	
i)	Health Record /Data clerk	
j)	Nutritionist	

No.	Item	No. Entire Facility
k)	Other allied health; peer educators, linkage persons, Community health volunteers	
2.	Total number of non-medical staff-support staff (e.g. cleaners, security)	

Data source: Hospital administrator

Personnel remuneration

No.	Designation/Cadre	Funded by	FTE (full time equivalent, Gross Monthly pay (KSh))	% allocation to the HIV/NCD (e.g., 100%)
1.				
2.				
3.				
4.				
5.				

Human resource/administrator at the facility

D. RECURRENT COSTS

i. Non-Pharmaceuticals and Other Supplies

No.	Materials & supplies	Funded by	Quantity	% allocated to HIV/NCD
1.				
2.				
3.				
4.				
5.				

Data source: In charge of HIV/NCD treatment

ii. DRUGS: exclude drugs paid for out-of-pocket

No.	Drug	Funded by	Quantity	% allocation to the intervention
1				
2				
3				
4				
5				
6				

Data source: Pharmacy delivery notes

E. CAPITAL GOODS & EQUIPMENT HIV/NCD TREATMENT

No.	Equipment/Implements	Funded by	Number	% allocation to the intervention
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Data source: HIV/NCD in charge

F. RECURRENT SERVICES/MAINTENANCE FOR FACILITY

No.	Maintenance costs (vehicles, building, furniture, equipment)	Funded by	Quantity	% allocation to HIV/NCD integration
1.	Calibration			
2.	Computers			
3.	Server maintenance			
4.	Renovations			
5.				
6.				
7.				
8.				

Data source: med sup/accountant

G. UTILITIES

	Utility item	Funded by	Quantity	% allocation to the intervention
1.	Water			
2.	Electricity			
3.	Internet			
4.	Security			
5.	Incineration			
6.				
7.				
8.				

Data source: Facility administrator/accountant

H. MISCELLANEOUS ITEMS (WHERE APPLICABLE)

No.	Item	Funded by	No. used	% allocation to the intervention
1.				
2.				
3.				
4.				
5.				

I. FACILITY SPACE**i. Building facility**

No.	Name of place e.g., any renovations done	Funded by	Floor space (m ²)
1.			
2.			
3.			
4.			
5.			

ii. Allocation of building space to HIV/NCD treatment

No.	Type of service: e.g., office, clinical ward, waiting for area, store, not in use	Funded by	Square meter surface area (m ²)	% occupied of total space	% allocation to intervention
1					
2					
3					
4					
5					
6					

Appendix 3: Key Informant Interview Guide

Introduction

My name is I am a postgraduate student pursuing a **degree of Doctor of Philosophy in Health Systems Management at the Kenya Methodist University**. I am carrying out a study whose objective is to develop an approach to inform HIV/NCD health services integration as a key component of universal health coverage by exploring the feasibility of integration and estimating the benefit to the health system in Kenya. Your participation will purely be voluntary. You will need approximately 30 minutes to respond to the questions. The information given to them will be treated with confidentiality. Your sincere and true response will contribute to the achievement of the aim of this study.

Respondents to be interviewed.

Category of respondent		Tick where it applies
Cadre	Consultants	
	Medical officers	
	Clinical officers	
	Nurses	
	Pharmacist /Pharm technologist	
	Laboratory technologist	
	Health Record /Data clerk	
	Nutritionist	
	HTS counsellor	
	Peer educator	
	Adherence counsellor	
	Community health volunteer	
	Other (Specify)	

Date of Interview_____

Interview Number_____

Name of health facility _____

1. Age of respondent _____

2. Sex _____

3. Position _____

4. Level of education _____

How long have you served in your current profession? _____

Section B.

A. Institutional support

1. Do you think the top management is supportive of HIV/NCD health services integration in your facility?
 - a) If yes, how?
 - b) If no, why do you think they are not supportive?
2. What would you propose that would support effective implementation of HIV/NCD service integration?
3. How do you see HIV/NCD service integration benefiting
 - a) Patients
 - b) the facility on resource utilization
 - c) healthcare workers in providing improved services for HIV/NCD patients.
4. Has your facility had trainings or workshops to build capacity for care providers to better handle HIV/NCD services.
5. In your opinion how do you think training employees to acquire skills that can support an integrated care model
6. What is your suggestion on building skills and competences for staff to serve in an integrated care model?
7. To enhance service provision and ensure continual improvement in service delivery, how does your facility monitor performance outcomes.
8. Which/who are the external entities or partners that your facility is working with to support integrated care model (especially HIV/NCD services)?
9. What kind of support are they providing?

B. Health Information processes

1. Information is quite key while managing patients or when making administrative decisions. How does your organization handle health information?
2. Which are the data collection tools available in your organization?
3. Are the tools paper based or electronic?
4. What are some of the challenges with the health information system in use?
5. How many data collection tools are available in your organization?
6. Do you receive timely information that supports you make decisions?
7. How do you disseminate/share information with colleagues (is it through meetings, they can access the information in the files, reports are done and shared)
8. Do you think patient and administrative data can be accessed by anyone or there are channels to ensure only those who should access it can access?
9. How do you handle data confidentiality/privacy?
10. Does your organization have a policy in place that guides data handling?

C. Pooling of Resources

1. Does your facility have staff handling only HIV patients or care providers handle all the patients visiting the facility?
2. Can the physicians handling HIV patients also manage NCD like diabetes or hypertension?
3. Have you had training's recently to build capacity for physicians so that they can manage both communicable and non-communicable diseases?
4. How are the HIV/NCD services funded in your facility (what does the government fund)?
5. Do you have partners funding any services in your facility, who are the partners and which services are they funding?
6. In your facility do you have partners having both HIV/NCD conditions paying out of pocket and why? Do you have patients paid for by private insurances or are there service that patients have to co-pay and why? Which are the services and why are they paid for in cash?
7. Do you think your facility is easily accessible by patients in terms of?

a) Location

b) Affordability of your services?

D. Collaborative guidelines

1. Does your facility have any collaborative guidelines to support HIV/NCD integration services? Briefly explain how the guideline is working for the facility.
2. Does your facility have a different team handling NCD and another handling HIV or all the conditions in this facility are managed under one leadership? Elaborate your answer.
3. Briefly explain the organogram of your facility (what are some of the roles of each level of management)
4. Is there a service charter in your facility? Which are the other policies that you are familiar with?
5. To ensure that there is accountability do you have feedback meetings on what is happening in the facility, how frequently? Is there a budget in place, how is it financed?

E. Organization Culture

1. Do your organization members embrace new approaches of doing things easily?
2. Are staff members allowed to propose new methods of handling things?
3. Do you think your organization staff members work as a team?
4. Are their goals set to be achieved by staff and how does the organization measure if the goals have been achieved?

F. Health system performance under integrated care model

1. Does your organization get feedback on patients' satisfaction with services offered to them?
2. Do you think patients are satisfied with HIV/NCD services provided for them?
3. Do you have patients under HIV/NCD care management in your facility?

Use Appendix 4 for cost analysis.

4. Does your facility have a work-plan with clear set goals that need to be met monthly, quarterly, bi-annually and annually?
5. Do you have meetings to evaluate performance in the periods set?
6. Are there meetings held to review whether set goals at the beginning of the year or month have been met?
7. What measures are taken if goals are not met?
8. To minimize and sustain the operational cost in the facility, how have new processes been created to merge HIV/NCD cases so that the organization can leverage on available resources. What plans are in place to merge NCD/HIV patient's processes?

Any other comments that can inform HIV/NCD service integration?

Thank you for your participation.

Appendix 4: Informed Consent Form

THESIS TITLE: THE ROLE OF HEALTHCARE SERVICES INTEGRATION IN HEALTH SYSTEM PERFORMANCE: A CASE OF HIV/AIDS AND NCD SERVICES IN NAKURU COUNTY, KENYA.

SITE OF RESEARCH: NAKURU COUNTY, KENYA.

PRINCIPAL INVESTIGATOR: DAVID NJUGUNA KINYANJUI

INSTITUTION: KENYA METHODIST UNIVERSITY, DEPARTMENT OF HEALTH SYSTEM MANAGEMENT

You are invited to participate in this survey because you are a healthcare worker who provides HIV/NCD services at healthcare facilities in Nakuru County, Kenya. This study aims to determine the influence of organization support, health information processes, pooled resources and collaborating guidelines on HIV/NCD integration.

This is an informed consent form. Feel free to ask for clarification where necessary. After this informed consent form has been readout, out and your questions answered, you will be asked if you wish to participate in this study. If you agree, we will request you to append your signature on this form. You will also get a copy of the informed consent form.

PROCEDURES

After signing the consent form, the research assistant will ask you questions about HIV/NCD integration in this facility including questions on the following topics:

- Organizational support
- Health information processes
- Pooled resources
- Collaboration guidelines
- Time and material cost for the HIV/NCD services integration in Kenya.

This survey will take one hour.

CONFIDENTIALITY

All information obtained from you will be kept in confidence. Your name will not be recorded anywhere in the files for this study where the results will be kept. You will also not be identified in any publication or report. You do not have to reveal any personal information if you do not want to, but if you are willing to share your experiences; it will be very helpful to us in further understanding HIV/NCD integration in Nakuru County.

RISKS

There are no risks involved in this study. It has been approved by the Science and Ethics Review Committee (SERC), National Council of Science, Technology and Innovation (NACOSTI) and the County Health Departments.

BENEFITS

There are no direct benefits to you, but the results of this study will be used to inform stakeholders about the need to study, mobilize and reorganize potential resources for HIV/NCD service integration. It will also inform the study population on the need to adopt and promote services that support and meet the needs of people with HIV and NCD comorbidities.

PARTICIPATION

Participation in this study is voluntary and you may withdraw from it at any time and without any adverse consequences.

CONTACTS

For more information, contact.

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Department of Population Health

Aga Khan University-East Africa

Mobile number: +254 722 986 349

WHAT YOUR SIGNATURE OR THUMBPRINT MEANS

PARTICIPATION IN RESEARCH IS VOLUNTARY. You have the right to say 'no' to participating in this study. A copy of this consent form will be given to you. Your signature or thumbprint below means that everything about this has a study been explained to you. It also means that you have had the opportunity to ask questions and get answers. If you wish to participate in this study, you should sign or place your thumbprint below.

Name of Study Participant

Study Participant's signature

Date

Name of Research Assistant

Designation

Research Assistant's signature

Date

Name of Translator

Translator's signature

Date

(If the participant is unable to read and/or write, an impartial witness must be present during the screening consent discussion. After the screening consent form

is read and explained to the participant, and after he/she has orally consented and his thumbprint taken, the witness must sign and personally date the consent form. By signing the form, the witness attests that he/she has accurately explained the information on the consent form to the participant; the participant has understood the information and freely given consent).

Name of Witness

Witness's signature

Date

Appendix 5: List of Sampled Health Facilities

No	Sub County	Select Ward	Name of Facility	KEPH level	Ownership
1	Gilgil	Elementaita	Bethania Clinic	Level 2	Private
2	Gilgil	Gilgil	Gilgil Center of Hope (Hope worldwide Kenya)	Level 2	FBO
3	Gilgil	Gilgil	Kikohey Dispensary	Level 2	GOK
4	Gilgil	Gilgil	NYS Dispensary (Gilgil)	Level 2	GOK
5	Gilgil	Gilgil	St. Mary's Hospital	Level 4	Private
6	Gilgil	Malewa West	Kasarani Dispensary (Malewa West)	Level 2	GOK
7	Gilgil	Malewa West	North-Lake Rocco Medical Centre	Level 3	Private
8	Gilgil	Mbaruk/Eburu	Eburu Dispensary	Level 2	GOK
9	Gilgil	Mbaruk/Eburu	Mbaruk Dispensary	Level 2	GOK
10	Gilgil	Murindati	Gilgil Astu Dispensary	Level 2	GOK
11	Gilgil	Murindati	Karunga Dispensary	Level 3	GOK
12	Kuresoi North	Kamara	Kamara Dispensary	Level 3	GOK
13	Kuresoi North	Kamara	St Martin De Porres (Static)	Level 2	FBO
14	Kuresoi North	Kamara	Total Health Centre	Level 3	GOK
15	Kuresoi North	Nyota	Molo South Dispensary	Level 2	GOK
16	Kuresoi North	Sirikwa	St Joseph Nursing Home	Level 4	Private
17	Kuresoi South	Amalo	Olunguruone Sub-District Hospital	Level 4	GOK
18	Kuresoi South	Keringet	Bararget Dispensary	Level 2	GOK
19	Kuresoi South	Keringet	Keringet Sub County Hospital	Level 4	GOK
20	Kuresoi South	Kiptagich	Kiptagich Model Health centre	Level 3	GOK
21	Molo	Elburgon	Arimi Dispensary	Level 2	GOK
22	Molo	Elburgon	Elburgon Sub County Hospital	Level 4	GOK
23	Molo	Elburgon	Nyakiambi Dispensary	Level 2	GOK
24	Molo	Elburgon	St Clare Health Centre	Level 3	FBO
25	Molo	Molo	GSU Dispensary	Level 2	GOK
26	Molo	Molo	Molo District Hospital	Level 4	GOK
27	Molo	Turi	Kiambiriria Dispensary	Level 2	GOK
28	Molo	Turi	Turi (PCEA) Dispensary	Level 2	FBO
29	Naivasha	Biashara	NYS Karate Dispensary	Level 2	GOK
30	Naivasha	Gilgil	Gilgil Subcounty Hospital	Level 4	GOK
31	Naivasha	Gilgil	Holy Spirit Health centre	Level 3	Private
32	Naivasha	Hellsgate	Karagita Health Centre	Level 3	GOK
33	Naivasha	Hellsgate	Kijani (Mirera) Dispensary	Level 2	GOK
34	Naivasha	Hellsgate	Nacoharg Medical Centre	Level 2	Private
35	Naivasha	Hellsgate	Naivasha (AIC)Medical centre	Level 3	Private
36	Naivasha	Lake View	ASN Upendo Village Dispensary	Level 2	GOK
37	Naivasha	Mai Mahiu	Holy Trinity Health Centre (Mai Mahiu)	Level 2	FBO
38	Naivasha	Mai Mahiu	Longonot Dispensary	Level 2	GOK
39	Naivasha	Mai Mahiu	Mai Mahiu Health Centre	Level 3	GOK
40	Naivasha	Maiela	Maiela Health Centre	Level 3	GOK

No	Sub County	Select Ward	Name of Facility	KEPH level	Ownership
41	Naivasha	Maiela	Moi Ndabi Dispensary	Level 2	GOK
42	Naivasha	Maiela	Ngondi Dispensary	Level 2	GOK
43	Naivasha	Naivasha East	Maraigushu Dispensary	Level 2	GOK
44	Naivasha	Olkaria	Flamingo Medical Centre	Level 4	Private
45	Naivasha	Olkaria	Oserian Health Centre	Level 3	Private
46	Naivasha	Viwandani	GK Prison Annex Dispensary	Level 2	GOK
47	Naivasha	Viwandani	Naivasha Maximum Prison Health Centre	Level 3	GOK
48	Nakuru East	Flamingo	Langa Langa Sub County Hospital	Level 4	GOK
49	Nakuru East	Kivumbuni	Hekima Dispensary	Level 2	FBO
50	Nakuru East	Menengai	Kiti Dispensary	Level 2	GOK
51	Nakuru East	Menengai	Menengai Dispensary	Level 2	GOK
52	Nakuru East	Menengai	Nairobi Women's Hospital - Nakuru (Hyrax)	Level 4	Private
53	Nakuru East	Nakuru Biashara	Afraha Maternity and Nursing Home	Level 4	Private
54	Nakuru East	Nakuru Biashara	Algadir Medical Centre	Level 3	FBO
55	Nakuru East	Nakuru Biashara	Bondeni Dispensary (Nakuru Central)	Level 2	GOK
56	Nakuru East	Nakuru Biashara	Bondeni Sub County Hospital	Level 4	GOK
57	Nakuru East	Nakuru Biashara	DR. B.K. Kariuki	Level 2	Private
58	Nakuru East	Nakuru Biashara	FHOK - Family Care Medical Centre	Level 2	FBO
59	Nakuru East	Nakuru Biashara	Hope Worldwide Nakuru	Level 2	FBO
60	Nakuru East	Nakuru Biashara	Nakuru Nursing Home	Level 4	Private
61	Nakuru East	Nakuru Biashara	St Elizabeth Nursing Home	Level 4	Private
62	Nakuru East	Nakuru Biashara	Valley Hospital Limited	Level 4	GOK
63	Nakuru East	Nakuru East	Fountain Medical Clinic	Level 3	FBO
64	Nakuru East	Nakuru East	Lanet Health Centre	Level 3	GOK
65	Nakuru East	Nakuru East	Mirugi Kariuki Sub County Hospital	Level 4	GOK
66	Nakuru North	Bahati	Bahati District Hospital	Level 4	GOK
67	Nakuru North	Bahati	Bahati Rural Health Centre	Level 3	GOK
68	Nakuru North	Dundori	Dundori Health Centre	Level 3	GOK
69	Nakuru North	Dundori	Kiwamu Dispensary	Level 2	GOK
70	Nakuru North	Kiamaina	Engashura Health Centre	Level 3	GOK
71	Nakuru North	Kiamaina	Esther Memorial Nursing Home	Level 3	Private

No	Sub County	Select Ward	Name of Facility	KEPH level	Ownership
72	Nakuru North	Kiamaina	St Antony Catholic Hospital	Level 4	FBO
73	Nakuru North	Lanet/Umoja	Nyonjoro Dispensary	Level 2	GOK
74	Nakuru North	Lanet/Umoja	Wesley Health Centre	Level 3	FBO
75	Nakuru West	Barut	Barut Dispensary	Level 2	GOK
76	Nakuru West	Kapkures	Kapkures Health Centre (Nakuru West)	Level 3	GOK
77	Nakuru West	Kapkures	Lalwet Dispensary	Level 2	GOK
78	Nakuru West	Kaptembwo	Mother Kevin Hospital (Catholic)	Level 4	FBO
79	Nakuru West	London	Fitc Dispensary	Level 2	GOK
80	Nakuru West	London	Industrial Area Dispensary	Level 2	GOK
81	Nakuru West	London	Nakuru Provincial General Hospital	Level 5	GOK
82	Nakuru West	Rhoda	Rhonda Health centre	Level 3	GOK
83	Nakuru West	Shaabab	Nakuru West (PCEA) Health Centre	Level 3	FBO
84	Nakuru West	Shaabab	Nakuru West Health Centre	Level 3	GOK
85	Nakuru West	Shaabab	Shabab Integrated Medical Clinic	Level 2	GOK
86	Nakuru West	Shaabab	Sunrise Evans Hospital	Level 4	Private
87	Njoro	Kihingo	Benmac Clinic	Level 3	Private
88	Njoro	Kihingo	Kihingo Dispensary (CDF)	Level 3	GOK
89	Njoro	Lare	Lare Health Centre	Level 3	GOK
90	Njoro	Mau Narok	Mau Narok Health Centre	Level 3	GOK
91	Njoro	Nessuit	Neissuit Dispensary	Level 3	GOK
92	Njoro	Njoro	Huruma Dispensary	Level 2	FBO
93	Njoro	Njoro	Njoro Sub County Hospital	Level 4	GOK
94	Njoro	Njoro	Piave Dispensary	Level 3	GOK
95	Rongai	Menengai West	Gsu Dispensary (Kabarak)	Level 2	GOK
96	Rongai	Menengai West	Kabarak Health Centre	Level 3	GOK
97	Rongai	Mosop	Ogilgei Dispensary	Level 2	GOK
98	Rongai	Soin	Dandelion Medica Center	Level 3	Private
99	Rongai	Soin	Soin Sub County hospital	Level 4	GOK
100	Rongai	Solai	Lower Solai Dispensary	Level 3	GOK
101	Rongai	Visoi	Rajuera Dispensary	Level 2	GOK
102	Rongai	Visoi	Rongai Health Centre	Level 3	GOK
103	Subukia	Kabazi	Kabazi Sub County Hospital	Level 4	GOK
104	Subukia	Kabazi	Upper Solai Health Centre	Level 3	GOK
105	Subukia	Subukia	Miloreni Dispensary	Level 2	GOK
106	Subukia	Subukia	Subukia Intergrated Medical Centre	Level 3	Private
107	Subukia	Subukia	Subukia Sub County Hospital	Level 4	GOK

Appendix 6: Costing Assumptions

Major assumptions used in the study include:

- i. Facility indirect capacity cost rates (CCR) were calculated for each disease area assuming that the duration of an average outpatient visit would be the same as an average disease area-specific facility visit by disease area.
- ii. With the exception of ARVs, the majority of pharmaceutical and laboratory consumable were costed using KEMSA 2021 sales price as reference unit price. The study assumed that the realized price of general clinical and administrative consumables, laboratory test kits and consumables.
- iii. Initial calculations of facility room CCR based on the collected catalogue of furniture and equipment show that most rooms have a CCR less than USD 0.01. We assumed that all facility locations, with the exception of labs and pharmacies, would have a CCR of USD 0.004 per minute. We assumed that on-site pharmacies and laboratories in Level 4 and 5 facilities would have a CCR of USD 0.01 per minute. These estimates are based on the research team's observation that most rooms would need to have an annual cost of USD 650 to have a CCR above USD 0.005. This would require multiple equipment with replacement costs over one-thousand US dollars, which are more often observed in laboratories and pharmacies in referral or higher-level hospitals.
- iv. In estimating annualized cost per ART client, the research assumed an average of seven facility visits per year for a stable client and ten visits per year for an unstable clients. These are the frequencies of visits indicated by the amount of ARV dispensed to the clients observed in our client shadowing process.

Appendix 7: Response and Frequency Distribution

Domains		Level 2	Level 3	Level 4	Level 5	Overall
Institutional Support						
Training	Response	Level 2	Level 3	Level 4	Level 5	Overall
1. Our organisation has continuous improvement trainings on emerging health issues	Agree	38 (47.5%)	20 (28.6%)	12 (26.1%)	0 (0%)	70 (35.4%)
	Disagree	4 (5%)	0 (0%)	2 (4.3%)	0 (0%)	6 (3%)
	Neutral	4 (5%)	0 (0%)	4 (8.7%)	0 (0%)	8 (4%)
	Strongly Agree	34 (42.5%)	50 (71.4%)	28 (60.9%)	2 (100%)	114 (57.6%)
2. Our organisation fully supports staff workshops, conference participation, seminars to help improve workers knowledge	Agree	44 (55%)	18 (25.7%)	10 (21.7%)	0 (0%)	72 (36.4%)
	Neutral	2 (2.5%)	0 (0%)	4 (8.7%)	0 (0%)	6 (3%)
	Strongly Agree	34 (42.5%)	52 (74.3%)	32 (69.6%)	2 (100%)	120 (60.6%)
3. I have enjoyed a fully sponsored degree programme paid for by our organisation	Agree	2 (2.5%)	0 (0%)	2 (4.3%)	0 (0%)	4 (2%)
	Disagree	26 (32.5%)	22 (31.4%)	10 (21.7%)	0 (0%)	58 (29.3%)
	Strongly Agree	6 (7.5%)	0 (0%)	2 (4.3%)	2 (100%)	10 (5.1%)
	Strongly Disagree	46 (57.5%)	48 (68.6%)	32 (69.6%)	0 (0%)	126 (63.6%)
4. Our organisation works closely with learning institutions to inform them on the health sector needs	Agree	48 (60%)	26 (37.1%)	10 (21.7%)	0 (0%)	84 (42.4%)
	Neutral	0 (0%)	4 (5.7%)	0 (0%)	0 (0%)	4 (2%)
	Strongly Agree	32 (40%)	40 (57.1%)	36 (78.3%)	2 (100%)	110 (55.6%)
5. I am a trainer in one of the local colleges/institutions in the area of my expertise	Agree	0 (0%)	2 (2.9%)	0 (0%)	0 (0%)	2 (1%)
	Disagree	24 (30%)	30 (42.9%)	20 (43.5%)	0 (0%)	74 (37.4%)
	Strongly Agree	6 (7.5%)	2 (2.9%)	0 (0%)	0 (0%)	8 (4%)
	Strongly Disagree	50 (62.5%)	36 (51.4%)	26 (56.5%)	2 (100%)	114 (57.6%)
Monitoring outcomes	Response	Level 2	Level 3	Level 4	Level 5	Overall
1. Our organisation conducts customer satisfaction surveys frequently	Agree	26 (32.5%)	28 (40%)	16 (34.8%)	2 (100%)	72 (36.4%)
	Disagree	12 (15%)	6 (8.6%)	2 (4.3%)	0 (0%)	20 (10.1%)
	Neutral	24 (30%)	16 (22.9%)	4 (8.7%)	0 (0%)	44 (22.2%)
	Strongly Agree	18 (22.5%)	20 (28.6%)	24 (52.2%)	0 (0%)	62 (31.3%)
2. Our organisation uses customer satisfactions surveys results to make improvements	Agree	32 (40%)	26 (37.1%)	18 (39.1%)	2 (100%)	78 (39.4%)
	Disagree	8 (10%)	2 (2.9%)	4 (8.7%)	0 (0%)	14 (7.1%)
	Neutral	24 (30%)	18 (25.7%)	2 (4.3%)	0 (0%)	44 (22.2%)
	Strongly Agree	16 (20%)	24 (34.3%)	22 (47.8%)	0 (0%)	62 (31.3%)
3. Our organisation involves staff in problem identification on issues concerning service delivery	Agree	40 (50%)	34 (48.6%)	20 (43.5%)	0 (0%)	94 (47.5%)
	Disagree	2 (2.5%)	2 (2.9%)	0 (0%)	0 (0%)	4 (2%)
	Neutral	6 (7.5%)	2 (2.9%)	2 (4.3%)	0 (0%)	10 (5.1%)

Domains		Level 2	Level 3	Level 4	Level 5	Overall
	Strongly Agree	32 (40%)	32 (45.7%)	24 (52.2%)	2 (100%)	90 (45.5%)
4. Our organisation takes corrective actions on gap/problems identified	Agree	32 (40%)	34 (48.6%)	20 (43.5%)	0 (0%)	86 (43.4%)
	Neutral	2 (2.5%)	2 (2.9%)	2 (4.3%)	0 (0%)	6 (3%)
	Strongly Agree	46 (57.5%)	34 (48.6%)	24 (52.2%)	2 (100%)	106 (53.5%)
Coordination with external entities	Response	Level 2	Level 3	Level 4	Level 5	Overall
1. We work closely with other sector coming up with initiatives that can improve the care to our patients	Agree	22 (27.5%)	10 (14.3%)	20 (43.5%)	0 (0%)	52 (26.3%)
	Strongly Agree	58 (72.5%)	60 (85.7%)	26 (56.5%)	2 (100%)	146 (73.7%)
2. Our organisation works closely with the national government to improve service delivery	Agree	12 (15%)	10 (14.3%)	18 (39.1%)	0 (0%)	40 (20.2%)
	Neutral	0 (0%)	2 (2.9%)	0 (0%)	0 (0%)	2 (1%)
	Strongly Agree	68 (85%)	58 (82.9%)	28 (60.9%)	2 (100%)	156 (78.8%)
3. Our facility works closely with the local government to improve service delivery	Agree	10 (12.5%)	10 (14.3%)	18 (39.1%)	0 (0%)	38 (19.2%)
	Neutral	0 (0%)	2 (2.9%)	0 (0%)	0 (0%)	2 (1%)
	Strongly Agree	70 (87.5%)	58 (82.9%)	28 (60.9%)	2 (100%)	158 (79.8%)
4. Community participation is embraced in our facility	Agree	8 (10%)	4 (5.7%)	4 (8.7%)	0 (0%)	16 (8.1%)
	Neutral	0 (0%)	2 (2.9%)	0 (0%)	0 (0%)	2 (1%)
	Strongly Agree	72 (90%)	64 (91.4%)	40 (87%)	2 (100%)	178 (89.9%)
	Strongly Disagree	0 (0%)	0 (0%)	2 (4.3%)	0 (0%)	2 (1%)
Health Information Processes						
Availability of information systems	Response	Level 2	Level 3	Level 4	Level 5	Overall
1. I have full access to our Health Information System	Agree	14 (17.5%)	14 (20%)	4 (8.7%)	0 (0%)	32 (16.2%)
	Disagree	0 (0%)	2 (2.9%)	6 (13%)	0 (0%)	8 (4%)
	Neutral	30 (37.5%)	4 (5.7%)	0 (0%)	0 (0%)	34 (17.2%)
	Strongly Agree	36 (45%)	50 (71.4%)	34 (73.9%)	2 (100%)	122 (61.6%)
	Strongly Disagree	0 (0%)	0 (0%)	2 (4.3%)	0 (0%)	2 (1%)
2. The current HMIS fully integrates data from individual records, service records and administrative records	Agree	14 (17.5%)	12 (17.1%)	12 (26.1%)	0 (0%)	38 (19.2%)
	Disagree	0 (0%)	4 (5.7%)	0 (0%)	0 (0%)	4 (2%)
	Neutral	30 (37.5%)	4 (5.7%)	0 (0%)	0 (0%)	34 (17.2%)
	Strongly Agree	36 (45%)	50 (71.4%)	34 (73.9%)	2 (100%)	122 (61.6%)
3. Our HMIS always provides me with all the data I need to make decisions	Agree	14 (17.5%)	16 (22.9%)	8 (17.4%)	0 (0%)	38 (19.2%)
	Disagree	2 (2.5%)	2 (2.9%)	2 (4.3%)	0 (0%)	6 (3%)
	Neutral	28 (35%)	8 (11.4%)	4 (8.7%)	0 (0%)	40 (20.2%)
	Strongly Agree	36 (45%)	44 (62.9%)	32 (69.6%)	2 (100%)	114 (57.6%)

Domains		Level 2	Level 3	Level 4	Level 5	Overall
4. I always document all the services I offer in our HMIS	Agree	12 (15%)	10 (14.3%)	6 (13%)	0 (0%)	28 (14.1%)
	Neutral	28 (35%)	6 (8.6%)	0 (0%)	0 (0%)	34 (17.2%)
	Strongly Agree	40 (50%)	54 (77.1%)	40 (87%)	2 (100%)	136 (68.7%)
5. The data collection tools are customized in our HMIS to suit our needs	Agree	14 (17.5%)	14 (20%)	10 (21.7%)	0 (0%)	38 (19.2%)
	Disagree	0 (0%)	4 (5.7%)	2 (4.3%)	0 (0%)	6 (3%)
	Neutral	26 (32.5%)	10 (14.3%)	6 (13%)	0 (0%)	42 (21.2%)
	Strongly Agree	40 (50%)	42 (60%)	28 (60.9%)	2 (100%)	112 (56.6%)
6. The CCC information system triages the NCD needs of its patient	Agree	14 (17.5%)	10 (14.3%)	10 (21.7%)	0 (0%)	34 (17.2%)
	Disagree	2 (2.5%)	4 (5.7%)	4 (8.7%)	0 (0%)	10 (5.1%)
	Neutral	0 (0%)	0 (0%)	2 (4.3%)	0 (0%)	2 (1%)
	Strongly Agree	64 (80%)	56 (80%)	30 (65.2%)	2 (100%)	152 (76.8%)
7. The CCC can detect and serve the NCD needs of a patient	Agree	2 (2.5%)	10 (14.3%)	4 (8.7%)	2 (100%)	18 (9.1%)
	Disagree	6 (7.5%)	16 (22.9%)	16 (34.8%)	0 (0%)	38 (19.2%)
	Strongly Agree	72 (90%)	42 (60%)	18 (39.1%)	0 (0%)	132 (66.7%)
	Strongly Disagree	0 (0%)	2 (2.9%)	8 (17.4%)	0 (0%)	10 (5.1%)
8. The CCC tracks the progress of NCD management and treatment	Agree	6 (7.5%)	12 (17.1%)	8 (17.4%)	0 (0%)	26 (13.1%)
	Strongly Agree	74 (92.5%)	58 (82.9%)	38 (82.6%)	2 (100%)	172 (86.9%)
Information Sharing	Response	Level 2	Level 3	Level 4	Level 5	Overall
1. My colleagues can access data that I key in, promptly	Agree	18 (22.5%)	10 (14.3%)	12 (26.1%)	0 (0%)	40 (20.2%)
	Disagree	4 (5%)	6 (8.6%)	8 (17.4%)	0 (0%)	18 (9.1%)
	Neutral	26 (32.5%)	10 (14.3%)	2 (4.3%)	0 (0%)	38 (19.2%)
	Strongly Agree	32 (40%)	44 (62.9%)	24 (52.2%)	2 (100%)	102 (51.5%)
2. It is easy to transmit information to my colleagues using our HMIS	Agree	12 (15%)	14 (20%)	14 (30.4%)	0 (0%)	40 (20.2%)
	Disagree	2 (2.5%)	2 (2.9%)	4 (8.7%)	0 (0%)	8 (4%)
	Neutral	34 (42.5%)	10 (14.3%)	0 (0%)	0 (0%)	44 (22.2%)
	Strongly Agree	32 (40%)	44 (62.9%)	28 (60.9%)	2 (100%)	106 (53.5%)
Data Security	Response	Level 2	Level 3	Level 4	Level 5	Overall
1. I have to use a username and a password to enable me to access our HMIS	Agree	6 (7.5%)	4 (5.7%)	0 (0%)	0 (0%)	10 (5.1%)
	Disagree	2 (2.5%)	0 (0%)	0 (0%)	0 (0%)	2 (1%)
	Neutral	34 (42.5%)	4 (5.7%)	0 (0%)	0 (0%)	38 (19.2%)
	Strongly Agree	38 (47.5%)	60 (85.7%)	44 (95.7%)	2 (100%)	144 (72.7%)

Domains		Level 2	Level 3	Level 4	Level 5	Overall
	Strongly Disagree	0 (0%)	2 (2.9%)	2 (4.3%)	0 (0%)	4 (2%)
2. Hospital Reports are always available to us whenever we need them	Agree	36 (45%)	10 (14.3%)	10 (21.7%)	2 (100%)	58 (29.3%)
	Neutral	8 (10%)	0 (0%)	0 (0%)	0 (0%)	8 (4%)
	Strongly Agree	36 (45%)	60 (85.7%)	36 (78.3%)	0 (0%)	132 (66.7%)
3. I have access to all patients' medical reports	Agree	34 (42.5%)	14 (20%)	8 (17.4%)	2 (100%)	58 (29.3%)
	Disagree	2 (2.5%)	8 (11.4%)	12 (26.1%)	0 (0%)	22 (11.1%)
	Neutral	4 (5%)	6 (8.6%)	2 (4.3%)	0 (0%)	12 (6.1%)
	Strongly Agree	40 (50%)	42 (60%)	24 (52.2%)	0 (0%)	106 (53.5%)
Pooled Resources						
Human Recourses	Response	Level 2	Level 3	Level 4	Level 5	Overall
1. I comfortably manage HIV patients with NCD	Agree	8 (10%)	8 (11.4%)	2 (4.3%)	0 (0%)	18 (9.1%)
	Disagree	0 (0%)	2 (2.9%)	2 (4.3%)	0 (0%)	4 (2%)
	Strongly Agree	72 (90%)	58 (82.9%)	40 (87%)	2 (100%)	172 (86.9%)
	Strongly Disagree	0 (0%)	2 (2.9%)	2 (4.3%)	0 (0%)	4 (2%)
2. I have been well trained and equipped to manage HIV and NCD cases	Agree	30 (37.5%)	24 (34.3%)	10 (21.7%)	0 (0%)	64 (32.3%)
	Disagree	4 (5%)	2 (2.9%)	18 (39.1%)	0 (0%)	24 (12.1%)
	Neutral	6 (7.5%)	2 (2.9%)	2 (4.3%)	0 (0%)	10 (5.1%)
	Strongly Agree	40 (50%)	42 (60%)	16 (34.8%)	2 (100%)	100 (50.5%)
3. I can only manage HIV cases	Agree	0 (0%)	4 (5.7%)	4 (8.7%)	0 (0%)	8 (4%)
	Disagree	24 (30%)	24 (34.3%)	6 (13%)	0 (0%)	54 (27.3%)
	Neutral	2 (2.5%)	0 (0%)	0 (0%)	0 (0%)	2 (1%)
	Strongly Agree	2 (2.5%)	4 (5.7%)	20 (43.5%)	0 (0%)	26 (13.1%)
	Strongly Disagree	52 (65%)	38 (54.3%)	16 (34.8%)	2 (100%)	108 (54.5%)
4. I can only manage NCD cases	Agree	0 (0%)	2 (2.9%)	0 (0%)	0 (0%)	2 (1%)
	Disagree	24 (30%)	32 (45.7%)	10 (21.7%)	0 (0%)	66 (33.3%)
	Neutral	2 (2.5%)	0 (0%)	0 (0%)	0 (0%)	2 (1%)
	Strongly Disagree	54 (67.5%)	36 (51.4%)	36 (78.3%)	2 (100%)	128 (64.6%)
	Strongly Agree	6 (7.5%)	16 (22.9%)	12 (26.1%)	2 (100%)	36 (18.2%)
5. We are sufficient (Numbers and skills mix) to manage our department	Disagree	44 (55%)	30 (42.9%)	14 (30.4%)	0 (0%)	88 (44.4%)
	Neutral	2 (2.5%)	2 (2.9%)	2 (4.3%)	0 (0%)	6 (3%)
	Strongly Agree	12 (15%)	12 (17.1%)	18 (39.1%)	0 (0%)	42 (21.2%)
	Strongly Disagree	16 (20%)	10 (14.3%)	0 (0%)	0 (0%)	26 (13.1%)
	Agree	34 (42.5%)	34 (48.6%)	14 (30.4%)	0 (0%)	82 (41.4%)
6. We need more staff members in our department	Agree	34 (42.5%)	34 (48.6%)	14 (30.4%)	0 (0%)	82 (41.4%)

Domains		Level 2	Level 3	Level 4	Level 5	Overall
	Disagree	8 (10%)	16 (22.9%)	18 (39.1%)	2 (100%)	44 (22.2%)
	Neutral	0 (0%)	2 (2.9%)	2 (4.3%)	0 (0%)	4 (2%)
	Strongly Agree	32 (40%)	16 (22.9%)	4 (8.7%)	0 (0%)	52 (26.3%)
	Strongly Disagree	6 (7.5%)	2 (2.9%)	8 (17.4%)	0 (0%)	16 (8.1%)
7. I need the training to be able to manage HIV patients with NCD conditions	Agree	32 (40%)	30 (42.9%)	22 (47.8%)	0 (0%)	84 (42.4%)
	Disagree	26 (32.5%)	6 (8.6%)	2 (4.3%)	0 (0%)	34 (17.2%)
	Neutral	6 (7.5%)	18 (25.7%)	6 (13%)	2 (100%)	32 (16.2%)
	Strongly Agree	16 (20%)	16 (22.9%)	16 (34.8%)	0 (0%)	48 (24.2%)
8. I regularly receive integrated care training	Agree	26 (32.5%)	20 (28.6%)	20 (43.5%)	0 (0%)	66 (33.3%)
	Disagree	6 (7.5%)	8 (11.4%)	8 (17.4%)	0 (0%)	22 (11.1%)
	Neutral	6 (7.5%)	6 (8.6%)	6 (13%)	0 (0%)	18 (9.1%)
	Strongly Agree	40 (50%)	30 (42.9%)	12 (26.1%)	2 (100%)	84 (42.4%)
	Strongly Disagree	2 (2.5%)	6 (8.6%)	0 (0%)	0 (0%)	8 (4%)
Funding Models	Response	Level 2	Level 3	Level 4	Level 5	Overall
1. HIV and NCD services are fully paid for by the government	Agree	8 (10%)	12 (17.1%)	0 (0%)	0 (0%)	20 (10.1%)
	Disagree	2 (2.5%)	8 (11.4%)	12 (26.1%)	0 (0%)	22 (11.1%)
	Neutral	2 (2.5%)	4 (5.7%)	16 (34.8%)	2 (100%)	24 (12.1%)
	Strongly Agree	48 (60%)	32 (45.7%)	8 (17.4%)	0 (0%)	88 (44.4%)
	Strongly Disagree	20 (25%)	14 (20%)	10 (21.7%)	0 (0%)	44 (22.2%)
2. HIV services are fully paid for by donors	Agree	0 (0%)	6 (8.6%)	0 (0%)	0 (0%)	6 (3%)
	Disagree	4 (5%)	0 (0%)	2 (4.3%)	0 (0%)	6 (3%)
	Neutral	2 (2.5%)	2 (2.9%)	0 (0%)	0 (0%)	4 (2%)
	Strongly Agree	74 (92.5%)	62 (88.6%)	44 (95.7%)	2 (100%)	182 (91.9%)
3. NCD services are fully paid for by the government	Disagree	2 (2.5%)	4 (5.7%)	20 (43.5%)	2 (100%)	28 (14.1%)
	Neutral	0 (0%)	0 (0%)	4 (8.7%)	0 (0%)	4 (2%)
	Strongly Agree	58 (72.5%)	48 (68.6%)	8 (17.4%)	0 (0%)	114 (57.6%)
	Strongly Disagree	20 (25%)	18 (25.7%)	14 (30.4%)	0 (0%)	52 (26.3%)
4. HIV and NCD services are fully paid for by the patient	Disagree	6 (7.5%)	12 (17.1%)	20 (43.5%)	2 (100%)	40 (20.2%)
	Neutral	6 (7.5%)	10 (14.3%)	12 (26.1%)	0 (0%)	28 (14.1%)
	Strongly Agree	6 (7.5%)	4 (5.7%)	2 (4.3%)	0 (0%)	12 (6.1%)
	Strongly Disagree	62 (77.5%)	44 (62.9%)	12 (26.1%)	0 (0%)	118 (59.6%)

Domains		Level 2	Level 3	Level 4	Level 5	Overall
5. HIV and NCD services are always paid for through health insurance	Agree	12 (15%)	8 (11.4%)	8 (17.4%)	2 (100%)	30 (15.2%)
	Disagree	10 (12.5%)	10 (14.3%)	4 (8.7%)	0 (0%)	24 (12.1%)
	Neutral	0 (0%)	6 (8.6%)	24 (52.2%)	0 (0%)	30 (15.2%)
	Strongly Agree	8 (10%)	4 (5.7%)	10 (21.7%)	0 (0%)	22 (11.1%)
	Strongly Disagree	50 (62.5%)	42 (60%)	0 (0%)	0 (0%)	92 (46.5%)
Geographic Setting	Response	Level 2	Level 3	Level 4	Level 5	Overall
1. Our facility is the only facility that serves all patients cases in this locality	Agree	8 (10%)	12 (17.1%)	6 (13%)	0 (0%)	26 (13.1%)
	Disagree	18 (22.5%)	14 (20%)	10 (21.7%)	0 (0%)	42 (21.2%)
	Strongly Agree	48 (60%)	38 (54.3%)	28 (60.9%)	2 (100%)	116 (58.6%)
	Strongly Disagree	6 (7.5%)	6 (8.6%)	2 (4.3%)	0 (0%)	14 (7.1%)
2. Patients easily access our facility for services	Agree	8 (10%)	12 (17.1%)	4 (8.7%)	0 (0%)	24 (12.1%)
	Disagree	4 (5%)	4 (5.7%)	0 (0%)	0 (0%)	8 (4%)
	Neutral	4 (5%)	2 (2.9%)	0 (0%)	0 (0%)	6 (3%)
	Strongly Agree	64 (80%)	52 (74.3%)	42 (91.3%)	2 (100%)	160 (80.8%)
3. The roads are okay during the rainy seasons so patients can easily access our facility	Agree	10 (12.5%)	8 (11.4%)	4 (8.7%)	0 (0%)	22 (11.1%)
	Disagree	8 (10%)	12 (17.1%)	8 (17.4%)	0 (0%)	28 (14.1%)
	Neutral	2 (2.5%)	2 (2.9%)	0 (0%)	0 (0%)	4 (2%)
	Strongly Agree	50 (62.5%)	46 (65.7%)	34 (73.9%)	2 (100%)	132 (66.7%)
	Strongly Disagree	10 (12.5%)	2 (2.9%)	0 (0%)	0 (0%)	12 (6.1%)
4. All services are offered in our facility - patients do not have to seek diagnostic services elsewhere	Agree	2 (2.5%)	6 (8.6%)	8 (17.4%)	0 (0%)	16 (8.1%)
	Disagree	26 (32.5%)	32 (45.7%)	4 (8.7%)	0 (0%)	62 (31.3%)
	Neutral	0 (0%)	4 (5.7%)	0 (0%)	0 (0%)	4 (2%)
	Strongly Agree	16 (20%)	22 (31.4%)	34 (73.9%)	2 (100%)	74 (37.4%)
	Strongly Disagree	36 (45%)	6 (8.6%)	0 (0%)	0 (0%)	42 (21.2%)
Governance Structure						
Governance Structure	Response	Level 2	Level 3	Level 4	Level 5	Overall
1. The CCC is fully managed by the program lead	Agree	18 (22.5%)	10 (14.3%)	2 (4.3%)	0 (0%)	30 (15.2%)
	Disagree	16 (20%)	4 (5.7%)	8 (17.4%)	0 (0%)	28 (14.1%)
	Neutral	2 (2.5%)	4 (5.7%)	2 (4.3%)	0 (0%)	8 (4%)
	Strongly Agree	44 (55%)	52 (74.3%)	32 (69.6%)	2 (100%)	130 (65.7%)
	Strongly Disagree	0 (0%)	0 (0%)	2 (4.3%)	0 (0%)	2 (1%)

Domains		Level 2	Level 3	Level 4	Level 5	Overall
2. The NCD clinic are fully managed by the health facility board	Agree	6 (7.5%)	8 (11.4%)	0 (0%)	0 (0%)	14 (7.1%)
	Disagree	2 (2.5%)	0 (0%)	2 (4.3%)	0 (0%)	4 (2%)
	Strongly Agree	72 (90%)	62 (88.6%)	44 (95.7%)	2 (100%)	180 (90.9%)
3. The CCC and NCD clinic are fully managed by the health facility board	Agree	14 (17.5%)	10 (14.3%)	6 (13%)	0 (0%)	30 (15.2%)
	Disagree	30 (37.5%)	28 (40%)	18 (39.1%)	0 (0%)	76 (38.4%)
	Neutral	12 (15%)	18 (25.7%)	6 (13%)	0 (0%)	36 (18.2%)
	Strongly Agree	20 (25%)	6 (8.6%)	8 (17.4%)	0 (0%)	34 (17.2%)
	Strongly Disagree	4 (5%)	8 (11.4%)	8 (17.4%)	2 (100%)	22 (11.1%)
4. The health facility board only manages the facility	Agree	8 (10%)	16 (22.9%)	6 (13%)	0 (0%)	30 (15.2%)
	Disagree	16 (20%)	16 (22.9%)	12 (26.1%)	0 (0%)	44 (22.2%)
	Neutral	4 (5%)	4 (5.7%)	0 (0%)	0 (0%)	8 (4%)
	Strongly Agree	46 (57.5%)	34 (48.6%)	28 (60.9%)	2 (100%)	110 (55.6%)
	Strongly Disagree	6 (7.5%)	0 (0%)	0 (0%)	0 (0%)	6 (3%)
5. The CCC program lead works closely with the health facility board	Agree	8 (10%)	12 (17.1%)	0 (0%)	0 (0%)	20 (10.1%)
	Neutral	0 (0%)	4 (5.7%)	0 (0%)	0 (0%)	4 (2%)
	Strongly Agree	70 (87.5%)	54 (77.1%)	46 (100%)	2 (100%)	172 (86.9%)
	Strongly Disagree	2 (2.5%)	0 (0%)	0 (0%)	0 (0%)	2 (1%)
6. All the activities in the health facility are managed by the facility in-charge	Agree	22 (27.5%)	18 (25.7%)	2 (4.3%)	0 (0%)	42 (21.2%)
	Disagree	0 (0%)	2 (2.9%)	0 (0%)	0 (0%)	2 (1%)
	Neutral	0 (0%)	2 (2.9%)	0 (0%)	0 (0%)	2 (1%)
	Strongly Agree	58 (72.5%)	48 (68.6%)	44 (95.7%)	2 (100%)	152 (76.8%)
7. Approvals to buy medical products are fully done by the health facility board	Agree	16 (20%)	10 (14.3%)	14 (30.4%)	0 (0%)	40 (20.2%)
	Disagree	10 (12.5%)	10 (14.3%)	2 (4.3%)	0 (0%)	22 (11.1%)
	Neutral	4 (5%)	6 (8.6%)	0 (0%)	2 (100%)	12 (6.1%)
	Strongly Agree	48 (60%)	44 (62.9%)	30 (65.2%)	0 (0%)	122 (61.6%)
	Strongly Disagree	2 (2.5%)	0 (0%)	0 (0%)	0 (0%)	2 (1%)
Policy	Response	Level 2	Level 3	Level 4	Level 5	Overall
1. Our organization has an operational policy (local level) in place	Agree	8 (10%)	4 (5.7%)	2 (4.3%)	0 (0%)	14 (7.1%)
	Strongly Agree	72 (90%)	66 (94.3%)	44 (95.7%)	2 (100%)	184 (92.9%)
2. I am knowledgeable about our organization's policy	Agree	6 (7.5%)	2 (2.9%)	2 (4.3%)	0 (0%)	10 (5.1%)
	Strongly Agree	74 (92.5%)	68 (97.1%)	44 (95.7%)	2 (100%)	188 (94.9%)
	Agree	4 (5%)	4 (5.7%)	4 (8.7%)	0 (0%)	12 (6.1%)

Domains		Level 2	Level 3	Level 4	Level 5	Overall
3. Our organization policy is aligned with the national policy	Strongly Agree	76 (95%)	66 (94.3%)	42 (91.3%)	2 (100%)	186 (93.9%)
4. I am aware of the Kenya Health policy, and we are fully implementing it in our facility	Agree	20 (25%)	6 (8.6%)	6 (13%)	0 (0%)	32 (16.2%)
	Strongly Agree	60 (75%)	64 (91.4%)	40 (87%)	2 (100%)	166 (83.8%)
5. I am aware of the UHC policy, and we are fully implementing it in our facility	Agree	8 (10%)	2 (2.9%)	8 (17.4%)	0 (0%)	18 (9.1%)
	Strongly Agree	72 (90%)	68 (97.1%)	38 (82.6%)	2 (100%)	180 (90.9%)
Accountability	Response	Level 2	Level 3	Level 4	Level 5	Overall
1. I am fully aware of my roles and responsibilities in the organization	Agree	8 (10%)	2 (2.9%)	2 (4.3%)	0 (0%)	12 (6.1%)
	Strongly Agree	72 (90%)	68 (97.1%)	44 (95.7%)	2 (100%)	186 (93.9%)
2. We work with partners both our/their roles and responsibilities are clear	Agree	8 (10%)	4 (5.7%)	4 (8.7%)	0 (0%)	16 (8.1%)
	Strongly Agree	72 (90%)	66 (94.3%)	42 (91.3%)	2 (100%)	182 (91.9%)
3. Financial records on how any funding is spent in our facility are accessible	Agree	10 (12.5%)	14 (20%)	10 (21.7%)	0 (0%)	34 (17.2%)
	Disagree	0 (0%)	2 (2.9%)	2 (4.3%)	0 (0%)	4 (2%)
	Neutral	2 (2.5%)	0 (0%)	2 (4.3%)	0 (0%)	4 (2%)
	Strongly Agree	68 (85%)	54 (77.1%)	32 (69.6%)	2 (100%)	156 (78.8%)
4. We (facility) operate with a budget	Agree	6 (7.5%)	6 (8.6%)	4 (8.7%)	0 (0%)	16 (8.1%)
	Strongly Agree	74 (92.5%)	64 (91.4%)	42 (91.3%)	2 (100%)	182 (91.9%)
5. Each department manages their budget	Agree	2 (2.5%)	10 (14.3%)	18 (39.1%)	2 (100%)	32 (16.2%)
	Disagree	22 (27.5%)	36 (51.4%)	6 (13%)	0 (0%)	64 (32.3%)
	Neutral	4 (5%)	8 (11.4%)	4 (8.7%)	0 (0%)	16 (8.1%)
	Strongly Agree	10 (12.5%)	10 (14.3%)	10 (21.7%)	0 (0%)	30 (15.2%)
	Strongly Disagree	42 (52.5%)	6 (8.6%)	8 (17.4%)	0 (0%)	56 (28.3%)
Organisation Culture						
Innovative oriented Culture	Response	Level 2	Level 3	Level 4	Level 5	Overall
1. Our organisation allows staff to come up with new ideas	Agree	22 (27.5%)	28 (40%)	8 (17.4%)	0 (0%)	58 (29.3%)
	Disagree	2 (2.5%)	2 (2.9%)	0 (0%)	0 (0%)	4 (2%)
	Neutral	2 (2.5%)	0 (0%)	2 (4.3%)	0 (0%)	4 (2%)
	Strongly Agree	54 (67.5%)	40 (57.1%)	36 (78.3%)	2 (100%)	132 (66.7%)
2. Our organisation allows staff members to implement new ideas	Agree	20 (25%)	28 (40%)	14 (30.4%)	0 (0%)	62 (31.3%)
	Disagree	16 (20%)	10 (14.3%)	2 (4.3%)	2 (100%)	30 (15.2%)
	Neutral	8 (10%)	4 (5.7%)	4 (8.7%)	0 (0%)	16 (8.1%)
	Strongly Agree	36 (45%)	28 (40%)	26 (56.5%)	0 (0%)	90 (45.5%)
3. Staff members are rewarded for the new ideas that improve efficiency in service delivery	Agree	10 (12.5%)	24 (34.3%)	18 (39.1%)	2 (100%)	54 (27.3%)
	Disagree	42 (52.5%)	16 (22.9%)	10 (21.7%)	0 (0%)	68 (34.3%)

Domains		Level 2	Level 3	Level 4	Level 5	Overall
	Neutral	16 (20%)	18 (25.7%)	6 (13%)	0 (0%)	40 (20.2%)
	Strongly Agree	10 (12.5%)	10 (14.3%)	10 (21.7%)	0 (0%)	30 (15.2%)
	Strongly Disagree	2 (2.5%)	2 (2.9%)	2 (4.3%)	0 (0%)	6 (3%)
4. Staff members are promoted when they successfully implement new ideas	Agree	2 (2.5%)	2 (2.9%)	0 (0%)	0 (0%)	4 (2%)
	Disagree	22 (27.5%)	28 (40%)	18 (39.1%)	2 (100%)	70 (35.4%)
	Neutral	2 (2.5%)	2 (2.9%)	0 (0%)	0 (0%)	4 (2%)
	Strongly Agree	8 (10%)	6 (8.6%)	0 (0%)	0 (0%)	14 (7.1%)
	Strongly Disagree	46 (57.5%)	32 (45.7%)	28 (60.9%)	0 (0%)	106 (53.5%)
5. Our organisation always invests in potential ideas that can improve service delivery	Agree	12 (15%)	36 (51.4%)	14 (30.4%)	0 (0%)	62 (31.3%)
	Disagree	4 (5%)	0 (0%)	0 (0%)	0 (0%)	4 (2%)
	Neutral	8 (10%)	0 (0%)	4 (8.7%)	0 (0%)	12 (6.1%)
	Strongly Agree	56 (70%)	34 (48.6%)	28 (60.9%)	2 (100%)	120 (60.6%)
6. Healthcare workers fully embrace working together with members from different departments as they serve HIV and NCD clients	Agree	18 (22.5%)	30 (42.9%)	8 (17.4%)	0 (0%)	56 (28.3%)
	Strongly Agree	62 (77.5%)	40 (57.1%)	38 (82.6%)	2 (100%)	142 (71.7%)
7. I fully share common values with colleagues in my organization	Agree	12 (15%)	18 (25.7%)	10 (21.7%)	0 (0%)	40 (20.2%)
	Strongly Agree	68 (85%)	52 (74.3%)	36 (78.3%)	2 (100%)	158 (79.8%)
9. Our health facility currently provides HIV/NCD healthcare services under one roof	Agree	8 (10%)	16 (22.9%)	2 (4.3%)	0 (0%)	26 (13.1%)
	Disagree	4 (5%)	8 (11.4%)	8 (17.4%)	0 (0%)	20 (10.1%)
	Strongly Agree	62 (77.5%)	32 (45.7%)	20 (43.5%)	2 (100%)	116 (58.6%)
	Strongly Disagree	6 (7.5%)	14 (20%)	16 (34.8%)	0 (0%)	36 (18.2%)
10. HIV/NCD integrated care is a superior form of patient care	Agree	10 (12.5%)	16 (22.9%)	4 (8.7%)	0 (0%)	30 (15.2%)
	Strongly Agree	70 (87.5%)	54 (77.1%)	42 (91.3%)	2 (100%)	168 (84.8%)
11. HIV/NCD integrated care saves clinic time, energy and resources	Agree	8 (10%)	14 (20%)	4 (8.7%)	0 (0%)	26 (13.1%)
	Strongly Agree	72 (90%)	56 (80%)	42 (91.3%)	2 (100%)	172 (86.9%)
12. I mostly have the same beliefs as my colleagues on work issues	Agree	12 (15%)	22 (31.4%)	6 (13%)	0 (0%)	40 (20.2%)
	Neutral	2 (2.5%)	6 (8.6%)	0 (0%)	0 (0%)	8 (4%)
	Strongly Agree	66 (82.5%)	42 (60%)	40 (87%)	2 (100%)	150 (75.8%)
13. I am always ready to learn from my colleagues on new practices	Agree	14 (17.5%)	18 (25.7%)	6 (13%)	0 (0%)	38 (19.2%)
	Strongly Agree	66 (82.5%)	52 (74.3%)	40 (87%)	2 (100%)	160 (80.8%)
Team Oriented Culture	Response	Level 2	Level 3	Level 4	Level 5	Overall

Domains		Level 2	Level 3	Level 4	Level 5	Overall
1. Our health facility leadership would like to see integrated health services	Agree	16 (20%)	18 (25.7%)	12 (26.1%)	0 (0%)	46 (23.2%)
	Neutral	12 (15%)	12 (17.1%)	10 (21.7%)	0 (0%)	34 (17.2%)
	Strongly Agree	52 (65%)	40 (57.1%)	24 (52.2%)	2 (100%)	118 (59.6%)
2. My organization has strong dedicated leadership that supports HIV/NCD clinics to work together	Agree	28 (35%)	20 (28.6%)	8 (17.4%)	0 (0%)	56 (28.3%)
	Disagree	0 (0%)	0 (0%)	2 (4.3%)	0 (0%)	2 (1%)
	Neutral	0 (0%)	0 (0%)	2 (4.3%)	0 (0%)	2 (1%)
	Strongly Agree	52 (65%)	50 (71.4%)	34 (73.9%)	2 (100%)	138 (69.7%)
3. Our different departmental leaders always work in harmony as a team	Agree	10 (12.5%)	14 (20%)	10 (21.7%)	0 (0%)	34 (17.2%)
	Strongly Agree	70 (87.5%)	56 (80%)	36 (78.3%)	2 (100%)	164 (82.8%)
4. Each leader in our organization has specific responsibilities they handle	Agree	6 (7.5%)	14 (20%)	6 (13%)	0 (0%)	26 (13.1%)
	Strongly Agree	74 (92.5%)	56 (80%)	40 (87%)	2 (100%)	172 (86.9%)
5. I am fully aware of our organization's vision and direction	Agree	12 (15%)	18 (25.7%)	8 (17.4%)	0 (0%)	38 (19.2%)
	Strongly Agree	68 (85%)	52 (74.3%)	38 (82.6%)	2 (100%)	160 (80.8%)
6. Our Health facility has at least one HIV/NCD integrated care champion	Agree	12 (15%)	18 (25.7%)	6 (13%)	0 (0%)	36 (18.2%)
	Disagree	26 (32.5%)	8 (11.4%)	4 (8.7%)	0 (0%)	38 (19.2%)
	Strongly Agree	36 (45%)	40 (57.1%)	36 (78.3%)	2 (100%)	114 (57.6%)
	Strongly Disagree	6 (7.5%)	4 (5.7%)	0 (0%)	0 (0%)	10 (5.1%)
7. The administrators in the health facility value HIV/NCD integrated care	Agree	16 (20%)	10 (14.3%)	4 (8.7%)	0 (0%)	30 (15.2%)
	Disagree	2 (2.5%)	4 (5.7%)	8 (17.4%)	0 (0%)	14 (7.1%)
	Neutral	14 (17.5%)	12 (17.1%)	8 (17.4%)	0 (0%)	34 (17.2%)
	Strongly Agree	48 (60%)	44 (62.9%)	26 (56.5%)	2 (100%)	120 (60.6%)
Outcome Oriented Culture	Response	Level 2	Level 3	Level 4	Level 5	Overall
1. This facility uses to pay for performance programs to improve the quality of HIV/NCD care	Agree	16 (20%)	18 (25.7%)	16 (34.8%)	2 (100%)	52 (26.3%)
	Disagree	28 (35%)	12 (17.1%)	2 (4.3%)	0 (0%)	42 (21.2%)
	Neutral	12 (15%)	18 (25.7%)	4 (8.7%)	0 (0%)	34 (17.2%)
	Strongly Agree	24 (30%)	22 (31.4%)	22 (47.8%)	0 (0%)	68 (34.3%)
	Strongly Disagree	0 (0%)	0 (0%)	2 (4.3%)	0 (0%)	2 (1%)
2. 360-Degree Feedback, also known as Multisource Feedback (MSF), is a performance appraisal methodology used to	Agree	24 (30%)	38 (54.3%)	22 (47.8%)	2 (100%)	86 (43.4%)
	Disagree	6 (7.5%)	0 (0%)	0 (0%)	0 (0%)	6 (3%)
	Neutral	2 (2.5%)	2 (2.9%)	0 (0%)	0 (0%)	4 (2%)

Domains		Level 2	Level 3	Level 4	Level 5	Overall
assess HIV/NCD care in this facility	Strongly Agree	48 (60%)	30 (42.9%)	24 (52.2%)	0 (0%)	102 (51.5%)
3. This facility has a balanced scorecard that measures HIV/NCD integration performance	Agree	10 (12.5%)	14 (20%)	12 (26.1%)	0 (0%)	36 (18.2%)
	Disagree	32 (40%)	8 (11.4%)	8 (17.4%)	0 (0%)	48 (24.2%)
	Neutral	6 (7.5%)	8 (11.4%)	2 (4.3%)	0 (0%)	16 (8.1%)
	Strongly Agree	30 (37.5%)	36 (51.4%)	22 (47.8%)	2 (100%)	90 (45.5%)
	Strongly Disagree	2 (2.5%)	4 (5.7%)	2 (4.3%)	0 (0%)	8 (4%)
4. This facility has a balanced scorecard that links the overall health sector strategies to measurable targets and actions	Agree	26 (32.5%)	26 (37.1%)	18 (39.1%)	0 (0%)	70 (35.4%)
	Disagree	2 (2.5%)	0 (0%)	0 (0%)	0 (0%)	2 (1%)
	Strongly Agree	50 (62.5%)	44 (62.9%)	28 (60.9%)	2 (100%)	124 (62.6%)
	Strongly Disagree	2 (2.5%)	0 (0%)	0 (0%)	0 (0%)	2 (1%)
5. This facility leadership facilitates a structured system for collecting information about the performance of healthcare workers engaged in HIV/NCD integrated services provision	Agree	34 (42.5%)	28 (40%)	16 (34.8%)	0 (0%)	78 (39.4%)
	Disagree	6 (7.5%)	0 (0%)	2 (4.3%)	0 (0%)	8 (4%)
	Neutral	2 (2.5%)	0 (0%)	0 (0%)	0 (0%)	2 (1%)
	Strongly Agree	38 (47.5%)	40 (57.1%)	28 (60.9%)	2 (100%)	108 (54.5%)
	Strongly Disagree	0 (0%)	2 (2.9%)	0 (0%)	0 (0%)	2 (1%)
Integration of healthcare services		Response	Level 2	Level 3	Level 4	Level 5
1. Most healthcare workers are competent to provide HIV and NCD services	Agree	22 (27.5%)	16 (22.9%)	6 (13%)	0 (0%)	44 (22.2%)
	Disagree	10 (12.5%)	12 (17.1%)	18 (39.1%)	0 (0%)	40 (20.2%)
	Neutral	0 (0%)	6 (8.6%)	2 (4.3%)	0 (0%)	8 (4%)
	Strongly Agree	48 (60%)	32 (45.7%)	20 (43.5%)	2 (100%)	102 (51.5%)
	Strongly Disagree	0 (0%)	4 (5.7%)	0 (0%)	0 (0%)	4 (2%)
2. HIV services are offered only by care providers in the CCC	Agree	4 (5%)	2 (2.9%)	2 (4.3%)	0 (0%)	8 (4%)
	Disagree	20 (25%)	10 (14.3%)	0 (0%)	2 (100%)	32 (16.2%)
	Neutral	0 (0%)	2 (2.9%)	0 (0%)	0 (0%)	2 (1%)
	Strongly Agree	30 (37.5%)	40 (57.1%)	38 (82.6%)	0 (0%)	108 (54.5%)
	Strongly Disagree	26 (32.5%)	16 (22.9%)	6 (13%)	0 (0%)	48 (24.2%)
3. NCD services are offered only by care providers in the main health facility	Agree	2 (2.5%)	8 (11.4%)	4 (8.7%)	0 (0%)	14 (7.1%)
	Disagree	12 (15%)	12 (17.1%)	2 (4.3%)	2 (100%)	28 (14.1%)
	Neutral	0 (0%)	4 (5.7%)	0 (0%)	0 (0%)	4 (2%)
	Strongly Agree	34 (42.5%)	26 (37.1%)	34 (73.9%)	0 (0%)	94 (47.5%)
	Strongly Disagree	32 (40%)	20 (28.6%)	6 (13%)	0 (0%)	58 (29.3%)

Domains		Level 2	Level 3	Level 4	Level 5	Overall
4. This facility has patient management guidelines for HIV service provision	Agree	12 (15%)	6 (8.6%)	2 (4.3%)	0 (0%)	20 (10.1%)
	Strongly Agree	68 (85%)	64 (91.4%)	44 (95.7%)	2 (100%)	178 (89.9%)
5. This facility has patient management guidelines for NCD service provision	Agree	12 (15%)	10 (14.3%)	4 (8.7%)	0 (0%)	26 (13.1%)
	Strongly Agree	68 (85%)	60 (85.7%)	42 (91.3%)	2 (100%)	172 (86.9%)
6. All HIV and NCDs lab tests are done in the main health facility lab	Agree	4 (5%)	12 (17.1%)	4 (8.7%)	0 (0%)	20 (10.1%)
	Disagree	32 (40%)	28 (40%)	6 (13%)	0 (0%)	66 (33.3%)
	Strongly Agree	8 (10%)	24 (34.3%)	36 (78.3%)	2 (100%)	70 (35.4%)
	Strongly Disagree	36 (45%)	6 (8.6%)	0 (0%)	0 (0%)	42 (21.2%)
7. HIV drugs are available and accessible in the main pharmacy	Agree	14 (17.5%)	14 (20%)	4 (8.7%)	0 (0%)	32 (16.2%)
	Disagree	20 (25%)	20 (28.6%)	2 (4.3%)	2 (100%)	44 (22.2%)
	Neutral	2 (2.5%)	2 (2.9%)	2 (4.3%)	0 (0%)	6 (3%)
	Strongly Agree	44 (55%)	34 (48.6%)	38 (82.6%)	0 (0%)	116 (58.6%)
8. All our patients including the HIV patients are managed at one common point of care	Agree	4 (5%)	14 (20%)	4 (8.7%)	0 (0%)	22 (11.1%)
	Disagree	4 (5%)	4 (5.7%)	2 (4.3%)	0 (0%)	10 (5.1%)
	Strongly Agree	50 (62.5%)	22 (31.4%)	10 (21.7%)	0 (0%)	82 (41.4%)
	Strongly Disagree	22 (27.5%)	30 (42.9%)	30 (65.2%)	2 (100%)	84 (42.4%)
9. HIV and NCD specialists regularly review each other's notes in the CCC	Agree	8 (10%)	16 (22.9%)	8 (17.4%)	0 (0%)	32 (16.2%)
	Disagree	2 (2.5%)	0 (0%)	0 (0%)	0 (0%)	2 (1%)
	Strongly Agree	70 (87.5%)	54 (77.1%)	38 (82.6%)	2 (100%)	164 (82.8%)
10. HIV and NCD specialists regularly consult about patient care in the CCC	Agree	6 (7.5%)	12 (17.1%)	2 (4.3%)	0 (0%)	20 (10.1%)
	Neutral	2 (2.5%)	0 (0%)	0 (0%)	0 (0%)	2 (1%)
	Strongly Agree	72 (90%)	58 (82.9%)	44 (95.7%)	2 (100%)	176 (88.9%)
12. The CCC has a sufficient number of NCD specialists on-site	Agree	4 (5%)	14 (20%)	6 (13%)	2 (100%)	26 (13.1%)
	Disagree	52 (65%)	36 (51.4%)	22 (47.8%)	0 (0%)	110 (55.6%)
	Neutral	4 (5%)	2 (2.9%)	0 (0%)	0 (0%)	6 (3%)
	Strongly Agree	12 (15%)	12 (17.1%)	14 (30.4%)	0 (0%)	38 (19.2%)
	Strongly Disagree	8 (10%)	6 (8.6%)	4 (8.7%)	0 (0%)	18 (9.1%)
13. HIV and NCD specialists are treated as equals within the clinic	Agree	12 (15%)	20 (28.6%)	4 (8.7%)	0 (0%)	36 (18.2%)
	Disagree	2 (2.5%)	2 (2.9%)	0 (0%)	0 (0%)	4 (2%)
	Strongly Agree	66 (82.5%)	48 (68.6%)	42 (91.3%)	2 (100%)	158 (79.8%)

Domains		Level 2	Level 3	Level 4	Level 5	Overall
14. The CCC and NCD care treatment plans are merged	Agree	6 (7.5%)	16 (22.9%)	4 (8.7%)	0 (0%)	26 (13.1%)
	Disagree	2 (2.5%)	2 (2.9%)	2 (4.3%)	0 (0%)	6 (3%)
	Neutral	2 (2.5%)	0 (0%)	0 (0%)	0 (0%)	2 (1%)
	Strongly Agree	70 (87.5%)	52 (74.3%)	38 (82.6%)	2 (100%)	162 (81.8%)
	Strongly Disagree	0 (0%)	0 (0%)	2 (4.3%)	0 (0%)	2 (1%)
15. The CCC scheduling systems allow NCD cases to be scheduled for a same-day appointment with HIV reviews	Agree	16 (20%)	12 (17.1%)	4 (8.7%)	2 (100%)	34 (17.2%)
	Disagree	2 (2.5%)	4 (5.7%)	6 (13%)	0 (0%)	12 (6.1%)
	Neutral	4 (5%)	2 (2.9%)	0 (0%)	0 (0%)	6 (3%)
	Strongly Agree	58 (72.5%)	52 (74.3%)	36 (78.3%)	0 (0%)	146 (73.7%)
16. I comfortably multitask in providing care for HIV as well as NCD patients	Agree	10 (12.5%)	6 (8.6%)	0 (0%)	0 (0%)	16 (8.1%)
	Disagree	10 (12.5%)	4 (5.7%)	2 (4.3%)	0 (0%)	16 (8.1%)
	Neutral	4 (5%)	8 (11.4%)	14 (30.4%)	0 (0%)	26 (13.1%)
	Strongly Agree	56 (70%)	48 (68.6%)	22 (47.8%)	2 (100%)	128 (64.6%)
	Strongly Disagree	0 (0%)	4 (5.7%)	8 (17.4%)	0 (0%)	12 (6.1%)
17. Our data collection systems have all patients who seek care from our facility	Agree	16 (20%)	14 (20%)	8 (17.4%)	0 (0%)	38 (19.2%)
	Strongly Agree	64 (80%)	56 (80%)	38 (82.6%)	2 (100%)	160 (80.8%)
18. I manage care needs for all patients both HIV and NCD patients	Agree	8 (10%)	6 (8.6%)	0 (0%)	0 (0%)	14 (7.1%)
	Disagree	10 (12.5%)	8 (11.4%)	12 (26.1%)	0 (0%)	30 (15.2%)
	Strongly Agree	58 (72.5%)	44 (62.9%)	22 (47.8%)	2 (100%)	126 (63.6%)
	Strongly Disagree	4 (5%)	12 (17.1%)	12 (26.1%)	0 (0%)	28 (14.1%)
	Neutral	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
19. I only manage HIV patients	Agree	2 (2.5%)	4 (5.7%)	0 (0%)	0 (0%)	6 (3%)
	Disagree	20 (25%)	10 (14.3%)	2 (4.3%)	2 (100%)	34 (17.2%)
	Strongly Agree	10 (12.5%)	16 (22.9%)	36 (78.3%)	0 (0%)	62 (31.3%)
	Strongly Disagree	48 (60%)	40 (57.1%)	8 (17.4%)	0 (0%)	96 (48.5%)
20. I only manage NCD patients	Agree	0 (0%)	4 (5.7%)	0 (0%)	0 (0%)	4 (2%)
	Disagree	24 (30%)	14 (20%)	8 (17.4%)	2 (100%)	48 (24.2%)
	Neutral	0 (0%)	0 (0%)	2 (4.3%)	0 (0%)	2 (1%)
	Strongly Agree	0 (0%)	0 (0%)	2 (4.3%)	0 (0%)	2 (1%)
	Strongly Disagree	56 (70%)	52 (74.3%)	34 (73.9%)	0 (0%)	142 (71.7%)
Sustainability Services		Response	Level 2	Level 3	Level 4	Level 5
1. NCD/HIV services are fully supported by health insurance in our facility	Agree	8 (10%)	2 (2.9%)	8 (17.4%)	0 (0%)	18 (9.1%)
	Disagree	8 (10%)	12 (17.1%)	10 (21.7%)	0 (0%)	30 (15.2%)

Domains		Level 2	Level 3	Level 4	Level 5	Overall
	Neutral	0 (0%)	8 (11.4%)	10 (21.7%)	2 (100%)	20 (10.1%)
	Strongly Agree	16 (20%)	14 (20%)	18 (39.1%)	0 (0%)	48 (24.2%)
	Strongly Disagree	48 (60%)	34 (48.6%)	0 (0%)	0 (0%)	82 (41.4%)
2. NCD/HIV services are partially supported by health insurance in our facility	Agree	10 (12.5%)	14 (20%)	14 (30.4%)	2 (100%)	40 (20.2%)
	Disagree	6 (7.5%)	8 (11.4%)	0 (0%)	0 (0%)	14 (7.1%)
	Neutral	0 (0%)	0 (0%)	10 (21.7%)	0 (0%)	10 (5.1%)
	Strongly Agree	12 (15%)	10 (14.3%)	20 (43.5%)	0 (0%)	42 (21.2%)
	Strongly Disagree	52 (65%)	38 (54.3%)	2 (4.3%)	0 (0%)	92 (46.5%)
3. NCD/HIV services are fully paid for by the patients (Out of pocket)	Agree	0 (0%)	2 (2.9%)	4 (8.7%)	0 (0%)	6 (3%)
	Disagree	10 (12.5%)	16 (22.9%)	16 (34.8%)	2 (100%)	44 (22.2%)
	Neutral	8 (10%)	10 (14.3%)	14 (30.4%)	0 (0%)	32 (16.2%)
	Strongly Agree	2 (2.5%)	2 (2.9%)	0 (0%)	0 (0%)	4 (2%)
	Strongly Disagree	60 (75%)	40 (57.1%)	12 (26.1%)	0 (0%)	112 (56.6%)
4. There is increasing demand for HIV/NCD services	Agree	4 (5%)	6 (8.6%)	0 (0%)	0 (0%)	10 (5.1%)
	Strongly Agree	76 (95%)	64 (91.4%)	46 (100%)	2 (100%)	188 (94.9%)
Health Services Performance						
Link needs and Objectives	Response	Level 2	Level 3	Level 4	Level 5	Overall
1. I believe if HIV/NCD needs are identified it will assist our organisation to minimise the cost of operations	Agree	8 (10%)	10 (14.3%)	4 (8.7%)	0 (0%)	22 (11.1%)
	Strongly Agree	72 (90%)	60 (85.7%)	42 (91.3%)	2 (100%)	176 (88.9%)
2. I am fully aware that if HIV and NCD services are put together patients waiting time would be less	Agree	10 (12.5%)	8 (11.4%)	2 (4.3%)	0 (0%)	20 (10.1%)
	Strongly Agree	70 (87.5%)	62 (88.6%)	44 (95.7%)	2 (100%)	178 (89.9%)
I3. It would be easy to build capacity if HIV and NCD services are put under one roof	Agree	14 (17.5%)	10 (14.3%)	4 (8.7%)	0 (0%)	28 (14.1%)
	Disagree	0 (0%)	0 (0%)	2 (4.3%)	0 (0%)	2 (1%)
	Neutral	0 (0%)	2 (2.9%)	4 (8.7%)	2 (100%)	8 (4%)
	Strongly Agree	66 (82.5%)	58 (82.9%)	36 (78.3%)	0 (0%)	160 (80.8%)
Shared Responsibilities						
Link needs and Objectives	Response	Level 2	Level 3	Level 4	Level 5	Overall
1. HIV and NCD clinics both have a separate HR data for their staff	Agree	2 (2.5%)	4 (5.7%)	6 (13%)	0 (0%)	12 (6.1%)
	Disagree	26 (32.5%)	18 (25.7%)	10 (21.7%)	2 (100%)	56 (28.3%)
	Strongly Agree	16 (20%)	30 (42.9%)	26 (56.5%)	0 (0%)	72 (36.4%)
	Strongly Disagree	36 (45%)	18 (25.7%)	4 (8.7%)	0 (0%)	58 (29.3%)
2. HIV and NCD clinics both pay for their overhead expenses	Disagree	14 (17.5%)	12 (17.1%)	8 (17.4%)	2 (100%)	36 (18.2%)

Domains		Level 2	Level 3	Level 4	Level 5	Overall
separately (water, electricity, general maintenance, vehicle maintenance)	Neutral	2 (2.5%)	0 (0%)	0 (0%)	0 (0%)	2 (1%)
	Strongly Disagree	64 (80%)	58 (82.9%)	38 (82.6%)	0 (0%)	160 (80.8%)
3. HIV and NCD clinics share one HR data for the staff	Agree	6 (7.5%)	12 (17.1%)	4 (8.7%)	0 (0%)	22 (11.1%)
	Disagree	8 (10%)	8 (11.4%)	8 (17.4%)	0 (0%)	24 (12.1%)
	Neutral	2 (2.5%)	0 (0%)	0 (0%)	0 (0%)	2 (1%)
	Strongly Agree	54 (67.5%)	22 (31.4%)	12 (26.1%)	2 (100%)	90 (45.5%)
	Strongly Disagree	10 (12.5%)	28 (40%)	22 (47.8%)	0 (0%)	60 (30.3%)
4. HIV and NCD clinics have a combined overhead cost Centre (utility bill)	Agree	4 (5%)	4 (5.7%)	0 (0%)	0 (0%)	8 (4%)
	Strongly Agree	76 (95%)	66 (94.3%)	46 (100%)	2 (100%)	190 (96%)
Merged patients flow processes		Response	Level 2	Level 3	Level 4	Level 5
1. Our registry captures both HIV and NCD data during patient registration	Agree	8 (10%)	10 (14.3%)	2 (4.3%)	0 (0%)	20 (10.1%)
	Disagree	4 (5%)	12 (17.1%)	4 (8.7%)	0 (0%)	20 (10.1%)
	Neutral	0 (0%)	2 (2.9%)	0 (0%)	0 (0%)	2 (1%)
	Strongly Agree	60 (75%)	38 (54.3%)	36 (78.3%)	2 (100%)	136 (68.7%)
	Strongly Disagree	8 (10%)	8 (11.4%)	4 (8.7%)	0 (0%)	20 (10.1%)
2. We have one cash collection office in the facility where HIV and NCD services are paid for	Agree	2 (2.5%)	6 (8.6%)	2 (4.3%)	0 (0%)	10 (5.1%)
	Disagree	4 (5%)	0 (0%)	0 (0%)	0 (0%)	4 (2%)
	Neutral	36 (45%)	32 (45.7%)	2 (4.3%)	2 (100%)	72 (36.4%)
	Strongly Agree	34 (42.5%)	26 (37.1%)	42 (91.3%)	0 (0%)	102 (51.5%)
	Strongly Disagree	4 (5%)	6 (8.6%)	0 (0%)	0 (0%)	10 (5.1%)
3. HIV and NCD clinics can comfortably manage patients from one access point	Agree	6 (7.5%)	10 (14.3%)	0 (0%)	2 (100%)	18 (9.1%)
	Disagree	4 (5%)	10 (14.3%)	6 (13%)	0 (0%)	20 (10.1%)
	Neutral	4 (5%)	2 (2.9%)	0 (0%)	0 (0%)	6 (3%)
	Strongly Agree	66 (82.5%)	48 (68.6%)	36 (78.3%)	0 (0%)	150 (75.8%)
	Strongly Disagree	0 (0%)	0 (0%)	4 (8.7%)	0 (0%)	4 (2%)
4. HIV and NCD clinics can comfortably use the main pharmacy to issue drugs to patients	Agree	6 (7.5%)	6 (8.6%)	2 (4.3%)	0 (0%)	14 (7.1%)
	Disagree	2 (2.5%)	0 (0%)	2 (4.3%)	0 (0%)	4 (2%)
	Strongly Agree	72 (90%)	64 (91.4%)	42 (91.3%)	2 (100%)	180 (90.9%)
5. Our registry only captures HIV patients' data	Agree	2 (2.5%)	8 (11.4%)	0 (0%)	0 (0%)	10 (5.1%)
	Disagree	28 (35%)	22 (31.4%)	22 (47.8%)	2 (100%)	74 (37.4%)
	Strongly Agree	34 (42.5%)	32 (45.7%)	24 (52.2%)	0 (0%)	90 (45.5%)
	Strongly Disagree	16 (20%)	8 (11.4%)	0 (0%)	0 (0%)	24 (12.1%)

Domains		Level 2	Level 3	Level 4	Level 5	Overall
6. Our registry only captures NCD patient's data	Agree	4 (5%)	8 (11.4%)	2 (4.3%)	0 (0%)	14 (7.1%)
	Disagree	28 (35%)	24 (34.3%)	18 (39.1%)	2 (100%)	72 (36.4%)
	Neutral	0 (0%)	0 (0%)	4 (8.7%)	0 (0%)	4 (2%)
	Strongly Agree	30 (37.5%)	30 (42.9%)	22 (47.8%)	0 (0%)	82 (41.4%)
	Strongly Disagree	18 (22.5%)	8 (11.4%)	0 (0%)	0 (0%)	26 (13.1%)
7. HIV and NCD services are managed from different access points	Agree	2 (2.5%)	2 (2.9%)	0 (0%)	0 (0%)	4 (2%)
	Disagree	16 (20%)	10 (14.3%)	0 (0%)	2 (100%)	28 (14.1%)
	Neutral	0 (0%)	4 (5.7%)	0 (0%)	0 (0%)	4 (2%)
	Strongly Agree	18 (22.5%)	30 (42.9%)	42 (91.3%)	0 (0%)	90 (45.5%)
	Strongly Disagree	44 (55%)	24 (34.3%)	4 (8.7%)	0 (0%)	72 (36.4%)
8. The combined streaming and triage process facilitates patient flow, prioritising HIV/NCD services	Agree	4 (5%)	18 (25.7%)	8 (17.4%)	0 (0%)	30 (15.2%)
	Neutral	2 (2.5%)	2 (2.9%)	4 (8.7%)	0 (0%)	8 (4%)
	Strongly Agree	74 (92.5%)	50 (71.4%)	34 (73.9%)	2 (100%)	160 (80.8%)
9. Requesting basic investigations (ECGs, urine tests, X-rays) during the triage process at the integrated HIV/NCD clinics improves flow by reducing the number of steps after the main clinical assessment	Agree	22 (27.5%)	26 (37.1%)	12 (26.1%)	2 (100%)	62 (31.3%)
	Neutral	4 (5%)	0 (0%)	2 (4.3%)	0 (0%)	6 (3%)
	Strongly Agree	54 (67.5%)	44 (62.9%)	32 (69.6%)	0 (0%)	130 (65.7%)
10. The introduction of a common HIV/NCD examination room supports a flexible assessment organizational work process and reduces the time staff spent searching for available space.	Agree	20 (25%)	22 (31.4%)	10 (21.7%)	2 (100%)	54 (27.3%)
	Disagree	2 (2.5%)	0 (0%)	0 (0%)	0 (0%)	2 (1%)
	Neutral	0 (0%)	2 (2.9%)	2 (4.3%)	0 (0%)	4 (2%)
	Strongly Agree	58 (72.5%)	46 (65.7%)	34 (73.9%)	0 (0%)	138 (69.7%)
11. Streamlined point of care testing, laboratory and pharmacy services facilitates flow by providing HIV/NCD services on-time and reducing dependency on external departments	Agree	26 (32.5%)	22 (31.4%)	12 (26.1%)	2 (100%)	62 (31.3%)
	Strongly Agree	54 (67.5%)	48 (68.6%)	34 (73.9%)	0 (0%)	136 (68.7%)
12. Dependency on external departments (laboratory and radiology departments) delays decision-making and patient outflow for HIV/NCD services.	Agree	24 (30%)	28 (40%)	10 (21.7%)	2 (100%)	64 (32.3%)
	Strongly Agree	56 (70%)	42 (60%)	36 (78.3%)	0 (0%)	134 (67.7%)

Appendix 8: Measures of Integration

Data element	SD	D	N	A	SA	N(P op)	Mean	Me dia n	Mo de	Std. Deviat ion
1. Institutional Support										
Coordination with external entities										
1. We work closely with other sector coming up with initiatives that can improve the care to our patients				52	146	198	4.737	5	5	0.441
2. Our organisation works closely with the national government to improve service delivery			2	40	156	198	4.778	5	5	0.44
3. Our facility works closely with the local government to improve service delivery			2	38	158	198	4.788	5	5	0.434
4. Community participation is embraced in our facility	2		2	16	178	198	4.859	5	5	0.514
Monitoring outcomes										
1. Our organisation conducts customer satisfaction surveys frequently		20	44	72	62	198	3.889	4	4	0.965
2. Our organisation uses customer satisfactions surveys results to make improvements		14	44	78	62	198	3.949	4	4	0.905
3. Our organisation involves staff in problem identification on issues concerning service delivery		4	10	94	90	198	4.364	4	4	0.675
4. Our organisation takes corrective actions on gap/problems identified			6	86	106	198	4.505	5	5	0.559
Training										
1. Our organisation has continuous improvement trainings on emerging health issues		6	8	70	114	198	4.475	5	5	0.717
2. Our organisation fully supports staff workshops, conference participation, seminars to help improve workers knowledge			6	72	120	198	4.576	5	5	0.554
3. I have enjoyed a fully sponsored degree programme paid for by our organisation	126	58		4	10	198	1.556	1	1	0.99
4. Our organisation works closely with learning institutions to inform them on the health sector needs			4	84	110	198	4.535	5	5	0.539
5. I am a trainer in one of the local colleges/institutions in the area of my expertise	114	74		2	8	198	1.566	1	1	0.892
2. Health Information Processes										
Availability of information systems										
1. I have full access to our Health Information System	2	8	34	32	122	198	4.333	5	5	0.966

Data element	SD	D	N	A	SA	N(P op)	Mean	Me dia n	Mo de	Std. Deviat ion
2. The current HMIS fully integrates data from individual records, service records and administrative records		4	34	38	122	198	4.404	5	5	0.842
3. Our HMIS always provides me with all the data I need to make decisions		6	40	38	114	198	4.313	5	5	0.897
4. I always document all the services I offer in our HMIS			34	28	136	198	4.515	5	5	0.772
5. The data collection tools are customized in our HMIS to suit our needs		6	42	38	112	198	4.293	5	5	0.904
6. The CCC information system triages the NCD needs of its patient		10	2	34	152	198	4.657	5	5	0.743
7. The CCC can detect and serve the NCD needs of a patient	10	38		18	132	198	4.131	5	5	1.372
8. The CCC tracks the progress of NCD management and treatment				26	172	198	4.869	5	5	0.339
Data Security										
1. I have to use a username and a password to enable me to access our HMIS	4	2	38	10	144	198	4.455	5	5	0.969
2. Hospital Reports are always available to us whenever we need them			8	58	132	198	4.626	5	5	0.563
3. I have access to all patients' medical reports		22	12	58	106	198	4.253	5	5	0.991
Information Sharing										
1. My colleagues can access data that I key in, promptly		18	38	40	102	198	4.141	5	5	1.028
2. It is easy to transmit information to my colleagues using our HMIS		8	44	40	106	198	4.232	5	5	0.933
3. Pooled Resources										
Funding Models										
1. HIV and NCD services are fully paid for by the government	44	22	24	20	88	198	3.434	4	5	1.644
2. HIV services are fully paid for by donors		6	4	6	182	198	4.838	5	5	0.6
3. NCD services are fully paid for by the government	52	28		4	114	198	3.485	5	5	1.81
4. HIV and NCD services are fully paid for by the patient	118	40	28		12	198	1.727	1	1	1.102
5. HIV and NCD services are always paid for through health insurance	92	24	30	30	22	198	2.323	2	1	1.459
Geographic Setting										
1. Our facility is the only facility that serves all patients cases in this locality	14	42		26	116	198	3.949	5	5	1.442
2. Patients easily access our facility for services	12	28	4	22	132	198	4.697	5	5	0.719

Data element	SD	D	N	A	SA	N(P op)	Mean	Me dia n	Mo de	Std. Deviat ion
3. The roads are okay during the rainy seasons so patients can easily access our facility	2	28	8	30	130	198	4.182	5	5	1.332
4. All services are offered in our facility - patients do not have to seek diagnostic services elsewhere		4		14	180	198	3.091	2	5	1.656
Human Recourses										
1. I comfortably manage HIV patients with NCD	4		4	18	172	198	4.768	5	5	0.738
2. I have been well trained and equipped to manage HIV and NCD cases		24	10	64	100	198	4.212	5	5	1
3. I can only manage HIV cases	108	54	2	8	26	198	1.939	1	1	1.38
4. I can only manage NCD cases	128	66	2	2		198	1.384	1	1	0.565
5. We are sufficient (Numbers and skills mix) to manage our department	26	88	6	36	42	198	2.899	2	2	1.414
6. We need more staff members in our department	16	44	4	82	52	198	3.556	4	4	1.308
7. I need the training to be able to manage HIV patients with NCD conditions		34	32	84	48	198	3.737	4	4	1.013
8. I regularly receive integrated care training	8	22	18	66	84	198	3.99	4	5	1.153
4. Governance Structure										
Accountability										
1. I am fully aware of my roles and responsibilities in the organization				12	186	198	4.939	5	5	0.239
2. We work with partners both our/their roles and responsibilities are clear				16	182	198	4.919	5	5	0.273
3. Financial records on how any funding is spent in our facility are accessible		4	4	34	156	198	4.727	5	5	0.601
4. We (facility) operate with a budget				16	182	198	4.919	5	5	0.273
5. Each department manages their budget	56	64	16	32	30	198	2.576	2	2	1.433
Governance Structure										
1. The CCC is fully managed by the program lead	2	28	8	30	130	198	4.303	5	5	1.126
2. The NCD clinic are fully managed by the health facility board		4		14	180	198	4.869	5	5	0.486
3. The CCC and NCD clinic are fully managed by the health facility board	22	76	36	30	34	198	2.889	3	2	1.289
4. The health facility board only manages the facility	6	44	8	30	110	198	3.98	5	5	1.329

Data element	SD	D	N	A	SA	N(P op)	Mean	Me dia n	Mo de	Std. Deviat ion
5. The CCC program lead works closely with the health facility board		2	4	20	172	198	4.818	5	5	0.559
6. All the activities in the health facility are managed by the facility in-charge		2	2	42	152	198	4.737	5	5	0.525
7. Approvals to buy medical products are fully done by the health facility board	2	22	12	40	122	198	4.303	5	5	1.061
Policy										
1. Our organization has an operational policy (local level) in place				14	184	198	4.929	5	5	0.257
2. I am knowledgeable about our organization's policy				10	188	198	4.949	5	5	0.22
3. Our organization policy is aligned with the national policy				12	186	198	4.939	5	5	0.239
4. I am aware of the Kenya Health policy, and we are fully implementing it in our facility				32	166	198	4.838	5	5	0.369
5. I am aware of the UHC policy, and we are fully implementing it in our facility				18	180	198	4.909	5	5	0.288
5. Organisation Culture										
Innovative oriented Culture										
1. Our organisation allows staff to come up with new ideas		4	4	58	132	198	4.606	5	5	0.634
2. Our organisation allows staff members to implement new ideas		30	16	62	90	198	4.071	4	5	1.069
3. Staff members are rewarded for the new ideas that improve efficiency in service delivery	6	68	40	54	30	198	3.172	3	2	1.149
4. Staff members are promoted when they successfully implement new ideas	106	70	4	4	14	198	1.737	1	1	1.1
5. Our organisation always invests in potential ideas that can improve service delivery		4	12	62	120	198	4.505	5	5	0.703
6. Healthcare workers fully embrace working together with members from different departments as they serve HIV and NCD clients				56	142	198	4.717	5	5	0.452
7. I fully share common values with colleagues in my organization				40	158	198	4.798	5	5	0.403
9. Our health facility currently provides HIV/NCD healthcare services under one roof	36		20	26	116	198	3.838	5	5	1.617
10. HIV/NCD integrated care is a superior form of patient care				30	168	198	4.848	5	5	0.359

Data element	SD	D	N	A	SA	N(P op)	Mean	Me dia n	Mo de	Std. Deviat ion
11. HIV/NCD integrated care saves clinic time, energy and resources				26	172	198	4.869	5	5	0.339
12. I mostly have the same beliefs as my colleagues on work issues			8	40	150	198	4.717	5	5	0.534
13. I am always ready to learn from my colleagues on new practices				38	160	198	4.808	5	5	0.395
Integration of healthcare services										
1. Most healthcare workers are competent to provide HIV and NCD services	4	40	8	44	102	198	4.01	5	5	1.246
2. HIV services are offered only by care providers in the CCC	48	32	2	8	108	198	3.485	5	5	1.77
3. NCD services are offered only by care providers in the main health facility	58	28	4	14	94	198	3.293	4	5	1.793
4. This facility has patient management guidelines for HIV service provision				20	178	198	4.899	5	5	0.302
5. This facility has patient management guidelines for NCD service provision				26	172	198	4.869	5	5	0.339
6. All HIV and NCDs lab tests are done in the main health facility lab	42	66		20	70	198	3.051	2	5	1.646
7. HIV drugs are available and accessible in the main pharmacy		44	6	32	116	198	4.111	5	5	1.225
8. All our patients including the HIV patients are managed at one common point of care	84	10		22	82	198	3.04	4	1	1.879
9. HIV and NCD specialists regularly review each other's notes in the CCC		2		32	164	198	4.808	5	5	0.466
10. HIV and NCD specialists regularly consult about patient care in the CCC			2	20	176	198	4.879	5	5	0.357
12. The CCC has a sufficient number of NCD specialists on-site	18	110	6	26	38	198	2.778	2	2	1.333
13. HIV and NCD specialists are treated as equals within the clinic		4		36	158	198	4.758	5	5	0.554
14. The CCC and NCD care treatment plans are merged	2	6	2	26	162	198	4.717	5	5	0.727
15. The CCC scheduling systems allow NCD cases to be scheduled for a same-day appointment with HIV reviews		12	6	34	146	198	4.586	5	5	0.819
16. I comfortably multitask in providing care for HIV as well as NCD patients	12	16	26	16	128	198	4.172	5	5	1.275

Data element	SD	D	N	A	SA	N(P op)	Mean	Me dia n	Mo de	Std. Deviat ion
17. Our data collection systems have all patients who seek care from our facility				38	160	198	4.808	5	5	0.395
18. I manage care needs for all patients both HIV and NCD patients	28	30		14	126	198	3.909	5	5	1.587
19. I only manage HIV patients	96	34		6	62	198	2.515	2	1	1.782
20. I only manage NCD patients	142	48	2	4	2	198	1.364	1	1	0.705
Outcome Oriented Culture										
1. This facility uses to pay for performance programs to improve the quality of HIV/NCD care	2	42	34	52	68	198	3.717	4	5	1.175
2. 360-Degree Feedback, also known as Multisource Feedback (MSF), is a performance appraisal methodology used to assess HIV/NCD care in this facility		6	4	86	102	198	4.434	5	5	0.686
3. This facility has a balanced scorecard that measures HIV/NCD integration performance	8	48	16	36	90	198	3.768	4	5	1.351
4. This facility has a balanced scorecard that links the overall health sector strategies to measurable targets and actions	2	2		70	124	198	4.576	5	5	0.654
5. This facility leadership facilitates a structured system for collecting information about the performance of healthcare workers engaged in HIV/NCD integrated services provision	2	8	2	78	108	198	4.424	5	5	0.795
Sustainability Services										
1. NCD/HIV services are fully supported by health insurance in our facility	82	30	20	18	48	198	2.596	2	1	1.649
2. NCD/HIV services are partially supported by health insurance in our facility	92	14	10	40	42	198	2.626	2	1	1.69
3. NCD/HIV services are fully paid for by the patients (Out of pocket)	112	44	32	6	4	198	1.717	1	1	0.977
4. There is increasing demand for HIV/NCD services				10	188	198	4.949	5	5	0.22
Team Oriented Culture										
1. Our health facility leadership would like to see integrated health services			34	46	118	198	4.424	5	5	0.769
2. My organization has strong dedicated leadership that supports HIV/NCD clinics to work together		2	2	56	138	198	4.667	5	5	0.552

Data element	SD	D	N	A	SA	N(P op)	Mean	Me dia n	Mo de	Std. Deviat ion
3. Our different departmental leaders always work in harmony as a team				34	164	198	4.828	5	5	0.378
4. Each leader in our organization has specific responsibilities they handle				26	172	198	4.869	5	5	0.339
5. I am fully aware of our organization's vision and direction				38	160	198	4.808	5	5	0.395
6. Our Health facility has at least one HIV/NCD integrated care champion	10	38		36	114	198	4.04	5	5	1.344
7. The administrators in the health facility value HIV/NCD integrated care		14	34	30	120	198	4.293	5	5	0.99
6. Health System Performance										
Link needs and Objectives										
1. I believe if HIV/NCD needs are identified it will assist our organisation to minimise the cost of operations				22	176	198	4.889	5	5	0.315
2. I am fully aware that if HIV and NCD services are put together patients waiting time would be less				20	178	198	4.899	5	5	0.302
13. It would be easy to build capacity if HIV and NCD services are put under one roof		2	8	28	160	198	4.747	5	5	0.576
Merged patients flow processes										
1. Our registry captures both HIV and NCD data during patient registration	20	20	2	20	136	198	4.172	5	5	1.411
2. We have one cash collection office in the facility where HIV and NCD services are paid for	10	4	72	10	102	198	3.96	5	5	1.192
3. HIV and NCD clinics can comfortably manage patients from one access point	4	20	6	18	150	198	4.465	5	5	1.079
4. HIV and NCD clinics can comfortably use the main pharmacy to issue drugs to patients		4		14	180	198	4.869	5	5	0.486
5. Our registry only captures HIV patients' data		24	74	10	90	198	3.343	4	5	1.619
6. Our registry only captures NCD patient's data	26	72	4	14	82	198	3.273	3	5	1.598
7. HIV and NCD services are managed from different access points	72	28	4	4	90	198	3.061	2	5	1.857
8. The combined streaming and triage process facilitates patient flow, prioritising HIV/NCD services			8	30	160	198	4.768	5	5	0.51

Data element	SD	D	N	A	SA	N(P op)	Mean	Me dia n	Mo de	Std. Deviat ion
9. Requesting basic investigations (ECGs, urine tests, X-rays) during the triage process at the integrated HIV/NCD clinics improves flow by reducing the number of steps after the main clinical assessment			6	62	130	198	4.626	5	5	0.544
10. The introduction of a common HIV/NCD examination room supports a flexible assessment organizational work process and reduces the time staff spent searching for available space.		2	4	54	138	198	4.657	5	5	0.573
11. Streamlined point of care testing, laboratory and pharmacy services facilitates flow by providing HIV/NCD services on-time and reducing dependency on external departments				62	136	198	4.687	5	5	0.465
12. Dependency on external departments (laboratory and radiology departments) delays decision-making and patient outflow for HIV/NCD services.				64	134	198	4.677	5	5	0.469
Shared Responsibilities										
1. HIV and NCD clinics both have a separate HR data for their staff	58	56		12	72	198	2.919	2	5	1.726
2. HIV and NCD clinics both pay for their overhead expenses separately (water, electricity, general maintenance, vehicle maintenance)	160	36	2			198	1.202	1	1	0.427
3. HIV and NCD clinics share one HR data for the staff	60	24	2	22	90	198	3.293	4	5	1.787
4. HIV and NCD clinics have a combined overhead cost Centre (utility bill)				8	190	198	4.96	5	5	0.197

Appendix 9: NACOSTI Research License

 REPUBLIC OF KENYA Ref No: 447205	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION Date of Issue: 17/January/2023
RESEARCH LICENSE	
	
This is to Certify that Mr. Njuguna Kiyanjui David of Kenya Methodist University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nakuru on the topic: THE ROLE OF HEALTHCARE SERVICES INTEGRATION IN HEALTH SYSTEM PERFORMANCE: A CASE OF HIV/AIDS AND NCD SERVICES IN NAKURU COUNTY, KENYA. for the period ending : 17/January/2024.	
License No: NACOSTI/P/23/22899	
Applicant Identification Number	Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Verification QR Code	
	
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See overleaf for conditions	

Appendix 10: KEMU SERC Authorization



KENYA METHODIST UNIVERSITY
P. O. BOX 267 MERU - 60200, KENYA FAX: 254-64-30162
TEL: 254-064-30301/31229/30367/31171 EMAIL: INFO@KEMU.AC.KE

December 14, 2022

KeMU/SERC/HSM 27/2022

NJUGUNA DAVID KINYANJUI
HSM-4-0230-1/2020

Dear David,

SUBJECT: THE ROLE OF HEALTH CARE SERVICES INTERGRATION IN HEALTH SYSTEM PERFORMANCE: A CASE OF HIV/AIDS AND NCD SERVICES IN NAKURU COUNTY, KENYA

This is to inform you that Kenya Methodist University Scientific Ethics and Review Committee has reviewed and approved your research proposal. Your application approval number is KeMU/SERC/HSM /27/2022. The approval period is 14th December, 2022 – 14th December, 2023.

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 Kenya Methodist University Scientific Ethics and Review committee.
- 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 KeMU SERC 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 KeMU SERC within 72 hours.
- V. Clearance for 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 expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- VII. Submission of an executive summary report within 90 days upon completion of the study to KeMU SERC.

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

DR. HERBERT KIREBE
SECRETARY, SERC

Appendix 11: NAKURU County Department of Health Authorization



DEPARTMENT OF HEALTH SERVICES NAKURU COUNTY



Email: cohealth.nakuru@gmail.com

DEPARTMENT OF HEALTH SERVICES
P.O. BOX 2060 – 20100
NAKURU

REF: NCG/CDPH/RES/VOL.1/2023/667

22nd March, 2023

To

- All Medical Superintendents
- All Sub County Team Leads
NAKURU

RE: RESEARCH AUTHORISATION

This letter serves an authorization from the Department of Health for **David K. Njuguna** who is a researcher to carry out research in your facility. The study titled is ***“The role of healthcare services integration in health system performance: A case study of HIV/AIDs and NCD services in Nakuru County, Kenya”***.

The study will be carried out in Nakuru County and was approved by Nakuru County Research committee on 15th March, 2023.

Please allow the investigator to carry out the study and accord him the necessary support.

DR. JOY MUGAMBI
COUNTY DIRECTOR, ADMINISTRATION & PLANNING
NAKURU



C.C:

- David K. Njuguna

Appendix 12: Publications

Public Health Research 2023, 13(2): 39-50
DOI: 10.5923/j.phr.20231302.01

Integration of HIV and NCD Service Provision: Cost Savings and Implications in Nakuru County, Kenya

Njuguna K. David^{1,*}, Caroline Kawila Kyalo², Eunice Muthoni Mwangi³

¹Health Economist, Ministry of Health, Nairobi, Kenya

²Health System Management Expert, Department of Health Systems Management, School of Medicine and Health Sciences, Kenya Methodist University, Nairobi, Kenya

³Health System Management Scientist, Department of Population Health, Aga Khan University-East Africa

Abstract Background: Dwindling donor funding has been on the rise. Therefore healthcare systems are forced to strategize on how to manage their service delivery with the available resources. There is need to sustain the healthcare services delivery. Integration of Human Immunodeficiency Virus (HIV) and (Non-Communicable Diseases) NCDs services has emerged as a potential solution to improve patient outcomes and optimize resource utilization. This study aimed to evaluate the cost savings associated with integrating HIV services with three common NCDs: Diabetes Mellitus (DM), hypertension (HTN), and the combination of diabetes and hypertension (DM/HTN) in Nakuru County. **Methods:** This study utilized a hybrid costing approach that combined both top-down and ingredients approaches. The costing analysis took a health system perspective and for acute conditions, the time horizon considered was a case management episode. To determine cost savings, integrated service costs were subtracted from the cumulative costs of individual services on a per-case basis. **Results:** Integration of HIV and diabetes services resulted in annual cost savings of KES 7,086 (21%) per case. Similarly, integrating HIV with hypertension services yielded cost savings of KES 6,166 (19%) per case. The greatest cost savings were observed when integrating HIV with both diabetes and hypertension services, with annual savings of KES 10,653 (29%) per case. **Conclusion:** The study results prove that integrating HIV/NCD services would save the healthcare system costs incurred while delivering the services in a parallel model. Hence recommends that healthcare service delivery be supported using an integrated care model to enhance sustainability of the services that have been heavily funded by donors in this country.

Keywords HIV/NCDs, Cost savings, Integration, Kenya, Costing, and Process map

1. Introduction

Kenya's recent reclassification as a lower middle-income country (LMIC) has significant implications for its eligibility for development assistance. As some donors begin to transition out, it is crucial to manage this transition effectively to prevent a reversal of the health gains achieved. To address this challenge, a reprogramming of health services is necessary, shifting from parallel disease programs to integrated health services and emphasizing preventive care through publicly funded primary healthcare. Integrating HIV and non-communicable disease (NCD) programs can generate cost savings that can be redirected towards strengthening healthcare systems, expanding access to care, and improving overall population health.

In Sub-Saharan Africa (SSA), non-communicable diseases (NCDs) such as diabetes, neoplasms, cardiovascular diseases,

and mental illnesses are prevalent among individuals living with HIV (HIV-positive people). The presence of these NCDs poses a significant threat to the progress made in HIV treatment programs. They not only contribute to increased impairment and mortality rates among HIV-positive individuals in SSA but also present additional challenges in providing comprehensive healthcare for this population [1]. People living with HIV (PLWHIV) are more susceptible to non-communicable diseases (NCDs) due to several factors. The inflammatory markers that are stimulated by HIV infection, as well as the potential adverse effects associated with antiretroviral therapy, contribute to this increased risk. Additionally, behaviors such as tobacco smoking, alcoholism, unhealthy diet, and physical inactivity further exacerbate the likelihood of acquiring NCDs among individuals with HIV. It is important to address these risk factors and promote healthy lifestyles to minimize the burden of NCDs in this population. [2]. High viral suppression and increased life expectancy among PLWHIV, and the expanded access to care also increase the window period for NCDs to progress as PLWHIV ages [3]. Elevated

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Drivers of a Functional Integrated HIV/NCDs Care Model for a Sustainable Healthcare System; Lessons from Nakuru County, Kenya

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¹Department of Planning, Ministry of Health, Nairobi, Kenya

²Department of Health Systems Management, School of Medicine and Health Sciences, Kenya Methodist University, Nairobi, Kenya

³Department of Population Health, Aga Khan University, East Africa

Abstract Background: Healthcare financing and resourcing have always been of great concern to low- and middle-income countries and households. Stakeholders must devise innovative ways to remain in operation amidst reducing financing and dynamic disease etiology to ensure that there is consistent access to quality healthcare services. The integration of Human Immunodeficiency Virus (HIV) and non-communicable disease (NCD) services has emerged as a crucial approach to optimize healthcare delivery and improve health outcomes. NCD and Human HIV programs are currently managed separately, despite frequent interconnections. The study aimed to conduct a regression analysis of an HIV/NCD integration model for healthcare providers to improve the performance of healthcare services in Nakuru County. **Methods:** This study explains the effect of the explanatory variables - institutional support, health information processes, pooled resources, and collaboration-on the explained variable- Healthcare System performance-, utilizing a multiple regression model. Organizational culture was also used to moderate the relationship between the explanatory variables and the explained variable. Data were collected from a representative sample of 123 healthcare workers drawn from 106 healthcare facilities providing both HIV/NCD services in Nakuru County, Kenya. The explanatory and moderating variables were selected based on their potential to influence healthcare system performance. The regression models were adjusted for potential confounding variables to ensure the robustness of the findings. **Results:** In the Multivariate analysis, organizational culture was significant in moderating the relationship between the integration of health services and the performance of the healthcare system, with a p-value of less than 0.05. Specifically, health facilities that embraced a team-oriented organization culture in delivering HIV/NCD service treatment and care were 2.142 times more likely to achieve sustainability of the services as compared to those that did not adopt a team-oriented organization culture. These results were statistically significant at a 95 percent confidence level. The findings of the study also revealed that institutional support in monitoring outcomes had a positive and significant influence on the performance of the healthcare system. Health information processes have a significant influence on healthcare system performance in Nakuru County. Health facilities that utilized functioning information systems during the provision of HIV/NCD services were 1.987 times more likely to achieve sustainability of the services compared to those without such systems. The findings also indicate that the performance of the healthcare system in Nakuru County was significantly influenced by human resources and funding models. Conversely, the findings suggest that there is no significant association between the collaboration guidelines and the performance of the healthcare system in Nakuru County. **Conclusions:** This study highlights the importance of cultivating a team-oriented organizational culture within healthcare facilities and a need for institutional support. Additionally, the availability and the ability to leverage on available resources contribute greatly to the sustainability of services, leading to a better-performing healthcare system. These findings can guide healthcare providers in developing strategies and interventions to enhance the integration of health services and improve overall healthcare outcomes.

Keywords HIV, NCDs, Integration, Healthcare System, Performance

1. Introduction

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The prevalence of non-communicable diseases (NCDs) on a global scale is persistently rising, resulting in approximately 41 million deaths every year. This staggering number accounts for approximately 71% of all deaths worldwide [1]. The rise in the burden of NCD among HIV-positive people is evident therefore, integrating these

Appendix 13: Conference Presentation acknowledgement



**NATIONAL SYNDemic DISEASES
CONTROL COUNCIL**

Telephone: 020-2896000 / 2711261 / 2715109
Hotline: 020-2715000
Toll-Free: 0800 720007
Fax No.: 020 -2711072
Email: communication@nsdcc.go.ke
Website: www.nsdcc.go.ke

Landmark Plaza
8th and 9th Floor
Argwings Kodhek Road
P.O. Box 61307-00200
NAIROBI

When replying please quote:

Ref. No. NACC/P/4/29/1/1

Date: September 11, 2023

David Njuguna
Ministry of Health,
NAIROBI

Dear Mr Njuguna,

RE: APPRECIATION

I would like to acknowledge and appreciate your participation in the session on the **Transition of Funding and Implementation Arrangements: Navigating Sustainability in the HIV Response**. Your conference presentation, the depth of your analysis and the clarity with which you presented the two topics;

- 1) The drivers of a functional HIV/NCD services integrated care model for a sustainable healthcare system;
- 2) The predictable cost savings from an integrated model and its implications in Nakuru County.

Your insights provided a deeper understanding of the challenges and opportunities in HIV/NCD service integration, and I am confident that they will have a lasting impact on the field. Thank you for your dedication and hard work in preparing and delivering such an informative and impactful presentation. Your contribution not only enriched the conference but also added significant value to the discussions surrounding the conference theme. The chance to engage with experts like yourself and exchange ideas is truly rewarding, and I believe that together, we can achieve even greater advancements in the field of HIV/NCD service integration.

Ending Syndemic Diseases as Public Health Threats in Kenya

National Syndemic Diseases Control Council is ISO 9001:2015 Certified

