INFLUENCE OF HUMAN IMMUNODEFICIENCY VIRUS (HIV) AND AIDS PREVALENCE ON THE SOCIO-ECONOMIC WELLBEING OF FISHERMEN IN FISH LANDING BEACHES IN HOMA BAY COUNTY, KENYA

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DECLARATION AND APPROVAL

Declaration

This thesis/project is my original work and has never been presented for any academic award in any institution.

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DEDICATION

To my late loving father and mother Mr. and Mrs. Casmir and Eunice Odumbe who gave their love, resources and unending prayers to God for my academic success.

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Glory, and honour to God almighty. My wife Rubina Florence Adhiambo Omare, my late father Mr Casmir Odumbe, my brother Mr Onesimus Odumbe and his family, my sisters Ms Elizabeth Omit and Ms Lucy Onyango who all stood with me and encouraged me to continue with my studies despite the odds. To my friends, Robin Masinde, Charity Kola, Michael Onyango, and Silas Odindo. I appreciate you for your support, encouragement, advice, and understanding throughout my master's course. I also direct my sincere appreciation to Mount Kenya University, and my supervisors, Dr Kefa Obondi Nyandoro and Dr Ibrahim Nyaboga, who guided me throughout this thesis proposal development. I would also like to recognize my Post Graduate Coordinator Dr Wambui Mwangi and Mrs. Loiser Mwakio, all lecturers, who supported me during the study period. To those that I have not acknowledged here, I thank you all for your great assistance.

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ABSTRACT

Human Immunodeficiency Virus (HIV) has negatively influenced the socio-economic wellbeing of affected countries. In 2020, the global economic impact of HIV/AIDS was estimated at a loss of $58 billion, with approximately 39 million individuals living with the condition and 630,000 deaths attributed to AIDS-related illnesses in 2022. HIV/AIDS reduces labour productivity due to illness, absenteeism, and premature death. The HIV/AIDS prevalence in Homa Bay County is almost 4 times higher (15.2%) than the countrywide HIV/AIDS prevalence, which stood 4% in 2023 when this study was conducted. This study sought to assess how the high incidence of HIV and AIDS in fish landing beaches in Homa Bay County affected the socio-economic well-being in the region. The study focused on three distinct objectives which sought to estimate the impact of HIV/AIDS on productivity and efficiency, human capital, costs of healthcare expenditure on the socio-economic wellbeing of fish landing beaches in Homa Bay County, Kenya. This study was directed by human capital theory and the neoclassical economic theory. The study used a mixed approach. The research adopted both descriptive and cross-sectional research designs. Purposive sampling was employed to identify the study area while simple random sampling techniques were utilized to select the study participants. A total of 178 households were sampled for this study. The researcher employed a questionnaire, a key informant interview schedule, and Focus Group Discussions (FGDs) guide to collect data. The research indicated that HIV/AIDS adversely affected the productivity of fishermen. Findings indicates that fishermen living with HIV/AIDS and also on ARVs were not as physically strong as their healthy counterparts. This contributed to reduced fish catch. The inefficiency was hard to avoid as many fishermen concealed their HIV status or looked healthy and were always ready to go fishing despite their physical weakness. The effects of HIV/AIDS on the health and well-being of fishermen has resulted in reduced productivity at the fish landing beaches in Homa Bay. Available human capital at the fish landing beaches was not healthy which resulted in lower productivity as labourers were weak and were not robust enough physically and mentally to produce expected fish catch within a given timeframe. HIV/AIDS-related healthcare expenditure at individual and household levels had the greatest influence on socio-economic wellbeing because the affected individuals and household lost their purchasing power after losing their jobs, both their lifesaving and assets to HIV/AIDS treatment and care as they fought to save their own lives or the lives of one or more infected members of their households. This was made worse by the high cost of healthcare and low income among the fishing communities at the fish landing beaches along the shores of Lake Vitoria. It was recommended that the government of Kenya should intensify their efforts to combat new infection which was found to be driven by illiteracy, cash flow and rampant prostitution because which was in turn fuelled by the fact that people didn't know each other due the immigration from other parts of the country and even illegal cross-borders immigration.

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AIDS	Acquired Immunodeficiency Syndrome
ARV	Antiretroviral
CASP	County AIDS Strategic Plan
CIDP	County Integrated Development Plan
COVID-19	CO stands for corona, VI for the virus, D for disease, and 19 for the year 2019
EGPAF	Elizabeth Glaser Paediatric AIDS Foundation
FGD	Focussed Group Discussion
GDP	Gross Domestic Product
HIPORS	HIV/AIDS Implementing Partners Online Reporting System
HIV	Human Immunodeficiency Virus
NACC	National Aids Control Council
ODK	Open Data Kit
RAs	Research Assistants
SARS	Severe Acute Respiratory Syndrome
SPSS	Statistical Package for the Social Sciences
TB	Tuberculosis
NGOs	Non-Governmental Organizations
NACOSTI	National Commission for Science, Technology & Innovation

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The United Nations Programme on HIV and AIDS reports that since the onset of the AIDS epidemic, more than 40 years ago, almost 85.6 million individuals worldwide have been infected with HIV/AIDS, and 40.4 million people have passed away from HIV/AIDS-related illnesses (UNAIDS, 2022). According to the research, 3,100 of the approximately 4,000 adolescent girls and young women aged 15 to 24 who contracted HIV/AIDS worldwide each week in 2022 did so in sub-Saharan Africa. According to UNAIDS data, 39 million individuals globally were predicted to be HIV/AIDS positive as of 2022. The most impacted region is SubSaharan Africa, where about two-thirds of all HIV/AIDS-positive individuals worldwide reside.

The prevalence of Human Immunodeficiency Virus (HIV) is intricately linked to socioeconomic wellbeing, with the disease's influence permeating multiple economic sectors, such as agriculture, education, and healthcare, among others. A UNAIDS study (2016) indicates that HIV/AIDS impacts the workforce, diminishes productivity, and elevates absenteeism, resulting in economic losses. A recent study by Kwon et al. (2020) showed that HIV/AIDS adversely affected labor productivity in sub-Saharan African nations, where the epidemic is most pronounced. A study published in The Lancet HIV/AIDS (2020) indicates that individuals with HIV and AIDS in sub-Saharan Africa reported a 3.3% decline in labor output attributable to sickness. Holmes et al. (2020) indicated that HIV/AIDS-related health care expenditures constituted 9% of overall health care spending in sub-Saharan African nations in 2018. A study by Razzak, Aziz, and Kazi (2021) revealed that HIV/AIDS adversely affected elementary school enrollment and completion rates in sub-Saharan African nations.

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The financial toll that HIV/AIDS takes on impacted people, communities, and healthcare systems has been brought to light by recent academic research in Asia (Masis, Gichaga, Zerayacob, Lu, & Perry, 2021). Promoting socioeconomic wellness and accomplishing sustainable development goals depend heavily on initiatives to decrease the incidence of HIV/AIDS and enhance the lives of individuals impacted by the virus. According to a Chinese study by Cheng et al. (2021), people with HIV had to deal with major financial obstacles like lower income and greater medical expenses. Their capacity to get necessities like food, housing, and education was subsequently impacted. According to an Iranian study by Shokoohi et al. (2021), HIV-positive people experienced discrimination and stigma at work, which resulted in fewer job prospects and income loss. Additionally, HIV-positive individuals may face discrimination in healthcare settings, which could limit their access to healthcare services and affect their health outcomes. Also, a study by Wilson et al. (2020) in Thailand found that the cost of providing antiretroviral therapy to HIV-positive individuals placed a significant burden on the healthcare system. This could limit resources available for other health services and impact the overall socio-economic well-being of the nation.

The Avert report of 2019 indicated that 85.7% of new HIV & AIDS illnesses among adolescents of 15 to 19 years in sub-Saharan Africa were girls (UNAIDS, 2021). UNAIDS further stresses the significance of HIV and AIDS on the socio-economic wellbeing of the region highlighting several key contextual factors that contribute to the incidence of these diseases in Sub-Saharan Africa, and how this, in turn, impacts socio-economic wellbeing as it demands significant financial resources which could otherwise be used in development programs. Sweeney et al. (2014) note that HIV/AIDS treatment programs in sub-Saharan Africa are costly and require sustainable funding to be effective. The study suggested that innovative financing mechanisms and collaborations between governments, donors, and the

private sector are needed to ensure the sustainability of HIV/AIDS programs and mitigate the economic repercussions of HIV.

Recent scholarly work in Kenya has highlighted the detrimental impact of HIV and AIDS prevalence on socio-economic wellbeing. Gathecha et al. (2021) discovered that HIV-positive individuals were more likely to experience reduced productivity due to ill health, stigma, and discrimination, resulting in lower income and economic insecurity. This can lead to increased poverty and decreased investment in human capital, leading to a reduction in economic growth. The influence of HIV & AIDS on the socio-economic wellbeing of fishermen is not only limited to the individual and household level but also affects the broader economy. HIV/AIDS prevalence can lead to a reduction in the labour force, particularly among young adults, which can lead to a decline in economic growth (Kirui et al., 2021). Additionally, HIV/AIDS treatment and care require significant investments in healthcare infrastructure and human resources, diverting resources away from other critical areas of development.

HIV/AIDS prevalence in Kenya remains a significant public health concern, with varying rates across different demographic groups and regions (Ngugi, Kimani, Kabiru, Ng'ang'a & Wamicwe, 2021). According to the Kenya AIDS Response Progress Report 2020, the estimated incidence of HIV & AIDS among adults of age 15-64 years in Kenya is 4.9%. The prevalence of HIV & AIDS is greater in women (6.2%) compared to men (3.4%). The Nyanza region of Kenya exhibits the highest prevalence of HIV/AIDS, estimated at 14.9%. The prevalence of HIV and AIDS is notably high in regions such as Nairobi (5.9%) and Western (5.1%). New cases of HIV/AIDS infections in Kenya have decreased in recent years, from an estimated 77,200 new infections in 2010 to 36,000 in 2020. The rate of AIDS-related deaths has significantly decreased, from approximately 76,300 in 2010 to 16,000 in 2020.

The prevalence of HIV and AIDS In the Nyanza region of Kenya, the estimated prevalence among individuals aged 15-64 years was 15.1% in 2020 (Owili et al., 2021). This exceeds the countrywide prevalence of HIV/AIDS in Kenya, estimated at 4.7% in the same year. Poverty, inadequate education, gender disparity, and cultural practices like widow inheritance and polygamy contribute significantly to the rising prevalence of HIV and AIDS. Initiatives to mitigate the proliferation of HIV/AIDS in the Nyanza region encompass enhancing access to HIV & AIDS testing and treatment, advocating for safer sexual behaviors, and tackling societal and cultural determinants that facilitate the transmission of the virus. Notwithstanding these initiatives, considerable efforts remain necessary to diminish the frequency of HIV/AIDS in the region.

The 2023 Kenyan HIV and AIDS Estimates report indicates that the rate of HIV/AIDS in Homa Bay County is 15.2%, which is more than four times the national rate of 4%. According to the County Integrated Development Plan (CIDP), children in Lakeside County of Homa Bay account for at least 15.1% of new HIV/AIDS infections in Kenya, while adults account for 14.0%. The 2016 HIV/AIDS County Profiles report shows that the prevalence rate of HIV/AIDS is higher in females (27.8%) compared to males (24.0%). This indicates that women exhibit greater susceptibility than men to contracting the HIV/AIDS virus.

The administration of Homa Bay County, in their ‘ CIDP 2018-2022 plans to continue to offer more sensitization programs to prevent the reoccurrences that affect the industrious populace, particularly the youth, and will require a whooping Ksh.70,000,000,000 (Seventy billion Kenya shillings) to specifically facilitate interventions to help lower the occurrences of HIV, shrink

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HIV/AIDS death toll, start a generation without HIV, increase access to care in the County but little evidence is available on the root courses of the HIV/AIDS prevalence in the county. This information that has challenged scientific research on HIV & AIDS prevalence has influenced researchers' perspectives regarding the high prevalence of HIV & AIDS in Homa Bay County, particularly its economic implications and effects on the fishing populations residing along the lake's shorelines, as well as potential mitigation strategies for this issue. This study delved deeper to understand the methodologies applied in the previous studies and determined how best to capture the real causes of the high HIV/AIDS prevalence in Homa Bay County and particularly in the fish landing areas along the shores and highlands of Lake Victoria.

1.2 Statement of the Problem

The Joint United Nations Programme on HIV/AIDS (UNAIDS) recorded approximately 38 million individuals with HIV & AIDS and 690,000 deaths due to AIDS-related illnesses in 2019, with an anticipated economic impact of $58 billion globally in 2020 (Chittooran, 2020; UNAIDS, 2019). HIV/AIDS also has a significant influence on productivity and economic growth, as individuals with the disease may need to take time off work for medical appointments or due to illness. Additionally, they may face discrimination and stigma in the workplace, which could negatively impact their job opportunities and income. The Elizabeth Glaser Pediatric AIDS Foundation [EGPAF], (2017), has revealed that 19,000 children in the Homa Bay County are HIV-positive, with only 8,000 identified and receiving treatment. If not addressed effectively, this problem will have significant and long-lasting negative impacts on the county's development plans for future generations. Despite massive funding and intervention efforts over the past thirty years, HIV and AIDS continue to be a significant concern in the County. The high rate of HIV & AIDS has extensive and profound repercussions, impacting communities socially, economically, and psychologically. In areas

with high HIV/AIDS prevalence, such as fish landing beaches, the economic consequences can be particularly significant. These beaches are crucial economic centres, providing livelihoods for many people, but HIV/AIDS can cause increased morbidity and mortality, resulting in reduced productivity and economic growth. The physically demanding nature of fishing means that the loss of skilled fishermen due to HIV/AIDS can lead to reduced fish catch, affecting the entire supply chain. The cost of healthcare services and HIV/AIDS treatment is also a significant burden, reducing investment in education and infrastructure. Additionally, stigma can limit economic opportunities, especially for women.

Despite comprehensive research on the economic and social ramifications of HIV/AIDS. Research gaps persist about its sector-specific repercussions, especially in fishing communities. These communities encounter distinct vulnerabilities including labor shortages, skill attrition, and challenges to community resilience. Current research, Sichei et al. (2020) and Mbong & Alagoa (2021), examines human capital in general, neglecting the particular dynamics of fishing communities. Although Pitts & Rosenman (2020) and Kapwepwe et al. (2021) offer insights into nations such as South Africa and Zambia. There is a paucity of emphasis on the Kenyan setting, especially in Homa Bay County, which exhibits one of the highest incidence rates of HIV & AIDS. Moreover, research by Comas-Herrera et al. (2021) investigates the impact of HIV/AIDS on education and workforce engagement, yet neglects the intergenerational consequences on skill transfer and human capital advancement within impacted households. Alemayehu et al. (2022) and Anand et al. (2019) underscore the financial consequences of HIV/AIDS. They do not explore healthcare expenditure patterns particular to fishing communities. This study seeks to examine the influence of HIV/AIDS prevalence on the socio-economic welfare of fishermen at fish landing beaches in Homa Bay County. The study offers a localized and sector-specific insights for a high-prevalence region in the country,

essential for targeted interventions.

1.3 Purpose of the study

The purpose of the study was to evaluate the influence of HIV/AIDS prevalence on the socioeconomic wellbeing of the fishing community, and how its negative effects can be countered to improve the socio-economic wellbeing of fishermen in the fish-landing beaches in Homa

Bay County, Kenya.

1.4 Objectives of the Study

i. To assess the influence of HIV/AIDS prevalence on the productivity of fishermen in fish landing beaches. A case of Homa Bay County, Kenya.
ii. To examine the influence of HIV/AIDS prevalence on human capital in the fish landing beaches. A case of Homa Bay County, Kenya.
iii. To examine the influence of HIV/AIDS prevalence on the healthcare expenditure of fishermen at the fish landing beaches. A case of Homa Bay County, Kenya.

1.5 Research Questions

i. What is the influence of HIV/AIDS prevalence on the productivity of fishermen in fish landing beaches in Homa Bay County, Kenya?
ii. What is the influence of HIV/AIDS prevalence on human capital in the fish landing beaches in Homa Bay County, Kenya?
iii. What is the influence of HIV/AIDS prevalence on the healthcare expenditure of fishermen in the fish landing beaches in Homa Bay County, Kenya?

1.6 Significance of the study

The investigation on the aftermath of Human Immunodeficiency Virus (HIV) prevalence on socio-economic welfare at fish landing beaches in Homa Bay County, Kenya, is important for various reasons: It sheds light on the impact of HIV and AIDS on socio-economic wellbeing in a specific context. The study focused on fish landing beaches in Homa Bay County, Kenya,

where fishing is a major economic activity. By examining how HIV/AIDS prevalence affects the economic well-being of people in this region, offering significant insights into the correlation between health and socio-economic well-being.

The study highlighted the unique challenges faced by communities in developing countries that are heavily affected by HIV. In many African countries, including Kenya, HIV/AIDS is a significant public health challenge, and it disproportionately affects marginalized communities such as fisherfolk. The study offered significant insights into the social and economic effects of HIV and AIDS in this setting by concentrating on this particular demographic. The study's conclusions can guide programmatic and policy initiatives to address how HIV/AIDS affects socioeconomic well-being. According to the study, the frequency of HIV & AIDS among Homa Bay County's fishermen is inversely correlated with their income, underscoring the necessity of focused interventions to mitigate the financial burden of the disease on this demographic. The results of the study can assist development professionals and policymakers in creating more efficient interventions to support individuals with HIV & AIDS and mitigate the financial impact of the disease.

1.7 Justification of the Study

The Fisheries Annual Statistical Bulletin (2021) published by The State Department for Fisheries and the Blue Economy within the Ministry of Agriculture, Livestock, Fisheries & Cooperatives presents an analysis comparing fish catches from Lake Victoria across riparian counties. Homa Bay County recorded the highest catch at 57%, followed by Siaya at 32%, with Kisumu and Busia each at 4%, while Migori reported the lowest catch at 3%. The investigation on the influence of HIV & AIDS prevalence on socio-economic welfare among fish landing beaches in Homa Bay County, Kenya is warranted for several reasons: HIV/AIDS is a

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substantial public health issue globally, particularly in Kenya, with Homa Bay County seeing a profound effect on the social and economic welfare of impacted persons and communities. Understanding the effect of HIV and AIDS prevalence on the socio-economic welfare of fishermen is essential for informing public health policies and initiatives designed to mitigate the disease's transmission; the fishing sector serves as a crucial source of income and sustenance for numerous individuals in Homa Bay County. The prevalence of HIV/AIDS among fisher folk may substantially impact the socio-economic welfare of the region, as it might diminish worker productivity, escalate healthcare expenditures, and decrease the disposable money available for investment. Despite the significance of the fishing sector in Homa Bay County, there exists a paucity of studies regarding the effects of HIV/AIDS prevalence on the socio-economic welfare of fishermen in this setting. This study intended to bridge the knowledge gap and improve understanding of the correlation between HIV & AIDS prevalence and socio-economic wellbeing in the fishing industry.

Without a thorough comprehension of the factors affecting HIV's impact on the fishing sector, initiatives aimed at mitigating the disease's spread among fisher folk may prove ineffective. This study aims to find factors that may reduce HIV prevalence rates and enhance public health and socio-economic well-being in the region under investigation. The economic repercussions of HIV on fishing communities can be significant, encompassing diminished output, elevated healthcare expenses, and decreased discretionary income. Identifying effective interventions to alleviate the social and economic repercussions of HIV on the fishing industry in Homa Bay County will improve the socio-economic wellbeing of both the fishing communities and the region. This study aims to bridge the knowledge gap and elevate awareness regarding the correlation between HIV prevalence and socio-economic wellbeing within the fishing business.

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1.8 Scope of the Study

Miller and Stebbins (2020) assert that the scope of an inquiry pertains to the parameters within which it is executed. This entails delineating the research domain and articulating the inquiry's emphasis, along with the variables that remain within permissible limits (Leedy & Ormrod, 2019). This may entail delineating the participants' characteristics, the degree of ideological congruence with the research objectives, and the timetable, which establishes a contextual framework for the study's scope. The scope of a survey pertains to its comprehensiveness, intensity, and intricacy, ensuring the study meets the requisite breadth, complexity, and detail in alignment with the research objectives, timeline, and available resources. The research focused on the fishing sector in Homa Bay County. The research was conducted from May 2023 to June 2023. The research assessed the influence of HIV and AIDS prevalence on productivity. The influence of HIV/AIDS on human capital, healthcare spending, and socioeconomic welfare in fish landing beaches. Data was gathered through a structured questionnaire aimed at a sample of 298 fishermen, fishmongers, fish traders, and officials of the Homa Bay county administration.

1.9 Limitations of the Study

The limitations of the study are those aspects of its design or methodology that could have a negative effect or affect how the study's findings are interpreted. Among these restrictions are Language barrier: Some of the study participants in the intended study sites could only understand their native tongue and did not speak English or Swahili. Methodological Limitations–- Gaining the full trust of the respondents to divulge the most sensitive and/or embarrassing but crucial information to the field data collection study team. Longitudinal effects – The time available for the research was limited and hence may not allow for a longitudinal study to enable assessment and verification of recurring and seasonal aspects of

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the study. Sample Size – Time limitation and limited funding limited the sample size and geographical coverage which decreased the sample size of the research study

1.10 Delimitations

To effectively and efficiently gather the data and elucidate the research questions to the respondents, the researcher engaged local research assistants who spoke in the local languages. To achieve the full trust of the research subjects and inspire them to disclose sensitive and vital information to my research team, the researcher consulted community leaders, community health workers and faith-based local leaders as well as assure the respondents of complete confidentiality and data protection in a language they can understand better. The researcher strived to scientifically calculate the sample size to ensure the researcher achieved the best representative sample size that responded to the study objectives within the budget and the study time frame. The researcher engaged in a purposive sampling procedure that aimed at reaching out to the most relevant research respondents with the most relevant information including key informants and the affected populations.

1.11 Assumption of the Study

i. The study assumed that the targeted participants willingly participated in the study ii. It is assumed that the participants provided truthful answers to the concerns raised in the surveys. iii. It is also assumed that the participants selected were representative of the target population.

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1.12 Operational definition of key terms

Longitudinal study	This form of research is used to study exclusive distinct cases. Longitudinal case studies are studies that collect ample quantities of data on a single individual or small cluster of people.
HIV/AIDS	HIV/AIDS (human immunodeficiency virus/acquired immunodeficiency syndrome) is a virus that compromises the immune system. If untreated, HIV can progress to AIDS (acquired immunodeficiency syndrome)
Open Data Kit (ODK)	"Open Data Kit" (ODK) is characterized as a complimentary, open-source suite of tools facilitating data collection via Android mobile devices and subsequent submission to an online server.
KoboCollect	KoBoCollect is a data collection software derived from the open-source ODK Collect. This tool facilitates primary data collecting in humanitarian emergencies and other difficult field environments."
GDP	The Gross Domestic Product (GDP) is defined as the aggregate of all value added within an economy. Valueadded refers to the worth of produced goods and services subtracted by the value of the goods and services required for their production, also known as transitional consumption"
HIV/AIDS prevalence rate	This is the number of individuals newly infected with HIV/AIDS in the reporting period per 1000 uninfected population.
HIV/AIDS infection	HIV/AIDS Infection occurs when blood infected with HIV, ejaculate or vaginal discharges enter the body. This can happen in several ways including having sexual intercourse with an infected companion.
COVID-19	"The word "C'' stands for Corona,''V'' stands for the virus, and "D" stands for disease. Previously, COVID-19 was denoted as the "2019 novel coronavirus'' or "2019-CoV".

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	The COVID-19 virus is a new virus related to the same family of viruses as Severe Acute Respiratory Syndrome (SARS) and some kinds of the common cold”
90-90-90 Treatment Target	“It is a motivated treatment plan to help terminate the AIDS epidemic which says that by the year 2020, up to 90 per cent of people living with the virus will have known their HIV status. By 2020, 90 per cent of people detected to be with HIV/AIDS infection will obtain antiretroviral treatment and that by 2020, 90 per cent of people in receipt of antiretroviral treatment will have viral clampdown”.
Socio-Economic Development	Improvements in the living standards of individuals and communities
Economic Development	Programs, policies or activities that seek to improve the economic well-being and quality of life of a community
Productivity	What is the output capacity achievable with a specified set of inputs?
Human Capital	The economic value of a worker's experience and skills.
Healthcare	The provision of health services to individuals either directly or indirectly

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CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Chapter two explores the literature linked to the research subject, including both empirical, and theoretical aspects and conceptual framework. The chapter also presents the identified key research gaps to be addressed.

2.2 Empirical Literature review.

2.2.1 HIV/AIDS Prevalence and Socio-Economic Wellbeing

The research conducted by Kastrau et al. (2021). The study was initiated due to the high frequency of HIV & AIDS in fishing communities and the potential economic consequences of the condition. The study utilized data from a household survey done in six fishing communities in Uganda to attain its purpose. The survey gathered information on the socioeconomic attributes of households, health conditions, labor productivity, and healthcare expenditures. The research employed econometric techniques to analyze the data and assessed the effect of HIV & AIDS on labor productivity and healthcare expenditures. The findings indicated that HIV-positive persons in fishing villages exhibited reduced labor productivity and elevated healthcare expenses relative to their HIV-negative peers. This led to diminished economic outputs and curtailed economic growth in the fishing villages. The research indicated that the effects of HIV and AIDS on labor productivity and healthcare expenditures were more pronounced among women and those with lower educational attainment.

Kyarisiima et al. (2020) did a study analyzing the gender dimensions of small-scale fishing and their correlation with HIV/AIDS in Tanzania. The research intended to investigate the prevalence of HIV/AIDS among women and men in fishing communities, the impact of HIV and AIDS on gender relations and economic opportunities, and the coping strategies employed by both genders in the context of small-scale fisheries. The study utilized a qualitative

methodology, featuring semi-structured interviews, focus group talks, and key informant interviews. The research was conducted in three coastal areas of Tanzania, involving male and female participants engaged in small-scale fisheries, along with key informants including healthcare professionals and community leaders. The study's findings indicated that HIV/AIDS disproportionately impacts women in fishing villages, revealing greater infection rates among women compared to men. This was ascribed to gender disparities, encompassing restricted access to education, healthcare, and economic possibilities. HIV/AIDS significantly impacted the economic prospects of both women and men in fishing villages, resulting in diminished fishing production and heightened healthcare expenses. Women, in particular, encounter prejudice in obtaining finance and career possibilities due to the stigma linked to HIV & AIDS. The research also delineated tactics employed by women and men in fishing villages to manage HIV/AIDS, including pursuing alternative livelihoods like agriculture and small enterprises, as well as obtaining assistance from social networks and community organizations.

A study by Muhamed analyzed the economic impacts of HIV and AIDS in rural coastal regions of Tanzania (Muhamed, 2020). The study sought to accomplish two main objectives: (1) to assess the economic burden of HIV & AIDS on afflicted households, and (2) to analyze the wider economic effects of HIV/AIDS on the local economy. The research employed a crosssectional approach and gathered data from 250 homes impacted by HIV/AIDS in six rural coastal areas in Tanzania. The data were gathered by a standardized questionnaire delivered to household heads or other adult members of the household. The questionnaire encompassed various subjects, including household demographics, HIV status, healthcare utilization, and economic results. The study utilized descriptive statistics and regression techniques to examine the data. Regression analyses were employed to evaluate the economic cost of HIV & AIDS on households and to investigate the correlation between HIV/AIDS and economic outcomes,

including household income, expenditure, and asset ownership. The research employed a computable general equilibrium (CGE) model to analyze the extensive economic impacts of HIV & AIDS on the local economy. The study revealed that HIV and AIDS significantly affect households and the local economy negatively. Those impacted by HIV/AIDS experienced reduced incomes, elevated healthcare expenses, and diminished asset ownership relative to those unaffected by the disease. The CGE model indicated that HIV/AIDS diminishes economic growth and results in decreased investment levels within the local economy. The research emphasized the necessity for focused interventions to alleviate the economic effects of HIV/AIDS in rural coastal communities in Tanzania.

Pabari (2019) investigated the correlation between HIV/AIDS and livelihoods within smallscale fishing communities. The research examined the current literature on the specified issue and integrated the findings to discern principal themes and knowledge deficiencies. The research employed a systematic literature review process to locate pertinent publications using electronic databases and manual reference list searches. Articles must be published in English, peer-reviewed, and provide information on HIV/AIDS and livelihoods in small-scale fishing to meet the inclusion criteria. Following a comprehensive screening process, 37 articles were recognized as fulfilling the inclusion requirements. The research employed a theme analysis methodology to examine the data from the chosen articles. The selected topics pertained to the effects of HIV & AIDS on small-scale fishing communities, encompassing economic, social, and psychological repercussions, along with the coping techniques employed by the afflicted populations. The research emphasized the need of confronting the stigma linked to HIV and AIDS and the necessity for customized interventions that include the distinct attributes of small-scale fishing communities.

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Pratomo et al. (2019) investigated the correlation between social capital and socio-economic wellbeing in small-scale fishing villages in Indonesia. The study aims to identify the facets of social capital that enhance socio-economic wellbeing in small-scale fishing communities, analyze the relationship between social capital and socio-economic wellbeing, and investigate the mechanisms by which social capital influences socio-economic wellbeing. The authors conducted a study of 216 small-scale fishing households in the coastal regions of Central Java, Indonesia, to attain these objectives. They gathered data on the socioeconomic attributes of the homes, their social capital, and their economic performance. Social capital was assessed by indicators including trust, reciprocity, social networks, and collective action. Economic performance was assessed using variables like income, profit, and productivity. The authors employed regression analysis to investigate the correlation between social capital and socioeconomic wellbeing. They employed structural equation modeling to investigate the mechanisms by which social capital influences socio-economic wellbeing. The study's findings indicated that social capital positively and significantly affects socio-economic wellbeing in small-scale fishing communities. Trust and collaborative action were identified as the paramount characteristics of social capital that enhance socio-economic wellbeing. The research additionally revealed that social capital impacts socio-economic wellbeing by influencing access to resources, information dissemination, and collaboration among fisherman.

2.2.2 HIV/AIDS Prevalence and Productivity

The research conducted by Mokgele L (2021) sought to examine the correlation between HIV & AIDS and labor force participation as well as absenteeism in South Africa. The authors posited that HIV/AIDS affects labor force participation and absenteeism, which may subsequently have considerable economic repercussions. The research utilized data from the fifth South African National HIV/AIDS Prevalence, Incidence, and Behaviour Survey

completed in 2017. The sample comprised 11,017 persons aged 15 to 64 years who completed both the HIV/AIDS test and the labor force module. The authors employed logistic regression models to investigate the relationship between HIV status and labor force participation and absenteeism, controlling for potential confounders like age, gender, education, and socioeconomic position. The research indicated that HIV-positive persons exhibited reduced likelihood of labor force involvement relative to HIV-negative individuals, with an odds ratio of 0.69 (95% confidence interval: 0.60-0.79). The authors discovered that HIV-positive people exhibited greater odds of absenteeism than their HIV-negative counterparts, with an odds ratio of 1.21 (95% confidence interval: 1.04 - 1.41).

Research conducted by Piotrowski M (2020) sought to fill gaps in the literature and evaluate the current data about the correlation between HIV/AIDS and agricultural productivity. The research employed a systematic literature review methodology, encompassing an extensive search of many databases and pertinent papers published from 1995 to 2019. The research was evaluated according to inclusion and exclusion criteria, resulting in a final sample of 36 studies from 10 sub-Saharan African nations. The authors employed a meta-regression analysis to aggregate the study results and measure the effect size of HIV & AIDS on agricultural productivity. The meta-regression analysis examined multiple study features, such as the nation of origin, data sources, and study design, among others. The research indicated that HIV/AIDS diminished agricultural productivity by 9-12%, with the most significant effects observed in regions with elevated HIV/AIDS prevalence rates. The research indicated that HIV/AIDS had a more pronounced effect on agricultural productivity among smallholder farmers, female farmers, and families with HIV-positive individuals.

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A study conducted by Boyer examined the correlation between HIV/AIDS and labor productivity as well as company performance in Zambia (Boyer C, 2020). The study intended to find out if the rate of HIV & AIDS within the workforce affects business production and whether firm size influences the association between HIV/AIDS and productivity. The research utilized data from the World Bank Enterprise Survey carried out in Zambia from 2014 to 2015. The survey gathered data on business characteristics, including size, industry, ownership, and workforce composition, alongside productivity, quantified by sales per employee. The poll also includes inquiries regarding the health state of employees, including their HIV status. The study sample comprised 705 enterprises, and the authors employed econometric techniques to analyze the data and evaluate the effect of HIV & AIDS on corporate production. The authors accounted for additional variables that may influence company productivity, including firm size, industry, and ownership structure. The research indicated that companies with a greater percentage of HIV-positive employees exhibited diminished productivity, particularly pronounced in small and medium-sized operations. The authors discovered that the correlation between HIV/AIDS and productivity was more pronounced in organizations with a higher percentage of unskilled workers, indicating that HIV/AIDS may disproportionately affect lessskilled employees.

A study conducted by Janssens examines the the effect of HIV & AIDS-related fatalities on household labor supply, consumption, asset accumulation, and poverty status (Janssens W. et al, 2019). The research utilized data from a longitudinal survey of households in rural Malawi conducted from 1998 to 2012. The sample comprised more than 10,000 households, yielding a total of almost 50,000 observations. The authors utilized difference-in-differences and fixedeffects regression models to evaluate the causal effect of adult mortality on household welfare outcomes. The research indicated that adult mortality associated with HIV/AIDS

adversely affected family welfare outcomes in rural Malawi. The authors discovered that HIV/AIDSrelated fatalities diminished the duration household members allocated to productive endeavors, such as agriculture and paid labor, while augmenting the time dedicated to caregiving tasks. The research indicated that HIV/AIDS-related fatalities correlated with diminished household spending, decreased asset accumulation, and heightened poverty levels.

Wilson's study investigated the impact of HIV & AIDS on labor market outcomes in Tanzania (Wilson N., 2018). The authors sought to examine if HIV-positive individuals experience labor market discrimination and its impact on their employment, income, and job types. The research utilized data from the Tanzania National Panel Survey, a nationally representative survey performed from 2012 to 2013. The sample comprised persons aged 15 to 60 who were either working or actively seeking employment. The authors employed regression analysis to assess the influence of HIV status on labor market outcomes, while accounting for additional variables that may impact employment and pay, including educational attainment, age, gender, and geographic region. The research indicated that HIV-positive people had reduced employment rates relative to their HIV-negative counterparts. They were also more inclined to engage in the informal sector and had diminished earnings, with the pay disparity widening as the HIVpositive persons aged. The authors indicated that HIV/AIDS significantly affects labor market results, potentially influencing economic growth and development. The study emphasized the necessity for legislation to mitigate labor market discrimination against HIV-positive individuals.

Mokgele (2021), Piotrowski (2020), and Wilson (2018) analyze the effect of HIV & AIDS on labour productivity across different sectors (e.g., agriculture, general labour markets, and firm performance), there is limited research specifically focusing on the fishing sector. Fishing

communities face unique challenges related to HIV/AIDS due to their mobility, risk-prone lifestyles, and reliance on physical labour, which remains underexplored. Janssens (2019) in Malawi and Boyer (2020) in Zambia, provide evidence from broader sub-Saharan contexts but fail to offer insights specific to Kenyan fishing communities. The distinct socio-economic and cultural characteristics of Homa Bay County, a high-prevalence area for HIV/AIDS, are not adequately represented in existing research. Mokgele (2021) and Wilson (2018) primarily focus on labour force participation, absenteeism, and wage gaps. However, they do not delve deeply into broader socio-economic consequences, such as shifts in household economic roles, community-level productivity dynamics, or the potential ripple effects of reduced productivity on food security and economic sustainability in fishing communities. Although Piotrowski (2020) addresses the unequal effect of HIV and AIDS on female farmers, none of the reviewed studies specifically examine the gendered effects of HIV/ AIDS on productivity within fishing communities. This gap is critical given the differing roles and vulnerabilities of men and women in such contexts. While Boyer (2020) and Wilson (2018) highlight productivity impacts, there is insufficient exploration of how access to healthcare services influences the productivity of HIV-positive individuals in fishing communities. This is particularly relevant given the high healthcare costs and logistical challenges faced by these populations.

2.2.3 HIV/AIDS Prevalence and Human Capital

Sichei and Muchapondwa analyzed the aftermath of HIV & AIDS on human capital and economic growth in Sub-Saharan Africa (Sichei et al, 2020). The authors sought to enhance the current knowledge regarding the economic ramifications of HIV/AIDS and offer guidance for regional policymakers. The research employs a panel dataset encompassing 39 SubSaharan African nations from 1990 to 2015. The authors utilized a dynamic panel data model to evaluate the influence of HIV & AIDS on human capital, quantified by years of education, and economic

growth, shown by real GDP per capita. The model accounts for additional variables that may affect human capital and economic growth, including health expenditure, trade openness, and government spending. The research indicated that HIV/AIDS adversely affects human capital and economic development in Sub-Saharan Africa. The authors specifically determine that a 10% rise in HIV & AIDS rate results in a 0.19% decrease in years of education and a 0.32% decline in real GDP per capita. The authors discovered that the results of HIV/AIDS on economic growth is more pronounced in nations with elevated HIV/AIDS prevalence rates and diminished beginning levels of human capital. The study highlighted the need for policies and activities aimed at reducing the prevalence of HIV/AIDS in Sub-Saharan Africa to improve human capital and stimulate economic growth in the region.

(Pitts and Rosenman, 2020) analyzed the impact of HIV and AIDS on household income in South Africa The study utilized panel data analysis to examine the relationship between HIV and AIDS prevalence and household income, while controlling for supplementary household and individual factors. The authors utilized data from the National Income Dynamics Study (NIDS), a longitudinal examination of families in South Africa. The sample comprised 6,952 households, with data gathered in 2010 and 2012. The authors employed a fixed-effects model to o evaluate the influence of HIV & AIDS prevalence on household income, while adjusting for time-invariant household and individual attributes. The authors discovered that the prevalence of HIV/AIDS adversely impacts household income, with a more pronounced effect in homes experiencing greater rates of HIV/AIDS. The authors discovered that families with an HIV-positive adult member had lower income levels compared to homes without such a person.

Mbong and Alagoa examined the effects of HIV/AIDS on labor productivity and economic growth in Sub-Saharan Africa (Mbong and Alagoa, 2021). The study specifically evaluated the

influence of HIV/AIDS on the economic growth and labor productivity in the region, while also proposing potential policy implications for enhancing socio-economic well-being. The research utilized secondary data from multiple sources, including the World Bank, the Joint United Nations Programme on HIV/AIDS (UNAIDS), and the International Labour Organization (ILO). The authors utilized regression analysis to assess the relationship between HIV/AIDS, labor productivity, and economic growth. A panel dataset was utilized, encompassing 25 Sub-Saharan African nations from 1990 to 2018. The study's findings indicated that HIV/AIDS adversely affects labor productivity and economic growth in SubSaharan Africa. The authors discovered that a rise in HIV and AIDS rate results in a decline in labor productivity and economic growth. The research indicated that initiatives designed to diminish the incidence of HIV/AIDS could enhance labor productivity and stimulate economic growth in the region.

Kapwepwe, Hikaumba, and Malambo examined the economic repercussions of HIV & AIDS on households in Zambia (Kapwepwe et al, 2021). The research was undertaken due to the significant incidence of HIV & AIDS in Zambia and its detrimental effects on households. The authors utilized secondary data from the 2018 Zambia Demographic and Health Survey (ZDHS) to examine the effects of HIV/AIDS on household income and spending. The ZDHS is a nationally representative survey that gathers data on several health and socio-economic factors, including the prevalence of HIV and AIDS. The research utilized a multivariate regression model to analyze the impact of HIV/AIDS on household income and expenditure, while controlling for additional socio-economic variables. The authors analyzed the existing correlation between HIV/AIDS and family poverty status. The research indicated that HIV/AIDS adversely affects household income and expenditure in Zambia. Households with

HIV-positive members had lower incomes and higher expenditures compared to those without HIV-positive members. The research demonstrated the detrimental impact of HIV&AIDS on household income and expenditure is more pronounced in homes with higher HIV/AIDS prevalence. Moreover, the study revealed that HIV/AIDS correlates with an increased probability of experiencing poverty. Households with HIV-positive individuals are more prone to experiencing poverty than those without HIV-positive individuals.

Comas-Herrera, Nugent, and Berman performed a systematic review examining the correlation between HIV/AIDS and human capital (Comas-Herrera et al, 2021). The research delineated the multiple paths by which HIV/AIDS influences human capital and evaluated its effects on different aspects of human capital, including education, workforce engagement, and productivity. The study's methodology entails a rigorous examination of the literature concerning HIV/AIDS and human capital. The authors performed an exhaustive search of pertinent databases and identified 52 studies that fulfilled their inclusion criteria. The papers were examined through a narrative synthesis methodology, and the authors discerned prevalent themes and patterns within the literature. The authors discovered that HIV/AIDS adversely affects human capital, especially regarding education and workforce engagement. The research additionally indicated that HIV/AIDS adversely affects productivity, however the evidence remains inconclusive. The research delineated multiple paths by which HIV/AIDS impacts human capital, encompassing heightened morbidity and death, diminished educational attainment, decreased labor force participation, and lowered productivity.

Sichei et al. (2020) and Mbong & Alagoa (2021) explore the effect of HIV/AIDS on human capital broadly, there is limited focus on specific sectors such as the fishing industry. Fishing communities may have unique vulnerabilities to the effects of HIV/AIDS, including impacts on labour availability, skills transfer, and community resilience, which remain underexplored.

Pitts & Rosenman (2020) and Kapwepwe et al. (2021), examines countries like Zambia and South Africa. There is a scarcity of research focusing on the Kenyan context, particularly in regions with high HIV/AIDS prevalence, such as Homa Bay County. This gap limits the applicability of findings to local populations and specific socio-economic conditions. ComasHerrera et al. (2021) identify the effect of HIV & AIDS on educational attainment and labour force participation. They do not adequately explore how the disease affects intergenerational human capital development, such as the education and skill acquisition of children in affected households. Sichei et al. (2020) and Kapwepwe et al. (2021), focuses primarily on household and national-level outcomes. There is a lack of studies examining how HIV/AIDS impacts community-level human capital especially in fishing communities. Although Kapwepwe et al. (2021) examine the economic ramifications of HIV/AIDS on households, there is limited exploration of how healthcare access, treatment availability, and health outcomes influence human capital development in affected communities, particularly in regions with high prevalence like Homa Bay County.

2.2.4 HIV/AIDS Prevalence and Healthcare Expenditure

Galárraga and associates performed a cost-benefit analysis, evaluating the economic return on investment, of a task-shifted cognitive behavioural therapy (CBT) intervention administered by paraprofessionals to mitigate alcohol consumption in a simulated cohort of 13,440 outpatients in Kenya (Galárraga et al., 2017). The research assessed the expenses and economic advantages from a societal viewpoint over a six-year period, applying a 3% yearly discount rate. The expenses encompassed all costs related to the training and administration of task-shifted CBT therapy. The advantages encompassed the economic effects of reduced HIV/AIDS incidence and enhancements in family and workforce productivity. We performed univariate and multivariate probabilistic sensitivity studies to evaluate the robustness of our findings. The

research indicated that in the basic scenario, the overall expenses for the CBT implementation amounted to $554,000, the benefits were valued at $628,000, resulting in a benefit-to-cost ratio of 1.13. Sensitivity tests indicated that, under the majority of assumptions, the benefit-to-cost ratio exceeded one, signifying that the intervention was cost-effective (i.e., yielded a positive return on investment). Moreover, the research indicated that the length of the treatment impact significantly influenced the outcomes in sensitivity analyses. The research determined that cognitive-behavioral therapy can be efficiently and cost-effectively delegated to paraprofessionals in Kenya. The study indicated that the intervention can yield reductions in morbidity and death, along with economic benefits for the healthcare system over the medium and long term. The findings had implications for other countries facing extensive HIV/AIDS epidemics, increased alcohol consumption, and a shortage of mental health professionals.

Piot, Bartos, Larson, Zewdie, and Mane presented a summary of advancements in addressing the HIV & AIDS epidemic over the last 25 years and highlighted additional problems (Piot et al, 2001). The aims of the study WAS T evaluated the principal accomplishments in addressing the HIV/AIDS epidemic, encompassing progress in treatment and prevention, while also addressing the persistent hurdles in attaining the UNAIDS 90-90-90 targets and eradicating the epidemic. The authors conducted a narrative review of the literature on HIV/AIDS, utilizing their extensive expertise in the subject matter to achieve these objectives. They presented a historical account of the pandemic, detailing its origins and initial reaction, and examined the significant milestones in the response during the last 25 years. The study assessed the present condition of the epidemic, including advancements toward the UNAIDS 90-90-90 targets, which aim for 90% of individuals living with HIV/AIDS to know their status, 90% of diagnosed individuals to receive antiretroviral therapy, and 90% of those in treatment to achieve viral suppression by 2020. The study ultimately addressed the persistent

issues in the response to HIV/AIDS, including the necessity for continuous funding, the mitigation of stigma and discrimination, and the engagement of key communities most impacted by the pandemic.

Alemayehu conducted an analysis of the economic effects of HIV/AIDS on households in Ethiopia (Alemayehu et al. R., 2022). The study sought to determine the economic impact of HIV/AIDS on households through an analysis of direct and indirect expenses, an examination of coping strategies utilized by households, and an identification of factors contributing to the economic burden associated with HIV/AIDS. The authors conducted a cross-sectional study in the Tigray region of Ethiopia to achieve these objectives. A sample of 600 homes was recruited, including 300 infected by HIV/AIDS and 300 not impacted. The authors gathered data on household socioeconomic attributes, direct medical expenses (including medicine and hospitalization), indirect costs (such as missed income and caregiving time), and coping strategies (such as borrowing and asset liquidation). The research employed descriptive statistics to evaluate the economic effect of HIV & AIDS on households, incorporating mean and median expenditures. They employed logistic regression to ascertain the parameters linked to the economic cost of HIV & AIDS on households. The study's findings indicated that households impacted by HIV/AIDS in Ethiopia endure a considerable economic strain, with direct and indirect expenses constituting a large share of household income. The research indicated that coping strategies employed by households, such asset liquidation or borrowing, correlated with an augmented economic burden. The research highlighted low income and absence of health insurance as variables contributing to the economic effect of HIV and AIDS on households.

Anand et al. (2019) evaluated the economic impacts of HIV & AIDS on individuals and households in Nigeria. The research sought to assess both the direct and indirect costs associated with HIV/AIDS for individuals and households, quantify the financial burden imposed by HIV and AIDS on households, and identify the factors that affect the economic effect of HIV/AIDS on these households. To accomplish these goals, the authors performed a cross-sectional study across six states in Nigeria, employing a multi-stage sampling methodology to identify participants. Data were gathered on the socioeconomic attributes of the households, their healthcare usage, and their HIV-related expenditures. Direct costs encompassed healthcare expenditures, and indirect costs comprised lost income resulting from disease or mortality. The authors employed descriptive statistics and regression analysis to evaluate the financial burden of HIV & AIDS on households and to determine the elements contributing to its economic impact. The study's findings indicated that HIV/AIDS places a substantial financial strain on impacted households in Nigeria. The mean yearly expenditure for HIV/AIDS treatment per individual was $1,216, constituting a significant fraction of the typical annual household income in Nigeria. Direct costs were the predominant portion of the economic burden, whereas indirect costs were comparatively minimal. The research indicated that the financial strain of HIV/AIDS was greater for households with lower socioeconomic level, residents in rural areas, and families with several members impacted by HIV.

Shroufi examined the correlation between HIV & AIDS and economic growth on a global scale (Shroufi A et al, 2022). The authors aimed to determine the influence of HIV & AIDS on the economic growth and explore possible strategies to alleviate the adverse impacts. The study's approach encompassed an extensive literature evaluation on the influence of HIV/AIDS on economic growth, alongside an analysis of economic data from other nations. The authors conducted interviews with essential stakeholders, including policymakers, researchers, and

representatives from impacted communities. The research indicated that HIV/AIDS adversely affects economic growth, especially in sub-Saharan Africa, where the epidemic's impact is more pronounced. The authors asserted that tackling HIV/AIDS is crucial for enhancing socioeconomic welfare and advocated for the establishment of comprehensive HIV/AIDS preventive and treatment initiatives. The authors emphasize the necessity for augmented investment in research and innovation to formulate novel HIV/AIDS prevention and treatment solutions. The study underscored the significance of collaborations among governments, international organizations, and impacted communities in mitigating the economic repercussions of HIV.

Alemayehu et al. (2022) and Anand et al. (2019) explore the economic burden of HIV/AIDS at the household level, there is a lack of sector-specific analyses, such as healthcare expenditure trends in fishing communities. These communities may have unique healthcare needs and expenditure patterns due to the interplay of HIV & AIDS rates and occupational health risks. Galárraga et al. (2017) and Anand et al. (2019) examine contexts in Kenya and Nigeria, respectively, but they lack granular focus on specific high-prevalence regions such as Homa Bay County. Localized data are essential to address the unique socio-economic and healthcare challenges faced by this region's fishing communities.Alemayehu et al. (2022) discuss household coping mechanisms, such as asset sales and borrowing, but there is limited research on the long-term socio-economic impacts of these strategies. For example, how do such mechanisms affect future financial stability and access to healthcare for fishing communities? Galárraga et al. (2017) discuss the cost-benefit analysis of interventions like cognitive behavioural therapy but focus on a broader population. There is little evidence on the economic benefits of HIV/AIDS prevention and treatment programs tailored specifically to high-risk, resource-constrained communities, such as those engaged in fishing. Anand et al. (2019) and

Alemayehu et al. (2022) focus primarily on direct healthcare costs and indirect economic burdens. However, there is a gap in exploring the integration of social support costs (e.g., caregiving and community-based programs) with healthcare expenditure, particularly in regions with high HIV/AIDS prevalence. Piot et al. (2001) emphasize progress in global HIV/AIDS responses, they do not provide empirical evaluations of the effectiveness of specific healthcare funding policies or programs in reducing economic burdens. There is a need for context-specific policy analysis to determine the effectiveness of healthcare subsidies or insurance in reducing costs for fishing communities.

2.3 Theoretical framework.

This research will be informed by human capital theory and neoclassical economic theory. The human capital theory clarifies the pandemic's impact on sustainable development in regions heavily affected by AIDS and already facing substantial poverty, highlighting critical elements essential to human capital. Neoclassical theory explains how HIV/AIDS influences economic growth by reducing the availability of human capital.

2.3.1. Human capital theory

The Human Capital Theory was initially introduced by economist Theodore W. Schultz during the 1960s. Schultz posited that enhancing education and training investments could elevate individual productivity and earning capacity, subsequently fostering economic growth and development (Schultz, 1961). Human capital refers to the knowledge, skills, and health that individuals acquire over time via education, training, and experience (Schultz, 1971). The Human Capital Theory has received considerable scrutiny and interest from economists and policymakers since its introduction. James Heckman, a Nobel laureate in economics, is among

those advocating for the theory. He has carried out comprehensive studies on the economic advantages of early childhood education and the significance of investing in human capital development from a young age. Heckman has posited that allocating resources to early childhood education can yield substantial long-term economic advantages, such as increased earnings, enhanced health outcomes, and diminished social inequality (Heckman, 2006).

Regarding the economic cost of a disease, human capital theories suggest that the cost can be measured by the lost productivity of individuals affected by the disease. However, this approach overlooks the broader societal costs of illness, such as healthcare expenses and the impact on caregivers. In "The Economic Burden of Illness: A Conceptual Framework and Review of the Literature" by Ellen S. O'Brien and colleagues, the authors argue for a more comprehensive approach to measuring the economic cost of illness that includes both individual and societal perspectives.

The aftermath of HIV/AIDS on human capital has been particularly severe in sub-Saharan Africa, where the epidemic has been most pronounced. The loss of human capital has been extensively documented and has been found to have significant negative effects on economic growth, education, and labour force participation. According to a study by Gakidou et al. (2007), the loss of human capital attributable to HIV and AIDS has resulted in a reduction of economic growth in sub-Saharan Africa by 0.3-1.5 percent annually. This is a significant reduction that has contributed to the region's ongoing economic struggles. The decline in human capital has resulted in diminished productivity, as individuals infected with HIV & AIDS frequently face inability to work or are compelled to resign from their positions due to illness or societal stigma. Another study by Kalemli-Ozcan et al. (2010) found that HIV/AIDS reduces the accumulation of human capital by reducing enrolment in primary education,

increasing school dropout rates, and reducing labour force participation. Children infected with HIV & AIDS are often unable to attend school regularly, leading to reduced educational attainment and lower levels of human capital. Loss of human capital due to HIV/AIDS has also had significant social and psychological impacts on individuals, families, and communities.

The human capital theory argues that investments in education and health can positively impact individual productivity, which can further promote economic growth and development. According to a study by Gupta, Grown, and Shetty (2003), HIV/AIDS negatively affects human capital accumulation and productivity, ultimately hindering economic growth. The study found that the disease results in a reduction in labour supply, as workers become ill or die, and their skills are lost. This loss of skills can lead to decreased labour productivity and long-term economic costs. Investments in HIV/AIDS prevention, treatment, and care can help mitigate the negative impact of the disease on labour productivity and socio-economic wellbeing. A study by Kaseje et al. (2015) found that antiretroviral therapy can improve the health of individuals living with HIV & AIDS, allowing them to remain productive members of the workforce. Additionally, prevention programs such as education and awareness campaigns can reduce the incidence of new infections, preserving human capital. Investments in research and development may facilitate the creation of novel treatments and technologies to address the disease, ultimately resulting in improvements in health outcomes and economic growth (Gupta et al., 2003).

2.3.2. Neoclassical economic theory

The neoclassical economic theory centres on the influence of HIV/AIDS on market forces and incentives. The disease can lead to a decline in the labour supply and a rise in labour costs, ultimately reducing economic growth and competitiveness. As workers become ill or die, their skills are lost, which results in reduced productivity and long-term economic expenses.

Additionally, investments in health may suffer as resources are channelled towards the treatment and care of HIV/AIDS patients, thus undermining efforts to improve socio-economic wellbeing.

The view that the neoclassical theory tends to view labour solely as a factor of production is shared by many scholars. For instance, Bendavid in the (Bendavid et al, 2012) journal argues that traditional economic models have been limited in their ability to account for the full range of social, moral, and ethical dimensions of HIV/AIDS. The authors state that "The emphasis on costs and benefits of prevention and treatment, rather than on individual and social welfare, may limit the usefulness of traditional economic models for understanding the HIV/AIDS epidemic." Moreover, researchers have pointed out that HIV/AIDS has significant social and ethical implications that are not captured by the neoclassical theory. For example, the disease disproportionately affects marginalized communities, such as women and sexual minorities, and can exacerbate existing social inequalities (Rice, 2014). This means that the economic effect of HIV/AIDS cannot be fully understood without considering the social and ethical dimensions of the disease.

The assumption that market forces and prices always work in the best interests of society is a fundamental tenet of neoclassical economic theory. However, this assumption has been challenged by scholars who argue that markets can fail to provide optimal outcomes in certain situations. This is especially pertinent in the context of HIV/AIDS, where market dynamics may prove inadequate in addressing the disease. Oster and Stern (2016) assert that the HIV/AIDS epidemic presents a considerable challenge to market solutions due to the negative externalities it produces, which can lead to market failures. The expense associated with HIV/AIDS treatment can be excessively high, resulting in limited access to necessary care for

those most in need. This creates a market failure, as the high cost of treatment prevents the market from functioning efficiently. Furthermore, the spread of HIV/AIDS can also create externalities that have negative effects on society as a whole. For example, the disease can lead to a decline in the labour force, which can reduce productivity and economic growth. It can also result in increased healthcare costs and reduced social welfare, as resources are diverted towards the treatment and care of those with the disease.

Neoclassical economic theory provides a framework for analyzing the economic impacts of HIV & AIDS prevalence on activities related to socio-economic wellbeing. According to the theory, HIV/AIDS can reduce the labour supply and increase labour costs, ultimately reducing economic growth and competitiveness. This is because workers become ill or die, and their skills are lost, which results in reduced productivity and long-term economic expenses. In countries with high HIV/AIDS prevalence, the disease has been shown to have a significant impact on socio-economic well-being activities. A study by Guinness et al. (2017) indicated that HIV/AIDS significantly reduced economic growth in South Africa from 1994 to 2005. The study estimated that the disease resulted in a 0.3% reduction in annual economic growth during this period. The expenses associated with HIV/AIDS treatment and care can yield considerable economic implications. In numerous low- and middle-income countries, treatment costs can be excessively high, leading to restricted access for individuals in critical need of care. This results in decreased productivity and economic growth, as individuals with
HIV/AIDS may be unable to work or may need to exit the workforce prematurely.

2.4 Conceptual Framework

Kaplan (2009) posits that a conceptual framework represents the researcher's perspective on the issue, guiding the study. It can also be considered a hypothetical model that categorizes the concepts employed in the investigation and their interrelationships. Mugenda and Mugenda

(2003) view the significance of a conceptual framework as a tool for the reader to quickly grasp the expected correlation between the independent and dependent variables. Figure 2.1 displays the conceptual framework employed in this research.

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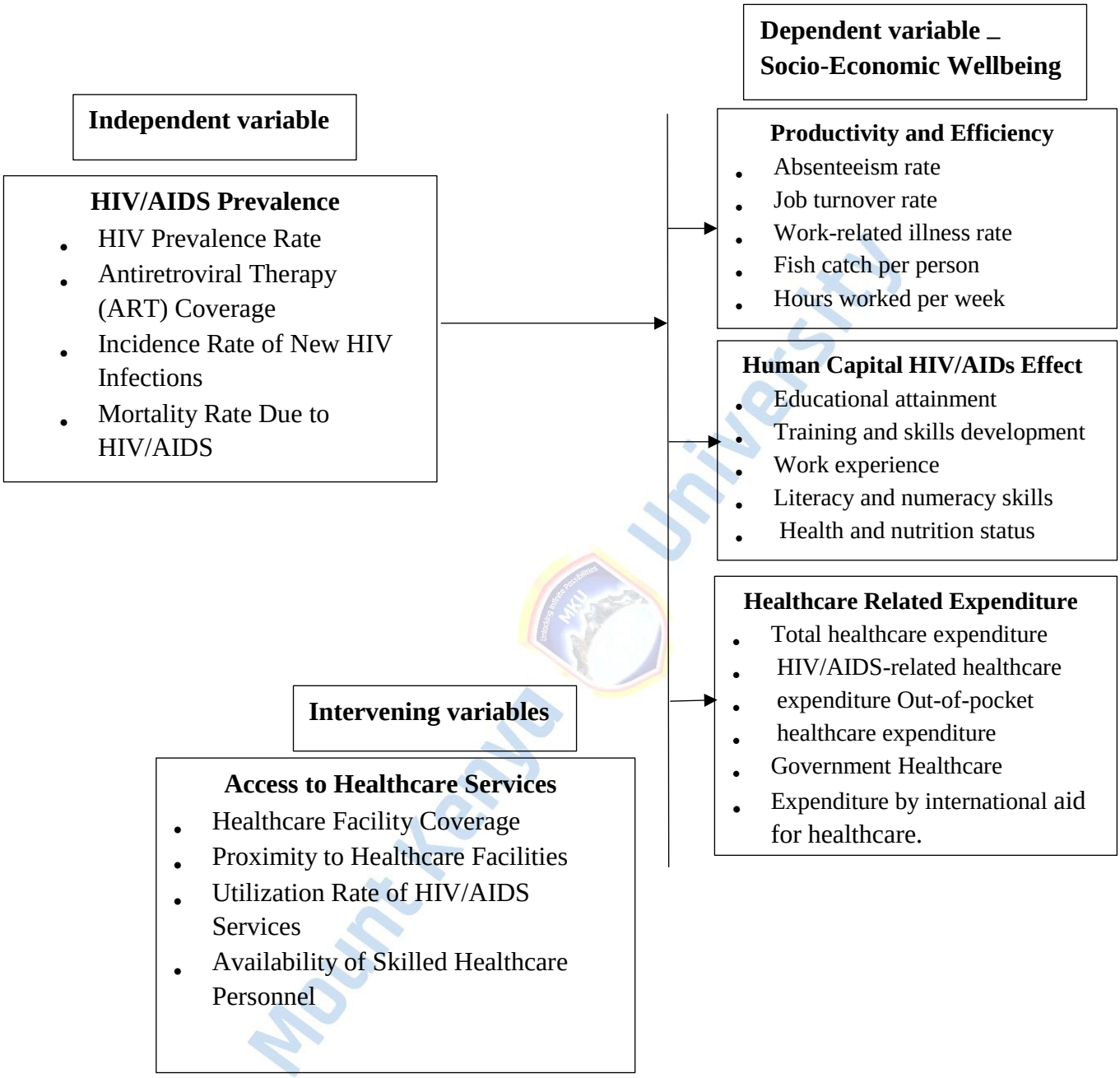

Figure 2.1: Conceptual Framework The study investigated the influence of HIV/AIDS on the productivity, efficiency, human capital, and socio-economic well-being of fishermen in fish landing beaches in Homa Bay

County, Kenya, as well as the economic costs of healthcare expenditure related to HIV/AIDS.

The conceptual framework for the study has 5 components: productivity and efficiency, human

capital, socio-economic wellbeing, healthcare expenditure, and mediating factors. The prevalence of HIV and AIDS is essential for the study, serving as a baseline for comprehending the epidemic's extent among fishermen in Homa Bay County. The indicators for this component, including the number of people diagnosed with HIV and AIDS, the prevalence rate, and the associated mortality and morbidity rates, facilitated the identification of the problem's magnitude and guided policy and programmatic interventions.

Productivity and efficiency are essential components to examining the impact of HIV/AIDS on the work performance of fishermen. The proposed indicators, such as absenteeism rate, job turnover rate, work-related illness rate, fish catch per person, and hours worked per week, helped to evaluate the influence of HIV/AIDS on the productivity and efficiency of fishermen, which could ultimately affect their wellbeing, livelihoods and the local economy. Human capital is another critical component that was considered as it relates to the skills, knowledge, and experience possessed by fishermen. The indicators, such as educational attainment, training and skills development, work experience, literacy and numeracy skills, and health and nutrition status, helped to evaluate the influence of HIV/AIDS on human capital and its effect on the socio-economic wellbeing of fishermen in the long term.

The study emphasizes socio-economic wellbeing by analyzing the influence of HIV/AIDS on the economy of fish-landing beaches in Homa Bay County. The indicators, including GDP, per capita income, poverty rate, employment rate, and income inequality, facilitated the assessment of HIV/AIDS's effects on economic growth, employment, and poverty levels. Healthcare expenditure is a crucial factor in assessing the economic costs associated with HIV/AIDS. The indicators, including total healthcare expenditure, HIV/AIDS-related healthcare expenditure, out-of-pocket healthcare expenditure, government healthcare expenditure, and international aid for healthcare, facilitated the assessment of the economic burden of HIV and AIDS on the healthcare system and the broader economy. Intervening variables, including social stigma

associated with HIV/AIDS, government policies regarding HIV/AIDS, access to healthcare services, availability of antiretroviral therapy (ART), and levels of HIV/AIDS-related knowledge and awareness, can influence the relationship between HIV/AIDS and other study components, such as productivity and income.

2.5 Identification of Research Gaps

A gap exists in research concerning the effect of HIV/AIDS on socio-economic wellbeing in Kenya. Whereas studies reviewed such as the (Pratomo et al, 2019) study which explored the gender dimensions of small-scale fisheries and their interplay with HIV/AIDS were gendered and was conducted in Tanzania, this study focused on adult fishermen, the specific effect of HIV & AIDS on the socio-economic well-being of fishermen and conducted in Kenya. Furthermore, a gap still exists in the availability of studies conducted on the ground which can generate more reliable evidence as opposed to desktop studies such as the study by Piotrowski M, Steffen M, and Agathos (2020) which aimed to address gaps in the literature and provide an assessment of the existing evidence on the relationship between HIV/AIDS and agricultural productivity. The study adopted a systematic literature review methodology, which involved a comprehensive search of various databases and relevant studies published between 1995 and 2019. This study, however, employed a more participatory approach which is more reliable to date because the study was carried out with the research subjects who are also the affected population. They were further involved in the qualitative method of data collection including KII and FGDs.

2.6 Recap of Literature Review/ Chapter Summary

Chapter two examined the literature review, encompassing the conceptual framework, theoretical literature review, empirical literature review, identification and documentation of

research gaps, and a summary of the chapter. The research titled “Effect of the Prevalence of HIV/AIDS and the Life Expectancy Rate on Economic Growth in Sub Saharan African (SSA) Countries (2016)” revealed a negative association between HIV/AIDS and socio-economic wellbeing in the Sub-Saharan African region, indicated by a coefficient of 0.014, significant at the 1% level. A 10% increase in HIV & AIDS prevalence results in a 0.14% decrease in the Gross Domestic Product (GDP) of the impacted region. The conceptual framework demonstrates the dynamic relationship between HIV/AIDS and socio-economic well-being. The study defined the dependent variable as socio-economic wellbeing and the independent variable as HIV/AIDS prevalence, outlining the relationship between these variables.

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CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

This chapter delineated the research methodology, strategy, study site, target population, sample processes utilized, and methods implemented. Furthermore, it encompassed the sample population/sample size, development of research tools, data collection methodologies and metrics, data analysis techniques and measures, and ethical considerations.

3.2. Research Methodology

This study utilized a mixed-methods approach. This methodology integrates quantitative and qualitative research techniques to offer a thorough comprehension of the study problem. The mixed-methods approach enables the collection of quantitative data for variable measurement

and qualitative data for contextual depth. This study employed various methodologies to examine the complex relationship between HIV/AIDS prevalence and its socio-economic effects on fishing communities in Homa Bay County. Quantitative data were gathered to assess variables. Qualitative data enhanced the findings by offering contextual insights. This amalgamation of methodologies proved suitable for tackling the complex nature of the study aims. Quantitative data gathering concentrated on three primary domains: productivity, human capital, and healthcare spending. Productivity was assessed by measures including the weight of fish captured per vessel and the incidence of fishing excursions interrupted by illness. Data on absenteeism rates, the attrition of skilled fishermen, and educational attainment within the fishing profession were gathered for human capital analysis. Healthcare spending statistics recorded the costs borne by families and people in the management of HIV and AIDS, encompassing treatment expenses and the economic impact of opportunistic infections. Standardized survey instruments were employed to collect data from 168 participants, establishing a foundation for statistical analysis.

Qualitative data were obtained via comprehensive interviews with important informants, such as fishers, healthcare professionals, and members from local NGOs. The interviews provide an enhanced comprehension of the contextual elements affecting the variables examined, including cultural beliefs and healthcare accessibility. Open-ended inquiries directed the talks, enabling participants to convey their lived experiences and viewpoints regarding the effects of HIV/AIDS. The mixed-methods technique was very appropriate for our investigation for various reasons. The intricacy of the research issue required a dual methodology to encompass both quantifiable trends and contextual aspects. The integration of methodologies guaranteed that the quantitative results were enhanced and elucidated by the qualitative narratives. The integration of data from both sources improved the study's validity and dependability,

facilitating a thorough and comprehensive investigation of the research issue. Structured questionnaires were utilized to gather quantitative data, and these instruments were pretested to verify reliability and validity. Semi-structured interviews and focus group discussions were utilized to gather qualitative data, enabling participants to express their experiences and perspectives.The amalgamation of quantitative and qualitative data transpired throughout the analysis and interpretation stages. Quantitative data were examined to discern trends and patterns, whilst qualitative data offered context and elucidations for these results. This methodology facilitated the correlation of quantitative data with real-world accounts, enhancing comprehension of the effect of HIV/AIDS prevalence on socio-economic welfare.

3.3. Research Design

This research will utilize qualitative and quantitative survey methods to achieve its objectives across five fishing settlements in Homa Bay County. The study utilized descriptive and crosssectional designs to examine the influence of stress from living with a serious illness, such as HIV/AIDS, on individual mental health. Individuals with HIV/AIDS exhibit an increased likelihood of mood, anxiety, and cognitive disorders (hvi.org, 2022). Furthermore, research is necessary to accurately depict the behaviors of fishermen in their natural environment, specifically at fish landing beaches, as indicated by Siedlecki (2020). The main objective of the descriptive research design was to systematically and accurately outline the characteristics of the fishing population, conditions, and phenomena (McCombes, 2020). In contrast, the cross-sectional research design was utilized because data were collected at a single point in time. The cross-sectional approach allowed for data collection from a large sample of participants, thereby facilitating group comparisons.

The study design included an analysis of the existing literature that generated key hypotheses about the HIV/AIDS problem in Homa Bay County. The research also ascertained whether a

relationship between the high HIV/AIDS prevalence rate and the socio-economic well-being of fishermen exists. The researcher worked closely with the community leaders on the ground to identify the structures on the ground including both registered and unregistered fishermen groups from which participants were drawn. The study endeavoured to include both small and bigger fish landing beaches. The respondents identified for the study were briefed about the study in good time to allow them to plan themselves and were visited and interviewed in the natural environment at the various fish landing beaches in Homa Bay County.

3.4. Location of the study

The research was conducted at five fish landing beaches: Nyandiwa, Ringiti, Remba, and Kwethumbe in Suba North Sub County, and Alum in Rachuonyo North Sub County, situated along the shores of Lake Victoria in Homa Bay County, involving a total of 298 respondents. Ringiti and Remba are islands in Lake Vitoria with a good fish harvest. The target locations are specifically the fish landing zones where fishermen land from all-night fishing expeditions in the lake to sell their fish to fishmongers and traders who are mainly women and girls. The sites are known to be the epicentres of high HIV/AIDS rates in Homa Bay County. The high prevalence of HIV is exacerbated by the rampant poverty among the communities living on the islands. This is further made worse by the economic practice where fish is exchanged for sex instead of cash. This results in exchanging partners resulting in the raping spread of HIV infection among the residents.

3.5. Target population

The research targeted adults aged above 18 years (adult fishermen, women and girls who are mainly fishmongers and traders). This proportion comprised 298 individuals in all five (5) fish landing beaches in Homa Bay County namely Nyandiwa, Ringiti, Remba and Kwethumbe, in Suba North Sub County, and Alum in Rachuonyo North Sub County along the shores of the

Lake Victoria in the County of Homa Bay. Out of this population, 178 participants were involved in HH Interviews targeted, 10 were Key Informants while 100 participated in the Focused group Discussions (FGDs).

Table 3.[1]: Target Population

Interview Method	**Sample size per site**	**Total no of respondents**
HH Interviews	Based on Population per site	178
Key Informant Interview (KIIs)	Varied per site	10
Focused group Discussions (FGDs)	2 FGDs x 5 sites x 10 pax	100
Total Sample size		**298**

3.6. Sampling procedures and techniques

Both random (probabilistic) and purposive (non-probabilistic) sampling techniques were employed to identify the research respondents. Purposive sampling was utilized to determine the study area, whereas a simple random sample procedure was employed to choose the study participants. The sample size for the quantitative study was determined through scientific calculation to ensure a representative number of respondents. Random sampling was thrn employed to select the quantitative respondents, including key informants and FGD

[1] $1 + Ne^2$

n = desired sample size N = total population e = the error term estimated at 7.5% level of significance

participants. The qualitative respondents were intentionally selected in partnership with local community leaders.

3.7. Sample size

The research was a complete cross-sectional study; therefore, an adequate sample size founded on the entire population in the County was used to give a level of confidence at 92.5%. The formula developed by Slovin (1960) was adopted to determine the sample size in the study as follows:

$$n = \frac{N}{1 + [303{,}806\ (0.075)^2]}$$

$$n = \frac{303{,}806}{1 + [303{,}806\ (0.075)^2]}$$

$$= 177.67$$

= 178 adults from the selected regions

This translated to an unsystematic sample of 178 adults from 178 households in the 5 targeted sites which were sufficient to give the researcher the assurance levels required for this study.

Table 3.2:

Sample size determination

Sub County	**Population**	**Study Sites (Landing Beach)**	**HH**
Rachuonyo North	178,868	Ringiti	36
		Remba	36
		Nyandiwa	40
		Kwethumbe	31
Suba North	124,938	Alum	36
Total Sample			**178**

Source: Field Data 2023

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3.8. Research instruments

The researcher created various information collection tools, including questionnaires, Focused Group Discussion guides, and Key Informant guides, to gather sufficient data addressing the research questions. The tools developed were piloted first and refined by incorporating comments from the field team during the pilot which is discussed in section 3.1.8 below.

Questionnaires (Household Interviews)

This study employed questionnaires to gather data from fishermen and their households. The questionnaires were employed for the subsequent purposes: a) engaged a substantial number of participants rapidly, b) provided respondents sufficient time to answer the questions, c) ensured a sense of security through secrecy, and d) maintained objectivity, minimizing prejudice associated with personal qualities, as shown in interviews. The questionnaires were organized into several subsections aligned with the primary research objectives, except for the initial subsection (section A), which aimed to gather demographic information about the participants, including sex, age, work experience, and educational attainment. Additional parts addressed the following factors: the productivity and efficiency of fisherman; the impact of HIV & AIDS on human capital; healthcare expenditures related to HIV/AIDS; and the impacts of HIV and AIDS on the socio-economic wellbeing of fishermen.

Key Informant Interviews

The respondents comprised leaders of registered fish dealers' associations, local community leaders (village elders), administrative leaders (chiefs), community health volunteers, health workers from designated health institutions, and government officials from the Sub Counties. A total of 10 participants were interviewed with this strategy. The justification for employing Key Informant Interviews is in their cost-effectiveness and efficiency, providing an economical means to obtain a comprehensive understanding of a situation, such as the effect of HIV on the socio-economic welfare of fishermen. The material collected originates from individuals with

pertinent expertise and insights, including health ministry officials in Homa Bay County and leaders of landing beach administration. The KII facilitate the emergence of novel and unforeseen concerns and concepts.

Focused Group Discussions

Homogeneous group talks were conducted among fish sellers, fisherman, and fishmongers at each beach, categorized by sex (male or female). This will encompass both fishmongers and fishermen. A minimum of two Focus Group Discussions (FGDs) were conducted at each of the five designated venues. Each focus group session consisted of 8 to 10 individuals. Each Focused Group Discussion session was facilitated by two individuals: a moderator and a notetaker. The meetings were audio-recorded to guarantee comprehensive information capture during the conversation. The justification for employing FGDs parallels that of KIIs; FGDs are also more expedient and cost-effective than questionnaire interviews. FGS produce comprehensive data as they capture material in the participants' vernacular, and the group dynamic facilitates the enhancement of responses, enabling participants to conceive concepts they may not have considered in a solitary interview.

Table 3. 3b

Total Sample Size

Interview Method	**Sample size per site**	**Total no of respondents**
HH Interviews	Based on Population per site	178
Key Informant Interview (KIIs)	Varied per site	10
Focused group Discussions (FGDs)	2 FGDs x 5 sites x 10 pax	100
Total Sample size		**298**

Source: Field Data 2023

3.8.1. Pilot Study

After training the research assistants, they piloted the tools to test the format, flow and phrasing of questions before the actual data collection commences. The piloting phase allowed for the

evaluation of the validity and reliability of the data collection instruments, aiming to reduce errors and biases encountered during the data gathering process. It also provided an opportunity for the research assistants to gain hands-on experience with the study tools before commencing fieldwork. Issues emerging from the pilot exercise and problems with the study tools were addressed to modify and improve the tools. The pilot study was conducted at Litare fish landing beach in Mbita Sub County, Homa Bay County.

3.9. Validity and Reliability

Validity denotes the degree to which research instruments and methodologies accurately assess what they are designed to evaluate. This study examined both internal and external validity.

Internal validity guarantees the legitimacy and accuracy of the study's conclusions, demonstrating appropriate respondent selection, data gathering methodologies, and analytical techniques. To improve internal validity, the data collection instruments were pretested in pilot research to detect and address potential concerns. The research supervisor subsequently evaluated the tools to verify they aligned with the study objectives and confirmed that the questions effectively measured the relevant constructs. Furthermore, specialists with expertise in HIV/AIDS-related socio-economic matters from local NGOs evaluated the instruments to offer further insights and confirm their pertinence to the study environment. External validity pertains to the degree to which a study's findings can be extrapolated to analogous contexts or groups. To improve transferability, a representative sample was chosen, and standardized data gathering tools were employed. The research process was thoroughly documented to allow other researchers to assess the relevance of the findings in comparable contexts.

Reliability denotes the consistency and dependability of research equipment and methodologies, guaranteeing that results may be duplicated under analogous situations. This study implemented many techniques to improve reliability. The researcher employed meticulously designed and standardized data collection instruments to reduce discrepancies in

responses. The tools underwent pretesting in the pilot research, and requisite modifications were implemented to rectify any discovered deficiencies. Data back-checking and verification were performed for a minimum of 10% of the respondents to identify and rectify any discrepancies. The reliability of the data collection equipment was evaluated statistically through Cronbach's alpha, yielding a coefficient of 0.78, indicating a strong level of internal consistency.

3.10. Data Collection Procedure

The study questions were administered through interviews. The researcher engaged with the respondents and elucidated the study's goal. The subjects granted verbal agreement to partake in the study, after which the research assistant/researcher commenced the interview session. Quantitative data was gathered through structured surveys and secondary data checklists, and qualitative data was obtained via key informants and focus group discussion guides. The qualitative conclusions complemented the data acquired by a quantitative methodology. To optimize the effectiveness and rapidity of data collection, the researcher formulated a qualitative and quantitative data collection instrument and utilized a mobile data collection methodology employing Open Data Kit (ODK) in the study's data gathering and management process.

Five research assistants who were experienced in field data collection were involved. They had been engaged in conducting both qualitative and quantitative research work. They were recruited and trained to ensure quality data was collected. Training of the research assistants which was done physically on the ground at two sites, one in Mbita and another in Homa Bay town focused on the following areas (a) background information about the study and the analysis purpose and objectives (b) data collection methods, including interview skills, observation techniques, note-taking, and documentation of information at the field level (c)

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safety and ethical considerations, and (d) familiarization with online data collection using a smartphone as a tool to enable them to quickly and reliably collect them and transmit it to a centralized server in real-time.

Field data collection

After piloting and making the necessary adjustments to the data collection tools, the data collection process commenced.

Conduct Household Interviews

Data was collected using questionnaires embedded in Android smartphones. KoboCollect data collection software was used. Fish traders included fishermen and sellers who were targeted for interviews. Respondents were selected randomly at the study sites. A total of 276 community members were interviewed employing three data collection methods.

3.11. Data analysis methods and procedures

The data gathered from participants was cleansed, encoded, and entered into the Statistical Package for Social Sciences (SPSS). The data was safeguarded and remained unattainable to unauthorized persons. Prior to data analysis, the researcher confirmed that the acquired data was securely stored on the KoboCollect server and adequately encrypted with a robust password to safeguard against unauthorized access. Subsequent to the submission of data to the server from their mobile devices, data collectors did not access the information subsequently. Consequently, the confidentiality of the data was protected and guaranteed. Kirk and Miller (2014) assert that descriptive analysis delineates a set of classifications to get dependable and reproducible conclusions from data. The dataset was subsequently imported into SPSS version 23.0 for additional analysis. The analysis produced percentages and means. The researcher investigated the existence of statistically significant disparities across several

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responder categories based on gender, age, and spatial location. The analyzed data was presented in clear, visually accessible graphs, charts, and tables that facilitated instant comprehension of the topic. The researcher employed both descriptive and inferential statistics, together with statistical tests, as evidence for the underlying reasons of HIV and AIDS transmission and its effect on socio-economic well-being. The qualitative audio data obtained from designated key informant interviews and structured focus group discussions was transcribed and classified appropriately. The research discovered developing themes, trends, patterns, and correlations within the data. The material supplemented the quantitative data, providing a thorough report on the fundamental causes contributing to the elevated HIV/AIDS prevalence in Homa Bay County.

3.12. Ethical Considerations.

Standard standards for securing ethical approval for the research process were followed. Data collection tools were submitted to the National Commission for Science, Technology, and Innovation (NACOSTI) and the Institutional Ethics Review Committee of Mount Kenya University in Kenya. Informed consent was secured from each participant, who signed the consent forms before participating in the study. The study's objective was explicitly communicated to each participant. Before the initiation of the conversations, consent to record the interviews during key informant and focus group discussions was secured from the participants. The participants were guaranteed confidentiality about their identities and the information they disclosed. The research assistants were directed and encouraged to comply with the Ethical Guidelines for field data collection. The researcher requested a study license from Mt Kenya University and a research permit from NACOSTI. The researcher directed data collectors to preserve participants' confidentiality and provide respect for all research subjects.

CHAPTER FOUR

RESEARCH FINDINGS, ANALYSIS AND PRESENTATION

4.1. Introduction

This chapter presents the findings obtained from the analysis of data gathered via the structured questionnaire and qualitative research guides. The acquired data was evaluated using descriptive methods, with results displayed in frequency tables and graphs. This chapter outlines the research findings, presents the research, interprets the findings, discusses the findings, and analyzes individual objective outcomes. Descriptive statistics were employed for data analysis utilizing SPSS version 23. The study involved 276 participants, comprising 168 household respondents, 100 fisherman, 8 key informants, and 100 focus group discussion participants, conducted over five landing beaches in Homa Bay County, representing 92.6% of the sample size. Data on their chosen demographic features was gathered, analyzed, presented, and debated in this chapter.

4.2. Demographics Characteristics of Study Participants

4.2.1. Response Rate

A total of 168 household interviews were conducted with fishermen at the fish landing beaches, achieving a response rate of 94.4% from the targeted 178 households. The observed rate was acceptable, likely due to the presence of fishermen engaged in work during the field survey, which limited their ability to respond. The response rate is detailed below.

Table 4.0

Response rate

Name of Beach	No of Interviews	Targeted Sample	% Response rate
Alum	35	36	97.2%
Kithumbe	32	36	88.9%

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Nyandiwa	33	40	82.5%
Remba	31	31	100%
Ringiti	36	36	100%
Total	**168**	**178**	**94.4%**

Source; Field Data, 2023

4.2.2 Age Group of Participants

Table 4.1

Age group of Participants

Age group of Participants	Frequency	Percent
18 - 29 years	44	26.2
30-39 years	57	33.9
40-49 years	36	21.4
50 - 69 years	22	13.1
70 years and above	2	1.2
Below 18	7	4.2
Total	168	100.0

Source: Field Data 2023

The majority of the research participants interviewed were aged 30 to 39 years, totaling 57 individuals. This translated to 33.0% followed closely by young adults in the age group of 18 to 29 years. They were 44 and comprised of (26.2%). The research indicated that child labour was practiced to a lesser extent, as at least 7 fishermen involved in the study were under 18 years, of age, accounting for 4.2% of the participants. A majority of the participants, 57 individuals or 33.0%, were aged 30 to 39 years. This suggests that the fishing business in the study area is primarily sustained by persons in their peak productive years. This demographic is likely to have the physical strength and experience necessary for labor-intensive fishing activities. people aged 18 to 29 constituted the second-largest demographic, with 26.2% (44 people) of the responses. This indicates that a substantial segment of the fishing workforce

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comprises relatively younger persons who may be freshly entering the field or are in the nascent phases of their fishing careers. The significant presence of individuals aged 30-39 and 18-29 highlights the critical role of fishing as a key source of income for adults in their productive years.

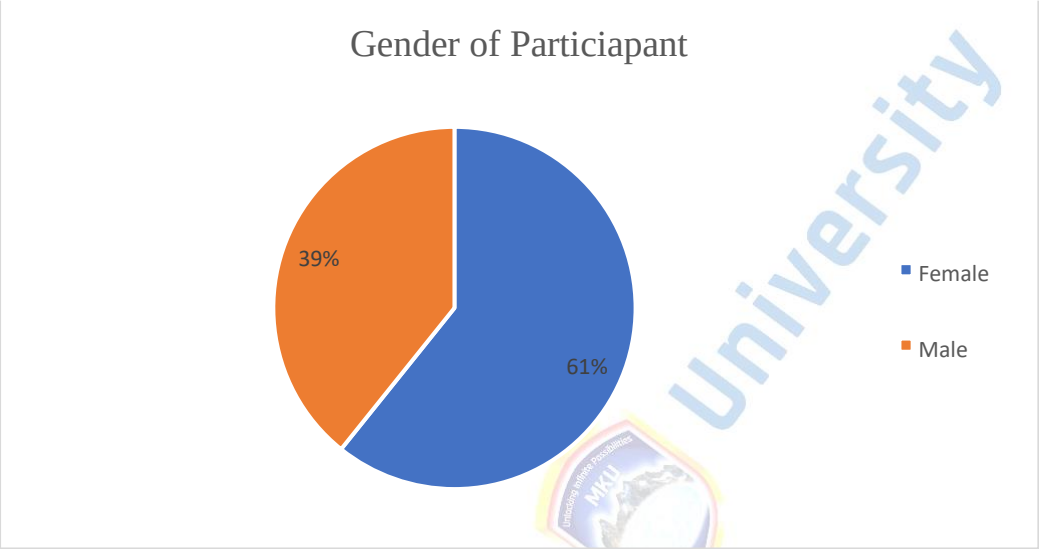

Figure 4.1: Gender of participants

Figure 4.1 presents the gender of participants in the study. Out of the 168 interviewed respondents, 102 were females while 66 were males representing 61% and 39% respectively. This was attributed to the higher population of women who own more fishing boats and businesses in most of the fish landing beaches, particularly on the islands of Remba and Ringiti in Lake Victoria. Among the lakeside communities, the fish business except for the actual fishing which is a female domain, is largely dominated by women who own boats, clean the fish, preserve the fish and sell the fish both in the local market and even in the urban markets of Kisumu and Nairobi. The number of women exceeded that of men at the majority of fish landing beaches.

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Table 4.2

4.2.3 Level of Education

Level of Education of Participants	Frequency	%
Certificate or Diploma (post KCSE)	12	7.1%
Graduate (Masters/PhD)	1	0.6%
Primary completed (KCPE)	50	29.8%
Primary Incomplete	52	31.0%
Secondary Complete (KCSE)	22	13.1%
Secondary incomplete	29	17.3%
Undergraduate (Degree)	2	1.2%
Total	**168**	**100.0%**

Source: Field Data 2023

The illiteracy rate among individuals residing and engaging in commerce at the fish landing beaches of Homa Bay is notably elevated. Table 4.2 represents the of education level of respondents in the study. Of the study participants, 131 had only primary education (complete and incomplete) including incomplete secondary education representing 78.1%. Out of these 52 did not complete primary school 50 had completed primary education and 29 dropped out of secondary school representing 31%, 29.8% and 17.3% respectively. A small proportion of 22 had completed high school education (KCSE) representing 13.1%, while only 2 had an undergraduate level of education representing 1.2%. A majority of participants (131 persons, or 78.1%) either completed elementary education, did not complete primary education, or discontinued secondary education. This elevated rate signifies that a considerable segment of the fishing population possesses only a fundamental level of education or less, hence constraining their access to chances necessitating further educational skills. The statistics indicate that the fishing community has considerable educational shortcomings, with most

individuals not advancing beyond primary education. This may restrict their capacity to pursue alternate work possibilities or obtain training for more sustainable or advanced fishing techniques.

4.3. Detailed research interpretation and discussions

4.3.1. Influence of HIV/AIDS on productivity and efficiency of fishermen

Table 4.3

Impact of HIV and AIDS on productivity of fishermen.

HIV & AIDS has had a negative impact on the productivity of fishermen.			
		Frequency	%
Extent of agreement	*Strongly Disagree*	*8*	*4.8*
	Disagree	*25*	*14.9*
	Moderately Agree	*6*	*3.6*
	Agree	*73*	*43.5*
	Strongly Agree	*56*	*33.3*
	Total	*168*	*100.0*

Source: Field Data 2023

Table 4.3 displays the research findings regarding the impact of HIV and AIDS on the productivity of fishermen. Among the 168 respondents, 73 expressed agreement with this finding, while 56 indicated strong agreement, corresponding to 43.5% and 33.3%, respectively. A total of 76.8% expressed agreement that HIV/AIDS negatively affects the productivity of fishermen. A small proportion of 25 respondents disagreed with the finding, with 8 respondents disagreeing strongly representing 14.9% and 4.8% respectively.

Table 4.4: Impact of HIV and AIDS on the efficiency of fishermen.

4.3.2. HIV/AIDS has had a negative impact on the efficiency of fishermen.

Extent of agreement	Frequency	%

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	Strongly Disagree	11	6.5
	Disagree	20 9	11.9 5.4
Extent of agreement	Moderately Agree	54	32.1
	Agree		
	Strongly Agree	74	44.0
	Total	168	100.0

Source: Field Data 2023

The research aimed to find if HIV/AIDS had a negative impact on the efficiency of fishermen. Table 4.4. shows that 128 participants out of the total 168 representing a total of 76.1% agreed that the frequency of HIV/AIDS has adversely affected the productivity of fishermen. Out of the 128, 74 agreed strongly while 54 agreed with this finding representing 44.0% and 32.1% respectively. FGD participants and key informants reported that despite the increased use of ARVs which has kept most of the fishermen who are living with HIV/AIDS alive for longer, it came with side effects which included appetite loss, diarrhoea, fatigue, and mood changes which hampered their efficiency fishing especially at night when most fishermen venture into the lake. Not sticking to a treatment plan was cited as the main cause of inefficiency as the virus became resistant to drugs and harder to treat which resulted in opportunistic infections and even death of fishermen and fishmongers at the fish landing beaches of Homa Bay.

4.3.3. Influence of HIV and AIDS on the health has resulted in reduced productivity

Table 4.5:

Influence of HIV/AIDS on the health has resulted in reduced productivity

	Extent of agreement	**Frequency**	**%**
	Strongly Disagree	10	6.0
	Disagree	20	11.9
Extent of	Moderately Agree	17	10.1
agreement	Agree	71	42.3
	Strongly Agree	50	29.8
	Total	**168**	**100.0**

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Source: Field Data 2023

Healthy populations have higher productivity as labourers are physically and mentally equipped to produce more within a given timeframe. Table 4.5 illustrates the findings regarding the influence of HIV/AIDS on health and its consequent effect on productivity reduction. Close to three-quarters of the study participants, 121 agreed that the impact of HIV and AIDS on the health and well-being of fishermen resulted in reduced productivity representing the majority at 72.1%. Of these, 71 concurred with the statement, while 50 expressed strong agreement with the statement that the impact of HIV & AIDS on the health and well-being of fishermen has resulted in reduced productivity at the fish landing beaches in Homa Bay representing 42.3% and 29.8% respectively. Only 20 respondents disagreed with the findings with 10 disagreeing strongly representing 9% and 6.0% respectively.

4.3.4. Number of days a week that a boat would fail to go fishing due to HIV/AIDS Illnesses

Table 4.6: Number of days in a week a boat fails to go fishing due to HIV/AIDS-related sickness

How many days in a week would the boat fail to go fishing due to HIV/AIDS-related sickness?

No of days per week		(n)	%
No of days per week	0.0 1.0	44	26.2
	2.0	16	9.5
	3.0	53	31.6
	4.0	43	25.6
		3	1.8
	5.0	3	1.8
	6.0	2	1.2
	7.0	4	2.4
	Total	**168**	**100.0**

Source: Field Data 2023

The findings in Table 4.7 show that a fishing boat in Homa Bay County requires a minimum of 4 able-bodied men to venture into the lake at night to go fishing every day of the week.

HIV/AIDS-related illnesses were found to be affecting the fishing schedules, which are strictly daily and mainly at night. The data in Table 4.6 shows that 53 respondents reported that fishermen failed to go fishing at least 2 days a week while 43 people reported that fishermen failed to go fishing for 3 days in a week due to HIV/AIDS-related illnesses, one or two of the crew members is unwell and the illness was attributed to the effect of opportunistic infections that are related to HIV/AIDS, this represented 31.6% and 25.6% of the respondents respectively. Some 16 respondents reported that fishermen may fail to go fishing at least 1 day a week representing 9.5% while 44 respondents reported that fishermen don't fail to go fishing even when they were sick representing 26%, an unexpected finding depicting the dire need to make money at the expense of their health and part of the evidence behind the reduced efficiency and productivity reported which was also corroborated by FGD participants and key informants that "these days boats get less catch because some of the fishermen are weak due to sickness and can't pull off the heavy duty of night time fishing.

4.3.5. Reduced weight of fish caught due to influence of HIV/AIDS-related illnesses

Table 4.7

Influence of HIV/AIDS prevalence on the weight of fish caught per day

Impact of HIV on the weight of fish caught per day in Kgs (Statistical Mean) (N=168)				
	Fish catch in Kgs/day and week by a big boat.	Fish catch in Kgs/day and week by a small boat.	Total average sale of fish catches by big boat (KES).	Total average sale of fish catches by small boat (KES).
Fish catch and sales per boat in Kgs/day and KES. (Mean)	250.7	104.4	125,330.5	52,178.5
Fish catch and sales per boat in Kgs/week and KES. (Mean)	1,754.6	730.5	877,313.50	365,249.50

Source: Field Data 2023

NB: Price of Nile perch per Kg in August 2023 at the fish landing beaches in Homa Bay.

Table 4.8

Loss in fish due to HIV related illnesses.

Loss in fish catch and sales by big and small boat in KES/week due to HIV related illnesses.

	Days missed by big boat	Days missed by small boat	Loss in sales by big boat in KES/week	Loss in sales by small boat in KES/week
~~No of days boat fails~~	2	2	250,661.00	104,357.00 to go fishing

One fishing boat require a minimum of 4 (four) able-bodied men to go fishing in the lake at night.

Source: Field Data 2023

The effect of HIV/AIDS on the weight of fish caught per day in kg was assessed and the findings were presented in Tables 4.7 and 4.8. The weight of fish caught per boat had been affected negatively by HIV/AIDS in Homa Bay County. A big fishing boat (with one engine) was found to be catching an average of 250.7 kgs of fish in one night and 1,754.6kg per week while a small boat would catch an average of 104.4 Kgs per night and 730.5 kgs per week (7 days) of fishing. However, the fishing crew would fail to go fishing for at least 2 days a week due to HIV/AIDS-related illnesses (opportunistic infections) when one or two members of the team fell sick and could not go fishing. This resulted in losses amounting to KES 250,661.00 per week ($1,740) and KES. 12,031,728.00 ($83,553)[2] annually per boat. This is clear evidence of the negative effect of HIV & AIDS on human capital which reduces income and consequently curtails the socio-economic wellbeing of the individual fishermen, the fishing industry and in turn the entire country.

[2] Exchange rate in August 2023 (1 USD = KES 144.72) Source: Central bank of Kenya.

During one of the KIIs conducted with the Alum BMU chairman said, *"The county health ministry told me that more than 15% of the HIV-positive people in Homabay County are from the fisher-folk group. My family and I have lived in the beach area for a long time. I'm in my third year as head of the Kendu Bay Beach Management Unit (BMU). I can tell you right now that fishermen are very likely to get HIV."* He confirmed that the vulnerability of fisher-folk to HIV has been exacerbated by risky behaviors, including 'fish for sex' or 'sex for fish', as well as widespread substance abuse, particularly alcohol and bhang. This was found to be made worse by the promotion of cultural practices centred around sexual relationships among the Luo community, including wife inheritance and *"golo kodhi* which loosely translates to 'removing seeds.

> *"I've been working to help people with HIV/AIDS for 15 years. If we want to make real progress against HIV/AIDS, we need to have an honest talk about cultural practices that are backwards and need to be thrown out. Pay close attention; A traditional practice called "golo kodhi," which roughly means "removing seeds," tells couples who have homesteads what they should do the night after planting. brought Luo's head to the village for a very important ceremony before planting season",* a key informant and medical officer in charge of HIV/AIDS partner coordination intimated.

He continued to elucidate that *"Tradition says that in the Luo culture, the mikayi (first wife) of the dala (homestead) should plant the maize seeds and gather the maize before anyone else. The Luo call these traditional practices golo kodhi and dwoko cham, and they are very important to them. As a way of "planting a seed" to ward off bad luck that might keep someone*

from getting a bumper crop, a husband and wife must have sex on the night before planting as part of the golo kodhi ritual. In Luo custom, a woman must have sex with her husband before she can plant the next day, no matter where she is. It doesn't matter if she's ready for it or not; it's worse if she's married to more than one man and has to wait for the first wife to return home.

4.3.6. Influence of HIV & AIDS on human capital for socio-economic well-being of fishermen

The influence of HIV and AIDS on the socio-economic well-being of fishermen about human capital was assessed, analysed and presented in tables 4.9 to 4.13.

Table 4.9

HIV/AIDS influence on absenteeism from work by skilled fishermen.

HIV/AIDS has resu work of skilled wo landing beaches.

		Frequency	Percent
Extent of agreement	Strongly Disagree	18	10.7
	Disagree	26	15.5
	Moderately Agree	13	7.7
	Agree	57	33.9
	Strongly Agree	54	32.1
	Total	**168**	**100.0**

Source: Field Data 2023

The research indicated that HIV/AIDS had a direct effect on the performance of skilled fishermen who are the backbone of the fishing industry. The finding was presented in Table 4.9 in which most of the participants, 111 representing 66% agreed in principle that HIV/AIDS had resulted in increased absenteeism from the work of skilled fishermen, out of the 111, 57 agreed while 54 agreed strongly, with this finding representing 33.9% and 32.1% respectively.

The skilled fishermen with HIV/AIDS would fail to report to work and to go fishing at least 2-3 times a week which would often result in their boat failing to go fishing altogether whenever the boat owner was unable to get replacement skilled fishermen to go fishing in the lake. Twenty-six respondents did not agree with this finding representing 15.5% while 18 respondents strongly disagreed with the finding representing 10.7%.

Table 4.10:

Effect of HIV/AIDs on socio-economic wellbeing in relation to human capital

The socio-economic wellbeing of fish landing beaches in Homa Bay County has been hampered by the impact of HIV/AIDS on human capital

		Frequency	%
Extent of agreement	Strongly Disagree	14	8.3
	Disagree	28	16.7
	Moderately Agree	19	11.3
	Agree	62	36.9
	Strongly Agree	45	26.8
	Total	**168**	**100.0**

Source: Field Data 2023

The aftermath of HIV/AIDS on the socio-economic well-being of fishermen about human capital was assessed, analysed and presented in Table 4.9. Out of the 168 respondents interviewed 107 reported that HIV/AIDS had hampered the socio-economic wellbeing of fish landing beaches in Homa Bay County through its impact on human capital, this represented 63.7%. In particular, 62 out of the 107 respondents agreed to this fact representing 36.9% while 45 participants agreed strongly with this finding, representing 26.8%. Qualitative study participants reported that “fishing is their main business and HIV/AIDS has reduced the strength and efficiency of the young able-bodied men who are needed to go fishing”. And that

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"fishing is an energy-intensive work that requires strong and healthy men to deliver however, many young men are living with HIV/AIDS and are on ARVs. This has negatively impacted their physical strength" and therefore productivity and efficiency which in turn affect socioeconomic wellbeing in Homa Bay County.

Table 4.11

Economic growth of fish landing beaches has been adversely affected by the influence of HIV/AIDS on education and health.

The economic growth of fish landing beaches has been adversely aff
HIV and AIDS on education, training, and health of the workforce.

		Frequency	Percent
Extent of agreement	Strongly Disagree	13	7.7
	Disagree	26	15.5
	Moderately Agree	16	9.5
	Agree	73	43.5
	Strongly Agree	40	23.8
	Total	**168**	**100.0**

Source: Field Data 2023

Table 4.11 above presents the findings on the impact of HIV/AIDS on the education, training, and health of the fishing and fish processing workforce. Participants of the qualitative research reported that over the years many skilled fishermen were lost to HIV/AIDS, especially before the introduction of ARVs, many are normally removed from the beaches when their health deteriorates and most ended up dying in their villages resulting in their dependants especially children dropping out of school. This also reduces the skilled workforce in the fishing industry. This was corroborated by 113 respondents representing 67.3% who agreed to the finding that the economic growth of fish landing beaches has been affected by the impact of

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HIV & AIDS on education and health. However, a small number of 28 respondents disagreed while 14 disagreed strongly representing 16.7% and 8.3% respectively.

4.3.7. Reduction in human resources due to HIV/AIDS has impeded socio-economic wellbeing of fishermen.

Table 4.12

Reduction in human resource due to HIV/AIDS has impeded socio-economic wellbeing.

The reduction in human resource due to HIV/AIDS has i		soc -economic
wellbeing and sustainability of FLBs.		
	Frequency	%
Extent of agreement	Strongly Disagree	16	9.5
	Disagree	24	14.3
	Moderately Agree	31	18.5
	Agree	57	33.9
	Strongly Agree	40	23.8
	Total	**168**	**100.0**

Source: Field Data 2023

Table 4.12 presents the finding on the reduction in human resources due to HIV/AIDS in relation to socio-economic wellbeing in which 97 respondents agreed with the finding that reduction in human resources due to HIV/AIDS has impeded the overall socio-economic wellbeing and sustainability of fish landing beaches representing 57.7%. This was also corroborated by FGD participants one of whom reported that "skilled labour at the fish landing beached decreased over the last 5 years as a result of HIV and AIDS-related illnesses and deaths. The illnesses and deaths, however, have decreased by 2023 due to increased use of ARVs provided for free by the government of Kenya, in fact, I think ARVs has even reduced the fear of contracting HIV/AIDS nowadays".

Table 4.13

No of fishermen who die annually as a result of HIV & AIDS-related illnesses.

How many working people (fishermen) die due to HIV/AIDS related illnesses in this landing beach in a year?

		Frequency	%
No of people		47	28.0
	0.0	10	6.0
	1.0	25	14.9
	2.0	23	13.7
	3.0	5	3.0
	4.0		
	5.0	25	14.9
	6.0	5	3.0
	7.0	2	1.2
	8.0	1	.6
	9.0	1	.6
	10.0	8	4.8
	12.0	1	.6
	15.0	2	1.2
	17.0	1	.6
	20.0	7	4.2
	25.0	2	1.2
	26.0	1	.6
	28.0	1	.6

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30.0	1	.6
Total	**168**	**100.0**

Source: Field Data 2023

Table 4.13 presents the number of individuals reported to have died from HIV/AIDS-related illnesses in the past year. Most of the respondents, 121 representing 72% reported that fishermen die of HIV/related illnesses, however, they reported varying number of deaths annually based on their location and knowledge of these deaths from the heath facilities where patients died, out of these 121, 25 respondents reported that 5 people die annually representing 14.9%, another 25 respondents reported that 2 people die annually representing 14.9%, 23 respondents representing 13.7% reported that at least 3 people die annually of HIV/AIDSrelated illnesses, while 23 respondents representing 13.7% participants reported that 5 people die annually. However, 47 respondents reported that no HIV/AIDS-related deaths occurred during the last one year as a result of ARVs or they had no idea if the deaths witnessed were caused by HIV/AIDS-related illnesses. This could have been attributed to two factors; the high levels of illiteracy among the fishermen and the traditional belief that HIV/AIDS was a just a curse locally referred to as "*chira*" and was not a disease that could be killing people, these factors that were found to fanning the high levels of HIV & AIDS prevalence along the lake shores and fishing islands in Lake Victoria.

4.3.8. Influence of HIV/AIDS on availability of Human resource and manpower in the fishing industry.

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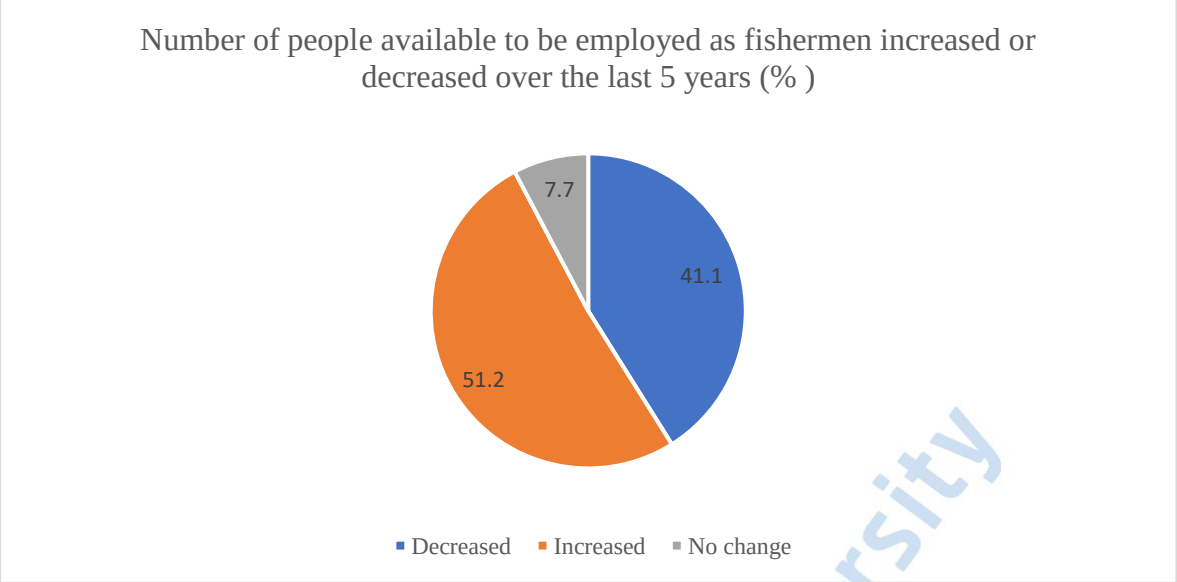

Figure 4.2: Change in the number of people available to be employed as fishermen (%).

Figure 4.2 present the results on the influence of HIV & AIDS on the change in the number of people available to be employed as fishermen at the fish landing beaches and 86 respondents representing 51% reported that the number of people available to be employed as fishermen are on the increase however 69 respondents representing 41% reported that the number has decreased over the last 5 years. This proportion of the population is an older population who have lived in the fish landing beach for more than 5 years and were more knowledgeable about the availably of about today as compared to more than 5 years ago when more individuals were available to be employed as fishermen at the fish landing beaches. The increase in available labour depicted by the high number of people available to be employed as fishermen could be attributed to the general inflation in the county and the high national unemployment rates particularly among the undereducated youth not only in Kenya but also throughout the East African region.

4.3.9. Influence of increased healthcare expenditure on socio-economic wellbeing.

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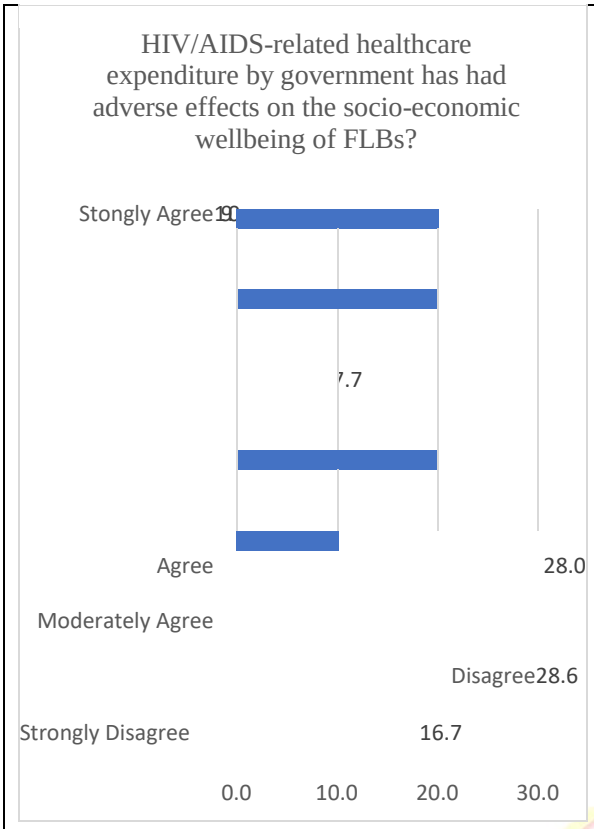


Figure 4.3a: healthcare expenditure by government

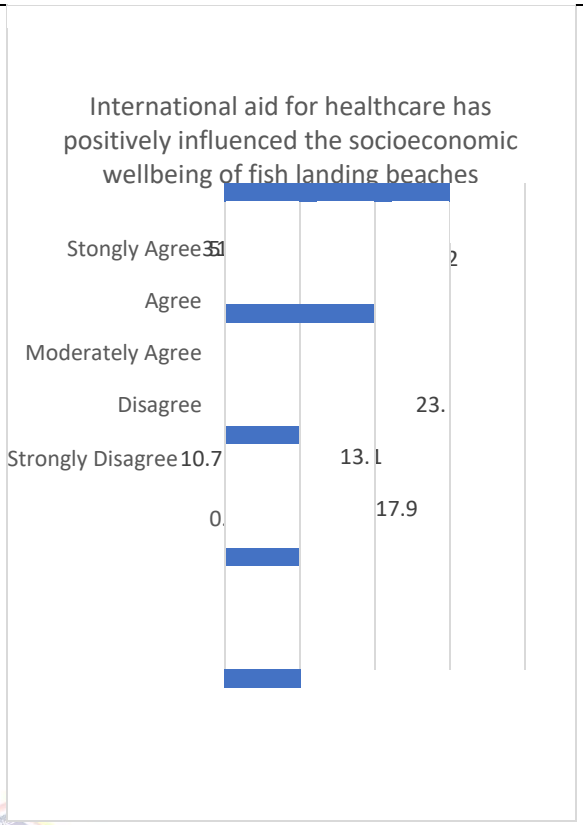
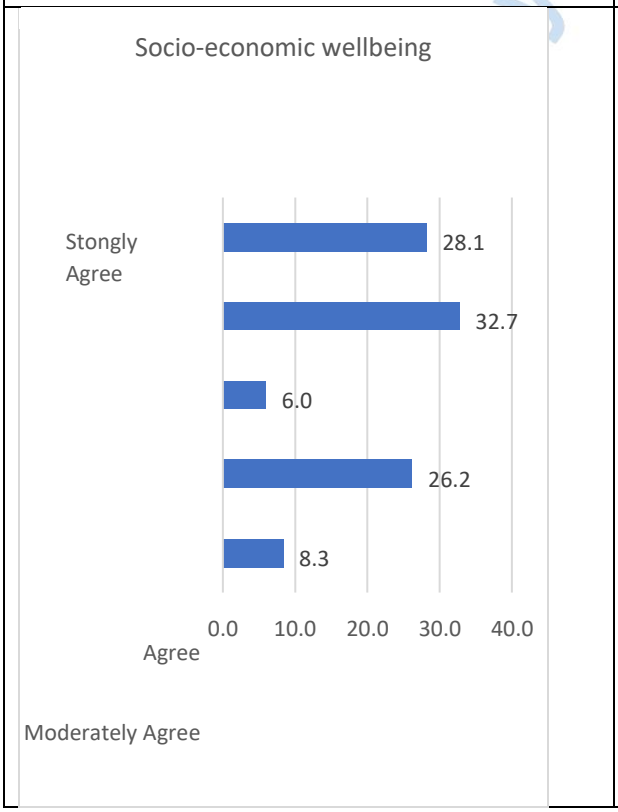
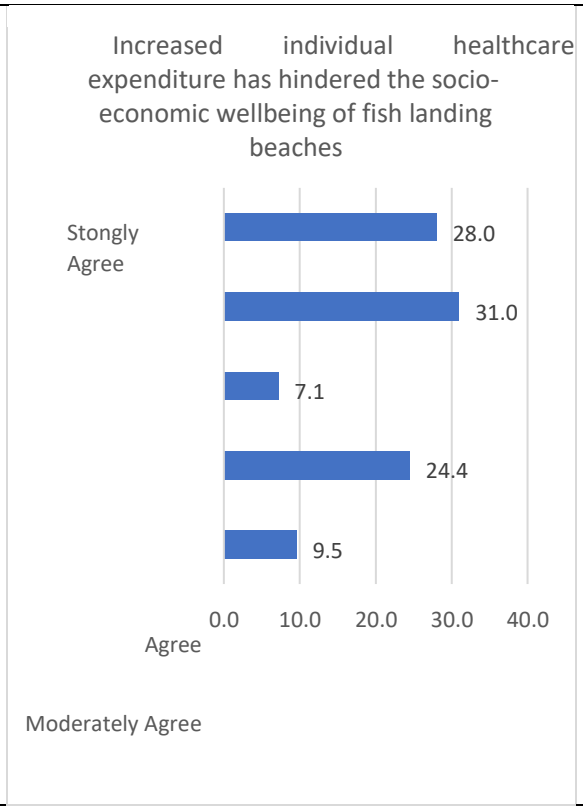


Figure 4.3b: International aid for healthcare





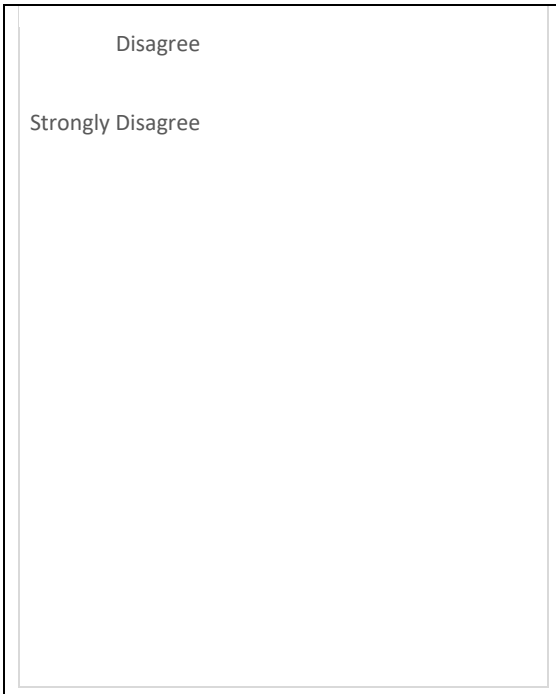


Figure 4.3c:

Figure 4.3d:

Figure 4.3: Impact of increased healthcare expenditure on socio-economic wellbeing.

The study found that HIV/AIDS-related healthcare expenditure by various stakeholders had some effect on the socio-economic wellbeing of fish landing beaches.

Table 4.3a present the finding on how HIV/AIDS-related healthcare expenditure by government had adverse effects on the socio-economic wellbeing of fish landing beaches, 47% agreed with this finding while 45.6% disagreed with a notable 16% disagreeing strongly with the finding. Those who disagreed with the finding (almost as many as those who agreed) asserted that government expenditure on healthcare could not have adverse influence on socioeconomic wellbeing of fishermen because government funding for development is under a different ministry and is specifically allocated to development and not health. Assessment on whether international aid for healthcare had positively influenced the socio-economic wellbeing was done and presented in table 4.3b. If respondents who moderately agreed are included, then close to three quarters, 120 respondents agreed with the finding that

international aid for healthcare had positively influenced the socio-economic wellbeing of fish landing beaches representing 71.4%. Table Table 4.3c present the finding that increased household healthcare expenditure has negatively impacted the socio-economic wellbeing of fishermen where 100 respondents agreed to this finding representing 60.8%, out of which 45 respondents representing 28% agreed strongly to that finding.

Table 4.3d presents the finding where 99 out of the 168 respondents agreed that increased individual healthcare expenditure had hindered the socio-economic wellbeing of fish landing beaches representing 59%. Out of these, 47 respondents agreed strongly with this finding representing 28%. The study found that increased HIV/AIDS-related healthcare expenditure both at individual and household and government levels had a negative influence on the socioeconomic wellbeing of fishermen in Homa Bay County. HIV/AIDS-related healthcare expenditure at individual and household levels impact was greatest on socio-economic wellbeing because the affected individuals and household lost their purchasing power after losing their jobs, both their life savings and assets to HIV/AIDS treatment and care as they fight to save their own lives or the lives of one or more infected members of their households. This was made worse by the high cost of healthcare and low income among the fishing communities along the shores of Lake Vitoria.

Table 4.13

The cost of consultation at the main health facilities

Consultation at the main health facility in this area in KES			
	0.0	Frequency	Percent

Cost of consultation	5.0	59	35.1
	20.0	1	.6
	50.0	10	6.0
	100.0	21	12.5
		36	21.4
	150.0	2	1.2
	200.0	26	15.5
	250.0	4	2.4
	300.0	4	2.4
	500.0	4	2.4
	1000.0	1	.6
	Total	**168**	**100.0**

Source: Field Data 2023

4.3.10. Cost of healthcare services

The cost of healthcare services at the fish landing beaches in Homa County are cheap and sometimes free in government health facilities. Most respondents, 35.1% (59) reported paying nothing to get all treatment (both consultation and medication from the health facilities, and 21.4% (36) reported paying only KES. 100, while 15.5% reported paying KES. 200 to receive health services from local health facilities particularly private ones. Most public health facilities at fish landing beached provided free HIV/AIDS related illnesses treatment including the provision of ARVs.

Table 4.16

Level of socio-economic wellbeing if there was no HIV/AIDS

Do you think that if there were no diseases such as HIV/AIDS in this landing beach, there would be more investment and socio-economic wellbeing for fishermen?

		Frequency	Percent
Response	No	18	10.7
	Not sure	5	3.0
	Yes	145	86.3
	Total	**168**	**100.0**

Source: Field Data 2023

4.3.11. Level of socio-economic wellbeing if there was no HIV/AIDS

The expected level of development if there was no HIV/AIDS was assessed and findings were presented in table 4.4 where 145 respondents interviewed representing 86.3% reported that if there was no HIV/AIDS in the fish landing beach, there would be more investment and socioeconomic wellbeing. However, 18 respondents disagreed with the finding representing 10.7%. HIV/AIDS has contributed to chronic sickness and deaths of skilled fishermen and workingage people. This caused in the loss of labour and human capital which in turn resulted in the loss of income particularly for sole breadwinners among the fishing communities effectively hampering the growth of the fishing industry which is a major contributor to the socioeconomic wellbeing in the lake shore counties such as Homa Bay.

4.3.12. The influence of high HIV/AIDS prevalence on income from fish production and GDP.

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Table 4.5 presents the findings regarding the impact of HIV/AIDS on income and the Gross Domestic Product (GDP) [3] of the fish landing beaches in Homa Bay County. Most respondents, 64.9% reported that the high HIV/AIDS prevalence had negative impacts on the income earned from fish production by fishermen at the fish landing beaches which in turn affected the Gross Domestic Product (GDP). The increase in the poverty rate is attributed to the high prevalence of HIV and AIDS in fish landing beaches at 67.8%, The employment rate had been negatively impacted by the HIV/AIDS prevalence in fish landing beaches, reported by 54.2%, while income inequality had worsened in this fish landing beach due to the HIV/AIDS prevalence, reported by 47.1% of the respondents.

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Table 4.17

The impact of high HIV prevalence on income from fish production (GDP).

	Level of Agreement					
	Strongly Disagree	Disagree	Moderately Agree	Agree	Strongly Agree	Total

[3] The GDP was explained to respondents as the "total of all value added created in an economy. The value added means the value of goods and services that have been produced minus the value of the goods and services needed to produce them"

The HIV prevalence has a negative impact on the income earned from fish production (GDP).	Frequency	21	32	6	65	44	168
	%	12.5	19.0	3.6	38.7	26.2	100.0
The poverty rate has increased as a result of the HIV prevalence	Frequency	22	29	3	61	53	168
	%	13.1	17.3	1.8	36.3	31.5	100.0
The employment rate has been negatively impacted by the HIV prevalence in fish landing beaches	Frequency	23	34	20	**4.3.13. 45**	46	168
	%	13.7	20.2	11.9	26.8	27.4	100.0
Income inequality has worsened in this fish landing beach due to the HIV prevalence	Frequency	23	45	21	50	29	168
	%	13.7	26.8	12.5	29.8	17.3	100.0

Source: Field Data 2023

4.3.14. Reasons for the persistently high prevalence of HIV & AIDS in the fish landing beaches over the last 5 years.

The main reasons behind the high HIV/AIDS prevalence at the fish landing beaches in Homa Bay county includes: Prostitution and exchanging of sex partners, newcomers to the island having sex with locals who are already infected due to too much alcohol consumption,

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reported by 22% of respondents, cash flow is high from the daily fish catch and sales which is a catalyst for alcohol and prostitution and once people are drunk, they don't use protection that leads to new infections and high HIV & AIDS prevalence reported by 15.5%, carelessness and ignorance – most of the young people who join the fishing industry are illiterate, most of whom did not even complete primary education. Sexual immorality without protection coupled with the high population and alcoholism reported by 14.9% while 13.7% of the respondents reported that the high HIV/AIDS rate is a result of the high immigration rate – these people come from different places, some even from neighbouring countries e.g. Uganda, Tanzania and as far as Congo DRC and they meet at the fish landing beaches, prostitution then easily pick up because people don't know each other. Another 13.7% reported that "sex for fish" also known as "*jaboya*" enforced mostly by male fishermen, fishermen exchanging sexual partners regularly and having unprotected sex without testing for HIV/AIDS AIDS and young fishermen having sex with older women for money. Such men and women were not willing to be educated on HIV/AIDS as reported by 11.9%, therefore contributing immensely to the persistently high frequency of HIV & AIDS in the fish landing beaches in Homa Bay County.

Table 4.18

Reasons for the high prevalence of HIV & AIDS in the fish landing beaches

Why do you think there is persistent high prevalence of HIV/AIDS in this landing beach over the last 5 years.	Frequency	%

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		37	22.0
	Prostitution and exchanging of sex partners, newcomers to the island have sex with locals who are already affected due to too much alcohol	4	2.4
	Alcoholism and illiteracy leading to skipping ARVs and spreading of HIV through unprotected sex	20	11.9
	Carelessness and ignorance - people not willing to be educated on HIV/AIDS	26	15.5
	Cash flow is high, alcohol and prostitution. Once people are drunk, they don't use protection that led to high HIV prevalence		
Reasons			
	High immigration rate - People come from different places e.g., Uganda, Tanzania meets there, prostitution then easily pick up	23	13.7
	High Population, ladies come with no work or education, they become alcoholics become commercial sex workers.	1	0.6
	High Population, ladies come with no work or education, they become commercial sex workers.	3	1.8
	HIV Prevalence has reduced	1	0.6
	I don't know	3	1.8
	Rape cases and forced sexual harassment by rich and illiterate fishermen on young women.	2	1.2
	Sex for fish with fisherman "jaboya" enforced mostly by male fishermen. - Exchanging sexual partners - No testing for HIV AIDS before engaging - No use of condom - young people have sex with older women because money - Alcohol - People do not listen to education on prevention of HIV	23	13.7
	Sexual immorality without protection, high population and alcoholism	25	14.9
	Total	168	100.0

Source: Field Data 2023

4.3.15. Ways to reduce the high prevalence of HIV and AIDS in this landing beach in Homa Bay County.

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Methods to ease the elevated incidence of HIV and AIDS were examined, and the results are presented in Table 4.7. 51.2% of respondents (86) indicated that the most effective method to diminish the high rates of HIV/AIDS is for the government to implement public awareness and education regarding the effects of alcohol and the risks associated with unprotected sex at fish landing beaches in Homa Bay County. Respondents in the qualitative study showed that fisherman, particularly the youth, exhibited a lack of interest in public awareness and education initiatives conducted by Non-Governmental Organizations (NGOs) and other civil society entities, instead showing deference solely to government programs. Approximately 18% of the study participants asserted that the most effective method to diminish the high prevalence of HIV & AIDS would be for the government to provide free condoms consistently and continually. It was observed that throughout the study period (August 2023), complimentary condoms were no longer accessible at the landing beaches and facilities. Additional strategies to mitigate the elevated rates of HIV/AIDS encompass: HIV & AIDS counseling and testing (6.5%), adequate provision of medications including antiretrovirals (4.2%), and promoting sexual abstinence as the most effective means to diminish HIV/AIDS prevalence, with condom usage (3%) as an alternative, among other measures delineated in table 4.7. A minority of respondents (3%) contended that mitigating the elevated HIV/AIDS prevalence is challenging due to the significant, marriage-like ties formed with their sexual partners, which are perceived as inviolable. A primary informant from the county government's health department indicated that "the most accessible location to find a sexual partner is at the fish landing beaches." Fishermen migrating from many regions, including Uganda, Tanzania, and as distant as the Democratic Republic of Congo, initiate casual sexual encounters in pursuit of superior fishing grounds."

Table 4.19

What can be done to reduce the high prevalence of HIV

What do you think can be done to reduce the high prevalence of HIV in this landing beach in Homa Bay county?

		Frequency	Percent
	Abstinence from sex is the best. If not use of condoms.	5	3.0
	A lot of focus should be put in preventing new HIV/AIDS infections.	2	1.2
	Government should create public awareness and education on the effects of alcohol and risk of unprotected sex	86	51.2
	Government to help by giving loans to empower young women	3	1.8
	Government to implement policies to regulate alcohol abuse by the youth	1	0.6
	Government to implement policies to regulate sexual immorality within the beaches	3	1.8
	HIV counselling and Testing	11	6.5
	HIV positive people should be encouraged to adhere to drugs.	1	0.6
Measures			
	Increase security especially rape	1	0.6
	Introduction and adoption of HIV vaccine	2	1.2
	It's a big challenge and hard to resolve. Humans are uncontrollably difficult.	1	0.6
	It's hard because they form serious relationships akin to marriage. You can't interfere.	5	3.0
	Keep off from ladies from Uganda as they are the cause of increased prostitution in this area	1	0.6
	Loans, financial access, local infrastructure improvement, roads are in bad state	1	0.6
	Make available free condoms and education on effective use	30	17.9
	People should stop engaging in irresponsible and unprotected sex.	5	3.0
	Prayers and awareness, turn to Christ and change lifestyle	2	1.2
	Provide skilled doctors	1	0.6
	Providing enough medicine including ARVs	7	4.2
	Total	**168**	**100.0**

Source: Field Data 2023

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4.4. Discussion of individual objective results.

The study involved interviews with 240 participants (168 household respondents, main fishermen and fishmongers, 64 FGD participants and 8 key informants) which was conducted in five landing beaches in Homa Bay County. The majority of the research participants interviewed were aged 30 to 39 years, totaling 57 individuals. This translated 33.0%. Out of the 168 interview respondents 102 were females while 66 were males representing 61% and 39% respectively. Most of the study participants, 131 had only primary education or incomplete secondary education representing 78.1%. Out of these 52 did not complete primary school, 50 had completed primary education while 29 dropped out of secondary school representing 31%, 29.8% and 17.3% respectively.

4.5. HIV/AIDS Prevalence and Productivity.

The study's first objective was to evaluate the effect of HIV/AIDS on the productivity of fishermen at fish landing beaches, specifically in Homa Bay County, Kenya. The study's results show that HIV/AIDS negatively affects the productivity of fishermen. According to the findings in table 4.4, most participants, 76.8% generally reported that HIV & AIDS has had a negative influence on their productivity as fishermen out of which 43.5% (73) agreed to this fact while 33.3% (56) agreed strongly with this finding. This implied that HIV/AIDS related illness made it difficult for all fishermen to go fishing every night of the week as required for them to catch adequate fish and generate adequate income for themselves and their employers. Findings about fishermen who were living with HIV/AIDS and on ARVs were reported not be as physically fit and as strong as their healthy counterpart. This contributed to reduced fish catch.

Table 4.4. shows that 128 participants of the total 168 representing a total of 76.1% agreed that HIV/AIDS has negatively influenced the efficiency of fishermen. Out of the 128, 74 agreed strongly while 54 agreed with this finding representing 44.0% and 32.1% respectively. FGD participants and key informants reported that despite the increased use of ARVs which has kept most of the fishermen who are living with HIV/AIDS alive for longer, it came with side effects side effects which included appetite loss, diarrhoea, fatigue, and mood changes which hampered their efficiency in fishing especially at night when most fishermen venture into the lake. Refusing to stick to the ARV a treatment plan was also cited as a significant cause the inefficiency as the virus become resistant to drugs and harder to treat which resulted in opportunistic infections and even death of skilled fishermen and fishmongers at the fish landing beaches of Homa Bay. This implied that less fish was caught by the same manpower and cost as compared to a fully healthy team of skilled fishermen. The inefficiency was hard to avoid as many fishermen concealed their HIV status or looked healthy and were always ready to go fishing.

The study by (Kastrau et al, 2021) which was motivated by the high HIV and AIDS rate in fishing communities and the potential economic consequences of the disease in Uganda found that HIV-positive individuals in fishing communities had lower labour productivity and higher healthcare costs compared to their HIV-negative counterparts. This resulted in lower economic outputs and reduced economic growth in the fishing communities. The study also found that the influence of HIV/AIDS on labour productivity and healthcare costs was more significant for women and individuals with lower levels of education. These results are similar to the finding of this study where 76.8% reported that HIV/AIDS has had a negative influence on the productivity of fishermen. This implied that HIV/AIDS related illness made it difficult for all fishermen to go fishing every night of the week as required for them to catch adequate

fish and generate adequate income for themselves and their employers. Fishermen who were living with HIV/AIDS and also on ARVs were reported not be as physically fit and as strong as their healthy counterpart. This contributed to reduced fish catch. This also resulted in lower economic outputs and reduced economic growth in the fishing communities in Homa bay, similar to Uganda.

4.6. HIV/AIDS and Human Capital

The second purpose of this study investigated the influence of HIV & AIDS on human capital concerning the socio-economic wellbeing of fish landing beaches in Homa Bay County, Kenya. Seventy-two point one percent of the survey participants, totaling 121, concurred that the influence of HIV/AIDS on the health and well-being of fisherman has led to diminished output. Of these, 71 individuals concurred with the statement, while 50 strongly concurred that the impact of HIV & AIDS on the health and well-being of fishermen has led to diminished output at the fish landing beaches in Homa Bay, representing 42.3% and 29.8%, respectively. This implied that available human capital at the fish landing beaches was not healthy which resulted in lower productivity as labourers and were not robust physically and mentally to produce more fish within a given timeframe. Some participants in the study who were HIV/AIDS positive (volunteered their HIV status) also cited stigma and depression as some of the challenges they were dealing with which negatively impacted their efficiency as fishermen.

At any particular moment a crew of fishermen must be composed of a minimum of 4 members to go fishing in the lake at night with one boat. The results presented in table 4.6 present the finding that 53 respondents agreed that they, fishermen may fail to go fishing at least 2 days in a week while 43 people reported that fishermen may fail to go fishing 3 days a week due to HIV/AIDS related illnesses, this represented 31.6% and 25.6% of the respondents. This happened when one or two of the crew members are unwell and many a times the illness was

attributed to the effect of opportunistic infections that were related to HIV/AIDS. Weight of fish catching per boat had been affected by the high rate of HIV & AIDS and its effects on human capital in Homa Bay County. A big fishing boat (with one engine) and 4 crew members was found to be catching on average 250.7 kgs of fish in one night and 1754.6kg per week while a small boat catches an average of 104.4 Kgs per night and 730.5 kgs per week (7days) of fishing. However, the research found that the fishing crew and boat would fail to go fishing for at least 2 days a week due HIV/AIDS related illnesses (opportunistic infections) when one or two members of team fell sick and could not go fishing. This resulted in losses amounting to KES 250,661.00 per week ($1,740) and KES. 12,031,728.00 ($83,553)[4] annually by big boats. The losses in the expected and projected earnings by fishermen resulted in reduced economic growth and therefore reduced socio-economic wellbeing in Homa Bay County.

The study identified that HIV/AIDS had direct effect on the performance of skilled fishermen who are the backbone of the fishing industry. The findings presented in table 4.9 above in which most of the participants, 111 representing (66%) agreed in principle that HIV/AIDS had resulted in increased absenteeism from work of skilled fishermen, out of the 111, 57 agreed while 54 agreed strongly with this finding representing 33.9% and 32.1% respectively. The skilled fishermen with HIV/AIDS would fail to report to work and to go fishing at least 2-3 times a week which would often result in their boat failing to go fishing all together whenever the boat owner was unable to get replacement skilled fishermen to go fishing in the lake. The focus group discussion revealed that a significant number of HIV-positive fisherman, regardless of skill level, succumbed during their most productive years. As younger and less experienced fisherman supplant them, fish output diminishes. The morale of healthy

[4] Exchange rate in August 2023 (1 USD = KES 144.72) Source: Central bank of Kenya.

employees may be impacted by issues related to family members or colleagues living with HIV/AIDS. This research indicates that HIV & AIDS adversely affects the health of

fishermen, which subsequently diminishes their efficiency and productivity in fishing, fish yield, and consequently their income. A decline in income within any sector would adversely affect both the industry's growth and the nation's GDP. Annual fish production is projected to be 150,000 metric tons. The sector currently represents about 0.5% of Kenya's Gross Domestic Product (GDP). This finding demonstrated that the effect of HIV/AIDS on economic growth is more pronounced in counties with elevated prevalence rates, such as Homa Bay, and diminished beginning levels of human capital, which impedes socio-economic well-being.

Table 4.12 presents the finding that reduction in human resource due to HIV/AIDS impeded the overall socio-economic wellbeing and sustainability of fish landing beaches as reported by 57.7% (97) participants. This was also corroborated by FGD participants one of who reported that “skilled labour at the fish landing beach decreased over the last 5 years as a result of HIV/AIDS related illnesses and deaths. The illnesses and deaths were at their worst 5 years ago however, the deaths have decreased now due to increased use of ARVs, in fact, it’s likely that ARVs has even reduced the fear of contracting HIV/AIDS nowadays”.

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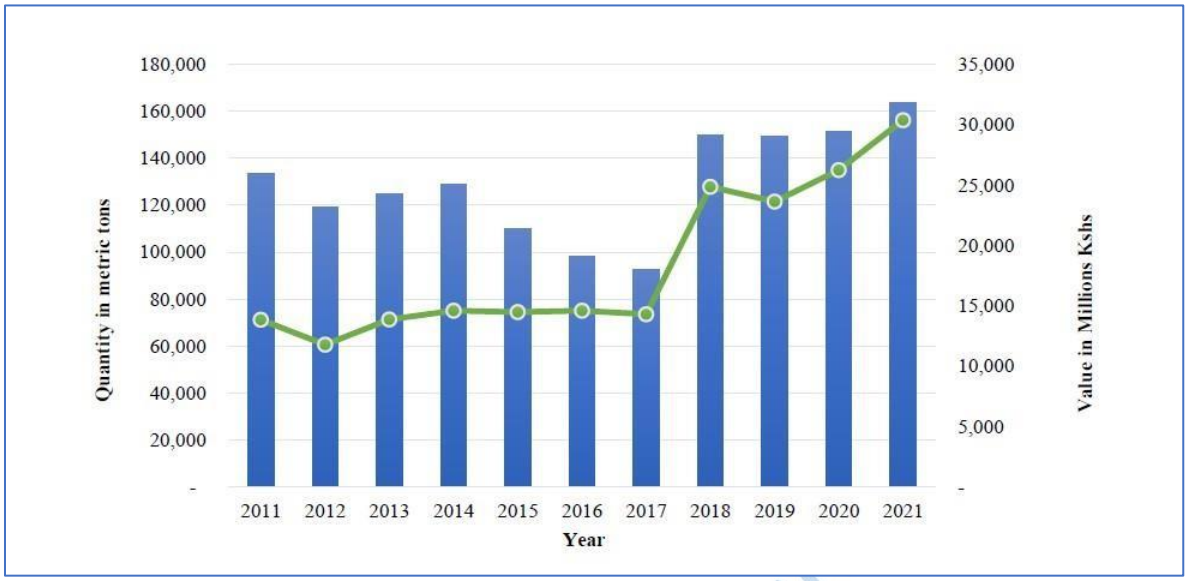

Figure 4.2e: Quantity and value of fish landings 2011-2021

This finding aligns with the Fisheries Annual Statistical Bulletin 2021 published by The State Department for Fisheries and the Blue Economy within the Ministry of Agriculture, Livestock, Fisheries & Cooperatives. The bulletin also reported a decline in the quantity and value of fish landings, decreasing from approximately 130,000 Metric Tons in 2014 (KES. 27.5 billion) to around 90,000 Metric Tons (KES. 17.5 billion) in 2017. As of 2021, the total fish production in the country reached 163,702 metric tons, valued at 30.38 billion Kenya shillings. This represented an 8.2% rise in production relative to the 151,289 tons valued at 26.25 billion Kenya shillings achieved in 2020. The fishery of Lake Victoria recorded a total of 94,349 metric tons, reflecting a 7% increase in catch from the 88,223 metric tons documented in 2020. The rise was linked to greater access to and utilization of ARVs among individuals living with HIV in the fishing sector, along with the easing of Covid-19 pandemic restrictions and the return to regular fishing hours. Figure 4.2e from the Fisheries Annual Statistical Bulletin 2021, published by The State Department for Fisheries and the Blue Economy within the Ministry

of Agriculture, Livestock, Fisheries & Cooperatives, illustrates a consistent decline in fish landings from 2014 to 2017.

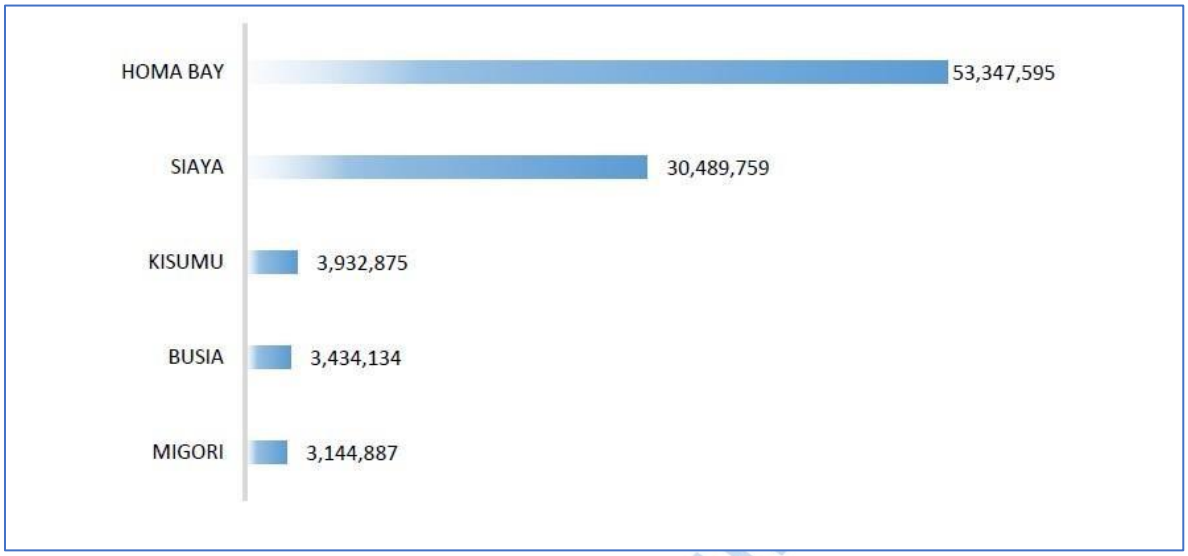

Figure 4.2f: Fish weight caught per riparian county during 2021.

According to the Fisheries Annual Statistical Bulletin 2021 by the State Department for Fisheries and the Blue Economy within the Ministry of Agriculture, Livestock, Fisheries & Cooperatives, an analysis was conducted to compare fish catches from Lake Victoria across riparian counties, as illustrated in figure 4.2f above. Homa Bay County recorded the highest catch at 57%, followed by Siaya at 32%, with Kisumu and Busia each at 4%, while Migori had the lowest catch at 3%.

However, the study examined what the level of socio-economic wellbeing would have been if there was no HIV/AIDS in Home Bay County and 145 respondents out of the 168 interviewed representing 86.3% reported that if there was no HIV/AIDS in the fish landing beach, there would be more investment and socio-economic wellbeing for fishermen and for the county. Only 18 respondents reported that there would be no difference representing 10.7% while 5 respondents were not sure representing 3%. This indicated that HIV/AIDS has negatively

affected the socio-economic welfare of the fishing industry in Homa Bay County and Kenya, as the fishing sector contributed 5% to the GDP.

Sichei and Muchapondwa analyzed the effects of HIV & AIDS on human capital and economic growth in Sub-Saharan Africa (Sichei et al, 2020). The research indicated that HIV/AIDS adversely affects human capital and economic growth in Sub-Saharan Africa. The authors specifically determine that a 10% rise in HIV/AIDS prevalence results in a 0.19% decrease in years of schooling and a 0.32% decline in real GDP per capita. The authors discovered that the effect of HIV/AIDS on economic growth is more pronounced in nations with elevated HIV/AIDS prevalence rates and diminished beginning human capital levels. This finding parallels the results of the study, which demonstrated that the impact of HIV/AIDS on economic growth is more pronounced in counties with elevated HIV/AIDS prevalence rates, such as Homa Bay, and diminished starting levels of human capital, hence hindering socioeconomic well-being.

4.7. **HIV/AIDS prevalence and Healthcare Expenditure**

The last and third objective examined the economic costs of healthcare expenditure in relation to HIV/AIDS on the socio-economic wellbeing of fishermen at the fish landing beaches, a case of Homa Bay County, Kenya. HIV/AIDS-related healthcare expenditure at individual and household levels had the impact was greatest on socio-economic wellbeing because the affected individuals and household lost their purchasing power after losing their jobs, both their life saving and assets to HIV/AIDS treatment and care as they fight to save their own lives or the lives of one or more infected members of their households. This was made worse by the high cost of healthcare and low income among the fishing communities along the shores of Lake Vitoria. This finding was partially similar to the Anand et al., (2019) who estimated

the economic impact of HIV/AIDS on individuals and households in Nigeria. The results of the study also showed that HIV/AIDS imposes a significant financial burden on affected households in Nigeria. Direct costs accounted for the majority of the economic burden, while indirect costs were relatively low. The study also identified that the financial burden of HIV/AIDS was higher for households with lower socioeconomic status, those living in rural areas, and those with multiple household members affected by HIV.

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CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the findings that arose from the analysis of the data that was collected and presented in Chapter 4. The chapter presents the conclusions made out of this study as well as recommendations of the study in which a total of 276 participants were interviewed including 168 household respondents, fishermen, 100 FGD participants and 8 key informants. The study was conducted in five landing beaches in Homa Bay County.

5.2 Summary of the result findings

Most of the interviewed respondents were in the age group of 30 to 39 years, they were 57 in number. This translated 33.0% followed closely by young adults in the age group of 18 to 29 years represented by 44 which translated 26.2%. The research also found that child labour was practiced to a lower extent because at least 7 fishermen who participated in the study were aged below 18 years representing 4.2%. Out of the 168 interview respondents 102 were females while 66 were males representing 61% and 39% respectively. Most of the study respondents, 131 had only primary education or incomplete secondary education representing 78.1%. Out of these 52 did not complete primary school 50 had completed primary education while 29 dropped out of secondary school representing 31%, 29.8% and 17.3% respectively. Only a small proportion of 22 (13.1%.) had completed high school education (KCSE).

5.2.1 HIV/AIDS Prevalence and Productivity

The research found that HIV/AIDS negatively influenced the efficiency and productivity of fishermen where 128 participants of the total 168 representing a total of 76.1% agreed that HIV & AIDS has had a negative impact on the efficiency of fishermen. Close to three quarters of the study participants, agreed that the impact of HIV/AIDS on the health and well-being of

fishermen has resulted in reduced productivity representing 72.1%. The qualitative study found that despite the increased use of ARVs which had kept most of the fishermen who were living with HIV/AIDS alive for longer, it came with side effects which included appetite loss, diarrhoea, fatigue, and mood changes which hampered their efficiency fishing especially at night when most fishermen venture into the lake. Not sticking to a treatment plan was cited as the main cause the inefficiency as the virus become resistant to drugs and harder to treat which resulted in opportunistic infections and even death of fishermen and fishmongers at the fish landing beaches of Homa Bay. It was found that weight of fish caught per boat had been affected negatively by HIV/AIDS in Homa Bay County. The fishing crew would fail to go fishing for at least 2 days a week due HIV/AIDS related illnesses (opportunistic infections) when one or two members of team fell sick and could not go fishing. This resulted in losses amounting to KES 250,661.00 per week by big boats and KES. 12,031,728.00 annually per boat. This implied that investments were hampered, loans taken were not repaid on time, and some business people lost part of or all of their businesses hence reducing the socio-economic wellbeing at the fish landing beaches and Homa Bay County which in turn negatively impact the national economy.

5.2.2 HIV/AIDS Prevalence and Human Capital

The study found that HIV/AIDS had direct effect on the performance of skilled fishermen who are the backbone of the fishing industry and that most of the respondents, 111 representing 66% agreed in principle that HIV/AIDS had resulted in increased absenteeism from work of skilled fishermen. The skilled fishermen with HIV/AIDS would fail to report to work and to go fishing at least 2-3 times a week which would often result in their boat failing to go fishing all together whenever the boat owner was unable to get replacement skilled fishermen to go fishing in the lake. This finding implied that much less fish was caught than expected and this

reduced the expected income for both the fisherman and the boat owners hence negatively impacting economic growth and development.

Participants of the qualitative research reported that over the years many skilled fishermen were lost to HIV/AIDS especially before the introduction of ARVs, many are normally removed from the beaches when their health deteriorates and most ended up dying in their villages resulting in their dependants especially children dropping out of school. These also reduce the skilled workforce in the fishing industry. This was corroborated by 113 respondents representing 67.3% who agreed to the finding that the economic growth of fish landing beaches has been adversely influenced by the impact of HIV/AIDS on education and health. Gender inequality especially against women and girls, difficulties in accessing adolescents and youth friendly HIV/AIDS services and poverty which makes it difficult for the youth in the county to continue with their education are fuelling high rates of HIV/AIDS in Homa Bay. Data from the qualitative interviews supported this finding; most KII participants cited poverty and gender inequality as some of the key drivers to cycle of high HIV/AIDS prevalence and slow socio-economic wellbeing despite the access to fish and regular income. HIV & AIDS is still one of the leading causes of death of young people particularly in Homa Bay County despite government and other health stakeholders' interventions to fight the high HIV/AIDS prevalence and HIV/AIDS-related opportunistic infections and illnesses. Overall, most of the interviewed respondents, 121 representing 72% reported that fishermen die of HIV/related illnesses, however, they reported varying number of deaths annually based on their location and knowledge of these deaths. The implication of this is that there are still many HIV/AIDS related deaths across the county which takes with it skilled labour and leave in its wake a hard-to-break cycle of poverty, illiteracy and disease which fuels each other.

5.2.3 HIV/AIDS Prevalence and Healthcare Expenditure.

The study found that HIV/AIDS-related healthcare expenditure by various stakeholders had some impact on the socio-economic wellbeing of fish landing beaches where 99 out of the 168 respondents agreed that increased individual healthcare expenditure had hindered the socio-economic wellbeing of fish landing beaches representing 59. The study found that increased household healthcare expenditure has negatively impacted the socio-economic wellbeing of fishermen where 100 respondents agreed to this finding representing 60.8%, out of which 45 respondents representing 28% agreed strongly to that finding. This implies that despite the intervention by the government which are largely involving care and treatment though the use of ARVs families with people with HIV and AIDS still have to meet the high cost of treating opportunistic infections, food and providing care to the sick some of whom were the sole breadwinners of those families this leads to impoverished families and HIV/AIDS orphans and vulnerable children worsening the already dire economic status of these families.

HIV/AIDS-related healthcare expenditure by government had adverse effects on the socioeconomic wellbeing of fish landing beaches, 47% agreed with this finding while 45.6% disagreed with 16% disagreeing strongly with the finding. Those who disagreed with the finding (almost as many as those who agreed) asserted that government expenditure on healthcare could not have adverse influence on socio-economic wellbeing of fishermen because government funding for development is under a different ministry and is specifically allocated to development and not health.

Assessment on whether international aid for healthcare had positively influenced the socioeconomic wellbeing was done and if respondents are included who moderately agreed then close to three quarters, 120 respondents agreed with the finding that international aid for

healthcare had positively influenced the socio-economic wellbeing of fish landing beaches representing 71.4%. Most respondents, 59 reported paying nothing to get all treatment (both consultation and medication from the health facilities representing 35.1%, 21.4% (36) reported paying only KES. 100, while 15.5% reported paying KES. 200 to receive health services from local health facilities particularly private ones. Most public health facilities at the fish landing beached provided free HIV/AIDS related illnesses treatment including provision of ARVs, however respondent cited acute lack of condoms which is a basic prevention solution. Expected level of development if there was no HIV/AIDS was assessed and 145 respondents interviewed representing 86.3% reported that if there was no HIV/AIDS in the fish landing beach, there would be more investment and socio-economic wellbeing. However, 18 respondents disagreed with the finding representing 10.7%. HIV/AIDS had contributed to chronic sickness and deaths of skilled fishermen and working age people. This resulted in loss of labour and human capital which in turn resulted in the loss of income particularly skilled fishermen who were also sole bread winners among the fishing communities effectively hampering the growth of the fishing industry which is a major contributor to the socio-economic wellbeing in the lake shore Counties such as Homa Bay.

Relationship Between the Findings and the Theoretical Framework

The connection between HIV/AIDS and socio-economic wellbeing can be elucidated through the Human Capital theory and the Neoclassical Economic Theory. Schultz contended that investment in education and training might enhance individual productivity and earning capacity, hence fostering economic growth and development (Schultz, 1961). He characterized human capital as "the knowledge, skills, and health that individuals acquire over time through education, training, and experience" (Schultz, 1971). The HIV/AIDS epidemic has profoundly affected human capital, especially in sub-Saharan Africa, where its impact has been most acute. The depletion of human capital has been thoroughly documented and is

associated with considerable adverse impacts on economic growth, education, and labor force participation. A research by Gakidou et al. (2007) indicates that the depletion of human capital from HIV/AIDS has diminished economic growth in sub-Saharan Africa by 0.3-1.5 percent annually. This substantial decrease has exacerbated the region's persistent economic difficulties. The depletion of human capital has resulted in diminished output, as individuals afflicted with HIV/AIDS frequently cannot work or are compelled to resign owing to disease or societal stigma.

The neoclassical economic theory centres on the influence of HIV/AIDS on market forces and incentives. The disease can lead to a decline in the labour supply and a rise in labour costs, ultimately reducing economic growth and competitiveness. As workers become ill or die, their skills are lost, which results in reduced productivity and long-term economic expenses.

This study found that the impact of HIV & AIDS on the health and well-being of fishermen has resulted in reduced productivity at the fish landing beaches in Homa Bay. This implied that available skilled fishermen which is that human capital at the fish landing beaches was not healthy which resulted in lower productivity as labourers and were not robust physically and mentally to produce more fish within a given timeframe. Hence, based on the Human Capital Theory, it can be argued that HIV/AIDS has a devastating impact on human capital, which curtails productivity and in return negatively affect socio-economic wellbeing in the fish landing beaches in Homa bay in in Kenya.

5.3 Conclusions

Going by the findings of the first objective, it can be concluded that there is a negative impact of HIV & AIDS on the productivity of fishermen in fish landing beaches, a case of Homa Bay County, Kenya. HIV/AIDS and its related illness that made it difficult for all fishermen to go

fishing every night of the week as required for them to catch adequate fish and generate adequate income for themselves and their employers. Fishermen who were living with HIV/AIDS and also on ARVs were reported not be as physically fit and as strong as their healthy counterpart. This contributed to reduced fish catch. Despite the increased use of ARVs which has kept most of the fishermen who are living with HIV/AIDS alive for longer, it came with side effects which included appetite loss, diarrhoea, fatigue, and mood changes which hampered their efficiency in fishing especially at night when most fishermen venture into the lake. As a result of HIV/AIDS prevalence less fish was caught by the same manpower and cost as compared to a fully healthy team of skilled fishermen. The inefficiency was hard to avoid as many fishermen concealed their HIV status or looked healthy and were always ready to go fishing.

Consistent with the findings of the second objective of this study it can be concluded that the impact of HIV/AIDS on the health and well-being of fishermen resulted in reduced productivity at the fish landing beaches in Homa Bay. The implication of this was that available skilled fishermen which is that human capital at the fish landing beaches was not healthy which resulted in lower productivity as labourers were not physically and mentally capable to produce more fish within a given timeframe. And therefore, based on the Human Capital Theory, it can be argued that HIV/AIDS has a devastating impact on human capital, which curtails productivity and in return negatively affect socio-economic wellbeing in the fish landing beaches in Homa bay in in Kenya.

And according to the findings on the third and last objective regarding impact of HIV/AIDS healthcare expenditure on socio-economic wellbeing, it can be concluded that increased household healthcare expenditure has negatively impacted the socio-economic well-being of fishermen. This implies that despite the intervention by the government which are largely

involving care and treatment though the use of ARVs families with people living with HIV/AIDS still have to meet the high cost of treating opportunistic infections, food and providing care to the sick some of whom were the sole breadwinners of those families this leads to impoverished families and HIV/AIDS orphans and vulnerable children worsening the already dire socio-economic status of these families.

Furthermore, it is concluded that HIV/AIDS negatively impacted on the health and hence performance of the fishing crew and less fish catch by weight per night. The weight of fish catching per boat had been affected by the high prevalence of HIV/AIDS in Homa Bay County because the fishing crews and boats would fail to go fishing for at least 2 days a week due HIV/AIDS-related illnesses when one or two members of team fell sick and could not go fishing. This resulted in losses amounting to KES 250,661.00 per week and KES. 12,031,728.00 annually each of the by big boats. The losses in expected and projected earnings by fishermen resulted in reduced economic growth and therefore eventually reduced socioeconomic wellbeing in Homa Bay County. It was further concluded that if there was no HIV/AIDS in the fish landing beach, there would be more investment and socio-economic wellbeing and that high HIV/AIDS prevalence had negative impacts on the income earned from fish production by fishermen at the fish landing beaches which in turn affected the Gross Domestic Product (GDP).

Finally, it was concluded that the main reason behind the high HIV/AIDS prevalence at the fish landing beaches in Homa Bay county was prostitution, newcomers to the fish landing beaches had unprotected sex with locals who are already infected due to too much alcohol consumption, this was made aggravate by the cash flow from the daily fish catch and sales which is a catalyst for alcohol. Carelessness and ignorance and illiteracy, high population,

high immigration rate where people come from different places, some even from neighbouring countries e.g., Uganda, Tanzania and others as far as Congo DRC. When they meet at the fish landing beaches, prostitution then easily picked up because people don't know each other. "Sex for fish" also known as "*jaboya*" enforced mostly by male fishermen, exchanging sexual partners regularly and having unprotected sex without testing for HIV/AIDS and young fishermen having sex with older women for money and who were not willing to be educated on HIV/AIDS together contributed immensely to the persistent high prevalence of HIV/AIDS in the fish landing beaches in Homa Bay County.

5.4 Recommendations

5.4.1 Recommendations to the authorities for implementation

To mitigate the effect of HIV/AIDS on the productivity and efficiency of fishermen and fish production at the fish landing beaches in Homa Bay County the study recommends that the Kenyan government should intensify their efforts to combat new infection which was found to be driven by illiteracy, cash flow and rampant prostitution. To achieve this, it is recommended that the government should introduce and enforce controls on alcohol sale and consumption especially by underage fishermen or child labourers who flooded the fish landing beaches in Homa Bay County.

1. Authorities ought to implement specialized HIV/AIDS preventive and treatment initiatives tailored for fishing communities. These programs ought to incorporate mobile clinics at fish landing sites to ensure prompt access to antiretrovirals, healthcare services, and education on medication compliance. This would reduce productivity losses due to illness-related absenteeism and enhance the economic output of fishermen.
2. Formulate and execute community-oriented projects to deliver education, vocational training, and health services specifically designed for fishing communities. Authorities

must to incorporate HIV/AIDS awareness and preventive initiatives into educational curricula to mitigate the enduring effects on human capital and promote retention in secondary school.

3. Augment governmental funding for HIV/AIDS healthcare and broaden the availability of complimentary healthcare services, encompassing antiretrovirals and therapies for opportunistic infections. Furthermore, guarantee a sufficient provision of essential preventive instruments, such as condoms, to diminish new infections and curtail household healthcare costs.

5.4.2 Recommendations to Service users/ beneficiaries

1. Fishermen ought to form cooperatives or community groups to establish support networks that facilitate access to common resources, such as substitute workers during illness, so minimizing disruptions in fishing operations and mitigating financial losses. 2. Fishermen and their families ought to engage in community education initiatives for HIV/AIDS prevention and pursue vocational training to diversify their revenue streams. This can alleviate the prolonged deficit of trained labor and enhance resilience against health adversities.
3. Fishermen ought to utilize accessible government healthcare resources, encompassing complimentary HIV/AIDS treatment initiatives. Community advocacy initiatives must be enhanced to guarantee ongoing access to free or subsidized healthcare services and preventive measures such as condoms.

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5.4.3 Recommendations for further research in this field of study

1. Future research should concentrate on estimating the economic impact of productivity losses attributable to HIV/AIDS at both community and regional levels.
2. Examine the enduring consequences of HIV/AIDS on intergenerational human capital development, particularly its influence on education and skills acquisition among the offspring of afflicted fisherman.
3. Perform sector-specific analyses to examine healthcare expenditure trends in fishing villages and evaluate the efficacy of international aid in mitigating these costs while enhancing overall socio-economic welfare.

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APPENDICES

APPENDIX I: RESEARCH TOOLS

The researcher seeks to assess the effectiveness of the County Governance System in the Provision of Social Services in Kajiado County, Kenya. Your response will be anonymous and will never be linked to you personally. Your participation is entirely voluntary.

PART A: DEMOGRAPHIC DATA

Please circle the most appropriate response

1. Please indicate your age.
   i) Less than 30 years [ ] 30-39 years [ ]
   ii) 40-49 years [ ] Over 50 years [ ]
2. Gender: Male [ ] Female [ ]
3. What is your educational background level?

Senior High School	[ ]	Graduate	[ ]
Certificate/ Diploma	[ ]	Any other Description	[ ]
Undergraduate	[ ]	None of the above	[ ]

PART B: PRODUCTIVITY AND EFFICIENCY OF FISHERMEN.

4. To what extent do you agree with the following statements about the productivity and efficiency of fishermen in fish landing beaches in Homa Bay County? Please indicate the extent to which you agree or disagree.

1 = strongly disagree (SD); 2=Disagree (MA); 3=moderately Agree (N); 4=Agree (A); 5= strongly agree (SA); guide the respondents by adding the initials as indicated.

	1	2	3	4	5
HIV/AIDS has had a negative impact on the productivity of fishermen					
HIV/AIDS has reduced the efficiency of fishermen					
prevalence of HIV/AIDS among fishermen has resulted in decreased work output					
HIV/AIDS has hindered the ability of fishermen in to effectively carry out their fishing activities.					
The impact of HIV/AIDS on the health and well-being of fishermen has resulted in reduced productivity					

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The burden of HIV/AIDS on the livelihood of fishermen has led to decreased efficiency in fish landing beaches					
The prevalence of HIV/AIDS has had a significant negative effect on the overall productivity and efficiency of fishermen in fish-landing beaches					

PART C: HIV/AIDS PREVALENCE AND HUMAN CAPITAL

5. To what extent do you agree with the following statements about the effect of HIV/AIDS in relation to human capital on the socio-economic wellbeing of fish landing beaches in Homa Bay County, Kenya? Please indicate the extent to which you agree or disagree.

Statement	1	2	3	4	5
HIV/AIDS has negatively impacted the availability of skilled labour on fish landing beaches in Homa Bay County					
The high prevalence of HIV/AIDS has led to reduced productivity and efficiency of fish landing beach activities in Homa Bay County, Kenya.					
The socio-economic wellbeing of fish landing beaches in Homa Bay County has been hampered by the impact of HIV/AIDS on human capital.					
HIV/AIDS has resulted in increased absenteeism and turnover of skilled workers in the fish landing beaches of Homa Bay County					
The high prevalence of HIV/AIDS has led to reduced investment in skill development and capacity building for fish landing beach activities in Homa Bay County					
The economic growth of fish landing beaches in Homa Bay County, Kenya has been adversely affected by the impact of HIV/AIDS on human capital, such as education, training, and health of the workforce.					
The reduction in human capital due to HIV/AIDS has impeded the overall socio-economic wellbeing and sustainability of fish landing beaches in Homa Bay County, Kenya.					

PART D: HIV/AID PREVALENCE AND HEALTHCARE EXPENDITURE

6. To what extent do you agree with the following statements about HIV/AID and healthcare expenditure? Please indicate the extent to which you agree or disagree.

	1	2	3	4	5
1. Total healthcare expenditure has negatively impacted the socioeconomic wellbeing of fish landing beaches in Homa Bay County, Kenya					
2. HIV/AIDS-related healthcare expenditure has had adverse effects on the socio-economic wellbeing of fish landing beaches in Homa Bay County, Kenya					
3. Out-of-pocket healthcare expenditure has had negative implications for the socio-economic wellbeing of fish landing beaches in Homa Bay County, Kenya					
4. Government healthcare expenditure has impacted the socioeconomic wellbeing of fish landing beaches in Homa Bay County, Kenya					
5. International aid for healthcare has influenced the socio-economic wellbeing of fish landing beaches in Homa Bay County, Kenya					
6. Healthcare expenditure has hindered the socio-economic wellbeing of fish landing beaches in Homa Bay County, Kenya					
7. Economic costs of healthcare expenditure related to HIV/AIDS have had negative effects on the socio-economic wellbeing of fish landing beaches in Homa Bay County, Kenya					

PART E: HIV/AIDS PREVALENCE AND SOCIO-ECONOMIC DEVELOPMENT

7. To what extent do you agree with the following statements about HIV/AIDS on the development? Please indicate the extent to which you agree or disagree.

	1	2	3	4	5
1. The HIV/AIDS prevalence in Homa Bay County has a negative impact on the gross domestic product (GDP) of fish landing beaches in the area					

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2. Per capita income in fish landing beaches in Homa Bay County has been adversely affected by the HIV/AIDS prevalence.					
3. The poverty rate has increased in fish landing beaches in Homa Bay County as a result of the HIV/AIDS prevalence					
4. The statement is that the employment rate has been negatively impacted by the HIV/AIDS prevalence in fish landing beaches in Homa Bay County.					
5. Income inequality has worsened in fish landing beaches in Homa Bay County due to the HIV/AIDS prevalence					
6. The overall socio-economic wellbeing in fish landing beaches in Homa Bay County has been negatively affected by the HIV/AIDS prevalence.					
7. the overall economic situation of fish landing beaches in Homa Bay County considering indicators such as GDP, per capita income, poverty rate, employment rate, and income inequality, in light of the HIV/AIDS prevalence					

PART A: DEMOGRAPHIC DATA

Please circle the most appropriate response

4. Please indicate your age

iii) Less than 30 years [ ] 30-39 years [ ]
iv) 40-49 years [ ] Over 50 years [ ]

5. Gender: Male [ ] Female [ ]

6. What is your educational background level?

Senior High School [ ] Graduate [ ]
Certificate/ Diploma [ ] Any other Description [ ]
Undergraduate [ ] None of the above [ ]

7. Designation …….

8. In your own opinion how has the prevalence of HIV/AIDS affected productivity and efficiency of fishermen in this region?

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9. In your own opinion how has the prevalence of HIV/AIDS affected human capital in this region?

10. In your own opinion how HIV/AID and healthcare expenditure derailed development?
11. Comment on the issues of development in this region with respect to high prevalence of HIV/AIDS

FOCUSED GROUP DISCUSSION

SECTION A: SURVEY SITE INFORMATION

To be completed by the enumerator

Question	
Name of Enumerator	
Date of Interview [dd/mm/yy]	
Name of County	
Name of Sub County	
Name of Location	

QUESTIONS

N/B: The facilitators should explain the purpose of the FGD and answer any preliminary questions. Make sure everyone understands what's going to happen and what the result will be.

Materials Needed: Tape recorder, Notebooks and Pens.

Facilitators: The session will be facilitated by one moderator and one note-taker.

Participants: All participants should range between 6 and 8.

1. Why is the HIV/AIDS prevalence rate high in Homa Bay County compared to other counties in Kenya?
2. What can we do differently to help us reduce the rate of HIV/AIDS infection in Homa Bay County?
3. At a personal level, what are some practices you have interacted with that relate to the prevention of HIV/AIDS infections? Kindly elaborate on how the methods work.

4. What do you think is the level of awareness about HIV/AIDS in the County?
5. What traditional practices do you think could be fueling the high HIV/AIDS infections in Homa Bay County?
6. What socio-economic practices do you think could be fueling the high HIV/AIDS infections in Homa Bay County?
7. What other practices do you think could be fueling the high HIV/AIDS infections in Homa Bay County?
8. What is the effect of HIV/AIDS on the economic growth of Homa Bay County?
9. In your efforts to reduce HIV/AIDS infections, what methods do you recommend for reducing the rate of infection in this community? Why?
10. In your opinion are there hidden and underlying risk factors affecting the rate of HIV/AIDS prevalence in Homa Bay County?
11. How can we address these underlying factors fueling the high rate of HIV/AIDS infection in Homa Bay County?
12. Who are the main HIV/AIDS programs implementing partners in Homa Bay County?
13. What do you think they not doing as well as expected with the resources allocated to them or that they bring into the HIV/AIDS sector in this county?
14. What challenges do you experience in the effort to fight HIV/AIDS infection and prevalence rates in this County?
15. What recommendations would you give to better help fight and reduce the high HV prevalence rate in this county?
16. What recommendations would give to help improve the economic growth of the county impacted negatively by the HIV/AIDS pandemic?

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APPENDIX II: ERC CERTIFICATE

Mount Kenya University

REF: **MKU/ISERC/3006**
TO: **SIXTUS OMARE ODUMBE**

Date: 08 August 2023

REG: **MDS/2017/70749**

Dear Sir/Madam,

RE: EFFECTS OF HUMAN IMMUNODEFICIENCY VIRUS (HIV) ON ECONOMIC DEVELOPMENT AMONG FISH LANDING BEACHES IN HOMA BAY COUNTY, KENYA

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **2050.** The approval period is **08/08/2023 - 07/08/2024.**

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 **Mount Kenya University**
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 **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** 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 **Mount Kenya University**

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

The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 0100, Thika

Yours sincerely,

Dr. Alfred Owino, PhD
Chairman, Mount Kenya University ISERC

APPENDIX III: LETTER OF INTRODUCTION FROM MKU

Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MDS/2017/70749

8th August, 2023

National Commission for Science Technology & Innovation (NACOSTI)
Off Waiyaki Way, Upper Kabete,
P.O Box 30623- 00100
NAIROBI, KENYA

Dear Sir/Madam,

RE: SIXUS OMARE ODUMBE-- REGISTRATION NO. MDS/2017/70749

The purpose of this letter is to introduce the above named student who is pursuing Master of **Arts in Development Studies** in the department of **Social and Development Studies** in the school **of Social Sciences**

The title of the thesis is **"Effects of Human Immunodeficiency Virus (HIV) on Economic Development among Fish Landing Beaches in Homabay County, Kenya."** It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **August, 2023 and October, 2023.**

Any assistance accorded to the student will be highly appreciated.

Thank you.

Dr. Samuel M. Karenga, Ph.D
Director, Graduate Studies
Enc.

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Tel: 020-2878 000, Cell: +254 709 153 000
Email: info@mku.ac.ke, Web: www.mku.ac.ke
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APPENDIX IV: NACOSTI RESEARCH LICENSE

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **112648**

Date of Issue: **23/August/2023**

RESEARCH LICENSE

This is to Certify that Mr.. Sixtus Omare Odumbe of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Homabay on the topic: EFFECTS OF HUMAN IMMUNODEFICIENCY VIRUS (HIV) ON ECONOMIC DEVELOPMENT AMONG FISH LANDING BEACHES IN HOMA BAY COUNTY, KENYA for the period ending : 23/August/2024.

License No: **NACOSTI/P/23/28714**

112648

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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See overleaf for conditions

APPENDIX VII: SIMILARITY INDEX

Odumbe Sixtus

INFLUENCE OF HUMAN IMMUNODEFICIENCY VIRUS (HIV) AND AIDS

Postgraduate 2025

POSTGRADUATE 2024/25

Mount Kenya University

PREVALENCE ON THE SOCIO-ECONOMIC WELLBEI…

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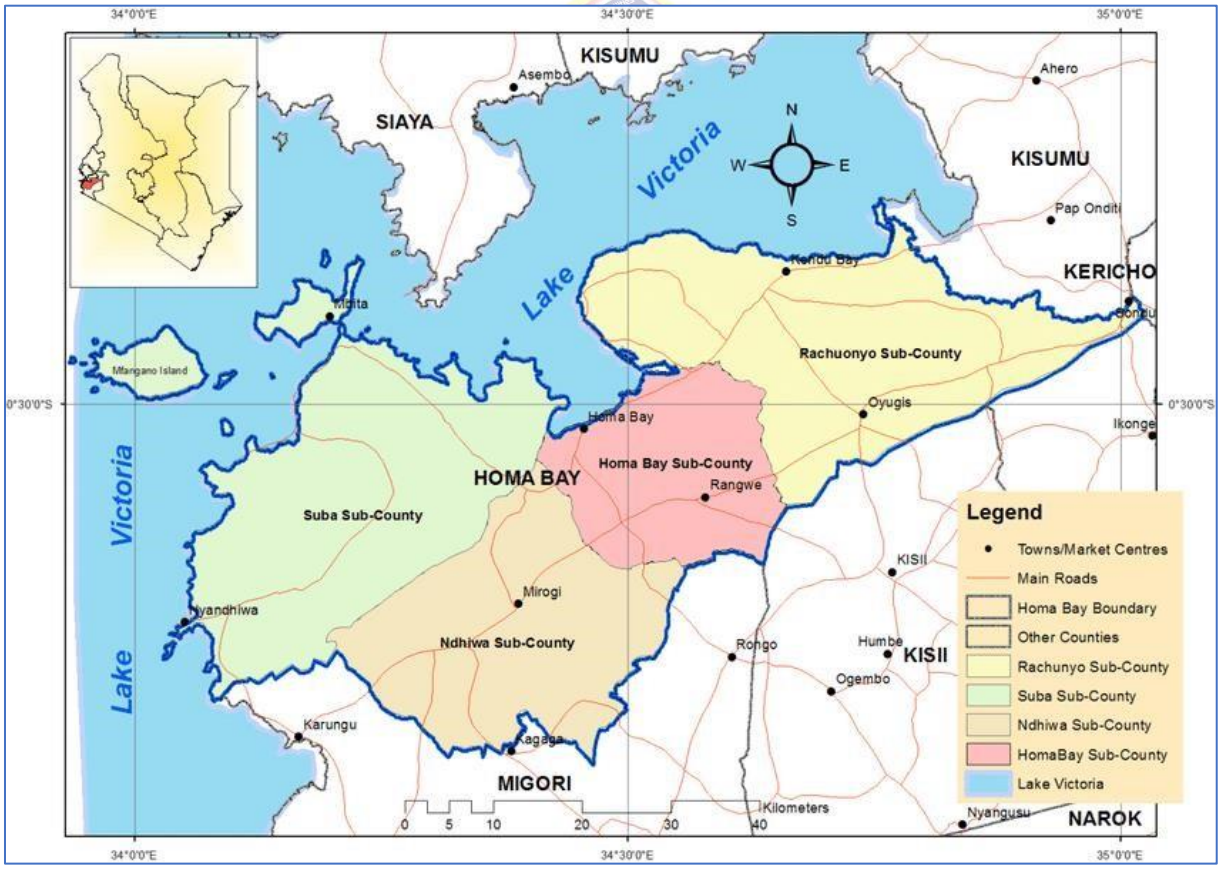
APPENDIX VIII: RESEARCH SITE MAP

Map of Homa Bay County



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