

**OUTCOME EVALUATION OF DIFFERENTIATED HIV
TESTING SERVICES IN IMPROVING LINKAGE OF NEWLY
DIAGNOSED CLIENTS TO CARE AND TREATMENT IN
SELECTED HEALTH FACILITIES IN MOROGORO REGION**

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CLIENTS TO CARE AND TREATMENT IN SELECTED HEALTH
FACILITIES IN MOROGORO REGION**

**BY
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**An Evaluation Report Submitted to the School of Public Administration and
Management in Partial Fulfilment of the Requirements for the Award of Master
of Science in Health Monitoring and Evaluation (MSc. HME) of Mzumbe
University
2025**

CERTIFICATION

We, the undersigned, certify that we have read and hereby recommend for acceptance by the Mzumbe University, a dissertation entitled ***Outcome Evaluation of Differentiated HIV Testing Services in Improving Linkage of Newly Diagnosed Clients to Care and Treatment in Selected Health Facilities in Morogoro Region***, in partial fulfillment of the requirements for award of the degree of Master of Science in Health Monitoring and Evaluation of Mzumbe University.

Signature:

Major Supervisor

Signature:

Co-Supervisor

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Internal Examiner

DECLARATION AND COPYRIGHT

I, **Boniface Germanus Centa**, declare that this thesis is my original work and that it has not been presented and will not be presented to any other university for a similar or any other degree award.

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DEDICATION

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LIST OF ABBREVIATIONS

ANO	Assistance Nursing Officer
ART	Antiretroviral Therapy
CBHTS	Community Based HIV Testing Services
CHMT	Council Health Management Team
CITC	Client Initiated Testing and Counselling
CTC	Care and Treatment Clinic
DAS	District Administrative Secretary
DC	District Council
DHTS	Differentiated HIV Testing Services
DMO	District Medical Officer
EN	Enrolled Nurse
FP	Focal Person
HBM	Health Belief Model
HCW	Health Care Worker
HIV	Human Immunodeficiency Virus
HMT	Hospital Management Team
HTS	HIV Testing Services
IDI	In-depth Interview
IPD	Inpatient Department
KVP	Key Vulnerable Population
LCM	Linkage Case Management

MATT	Medical Attendant
MoH	Ministry of Health
MOI	Medial Officer Incharge
NASHCOP Programme	National AIDS Sexual Transmitted Infections and Hepatitis Control
OPD	Outpatient Department
PITC	Provide Initiated Testing and Counselling
PLHIV	People Living with HIV
RAS	Regional Administrative Secretary
RCH	Reproductive Child Health
RHMT	Regional Health Management Team
RN	Registered Nurse
SEM	Social Ecological Model
SP	Strategic Plan
STI	Sexual Transmitted Infection
THIS	Tanzania HIV Impact Survey
VH	Viral Hepatitis

OPERATIONAL DEFINITIONS

HIV Testing Services: Refers to the entire set of services that should be given in conjunction with HIV testing. It acts as HTS package comprising of demand generation, pre-test information, HIV testing, post-test counselling, and effective links to prevention, care, treatment and support services for both HIV positive and HIV negative persons (MoH, 2022).

Linkage to HIV Care and Treatment Services: Refers to the process whereby newly HIV diagnosed individuals are enrolled or transitioned from testing points to care and treatment clinics for accessing comprehensive care including ART (MoH, 2022).

Differentiated HIV Testing Services (DHTS): Refers to clients centered approach that tailors the HIV testing process to specific groups and contexts. This means offering different HIV testing strategies such as provider-assisted or HIV self-testing in various locations to make HIV testing more accessible and effective for everyone (MoH, 2019, 2022).

ABSTRACT

Background: Linkage to HIV care and treatment following diagnosis is essential for the prompt initiation of antiretroviral therapy and for effective epidemic control. The NASHCoP 2022-2026 Strategic Plan aims to achieve 100% linkage rate. This evaluation assessed the effectiveness of Differentiated HIV Testing Services and contextual factors influencing linkage to care and treatment among newly HIV clients in Morogoro region from January 2024 to February 2025.

Methods: A sequential explanatory mixed-methods was used. Quantitatively, a multistage sample of 392 newly diagnosed clients was drawn from facility records. Data on the linkage proportion, timeliness, and associated factors were analysed using descriptive statistics and a logistic regression in STATA v17.0. Qualitatively purposively selected 6 healthcare providers who provide HTS at various testing points were interviewed in-depth; transcripts underwent phenomenological analysis in ATLAS.ti v9 to identify facilitators and barriers of linkage to care.

Results: Of the newly diagnosed clients, 90.05% were successfully linked to care, with 95% of those linked being enrolled on the same day of diagnosis. Higher odds of successful linkage were observed among females (AOR=20.7; $P<0.001$), married (AOR=6.09; $P=0.028$), clients who lived within five kilometres from CTC (AOR=5.03; $P=0.018$), diagnosed during return visits (AOR=16.8; $P<0.001$), clients with recorded phone contacts (AOR=7.19; $P=0.014$), and those diagnosed at dispensaries (AOR=2.10; $P=0.017$). Qualitative findings identified key facilitators including high quality pre and post-test counseling, positive provider-client relationships, active phone follow-up, support from expert clients and mentor mothers, and weekly departmental meetings. Major barriers included cultural denial among Maasai pastoralist communities, religious beliefs, unavailability of CTC services on weekends, stigma and distance to CTC.

Conclusion: Linkage to HIV care was high but below universal targets, with same-day enrolment common. Success was influenced by gender, marital status, distance, and contact availability, proper counseling, and peer support. Persistent cultural, religious, and stigma-related barriers require targeted interventions.

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CHAPTER ONE

PROBLEM AND CONTEXT OF THE STUDY

1.1 Background Information

Human Immunodeficiency Virus remain to be a significant global public health concern (MoH, 2022; UNAIDS, 2023). In 2022, approximately 39.9 million people were living with HIV, including 1.3 million newly infected individuals, and 630,000 people died from illnesses related to acquired immunodeficiency syndrome AIDS, most people infected with HIV live in sub-Saharan Africa, which has the highest HIV/AIDS burden in the world, accounting for an estimated 66% of all HIV cases globally (UNAIDS, 2023).

Tanzania is one of the five countries in Africa with the highest burden of HIV (THIS, 2023). The prevalence of HIV remains high at 4.4 among Tanzania adolescents and adults despite showing a decline from 4.7% reported in 2016 (TACAIDS, 2023). The prevalence of HIV is higher among women (5.6%) than men (3.0%), corresponding to approximately 1,548,000 adults living with the virus (TACAIDS, 2023). However, the country has made notable progress towards HIV epidemic control in addressing Joint United Nations Programme on HIV/AIDS 95-95-95 targets by 2025 (TACAIDS, 2023). According to the Tanzania HIV Impact Survey 2022-2023, 83% of People Living with HIV (PLHIV) knew their status. Among them, 98% were retained on Antiretroviral Therapy (ART), and among those on ART, 94% had achieved viral suppression (TACAIDS, 2023). Despite this progress, some populations such as Key Vulnerable Populations, men, children, adolescents and young are being left behind (MoH, 2022).

Differentiated HIV Testing Services (DHTS) offers an opportunity to reach all people with the testing services while ensuring that those who test positive are linked to care and treatment. DHTS refers to client-centered approach designed to enhance the accessibility, efficiency, and uptake of HIV testing by tailoring service delivery to the diverse needs, preferences, and circumstances of various populations. Rather than using a one-size-fits-all model, differentiated HTS adapts the “who”, “where”, “when”, and “how” of testing to best suit clients and health system capacities (MoH,

2019, 2022). This approach includes offering testing through multiple models such as facility-based testing, community outreach, index testing, and self-testing (MoH, 2019, 2022). It also considers client characteristics such as age, gender, risk profile, and frequency of testing aiming to reach all people depending on their needs and context.

The HIV testing services are the important entry point for prevention, care, treatment and support services for PLHIV (Kelly et al., 2019). HIV testing services aim to diagnose new HIV clients and connect them to care and treatment, which is crucial for HIV control and improving health outcomes (Sanga et al., 2019). Different populations require tailored prevention approaches. Therefore, implementing differentiated care models is essential to enhance interventions that cater to each individual's needs. This includes utilizing proven facility-based and community-based services. The county's priority is to ensure that HIV prevention, care, and treatment services are comprehensive, addressing each person's overall health needs, including co-morbidities (MoH, 2022).

The differentiated HIV testing services offer an opportunity for newly HIV-diagnosed individuals to get enrolments, initiation of ART treatment and support services in a timely manner (Kayabu et al., 2018; Rentsch et al., 2018; Sanga et al., 2017). The differentiated HIV testing services are expected to achieve timely and successful linkage of newly diagnosed clients to care and treatment (Kayabu et al., 2018; Rentsch et al., 2018; Sanga et al., 2017). To prevent delays in starting HIV treatment, clients must arrive on time, as late presentations can hinder timely prophylaxis and ART initiation, accelerate disease progression and increase community transmission (Kayabu et al., 2018). It is critical to ensure that we have updated data to inform the efforts aiming to achieve a successful 100% linkage to treatment among diagnosed HIV individuals as desired by both the global and national guidelines (Bajaria et al., 2021; MoH, 2019).

1.2 Problem Statement

Linkage to HIV care and treatment is a vital step in the continuum of HIV services, ensuring that individuals who test positive for HIV receive timely initiation of

Antiretroviral Therapy (ART), ongoing medical support, and adherence counselling (Maughan-Brown et al., 2019; Sanga et al., 2017). Prompt linkage is associated with improved clinical outcomes, reduced viral transmission, and decreased mortality among people living with HIV (PLHIV) (Maughan-Brown et al., 2019; Sanga et al., 2017). Recognizing this, Tanzania has implemented various efforts to ensure that all individuals who are diagnosed with HIV are promptly enrolled in care (Kway et al., 2022; Maughan-Brown et al., 2019; Sanga et al., 2017, 2019; Uvila et al., 2019). However, despite the scale-up of HIV testing services and the expansion of care and treatment clinics (CTCs), challenges persist, and many newly diagnosed individuals are not effectively linked to treatment services (Bajaria et al., 2021; Harklerode et al., 2020; Kayabu et al., 2018).

To address this gap, the Ministry of Health through the National AIDS, STIs and Hepatitis Control Programme (NASHCOP) launched the 2022-2026 Strategic Plan, which aims to end AIDS as a public health threat by 2030 (MoH, 2022). The plan outlines differentiated HIV testing approaches and emphasizes mandatory linkage to care for all HIV-positive clients, regardless of the testing modality (MoH, 2022). Strategies such as index case testing, community-based testing, male-friendly services, and client-initiated testing are prioritized. Importantly, the strategic plan sets a target of achieving 100% linkage of newly identified PLHIV to care and treatment services by 2022 and maintaining this through 2025. Interventions such as escorted referrals, linkage case management (LCM) using expert clients, and the establishment of post-test clubs have been recommended to support this goal (MoH, 2022).

Despite the rollout of these initiatives, and the expansion of care and treatment clinics (CTCs), challenges persist, and many newly diagnosed individuals are not effectively linked to treatment services (Bajaria et al., 2021; Harklerode et al., 2020; Kayabu et al., 2018). Moreover, several studies conducted in Tanzania and other sub-Saharan African countries continue to report suboptimal linkage rates, with multiple factors hindering access to care following diagnosis (Bajaria et al., 2021; Harklerode et al., 2020; Kayabu et al., 2018; Rentsch et al., 2018; Sanga et al., 2017,

2019; Uvila et al., 2019). It remains unclear how well current linkage strategies are functioning in different contexts, including in areas such as Morogoro Municipal and Kilosa District Council. This study, therefore, evaluated the outcomes of existing linkage interventions, identified the proportion of newly diagnosed clients who successfully enrol in care, and explore the factors influencing linkage performance in these districts.

1.3 Main Evaluation Objective

To evaluate an outcome of differentiated HIV testing services in improving linkage of newly diagnosed clients to care and treatment in Morogoro region.

1.3.1 Specific Evaluation Objectives

- i. To assess the proportion of newly diagnosed clients linked to care and treatment from January 2024 to February 2025, in selected health facilities in Morogoro region.
- ii. To determine the timeliness of linkage of newly diagnosed clients from testing to care and treatment in selected health facilities in Morogoro region.
- iii. To examine factors associated with linkage of newly diagnosed clients to care and treatments in selected health facilities in Morogoro region.
- iv. To explore the healthcare workers' experiences related to linkage of newly diagnosed clients to care and treatment in selected health facilities in Morogoro region.

1.4 Main Evaluation Question

What is the effect of differentiated HIV testing services in improving linkage of newly diagnosed clients to care and treatment in selected health facilities in Morogoro region?

1.4.1 Specific Evaluation Questions

- i. What is the proportion of newly diagnosed clients linked to care and treatment from January 2024 to February 2025, in selected health facilities in Morogoro region?
- ii. What is timeliness of linkage of newly diagnosed clients from testing points to care and treatment in selected health facilities in Morogoro region?

- iii. What factors are associated with linkage of newly diagnosed clients to care and treatments in selected health facilities in Morogoro region?
- iv. How do healthcare workers perceive their experiences related to linkage of newly diagnosed clients to care and treatment in selected health facilities in Morogoro region?

1.5 Significance of the Study

- i. The evaluation is essential for enhancing HIV service delivery from the facility level to higher managerial levels, including the Council Health Management Team (CHMT), Regional Health Management Team (RHMT), implementing partners, and national stakeholders such as the Ministry of Health, National AIDS Control Programme (MOH-NACP). This evaluation will focus on the linkage of newly diagnosed HIV patients from testing sites to care and treatment clinics in the Morogoro region.
- ii. The findings will provide evidence-based insights that support informed decision-making across all levels of health management. This will help in developing strategies to improve the sustainability and performance of HIV services.
- iii. This evaluation is part of the requirements for obtaining a Master of Science in Health Monitoring and Evaluation from Mzumbe University, contributing to both academic knowledge and practical advancements in health management.

1.6 Programme Description

NASHCOP stands for National AIDS, Sexual Transmitted Infections and Hepatitis Control Programme. This is among the programmes within the Ministry of Health, which deals with fighting against HIV/AIDS diseases, sexually transmitted infections and viral hepatitis. It has a goal of accelerating the reduction of new HIV and VH infections and improving treatment outcomes. Tanzania was proud to announce the development of its inaugural integrated National HIV, STIs, and Hepatitis Control Programme Strategic Plan (NASHCoP SP 2022-2026). This initiative reflects our commitment to addressing the global call for a strategic shift towards programmes and policies that effectively identify and mitigate inequalities and barriers in

healthcare access. The strategies and ambitious targets set out in this Strategic Plan provide insights into the direction we are heading towards ending AIDS, STIs and viral hepatitis by 2030.

The NASHCOP SP it outlines the goals, objectives, and strategies that translate Tanzania's vision and mission for July 2022 to June 2026, narrating how to strengthen health and other systems to successfully combat HIV and AIDS. This strategic plan is informed by global, regional and national health sector policies and strategies and the multisectoral response framework. The Plan will guide all stakeholders by informing their implementation plans at the national and sub-national levels. It structured to focus on 9 priority strategic areas that have prioritized 33 interventions and those interventions will be monitored through at least one outcome indicator with mid line and end-line targets.

Hence, this evaluation based on priority strategic area number one namely "Differentiated HIV Testing Services" that focused on "Linkage to HIV services intervention", with a strategic outcome stated that, "by 2022, a hundred percent (100%) of all newly identified PLHIV (irrespective of HTS modality) are successfully linked to HIV care, treatment, and support services and maintained through 2025".

1.6.1 Differentiated HIV Testing Services (DHTS)

Differentiated HIV Testing services in Tanzania are designed to act as a clients centered approach aiming to provide HIV testing services to individuals by various testing strategies and testing modalities that are tailed to the needs and risk profiles of diverse populations, ensuring that testing is accessible, acceptable, effective and to link those with positive and negative HIV results in appropriate services. These modalities including provider-initiated HIV testing and counselling (PITC), client-initiated HIV testing and counselling (CITC) and HIV self-testing (HIVST). The testing modalities goes concurrently with testing strategies including optimized PITC, index case testing, KVP testing, moonlight testing, mobile testing, social networking strategies, self-testing, ANC testing, IPD testing, male testing and community testing.

1.6.2 Linkage to HIV Services

Connecting or enrolling newly HIV positive to care and treatment clinics. One central component is ensuring strong, timely linkage of all individuals who test HIV positive into care and treatment services (including same day initiation of ART where feasible) as well as for those with negative results are linked into preventive services such as condom or PrEP. Linkage mechanism including escorting system, use of referral forms, uses of peers, follow-up and tracking systems are to be strengthened to minimize delays or losses along the test and treat cascade. These differentiated approaches are underpinned by continuous quality assurance (including verification of HIV positive status), data monitoring, and geographic targeting to reach hotspots and lagging populations, ensuring that no group is left behind in the quest to achieve national HIV targets.

1.6.3 Targets of Linkage to HIV Intervention

By 2022, a hundred percent (100%) of all newly identified PLHIV (irrespective of HTS modality) are successfully linked to HIV care, treatment, and support services and maintained through 2025.

1.6.4 Logical Model

Below is the logical model focusing on the linkage to care and treatment among newly diagnosed HIV clients according to the NASHOP Strategic Plan 2022-2026.

Table 1.1 Logical Model

Inputs	Activities	Outputs	Outcome	Impact
Human Resources	Training Health Care Providers	Number of Human Resources Trained on Linkage	Increasing Enrolment to Care and Treatment Clinics (100%), for All Newly Diagnosed HIV Clients.	Reduced HIV/AIDS Related Mortality and Morbidity
HIV Test Kits	Post-Test Counseling	Number of Clients Received Post-Testing Counseling		
Financial Resources	Linking Clients to CTC	Number of Clients Linked to CTC		Improved Quality of Life among PLHIV
Training	-Escorting Clients -Connecting with Expert Clients, -Providing Referral to Clients			
SBCC Materials	Supportive Supervision	Number of Supervisions Conducted		
HTS/CTC Room				

1.6.5 Stakeholder Engagement Matrix

Below is a table outlining the stakeholder matrix as drawn in the NASHCoP strategic plan 2022-2026.

Table 1.2 Stakeholder Engagement Matrix

Name of Stakeholder	Role in the Programme	Interest/Perspective on Evaluation	Role in Evaluation	Means of Communication	Level of Importance
MOH-Tanzania	Implementing health policies and programmes	Evaluating health outcomes related to HIV interventions	Providing health system data and support evaluations	Official reports, meetings	High
NASHCOP	Coordinating and overseeing national HIV strategies and policies	Ensuring programme effectiveness and alignment with national goals	Providing guidelines, monitoring progress, and reporting findings	Reports, meetings, official documents	High
TACAIDS	Coordinating HIV response across sectors	Assessing impact on national HIV statistics	Facilitating data collection and analysis	Workshops, reports, conferences	High
NACOPHA	Advocating for the rights and needs of People Living with HIV (PLHIV) in Tanzania, coordinating efforts among PLHIV for effective HIV response	Assessing the effectiveness of differentiated HIV testing services and ensuring that PLHIV are successfully linked to care and treatment.	Participating in data collection, providing feedback on findings, and advocating for necessary changes based on evaluation results	Meetings, reports, community forums, social media, newsletters	High
RHMT	Overseeing and coordinating the implementation of health services example HIV/AIDS interventions	Ensuring the programme meets regional health targets, improve service delivery	Facilitating access to data, oversee field level evaluation activities	Workshops, phone calls, emails	High
CHMT	Coordination, and support by assessing implementation	Monitoring programme impact on linkage rates, identifying	Providing operational data and insights,	Phone calls, emails, and local meetings	High

	n of service delivery through HIV interventions as well as	operational challenges	ensuring local support for evaluators		
Implementin g Partners	Funding and providing technical assistance, capacity building, and oversee the programme implementation	Accountability for investments and impact, opportunity to refine implementation strategies	Contributin g to technical expertise and ensuring data quality	Reports, regular review meetings, and emails	High
Health Facilities	Providing HIV testing services and escort aiming to initiate linkage of newly diagnosed clients to care and treatment clinics	Enhance service delivery and ensure successful linkage of newly diagnosed clients to care and treatment	Providing programme data, insights on challenges and participatin g in interviews	Data sharing platforms, phone calls, and on-site visits	High
Community Based Organization	Outreach, client follow-up, and psychosocial support	Assessing their role in improving linkage rates and identifying additional support needed	Sharing field level insights and engage in focus group discussions	Phone calls, community meetings, and reports	High
PLHIV	Advocating for client needs and provide feedback on service quality	Assessing programme impact from a client perspective and identifying areas for improvement	Participatin g in interviews, focus groups, and sharing testimonials	Focus group discussions and interviews	High

CHAPTER TWO

LITERATURE REVIEW

2.1 Empirical Literature Review

2.1.1 The Proportion of Linkage to Care and Treatment Clinics among Newly PLHIV

Several studies have examined the proportion of people living with HIV (PLHIV) who are successfully linked to care following diagnosis, with findings showing significant variability across settings and testing modalities. A study titled *“Characterizing a Leak in the HIV Care Cascade: Assessing Linkage between HIV Testing and Care in Tanzania”* investigated 1275 patients diagnosed with HIV and found that 932 (73.1%) were successfully linked and enrolled in care, confirmed through matched CTC records referral forms (Harklerode et al., 2020). Similarly, in Mbeya, Tanzania, another study on *“Linkage into Care among Newly Diagnosed HIV-Positive Individuals Tested through Outreach and Facility-based HIV Testing Models”* reported a 78% linkage rate (Sanga et al., 2017). Another study in Mbeya reported linkage of 52.3% successful linkage among HIV clients diagnosed in mobile/outreach programme (Kway et al., 2022).

These findings suggest high but inconsistent linkage outcomes in Tanzanian contexts. Evidence from other sub-Saharan African countries reflects similar challenges. For instance, in South Africa, Meehan et al. (2018) reported that linkage to HIV care among clients tested in community-based HIV testing services in Cape Town was 63.1%. The study further highlighted that the proportion of linkage was significantly influenced by the type of HIV testing service offered, indicating that service delivery models play a critical role in determining outcomes. Collectively, these studies reveal a persistent gap between diagnosis and treatment initiation, with most contexts falling short of the global target of 100% same-day linkage. Moreover, while several improvements have been made in ensuring successful linkage of newly clients to CTC, there remain dearth evidence in the current literature on how these initiatives have yielded the desired outcomes.

2.1.2 Average Time of Linkage to Care and Treatment Clinics among Newly PLHIV

Beyond the proportion of linkage, the timeliness of linkage has been recognized as equally critical in determining treatment outcomes and reducing HIV transmission (Harklerode et al., 2020; Sanga et al., 2019). Evidence suggests that many newly diagnosed individuals experience delays before enrolling in HIV care and treatment services (Harklerode et al., 2020; Kayabu et al., 2018; Sanga et al., 2017, 2019; Uvila et al., 2019). A study conducted in Magu District, Tanzania, titled *“Enrollment in HIV Care and Treatment Clinic and Associated Factors among HIV Diagnosed Patients”* found that even after receiving a positive HIV test, many patients delayed accessing CTC services or failed to enrol entirely (Uvila et al., 2019).

Among those who enrolled, the majority experienced delays, with over half taking three months or more to be enrolled into care (Uvila et al., 2019). The median time from diagnosis to enrolment in a CTC was 6.2 months. These findings underscore the challenges of timely linkage, highlighting issues such as denial of diagnosis, stigma, and time required to psychologically internalize one’s HIV-positive status as major contributors to delay. Such delays reduce the effectiveness of treatment as prevention and contribute to poor clinical outcomes (Harklerode et al., 2020; Sanga et al., 2019), further emphasizing the importance of interventions aimed not only at achieving high linkage rates but also at ensuring rapid initiation of ART. Evidence are required to inform the current trends in the linkage timing, thus is critical to inform policy makers and implementers on effectiveness of the strategies on ensuring timely linkages.

2.1.3 Factors Influencing Enrolment to Care and Treatment Clinics

Multiple studies have explored the determinants that influence whether individuals diagnosed with HIV successfully enrol in care and treatment services, revealing a complex interplay of socio-demographic, behavioural, and health system factors (Harklerode et al., 2020; Kayabu et al., 2018; Sanga et al., 2017, 2019; Uvila et al., 2019). In Magu District, Tanzania, Uvila et al. (2019) examined factors associated with enrolment into Care and Treatment Clinics (CTCs) and identified a wide array of potential influences. These were inadequate health education about HIV, fear of

stigma, concerns about disclosing status to partners, anticipated negative family reactions, and socio-demographic attributes such as place of residence, age, sex, marital status, and distance to health facilities.

However, after adjusting for confounders in multivariable logistic regression, only place of residence and age remained statistically significant in the study (Uvila et al., 2019). Individuals residing in more remote rural villages had substantially lower odds of enrolment compared to those in semi-urban settings, suggesting geographic isolation or limited access to services as persistent barriers. Older clients (35-44 and ≥ 45 years) had approximately two-fold higher odds of enrolment compared to younger individuals aged 15-24, indicating potential age-related differences in health-seeking behaviour, perceived risk, or readiness to engage with care (Uvila et al., 2019).

Other regional evidence reinforces and extends these findings by highlighting additional and sometimes overlapping determinants. In Mozambique, the Chókwè Health and Demographic Surveillance System evaluation of a high-coverage ART programme combining annual home-based HIV testing, active linkage services, and “test and start” strategies found that age, sex, and HIV-risk characteristics were associated with successful linkage (Pathmanathan et al., 2021). This reflects a pattern whereby demographic attributes and perceived or actual risk profiles shape individuals’ responsiveness to linkage efforts.

In Tanzania, Rentsch et al. (2018) investigated linkage and ART initiation disaggregated by testing modality and found that testing modality, sex, age, village of residence, rurality, distance from household to CTC, and facility infrastructure independently influenced whether a newly diagnosed person linked to care. These findings suggest that both individual-level characteristics (example age and sex) and structural/contextual factors (example rural location, physical access, how and where testing occurs) exert significant influence. The role of testing modality also implies that some entry points such as facility-based vs. community-based may be more conducive to immediate enrolment, perhaps due to differences in immediacy of referral, counselling quality, or linkage support embedded within the modality.

Empirical studies also catalog a broad set of barriers impeding successful linkage after HIV diagnosis, spanning individual, caregiver-related, social, and health system domains. Bajaria et al. (2021), in their study on orphaned and vulnerable children (OVC) in Tanzania, highlighted how caregiver vulnerability specifically disability intersected with structural and system-level barriers such as inadequate trained personnel, weak referral systems, economic constraints, and distance to facilities to hinder linkage. This work draws attention to the compounded disadvantage faced by OVCs under the care of disabled caregivers, suggesting that caregiver capacity and household vulnerability are critical client-contextual barriers often underappreciated in standard linkage performance metrics.

Kway et al. (2022), examining mobile diagnostic and counselling services in Mbeya, identified a constellation of barriers including mobility, stigma and discrimination, religious and superstitious beliefs, hopelessness, and poverty, with an additional behaviourally-driven phenomenon where clients sought services far from their home to avoid identification and associated social repercussions. These findings align with broader evidence that psychosocial factors (such as anticipated stigma and fear of involuntary disclosure) and socio-economic precarity significantly disrupt linkage continuity, even when initial HIV testing is accessed. The notion of health-seeking in anonymity (such as traveling farther to avoid recognition) paradoxically introduces geographic “self-imposed” barriers, exacerbating challenges of follow-up and continuity.

Collectively, the literature illustrates that while some structural facilitators (example proximity, integrated referral pathways) can promote linkage, a variety of interconnected barriers persist. Stigma, both internalized and community-level, remains pervasive, compounding delays or outright refusal of care (Kway et al., 2022; Sanga et al., 2019). Cultural and religious interpretations of HIV (example belief in witchcraft or faith healing) may compete with biomedical messaging, as observed in multiple Tanzanian settings, leading to diagnostic denial or preference for spiritual remedies over treatment initiation (Kway et al., 2022; Sanga et al., 2019).

Economic barriers, including transport costs, may further impede access, particularly when combined with service fragmentation such as multiple required visits or limited-service availability example weekend closures of CTC clinics (Kway et al., 2022; Sanga et al., 2019). These findings suggest that successful linkage interventions must be multi-pronged, addressing not only the referral logistics but also socio-cultural beliefs, caregiver contexts, and health system responsiveness, especially for high-risk or marginalized subpopulations.

Taken together, the empirical literature points to persistent inequities in linkage driven by geography (distance and rurality), demographic profiles (younger age being less likely to enrol), and the structural configuration of testing and referral systems. Although psycho-social barriers like stigma, fear of disclosure, and inadequate knowledge are frequently cited as important in unadjusted analyses or qualitative observations, their independent quantitative significance may be context-dependent or mediated through other variables, as reported by (Harklerode et al., 2020; Uvila et al., 2019).

Although several studies in Tanzania and elsewhere have examined linkage to HIV care, most have focused on either proportions or delays in enrollment, with limited attention to contextual factors such as cultural beliefs, weekend service gaps, or the role of phone follow-up. Few have combined quantitative outcomes with healthcare workers lived experiences to provide a holistic view. This study addresses these gaps by applying a mixed-methods approach in Morogoro to assess proportions, timeliness, determinants, and provider perspectives on linkage to HIV care. Additionally, the study provides updated data assessing the effectiveness of the NASHCoP 2022-2026 strategic plan on ensuring 100% same-day linkage to care.

2.2 Theoretical Literature Review

This study employed two theoretical frameworks: the Health Belief Model (HBM) and the Social Ecological Model (SEM). The HBM was applied to explore healthcare workers' perceptions of the facilitators and barriers influencing linkage to care and treatment centers (CTCs). It provided a useful lens for understanding how individual-level factors such as perceived susceptibility, perceived benefits, perceived barriers,

and self-efficacy influences healthcare workers' actions and attitudes toward supporting clients' linkage to care. On the other hand, the SEM was utilized to capture the broader, multi-level influences that affect linkage to CTCs among newly diagnosed clients. This model recognizes that health behaviors are not only determined by individual beliefs but are also shaped by interpersonal relationships, community norms, organizational systems, and policy environments. Together, the HBM and SEM offered a complementary understanding by linking individual cognitive factors with structural and contextual determinants. Below detailed analysis of the theoretical review.

2.2.1 Health Believes Model (HBM)

The Health Belief Model (HBM) is a psychological framework developed in the 1950s by social and behavioral scientists affiliated with the U.S. Public Health Service (Rosenstock, 1974). It was created to explain and predict health-related behaviors, particularly the adoption of preventive health services, by emphasizing individuals' perceptions and attitudes toward health risks and interventions (Rosenstock, 1974). The model continues to be one of the most widely utilized theories in health education, psychology, and public health practice.

The Health Belief Model was initially grounded in four cognitive constructs: perceived susceptibility, referring to an individual's assessment of the risk of becoming ill or experiencing an undesirable outcome (Rosenstock, 1974); perceived severity, which involves the individual's evaluation of the seriousness of the illness, condition, or adverse outcome and its potential consequences; perceived barriers, indicating the individual's evaluation of the factors that may hinder the adoption of the recommended action or behavior; and perceived benefits, which reflect the individual's assessment of the positive outcomes of adopting the suggested behavior (Rosenstock, 1974). Two additional cognitive constructs were later incorporated into the Health Belief Model: cues to action, which refer to internal or external prompts that may trigger health-related behavior—such as physical symptoms (internal) or media campaigns (external); and self-efficacy, defined as the confidence in one's ability to successfully perform the new health behavior (Rosenstock, 1974).

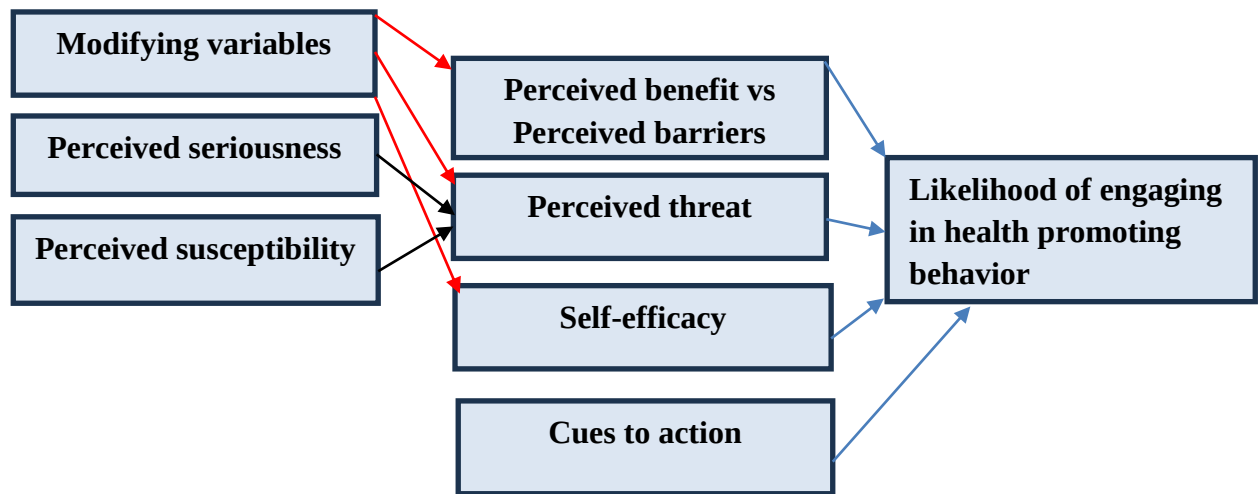
Application of the HBM to this Study

The HBM provides a useful framework for understanding the linkage of newly diagnosed HIV clients to care and treatment clinics in Morogoro region. In this context, perceived susceptibility relates to whether individuals acknowledge their vulnerability to the health impacts of HIV, while perceived severity reflects their understanding of the consequences of untreated infection, including illness, social stigma, and even death. These perceptions influence whether newly diagnosed clients view linkage to care as necessary.

Perceived benefits align with the belief that enrolling in a CTC and initiating ART will lead to improved health outcomes, prevention of opportunistic infections, and the possibility of living a longer, healthier life. Conversely, perceived barriers such as distance to health facilities, fear of stigma or social isolation, and logistical or financial constraints may discourage clients from linking to care. Some individuals may even choose to enrol in distant facilities to conceal their status from their community, illustrating how barriers are both structural and social.

Cues to action such as quality counselling, phone follow-ups, or encouragement from expert clients and mentor mothers also play a central role in prompting newly diagnosed clients to take the step of enrolling in care. Finally, self-efficacy is crucial, as clients must feel confident in their ability to navigate stigma, adhere to treatment, and sustain engagement with health services. By examining these constructs, the HBM helps explain the factors influencing whether newly diagnosed HIV clients in Morogoro successfully link to care, and it provides a theoretical foundation for designing interventions to strengthen linkage and overcome barriers.

Figure 2.1: Diagram of Health Beliefs Model (HBM)



Source: Rosenstock & Becker 1974

2.2.2 Social Ecological Model (SEM)

The social ecological model (SEM) is a theoretical framework posting that health behaviours and outcomes are shaped by a dynamic interplay between individuals and their environments across multiple levels (Bronfenbrenner, 1979; Sallis et al., 2008; Snyder et al., 2021). Rather than viewing behaviour as the product of isolated personal choices, SEM recognizes that individuals are embedded within broader social, institutional, community, and policy contexts that exert influence both directly and indirectly (Bronfenbrenner, 1979; Sallis et al., 2008; Snyder et al., 2021).

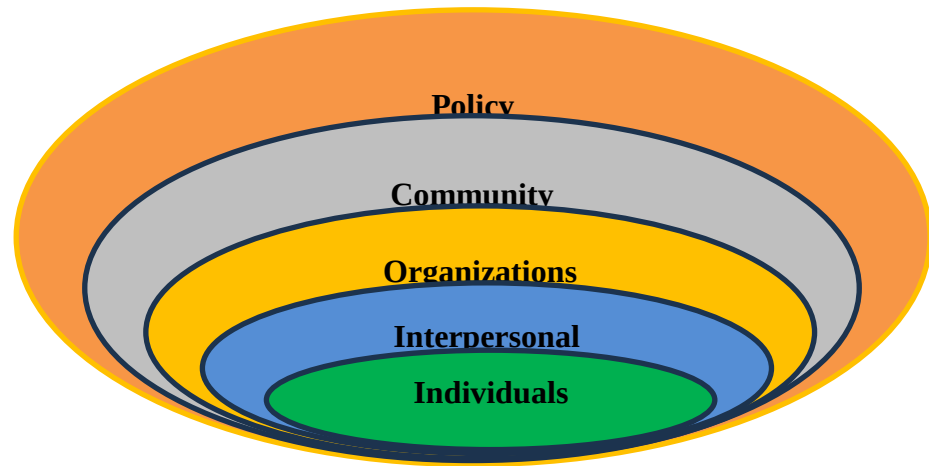
At the core are individual factors such as knowledge, attitudes, beliefs, and skills that predispose or deter a person from engaging in particular health actions. Surrounding this are interpersonal relationships, including family, partners, and peers, which can offer support, exert pressure, or transmit norms that affect decision-making (Bronfenbrenner, 1979; Garbarino, 1980; Sallis et al., 2008). Organizational or institutional environments such as the structure of health facilities, availability of services, referral processes, and staffing patterns mediate how easily individuals can act on intentions. The community level encompasses broader social networks, cultural norms, and informal support systems that shape collective expectations and acceptance of health behaviours. Finally, the policy level entails formal rules, strategies, and resource allocations such as national guidelines, strategic plans, and

regulations that establish the enabling or constraining framework within which all other levels operate (Bronfenbrenner, 1979; Garbarino, 1980; Sallis et al., 2008).

Applying the SEM to this study allows for a comprehensive understanding of the determinants of linkage to HIV care and treatment among newly diagnosed clients, as well as the lived experiences reported by healthcare workers. At the individual level, newly diagnosed clients' personal beliefs about HIV, perceived risks, and readiness to engage in care influence whether they accept linkage, reflecting how internal cognition and self-efficacy interact with diagnosis. Interpersonal dynamics such as partner involvement, family support, or fear of disclosure shape social encouragement or deterrence for linkage, with married clients or those accompanied often exhibiting higher linkage rates. Institutional factors emerged in providers' accounts when describing operational barriers, such as limited CTC availability on weekends, fragmented referral systems, or mismatches between testing points (such as OPD or laboratory) and linkage services, which hinder smooth transitions into care.

At the community level, cultural norms and collective beliefs especially among pastoralist or religious groups affect stigma, denial, and alternative explanatory models for HIV, influencing both clients' and community health workers' interactions around linkage. Finally, the policy environment, embodied in national strategies like the NASHCOP Strategic Plan and its emphasis on 100% linkage and differentiated testing modalities, provides the structural intent and guidance that shape facility level practices and resource prioritization. The SEM thus offers a layered lens through which to interpret facilitators and barriers, underscoring that effective linkage interventions must simultaneously address individual motivations, social support structures, service delivery systems, community norms, and policy coherence.

Figure 2.2: Social Ecological Model (SEM)



Source: Bronfenbrenner 1977

2.3 The Conceptual Model

The conceptual model (Figure 2.3) illustrates how multiple categories of independent variables demographic, HIV service provision, and organizational factors interact to influence the dependent variable, which is linkage to care and treatment clinics, including the timeliness of such linkage. Demographic factors such as age, sex, marital status, pregnancy status, and availability of a client's phone number are expected to shape health-seeking behaviours and readiness for enrolment. For instance, younger clients or males may be less likely to link compared to older or female counterparts, while married clients or those with recorded phone contacts may have stronger social support and follow-up mechanisms that facilitate linkage.

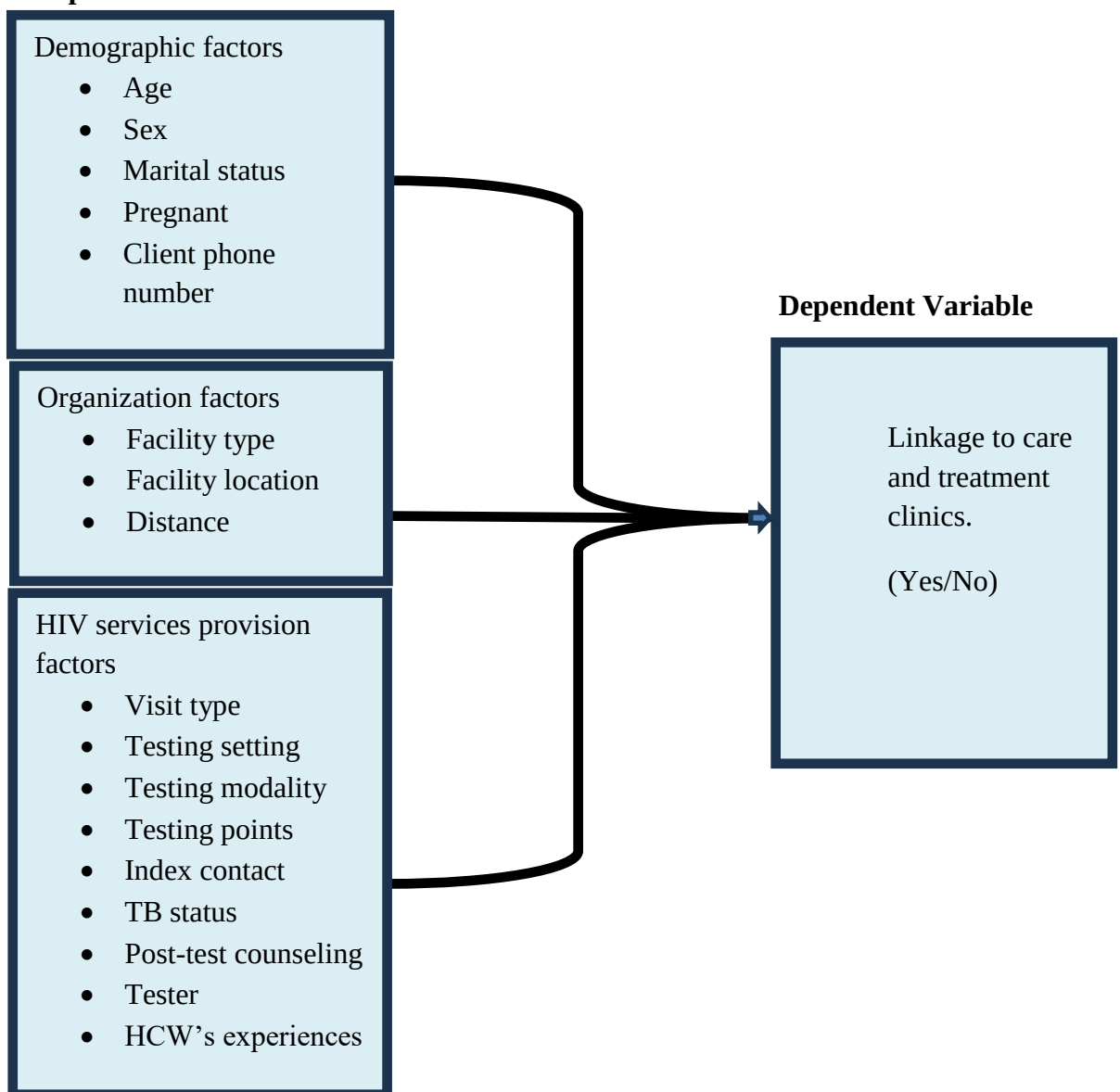
Similarly, HIV service provision factors directly influence whether a newly diagnosed client transitions smoothly into care. These include the type of visit (new versus return), the testing setting (facility-based, community-based), testing modality (provider-initiated testing, client-initiated, self-testing), the specific testing points (such as OPD, ANC, IPD, laboratory), and whether index contact tracing was used. Other service provision factors such as TB status, quality of post-test counselling, the cadre of the tester, and the broader experiences of healthcare workers determine how well clients are prepared, supported, and motivated to accept linkage.

Finally, organizational factors such as facility type (hospital, health centre, dispensary), facility location (urban versus rural), and distance to the facility shape structural accessibility to services. Together, these factors interact in complementary or constraining ways to determine the likelihood and timeliness of successful linkage to HIV care and treatment clinics, thereby highlighting the multifaceted nature of the linkage process.

2.4 The Conceptual Model

Figure 2.3: The Conceptual Model

Independent Variables



Source: Researcher Own Construction 2025

CHAPTER THREE

METHODOLOGY

3.1 Study Area

This evaluation was conducted in Morogoro region, located in the eastern part of Tanzania. According to the national census 2022, the region has an estimated population of 3,197,104 people (The United Republic of Tanzania, 2022), and is one of the 31 administrative regions in the country. The majority of the population is engaged in agricultural activities, with some involved in mining, fishing, and trading. Morogoro region has an HIV prevalence of 3.3% as reported in the 2022/23 Tanzania HIV Impact Survey (TACAIDS, 2023), representing a decline from the 4.2% recorded in 2016/17. As of October 2024, the region had approximately 60,810 people currently receiving antiretroviral therapy according to the programme data (MoH, 2024).

The evaluation was conducted specifically in two districts: Morogoro Municipal Council and Kilosa District Council. These districts were purposefully selected based on their significant contribution to the region's HIV burden. According to programme data by October 2024, Morogoro Municipal Council reported an HIV testing yield of 3.6% and accounted for 27% of all active ART clients in the region. Similarly, Kilosa District Council reported a yield of 1.1% and contributed 17% of active ART clients (MoH, 2024). These figures underscore the importance of focusing on these districts, as they are among the highest contributors to new HIV diagnoses and on ART clients in the region.

Given the region's HIV profile and the strategic importance of ensuring effective linkage to care, Morogoro Region presents a relevant and appropriate setting for assessing the implementation of HIV linkage strategies. Specifically, it examines the extent to which differentiated HIV testing services contribute to the successful linkage of newly diagnosed individuals to HIV care and treatment. This is in line with the National AIDS, STIs and Hepatitis Control Programme (NASHCOP) Strategic Plan 2022-2026, which targets 100% linkage of all newly identified people

living with HIV regardless of the testing modality to care and treatment services by 2022, with continuity through 2025.

3.2 Evaluation Design

This evaluation employed a cross-sectional study design, which was appropriate for assessing the contemporaneous association between exposures and health outcomes (Aggarwal & Ranganathan, 2019; Bernadette Capili, 2021; Ranganathan & Aggarwal, 2019). The design enabled the evaluation to determine the proportion of individuals who were successfully linked to HIV care and treatment services after testing and to identify factors associated with successful linkage. The cross-sectional design has also been utilized in previous studies investigating similar topics, supporting its relevance and applicability (Kayabu et al., 2018; Meehan et al., 2018; Sanga et al., 2017).

3.3 Evaluation Approach

The evaluation adopted a sequential explanatory mixed-methods approach, which involved two phases: an initial quantitative phase followed by a qualitative phase. This design allowed for the integration of findings, with the qualitative data providing deeper insight into the quantitative results (Dawadi et al., 2021; Kajamaa et al., 2020). The mixed methods approach was suitable for this study in order to provide a comprehensive understanding of the linkage activities which had not been covered in previous studies (Dawadi et al., 2021; Kajamaa et al., 2020). The quantitative component served as the primary method for addressing specific evaluation objectives one through three, namely, determining the proportion of newly diagnosed clients linked to HIV care, assessing the timeliness of linkage from testing points to care and treatment clinics, and examining the factors associated with successful linkage. The qualitative component, applied to address objective four, explored the experiences of healthcare workers at health facilities concerning the linkage of newly diagnosed clients from testing points to care and treatment services.

3.4 Target Population

The target population in this evaluation was newly HIV diagnosed clients and health care workers providing HIV testing and linkage activities. Newly HIV diagnosed

clients was the target population for specific objectives 1, 2 and 3, while the health care workers were the target group for objective 4.

3.5 Sample Size

For the quantitative part, the sample size of this evaluation was calculated mathematical by using a Yamane formula for calculating sample size for known and finite populations. The Yammane sample Formular is given by $n = N/(1+Ne^2)$

Whereas:

n = sample size

N = target population (Clients on ART in Morogoro Municipal and Kilosa District Council = 3365)

e = margin of error which is 0.05

Therefore,

$$n=3365/(1+3365 \times 0.05^2)$$

$$n=3365/(1+3365 \times 0.0025)$$

$$n=3365/(9.4125)$$

$$n=357$$

In additional to 10% of non-response and defaulters

$$357 \times 10\% = 35$$

$$357 + 35 = 392$$

$$n=392$$

Hence, the sample size of this evaluation was 392.

For qualitative part, the sample size was determined based on the principle of data saturation as recommended in qualitative research (Morse, 2000). Six healthcare providers were engaged in the in-depth interviews to reach the data saturation. The initial plan was to conduct 12 in-depth interviews, but due to saturation of information, only 6 in-depth interviews were conducted.

3.6 Sampling Techniques

This evaluation employed different sampling techniques for the quantitative and qualitative components.

Quantitative Component

Proportion-to-size sampling was used to select participants from two chosen districts and 10 health facilities. Morogoro Municipal Council contributed 233 participants from five health facilities, while Kilosa District Council involved 159 participants from five health facilities. Each health facility in Morogoro MC included 46 participants, whereas facilities in Kilosa DC included 31 participants.

A multistage sampling technique was applied for the quantitative component. In the first stage, stratified sampling was used to select districts with tier one and tier two facilities, based on their high number of clients on antiretroviral therapy, which indicated a greater likelihood of identifying newly diagnosed clients.

In the second stage, simple random sampling was employed to select five health facilities from each district using the lottery method. In the third stage, systematic sampling was used to select participants for the study, beginning with the first newly diagnosed client listed on the page and skipping every one newly diagnosed client in the HTS registers.

Qualitative Component

For the qualitative component addressing Objective 4, a purposive sampling technique was used to select healthcare workers involved in HIV testing and linkage services at the selected health facilities. Participants were purposively chosen to ensure diversity across different testing units from facility-based and community-based settings and to include those who were likely to have rich, relevant experience and knowledge related to linkage processes. Purposive sampling is widely recommended in qualitative research for the selection of information-rich cases (Ryan et al., 2007).

3.7 Inclusion Criteria

- i. Individual living with HIV who were newly diagnosed with HIV in the period of January 2024 to February 2025 in different testing points in the sampled health facilities.
- ii. Healthcare providers working in the HIV testing units (such as OPD, IPD, ANC, community, CTC etc) in the sampled health facilities.

3.8 Exclusion Criteria

- i. Individual in the HTS register who mis important information like test results, and key demographic characteristics.
- ii. Healthcare providers who were new to the HIV testing services. Who had worked in HIV testing points, less than a year.

3.9 Study Variables and their Measurements

Table 3.1 Dependent and Independent Variables

Category/Factor	Variable	Measurement
Dependent Variables		
Linkage	Successful linkage to HIV care and treatment clinics (CTC's)	Yes, No
Independent Variables		
Demographic	Sex	Female, Male
	Age	Years
	Marital Status	Married, Not married
	Pregnant	Yes, No
	Client's Phone Number	Yes, No
Organization/Facility Attributes	Facility Type	Dispensary, Health center, Hospital
	Location of Facility	Urban, Rural
	Distance to the CTC	Less than 5km, More than 5km
HIV Services Provision Cascade	Visit Type	New, Return
	Testing Settings	Facility, Community
	Testing Modality/Approach	PITC, CITC, CBHTS
	Testing Point/Entry Point	OPD, IPD, RCH, Index, VCT, STI, TB, KVP
	Index Contact	Yes, No
	TB Status	Suspect, No Symptoms
	Pre-test Counseling	Yes, No
	Post-test Counseling	Yes, No
	Profession of Tester	Clinicians, Nurses, Counselors, Laboratory Technicians
	HCWs experiences	Themes

3.10 Data Collection Methods and Instruments

Data were collected sequentially beginning with quantitative data collection and analysis then followed with the qualitative data collection and analysis.

Quantitative Data Collection

For the quantitative component, data were obtained through secondary sources by reviewing relevant facility-based and programmatic records. These sources included HTS registers, HTS referral forms, pre-ART registers, ART registers, linkage case management (LCM) registers, CTC2 files, and the CTC2 database. A structured data extraction checklist was developed to systematically capture the information needed to address the study objectives. The checklist was based on variables available in the source documents, with a focus on HIV testing, referral, and linkage indicators. Information extracted from the document review encompassed clients' demographic details (such as age, sex, marital status, education level, and occupation), testing and linkage data (including testing modalities, diagnosis dates, and linkage dates), and health facility characteristics (such as facility type and location—urban or rural).

Before full-scale implementation, the checklist was piloted at St. Benedict Health Centre in Nsimbo District Council, Katavi region, to assess its clarity, relevance, and comprehensiveness. Minor revisions were made based on the pilot findings to improve its effectiveness. The finalized tool was digitized using the Kobo Toolbox and deployed for field data collection via the Kobo Collect Android application installed on a Samsung tablet, enabling secure, efficient, and paperless data gathering.

Qualitative Data Collection

For the qualitative component, data were collected through in-depth interviews (IDIs) with healthcare providers directly involved in HIV testing and linkage services. Interviews were guided by a Kiswahili-language interview protocol, chosen because Kiswahili is widely spoken and understood by all participants, ensuring clear communication and comfortable engagement. These interviews were conducted within health facilities, in private rooms that provided a conducive setting for open dialogue while safeguarding confidentiality.

Each interview was audio-recorded with the participant's consent and supplemented by detailed note-taking. The interviews were led by the principal investigator, assisted by a trained research assistant. Prior to the main data collection, the interview guide was piloted with one healthcare provider at St. Benedict Health Centre in Nsimbo District Council, Katavi Region. Based on feedback from the pilot, the guide was refined by reordering questions and incorporating probing prompts to enhance conversational flow and elicit richer, more nuanced responses regarding participants' experiences and perceptions of linkage to care. These probing questions also explored cultural beliefs and their influence on linkage to CTCs, particularly among the Maasai community residing in the study area.

In-depth interviews were selected as the most suitable method for this study population, which consisted of healthcare workers (HCWs). Conducting focus group discussions (FGDs) was deemed impractical due to HCWs' demanding schedules and the difficulty of assembling them simultaneously. Additionally, the sensitive nature of HIV-related services could inhibit open discussion in a group setting. IDIs offered a more private and confidential environment, encouraging candid and detailed responses. This approach allowed participants to freely share their personal experiences, perceptions, and challenges in delivering and facilitating HIV testing and linkage to care and treatment services.

3.11 Data Management

Quantitative Data Management

For the quantitative component, data management procedures were implemented to ensure accuracy, completeness, and confidentiality. At the health facility level, all completed data collection forms were cross-checked daily for completeness and internal consistency before submission. Finalised records were uploaded to the Kobo toolbox, which was password-protected to maintain data security. The final dataset was exported in Microsoft Excel format and stored on a password-protected computer accessible only to the principal investigator. A backup copy was converted into STATA (.dta) format for cleaning and analysis.

During data cleaning, all string variables were coded into a numeric format to facilitate statistical analysis in STATA version 17.0. New numeric variables were generated for coded responses, and dummy variables were created where appropriate. Data cleaning included checking for duplicates, outliers, inconsistencies and missing values. All quantitative data management and analyses were conducted using STATA v17.0.

Qualitative Data Management

For the qualitative component, strict data handling procedures were followed to maintain confidentiality and ensure data integrity. Audio recordings and field notes were transferred to password-protected computers every evening after interviews. All interviews were transcribed verbatim within 24 hours of data collection, in line with best practice recommendations (Savenye & Robinson, 2005). Process notes and memos were created to capture contextual insights and emerging themes during transcription, which enriched subsequent analysis.

Each transcript underwent spot-checking and quality review by both the interviewer and the note-taker to verify accuracy, as recommended in prior qualitative studies (Mboma et al., 2018). Swahili transcripts were subsequently translated into English to facilitate analysis, ensuring that meaning was preserved and enhancing the trustworthiness of the findings (Ryan et al., 2007).

3.12 Data Analysis

Data analysis in this evaluation was conducted sequentially, beginning with the quantitative component, followed by the qualitative component. The sequential explanatory approach allowed the quantitative findings to guide the qualitative inquiry, while the qualitative results provided a deeper understanding and context for the quantitative trends.

Quantitative Data Analysis

The cleaned quantitative dataset, along with its corresponding Stata do-file, was securely saved and used for analysis. Both descriptive and inferential analyses were conducted using Microsoft Excel (Office 365) and Stata version 17.0. Microsoft

Excel was primarily used to generate visual summaries, including pie charts, which were used to present key findings in the results section.

Descriptive statistics were performed to summarise the socio-demographic characteristics of participants and to respond to objectives one and two. Frequencies, proportions, and summary statistics were generated for variables related to HIV testing and linkage. Comparisons between male and female participants were assessed using the Chi-square (χ^2) test, as the variables were categorical in nature.

To address Objective 3, inferential statistics were conducted using binary logistic regression to determine factors associated with successful linkage to care and treatment. Binary logistic regression was appropriate because the outcome variable, linkage to care, was dichotomous (linked vs. not linked). Binary logistic regression was first performed to assess the crude association between independent variables and the outcome. Subsequently, a multivariable logistic regression was conducted using a stepwise backwards elimination method, where all potential predictors were initially included and non-significant variables were sequentially removed until only significant predictors remained. Odds ratios (ORs) with 95% confidence intervals (CIs) were reported, and p-values less than 0.05 were considered statistically significant. The results are presented in tables and figures for clarity.

Qualitative Data Analysis

Qualitative data analysis was conducted inductively, beginning during data collection through the use of probing questions and reflective memo writing, as recommended by Savenye & Robinson (2005). A phenomenological analysis technique was employed to interpret the in-depth interview (IDI) transcripts to identify codes, categories, patterns, and emerging themes that reflected healthcare workers' experiences regarding the linkage of newly diagnosed HIV clients to care and treatment clinics.

The analysis was conducted using ATLAS.ti software version 9, into which all six in-depth interview translated transcripts were uploaded. Coding involved highlighting meaningful data segments and assigning appropriate codes. Through

this process, 22 codes were generated from the dataset. Memo writing was done concurrently to capture the researcher's reflections, contextual notes, and emerging insights related to the research questions. After the coding process, codes with similar meaning were grouped into broader themes, referred to as "code groups" in ATLAS.ti version 9. Each code group was linked to its respective codes, memos, and illustrative quotations. Finally, a code report was generated from ATLAS.ti, which contained the themes, memos, codes, and selected quotations. This report served as the primary basis for writing the qualitative results. Table 3.3 provides a detailed description of the analysis procedure undertaken for every objective.

Table 3.2 Analysis Matrix/Plan

Study Objectives	Target Group	Variable Definition and	Data Collection Methods	Data Sources	Data Analysis
To assess the proportion of newly diagnosed clients linked to care and treatment clinics from January to December 2024 in selected health facilities in Morogoro region.	Newly diagnosed clients	Number of clients linked to HIV care (Yes, No)	Documental review of the HTS register, HTS referral forms, pre-ART register, Clients' files and CTC2 Database	Secondary data	Descriptive statistic
To determine the timeliness of linkage of newly diagnosed clients from testing points to care and treatment in selected facilities in Morogoro region	Newly diagnosed clients	Number of days taken to link newly HIV diagnosed clients (days 1, 2, 3, 4, etc)	Documental review in HTS registers, HTS referral forms, pre-ART register, Clients' files, CTC2 Database	Secondary data	Descriptive statistic
To examine the factors associated with linkage of newly diagnosed clients to care and treatments in selected health facilities in Morogoro region	Newly diagnosed linked	<p>Client's factors: Age, Sex, Marital status, Pregnant, Phone number</p> <p>Organization factors: facility type, facility location and distance</p> <p>HIV services provision factors; visit type, testing settings, testing modality, testing points, index client, TB status, post-test, counseling and tester</p>	Documental review in HTS registers, referral forms, pre-ART register, Clients files, CTC2 Database	Secondary data	Binary logistic regression, using Stata version 17.0
To explore the healthcare workers' experiences related to linkage of newly diagnosed clients to care and treatment in selected health facilities in Morogoro region	Health care workers	Themes and direct quotations	In-depth interviews	Primary data	Phenomenological analysis technique, using Atlas.ti. v9

3.13 Ethical Consideration

This study adhered to all required ethical standards for research involving human participants. The study protocol was first reviewed and approved by the Mzumbe University Directorate of Research and Postgraduate Studies, which provided the primary ethical clearance for the evaluation. Subsequently, administrative permissions were obtained from the Morogoro Regional Secretariat and the respective Council Health Management Teams (CHMTs) of Morogoro Municipal Council and Kilosa District Council, allowing access to the health facilities and routine programme data.

Informed consent was obtained from all qualitative participants before the commencement of in-depth interviews. The purpose, procedures, potential risks, and benefits of the study were explained in Kiswahili, the language familiar to participants, to ensure full understanding. Participation was entirely voluntary, and participants were informed of their right to withdraw at any point without penalty or impact on their work responsibilities or access to services.

To ensure confidentiality and data protection, no personal identifiers such as names or phone numbers were included in the analysis datasets or reports. All quantitative data extracted from facility registers were anonymized, and codes were used in place of any identifying information. Qualitative interviews were audio-recorded with participant permission, and the recordings were transcribed and translated without including personal identifiers. Both recorded audios and transcripts were securely stored on password-protected computers, accessible only to the principal investigator and authorized research team members. Data will be retained for academic purposes only.

CHAPTER FOUR

PRESENTATION OF RESULTS

4.1 Socio-Demographic Characteristics of Participants

4.1.1 Socio-Demographic Characteristics of Participants in Quantitative Part

The mean age in the study population was 36 years with a standard deviation (SD) of 12.7, the youngest participant was 2 years while the oldest was 70 years. This evaluation involved a review of 392 records of newly diagnosed HIV clients recorded in the HTS registers. More than half (53.32%) of the study population were married. The majority (80.87%) of participants in this study had documented their phone number in the HTS register. More than half (59.44%) of study participants were staying in Morogoro Municipal Council. Four in ten (40.56%) of the records reviewed were at health centre, while three-quarters (75.77%) of the participants were located in urban areas. (Table 4.1).

Table 4.1 Socio-Demographic Characteristics of Study Participants (N = 392)

Variable	Category	Sex				Total	
		Male		Female			
		N	%	N	%	N	%
Marital Status	Single	86	44.79	97	48.5	183	46.68
	Married	106	55.21	103	51.5	209	53.32
Phone Number	No	38	19.79	37	18.5	75	19.13
	Yes	154	80.21	163	81.5	317	80.87
Council	Morogoro MC	113	58.85	120	60	233	59.44
	Kilosa DC	79	41.15	80	40	159	40.56
Facility Type	Dispensary	58	30.21	67	33.5	125	31.89
	Health centre	78	40.63	81	40.5	159	40.56
	Hospital	56	29.17	52	26	108	27.55
Facility Location	Urban	149	77.6	148	74	297	75.77
	Rural	43	22.4	52	26	95	24.23

4.1.2 Demographic Characteristics of Participants in Qualitative Part

The qualitative part of the study engaged six healthcare providers who participated in the in-depth interviews (IDIs). These participants had a mean age of 38.16 years. They had an average working experience of 12.3 years; the least experienced had 2 years of providing HIV testing services, while the most experienced person had 20 years. The participants worked at different testing points such as index, laboratory, ANC, IPD and OPD. (Table 4.2)

Table 4.2 Demographic Characteristics of Healthcare Workers who were Involved in the In-depth Interviews (06 IDI's)

Data collection techniques	Sex	Age	Professional	Experiences (Years)	Facility Type	Testing Points
IDI (01)	Male	27	Lab tech	2	Heath Centre	Index
IDI (02)	Female	30	Lab tech	10	Dispensary	Laboratory
IDI (03)	Female	54	RN	20	Hospital	IPD / OPD
IDI (04)	Female	31	RN	9	Dispensary	ANC
IDI (05)	Female	45	RN	20	Hospital	OPD / index
IDI (06)	Female	32	ANO	13	Health Centre	ANC

4.2 The Proportion of Linkage to Care and Treatment among Newly Diagnosed HIV Clients from January 2024 to February 2025 in Morogoro Region

The majority (90.05%) of individuals newly diagnosed with HIV in this study were successfully linked to care and treatment clinics (CTC). A statistically significant difference was observed in linkage rates between males and females, with a higher proportion of female clients successfully linked compared to male clients (95.5% vs. 84.38%; $p < 0.001$) (Table 4.3).

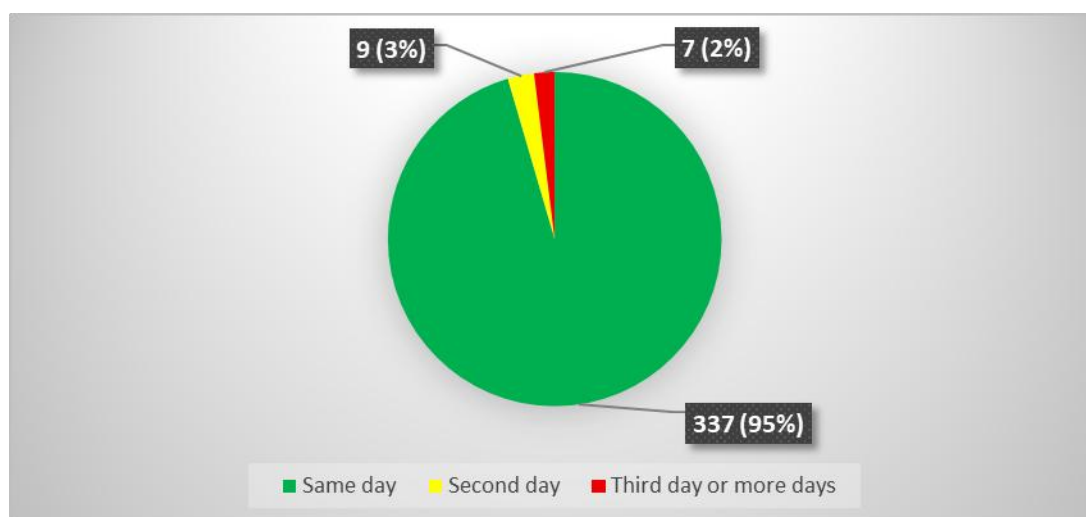
Table 4.3 The Proportion of Linkage to Care and Treatment among Newly Diagnosed Clients in Morogoro Region from January 2024 to February 2025 (N = 392)

Variable	Category	Sex				Total		P value
		Male		Female				
		N	%	N	%	N	%	
Linked to CTC	No	30	15.63	9	4.5	39	9.95	< 0.001
	Yes	162	84.38	191	95.5	353	90.05	

4.3 Timeliness of Linkage of Newly Diagnosed Clients from Testing Points to Care and Treatment in Selected Health Facilities in Morogoro Region

Among newly diagnosed HIV clients who were successfully linked to care and treatment clinics, majority (95%) of them were linked on the same day that they received the test results. (Figure 4.1).

Figure 4.1 Duration Taken by Newly Diagnosed HIV Clients to be Linked into Care and Treatment Clinics in Selected Health Facilities in Morogoro Region for the Period of January 2024 to February 2025 (N = 353)



4.4 Factors Associated with Linkage to Care and Treatment among Newly Diagnosed HIV Clients in Morogoro Region

In the bivariable logistic regression analysis, as presented in Table 4.5, several variables namely sex, marital status, client ownership of a phone number, facility type, distance to the health facility, visit type, and index contact were significantly associated with linkage to care and treatment clinics among newly diagnosed HIV clients. Female clients were more likely to be linked to care and treatment clinics compared to male clients (Crude Odds Ratio [COR] = 3.93, 95% CI = 1.81–8.51, $P = 0.001$). Newly diagnosed PLHIV who were married had higher odds of being linked to care and treatment than those who were single (COR = 5.12, 95% CI = 2.29–11.46, $P < 0.001$). Clients who provided their phone numbers to healthcare workers (documented in HTS registers) were more likely to be linked to HIV care and treatment clinics than those without recorded phone numbers (COR = 3.05, 95% CI = 1.51–6.16, $P = 0.002$).

Newly diagnosed HIV clients identified at dispensaries were more likely to be linked to care and treatment clinics compared to those diagnosed at hospitals or health centres (COR = 5.79, 95% CI = 2.10–15.96, $P = 0.001$). Clients residing within five

kilometres of a CTC were more likely to be linked to care and treatment than those living farther away (COR = 9.27, 95% CI = 4.54–18.9, $P < 0.001$). Those diagnosed during a returned visit had higher odds of linkage compared to those diagnosed during a new visit (COR = 8.73, 95% CI = 4.09–18.63, $P < 0.001$). Additionally, clients elicited as contacts from index cases were more likely to be linked to care and treatment clinics than those who were not (COR = 5.14, 95% CI = 1.96–13.4, $P = 0.001$).

After adjusting for potential confounders in the multivariable logistic regression (Table 4.5), several variables remained significantly associated with linkage to care and treatment clinics. These included sex, marital status, client ownership of a phone number, facility type, distance to the health facility, and visit type. Female clients newly diagnosed with HIV at various testing points were more likely to be linked to care and treatment clinics than male clients (Adjusted Odds Ratio [AOR] = 20.7, 95% CI = 0.66–92.4, $P < 0.001$). Married clients had higher odds of linkage compared to single clients (AOR = 6.09, 95% CI = 1.21–30.4, $P = 0.028$). Clients with documented phone numbers in HTS registers were more likely to be linked to care and treatment clinics than those without (AOR = 7.19, 95% CI = 1.48–34.9, $P = 0.014$).

Newly diagnosed PLHIV at dispensaries were more likely to be linked to care and treatment clinics compared to those diagnosed at hospitals or health centres (AOR = 2.10, 95% CI = 1.47–7.06, $P = 0.017$). Clients living within five kilometres of a health facility or CTC had higher odds of linkage than those living farther away (AOR = 5.03, 95% CI = 1.32–19.1, $P = 0.018$). Finally, individuals diagnosed during a returned visit were more likely to be linked to care and treatment clinics compared to those diagnosed during a new visit (AOR = 16.8, 95% CI = 3.81–74.3, $P < 0.001$).

Table 4.4 Logistic Regression of Factors Associated with Linkage to Care and Treatment among Newly Diagnosed Clients in Morogoro Region

Variable	Category	Bivariable Regression		Logistic	Multivariable Regression		Logistic
		COR	95% CI	P	AOR	95% CI	P
Age	Years	0.98	0.96 – 1.01	0.41	0.98	0.93 – 1.03	0.44
Sex	Male	1.0			1.0		
	Female	3.93	1.81 – 8.51	0.001	20.7	0.66 – 92.4	<0.001
Marital status	Single	1.0			1.0		
	Married	5.12	2.29 – 11.46	<0.001	6.09	1.21 – 30.4	0.028
Pregnant status	No Pregnant	1.0			1.0		
	Pregnant	3.50	0.45 – 26.89	0.22	2.66	0.23 – 30.2	0.43
Phone number	Not Present	1.0			1.0		
	Present	3.05	1.51 – 6.16	0.002	7.19	1.48 – 34.9	0.014
Facility Type	Hospital	1.0			1.0		
	Dispensary	5.79	2.10 – 15.96	0.001	2.10	14.7 – 7.06	0.017
	Health Centre	2.71	1.29 – 5.68	0.008	2.81	0.07 - 100	0.57
Facility Location	Urban	1.0			1.0		
	Rural	1.85	0.75 – 4.57	0.18	0.88	0.11 – 6.77	0.90
Facility Distance	More than 5km	1.0			1.0		
	Less than 5km	9.27	4.54 – 18.9	<0.001	5.03	1.32 – 19.1	0.018
Council	Morogoro MC	1.0			1.0		
	Kilosa DC	0.77	0.39 – 1.50	0.45	0.74	0.13 – 4.02	0.73
Visit Type	New visit	1.0			1.0		
	Returned Visit	8.73	4.09 – 18.63	<0.001	16.8	3.81 – 74.3	<0.001
TB Status	No Symptoms	1.0			1.0		
	Suspect	0.87	0.25 – 3.05	0.83	0.39	0.05 – 3.01	0.37
Testing Settings	Community	1.0			1.0		
	Facility	0.59	0.27 – 1.25	0.17	0.33	0.03 – 3.10	0.33
Testing Modality	CBHTS	1.0			1.0		
	PITC	0.50	0.23 – 1.10	0.08	0.00	7.35 – 0.26	0.018
	CITC	1.29	0.45 – 3.68	0.63	0.18	0.00 – 30.5	0.51
Tester Professional	Clinician	1.0			1.0		
	Nurse	0.69	0.25 – 1.90	0.84	0.47	0.00 – 49.1	0.75
	Counselor	1.85	0.50 – 6.85	0.35	2.61	0.21 - 184	0.12
	Lab Technologist	0.56	0.20 – 1.52	0.25	2.96	0.08 - 105	0.55
Index Contact	No index	1.0			1.0		
	Client with Index	5.14	1.96 – 13.4	0.001	6.03	0.89 – 40.6	0.065

4.5 The Healthcare Workers' Experiences Related to Linkage of Newly Diagnosed HIV Clients to Care and Treatment in Morogoro Region

The analysis of six in-depth interviews revealed two major themes concerning healthcare workers' experiences in facilitating the linkage of newly diagnosed HIV clients from testing points to care and treatment clinics (CTCs). These themes are: facilitators towards linkage to care and treatment clinics among newly diagnosed HIV clients, and secondly, barriers towards linkage to care and treatment clinics among newly diagnosed HIV clients, as summarized in Table 4.5 below.

Table 4.5 Summary of Themes and Codes Analysed from the Data

Part	Themes	Codes
Facilitators towards linkage to care and treatment clinics among newly diagnosed HIV clients	Provision of good counselling to clients	Counselling is everything Presence of a Psychologist
	Customer care and relationship	Customer care
		Good language
		Quality services
	Follow-up through the client's Phone number	Exchanging phone numbers
	Influence from treatment advocates	Uses of Expert clients Uses of Mental Mothers
Barriers towards linkage to care and treatment clinics among newly diagnosed HIV clients	Weekly departmental meeting with health care providers	Regular meeting at testing point
	Pastoralist society beliefs	Pastoralist traditional beliefs
		Masai culture
		Traditional beliefs
	Religious beliefs	Religious beliefs
	Unavailability of CTC services in weekends	Weekend CTC does not operate
	Distance from CTC	Distance involves cost
	Stigma	Stigma in the community
		Client is not ready to be linked
		Self-stigma CTC located near OPD, Lab

Facilitators towards Linkage to Care and Treatment Clinics among Newly Diagnosed HIV Clients

(i) Provision of Good Pre- and Post-Test Counselling

Healthcare workers emphasised the importance of high-quality counselling as a crucial determinant for successful linkage. They reported that when clients are well-informed about their HIV status and the benefits of enrolling in care and treatment

services, they are more likely to accept linkage to CTC. One healthcare provider working at the outpatient and index testing point explained:

“First, to successfully link a client, it starts right here at the testing point. As a provider, if you don’t give good counselling, it’s unlikely the client will agree to join CTC services. So, counselling is a key part. When you educate the client well and they understand why they should start treatment and its benefits, it makes it much easier for them to accept the services.” (IDI 05).

A similar experience was pointed out by another provider at the ANC testing point:

“The first factor is counselling because counselling is everything. It depends on how health care provider you provide counsel the client and what areas you cover in your counselling. So, for me, that’s the key factor that makes it easy for the client to accept being linked to the care and treatment clinic, which is only good counselling, that I know” (IDI 04).

(ii) Customer Care and Provider-Client Relationship

Healthcare providers reported that respectful communication, good language, and quality services contributed to a positive relationship with clients. This relationship helped build trust and encouraged newly diagnosed clients to enrol in care. One ANC provider stated:

“Using good language with clients and having a good relationship are also factors towards linkage of HIV positive clients to care and treatment clinics. If a health care worker welcomes the client warmly, provides counselling well, uses polite language so the client understands, and gives them the chance to ask questions, all of this builds trust, which encourages the client to accept care and treatment services” (IDI 04)

(iii) Follow-Up via Phone Calls

Some clients initially declined linkage despite counselling. Providers shared that obtaining clients’ phone numbers and conducting follow-up calls in the days after diagnosis helped increase acceptance of CTC services. As one participant explained:

“Facility healthcare providers and community health workers, including expert clients, also exchange phone numbers with newly identified HIV-positive clients and maintain communication over the following days until the clients accept CTC services. This method is very helpful in connecting clients to care.” (IDI 05)

(iv) Support from Treatment Advocates

Healthcare workers noted that expert clients and mentor mothers (“mama vinara”) play a critical role in encouraging newly diagnosed clients to accept their status and begin treatment. Their testimonies offer real-life hope and reassurance. One provider stated:

“Also, our expert clients help a lot in linking new identified positive to CTC. They are willing to share their own experiences, saying, I am HIV positive, I use ARV drugs, and I started in a certain year, but today I am healthy, and if you met me on the street, you wouldn’t know. As you’ve seen yourself, our expert clients are very healthy looking you wouldn’t know they are living with HIV so this helps build trust” (IDI 05).

Another provider added:

“Many staff working at care and treatment clinic (CTC) especially Expert Clients and Mentor Mothers (mama vinara) are HIV positive themselves. So, they use their experience to convince new clients who are identified as HIV positive to be enrolled into a care and treatment clinic” (IDI 01).

A third provider at ANC elaborated further:

Second, the community health volunteers known as (mama vinara), these women live in the community and they have close relationships with newly HIV clients. Their effort helps in linking newly diagnosed women with HIV very easily to PMTCT services, they are also used in tracing and encouraging clients to start ART” (IDI 06).

(v) Regular Departmental Meetings with Health Care Workers

Routine weekly meetings among healthcare providers were reported to be instrumental in strengthening linkage practices, especially for inpatient clients. One informant shared:

“We also conducting frequent meetings in weekly bases, to review ward-level data of inpatient department and making follow-up on data of positive identified clients, sometimes we find clients have moved to other wards or discharged to home without linking to CTC, these close follow-ups help to reduce number of new diagnosed clients who not linked to CTC” (IDI 03).

Barriers towards Linkage to Care and Treatment Clinics among Newly Diagnosed HIV Clients

Five sub-themes emerged from the analysis of the six translated in-depth transcripts (IDI) with healthcare providers. These sub-themes reflect the healthcare workers' experiences regarding the barriers to linking newly diagnosed HIV clients to care and treatment clinics (CTCs) in the Morogoro region. The sub-themes are described below:

(i) Pastoralist Community Beliefs

Healthcare providers reported that cultural beliefs among pastoralist communities, particularly the Maasai, pose significant challenges to linkage. These clients often reject their HIV-positive results and refuse to initiate care or antiretroviral therapy (ART). Healthcare workers described persistent misconceptions among these communities, including a belief that HIV does not affect the Maasai. Despite the adequate pre- and post-test counselling, some individuals refused linkage, even threatening healthcare workers in extreme cases. One provider shared the following:

“In the past, many clients used to refuse care and treatment, but from 2019 to the present, only a few still decline. When refusal does occur, it is mostly among members of the Maasai community. The Maasai, regardless of how much counseling is provided, tend to completely reject care. In short, they do not believe they can contract HIV. They are more likely to accept a diagnosis of TB than HIV. They simply do not agree. Even if offered just one pill with the hope they will return the next day, they do not come back. The Maasai present a major challenge because they consistently refuse care and treatment services. They believe they can get TB and will accept TB medication willingly and adhere to it, but they reject HIV medication. In some cases, service providers may even face threats. I was once threatened with a knife at the facility by a Maasai man who had come with his wife for antenatal services. After testing, both were found to be HIV positive.” (IDI 04).

Another provider stated:

“Some individuals decline CTC services due to cultural beliefs. For instance, in pastoralist communities, many people do not believe HIV exists. As a result, when someone from such a group is diagnosed, it often takes a long time to link them to care. Their beliefs frequently lead them to refuse linkage. These cases present real challenges and demand a great deal of patience and follow-up. Testing and

counselling alone are not sufficient education is essential. For example, we diagnosed a 24-year-old Maasai woman with both HIV and syphilis. She refused to begin ARVs, insisting her husband must come first. When we reached out to him, he declined to come. The woman later returned for antenatal follow-up, and we reminded her to start both treatments. She agreed to syphilis treatment but continued to refuse ART. At present, she has disappeared. This is common among pastoralist groups, who frequently move from place to place and are difficult to trace.” (IDI 06).

Additional perspectives highlighted similar challenges:

“For us in this district, we have a big challenge with the pastoralist community they will easily accept TB treatment but not ARVs. If you tell them they have TB, even if they don’t, they will agree to take TB medication, but not ARVs. They still don’t accept HIV as an issue affecting their community, they believe it’s a problem for other people, and most of our surrounding community here is pastoralist; this remains a big challenge and shows that education is still very much needed for this community” (IDI 05).

Another participant added pointing how beliefs influence to retard successful linkage after positive HIV testing:

“Yes, they refuse CTC services. For example, recently, I tested two children, one was 9 years old and the other 19. The guardian (a Maasai woman) agreed to link the orphaned 9-year-old to care but denied the 19-year-old’s results, saying the girl was bewitched. She refused linkage despite counseling. Cultural beliefs and lack of education about HIV greatly hinder linkage to care and treatment clinics” (IDI 03).

(ii) Religious Beliefs

Some clients declined care due to religious beliefs, opting instead to rely on prayer for healing. Healthcare providers noted that even with appropriate counselling, certain individuals expressed strong faith-based convictions that God would cure them, making them unwilling to start ART. A provider shared:

“But there are others who completely refuse because they don’t believe it. For example, I had one client who came in very confident, saying I’m fine, I want to test because I’m about to get married. Because he was so confident, when I tried to counsel him, he felt like I was wasting his time. In the end, his test results showed he was HIV positive. Even now, I don’t know if he ever started treatment because after that he told me he went back to his church, prayed, and believed he was healed” (IDI 05).

Another noted:

“Another adult, over 50 years old, revealed after testing that he’s known his status since 2000 but doesn’t believe in using ART. He believes in prayer and refused to start treatment even after further counselling” (IDI 03).

(iii) Unavailability of CTC Services on Weekends

Several providers reported that most CTCs do not operate on weekends, creating a missed opportunity to link clients diagnosed during weekend testing. While HIV testing services especially at the laboratory and OPD are available daily, clients diagnosed on Saturdays or Sundays are often advised to return on Monday, which many fail to do. As one provider explained:

“Yes, one of the factor hindering linkage is that CTC services are not available on weekends, particularly Saturday and Sunday. If a client is diagnosed in the laboratory over the weekend, they may be asked to return on Monday but often, they don’t come back. That becomes a missed opportunity to link the client to CTC.” (IDI 01).

(iv) Distance to Care and Treatment Clinics

Healthcare providers also highlighted distance as a logistical barrier. Some clients receive HIV testing services far from their homes, making it difficult for them to return for enrolment at the same facility. Although referral forms are issued for enrolment at nearby CTCs, providers noted that in practice, clients are often retested at the new facility or choose not to complete the linkage process. One participant shared:

“Sometimes a client comes here for testing but prefers to start treatment at another facility closer to home. However, some of them end up not enrolling at all, instead, they tested again and were termed as new HIV positives. For instance, a client came from Ludewa and was referred, but whether they actually linked is uncertain.” (IDI 05)

(v) Stigma

Stigma emerged as a significant theme, appearing at both personal and community levels. Some clients reportedly struggle with self-acceptance after diagnosis, leading to refusal of services. Others avoid linkage due to fear of being seen accessing services at CTCs, particularly when the CTC is located near high-traffic areas such as OPD, RCH, or the laboratory. One healthcare provider explained:

“Also, there should be continued community education because stigma still exists, and personal stigma stops some people from seeking services. For example, near where I live, someone tested HIV positive but never started treatment. This makes things difficult. If people are educated that HIV testing and treatment are free and available, more people would start treatment. So, education is still very needed because stigma is still a big challenge for clients diagnosed with HIV” (IDI 05).

The same provider continued to share experiences related to self-stigma among newly diagnosed HIV clients. Providers emphasized that clients often struggle to accept their HIV-positive status, which results in delayed or missed linkage to CTC.

One participant noted:

“Yes, there are clients who refuse to be linked into CTC, not many, but a few they don’t accept themselves yet, and until you accept yourself, you can’t start medication. That’s why they refuse” (IDI 05).

Other providers described a compounded situation involving both self-refusal and unfriendly services at health facilities that lack sufficient privacy for HIV care.

“Refusal is common among those who are unprepared. They may have come in with unrelated symptoms and tested positive unexpectedly. One client agreed to start just to please me but later called to say she wasn’t ready.” (IDI 01)

“One major challenge is the small size of our facility. The buildings are very close together, and some clients do not want others to know their HIV status. The CTC room is located along a busy corridor that also houses the RCH room and the laboratory, which makes some clients uncomfortable and reluctant to enroll.” (IDI 02)

CHAPTER FIVE

DISCUSSION OF RESULTS

5.1 Linkage to Care and Treatment among Newly Diagnosed HIV Clients (January 2024 to February 2025) in Morogoro Region

According to both global and national guidelines, all individuals diagnosed with HIV should be promptly linked to care and treatment services following diagnosis (Bajaria et al., 2021; MoH, 2019). Linkage to care serves as a critical bridge between HIV testing and the initiation of antiretroviral therapy (ART), ensuring that individuals receive timely treatment, care, and support (Maughan-Brown et al., 2019; Sanga et al., 2017). Despite this advantage, the successful linkage of newly diagnosed HIV individuals has not been smooth in the majority of the areas where the pandemic is prevalent (Kway et al., 2022; Maughan-Brown et al., 2019; Sanga et al., 2017, 2019; Uvila et al., 2019).

This evaluation assessed linkage to care among newly diagnosed HIV clients in Morogoro region between January 2024 and February 2025. The findings showed that 90.05% of individuals diagnosed with HIV were successfully linked to care and treatment clinics (CTCs). Although this proportion falls short of the global and national targets, which aim for 100% of people living with HIV (PLHIV) to be initiated on treatment as per the National AIDS and STI Control Programme (NASHCOP) Strategic Plan 2022-2026, the findings of this evaluation represent a comparatively strong performance.

The linkage rate observed in this study exceeds that reported in several previous studies. For instance, in Mwanza, only 73.1% of newly diagnosed individuals were linked to care during the study period (Harklerode et al., 2020). Similarly, in Mbeya, linkage rates of 78% and 52.3% were reported in separate studies among newly diagnosed clients (Kway et al., 2022; Sanga et al., 2017). Comparable trends of lower linkage rates have also been documented across sub-Saharan Africa (SSA). In South Africa, for example, a retrospective study conducted in a community-based HIV testing service (HTS) programme reported a linkage rate of 63.1% among diagnosed individuals (Meehan et al., 2018).

The relatively high linkage rate observed in Morogoro may reflect the impact of ongoing quality improvement initiatives and programmatic investments in HIV testing and treatment services. However, despite this progress, an unacceptable proportion of individuals diagnosed with HIV during the evaluation period were not linked to care. This indicates a persisting gap and underscores the continued need for more effective strategies to ensure that all clients diagnosed with HIV are successfully enrolled in care and treatment services. This highlights the need for context specific and targeted interventions that address the contextual barriers towards ensuring 100% linkage as desired by the global and national targets.

5.2 The Timeliness of Linkage to Care and Treatment among Newly Diagnosed HIV in Morogoro Region (January 2024 to February 2025)

Timely linkage to HIV care and treatment services following diagnosis is widely recognised as a critical step in the HIV care continuum (Sanga et al., 2017, 2019). Prompt initiation of antiretroviral therapy (ART) not only improves individual clinical outcomes by suppressing viral replication but also contributes to broader public health goals through the reduction of HIV transmission within communities (Harklerode et al., 2020; Sanga et al., 2019). According to the National AIDS Control Programme (NACP) under the NASHCOP Strategic Plan (2022-2026), all individuals diagnosed with HIV are expected to be linked to care and initiated on treatment on the same day of diagnosis. Studies such as those by Sanga et al. (2019) and Harklerode et al. (2020) have reported the importance of minimising delays between diagnosis and treatment initiation as a fundamental strategy in achieving epidemic control.

The present evaluation assessed the timeliness of linkage to care and treatment among newly diagnosed HIV clients in Morogoro region between January 2024 and February 2025. The findings revealed that 95% of clients were linked to care and treatment services on the same day they received their HIV diagnosis. While this high percentage suggests commendable progress in the implementation of same-day ART initiation, it still falls short of the national and global target of 100% same-day linkage. Notably, 3% of clients were linked on the second day following diagnosis, and 2% were linked after three or more days. Although these delays may seem

minimal in numerical terms, they represent critical missed opportunities for immediate intervention, especially given the significant benefits of same-day ART initiation. Each delay, however short, may expose individuals to additional psychosocial, logistical, or health system-related barriers that could ultimately hinder successful engagement in care and adherence to treatment (Bertolino et al., 2023; Maughan-Brown et al., 2019).

When compared with findings from other regions, the performance in Morogoro appears significantly better. For instance, a study conducted in Mwanza by Harklerode et al. (2020) reported that only 81.1% of newly diagnosed clients were linked to care on the same day of diagnosis, with a median time of three days for those who were not linked immediately. Similarly, a study by Sanga et al. (2017) conducted in Mbeya revealed a median time to linkage of one day at facility-based sites and six days at mobile or outreach testing sites. Furthermore, another study in Tanga reported that 11.6% of clients in the study linked to the CTC after three months of their HIV positive diagnosis (Kayabu et al., 2018). These comparisons suggest that the efforts undertaken by the Ministry of Health through the NASHCOP, in collaboration with partners, to improve service delivery models, strengthen client follow-up mechanisms, and enhance health worker training may have contributed to more effective and rapid linkage to treatment services.

Nevertheless, while the performance is relatively strong, the presence of even a small proportion of clients who are not linked to care on the same day indicates lingering systemic and individual-level challenges that must be addressed. Achieving the national target of 100% same-day linkage is not only a policy mandate but also a crucial step toward ensuring that no individual is left behind in the HIV response. Sustained efforts to close the remaining gaps through service quality improvement, enhanced client education, and targeted health system strengthening should be continued to achieve timely target as vital strategy for controlling new HIV infections and reducing mortality.

5.3 Factors Associated with Linkage to Care and Treatment among Newly Diagnosed HIV Clients in Morogoro Region

Linkage to care and treatment services among newly diagnosed HIV clients is a critical step in the HIV care cascade, as it enables prompt initiation of antiretroviral therapy (ART), which is essential for viral suppression, improved health outcomes, and prevention of HIV transmission (Maughan-Brown et al., 2019; Sanga et al., 2017; Uvila et al., 2019). Several factors, including individual characteristics, health system attributes, and broader societal or cultural influences, are known to affect whether individuals successfully transition from diagnosis to treatment (Uvila, 2018). Understanding these factors in the local context of Morogoro region is crucial for informing tailored strategies aimed at improving timely linkage and reducing HIV-related morbidity and mortality.

The present evaluation found that female clients were significantly more likely to be linked to care and treatment services compared to their male counterparts. This finding aligns with previous studies conducted in Tanzania, including those by Uvila et al. (2019) and Harklerode et al. (2020) in Magu District, as well as a study by Kway et al. (2022) in Mbeya, which consistently reported higher rates of linkage among women. One possible explanation for this trend is that women are often diagnosed at Prevention of Mother to Child Transmission (PMTCT) clinics during antenatal care visits, where HIV testing and ART initiation are integrated within the same service point. This co-location facilitates a seamless transition from diagnosis to care. In contrast, many men may be diagnosed through outpatient departments (OPDs) or community-based outreach testing services, which are often disconnected from Care and Treatment Clinics (CTCs). As a result, men may face additional logistical or psychological barriers to accessing treatment services.

Moreover, the findings from qualitative interviews conducted during this evaluation provide deeper insight into the gender disparity in linkage. In particular, cultural beliefs within the Maasai communities in the study area appear to significantly hinder male engagement in HIV care. Participants reported that many men in this society find it difficult to accept an HIV-positive diagnosis, as prevailing masculine

norms and myths perpetuate the belief that men are immune to HIV but susceptible to other diseases like tuberculosis. It is known that men in sub-Saharan Africa are less likely to test for HIV and link to treatment than women, and are more likely to be diagnosed with advanced disease stage (Sileo et al., 2018).

This follows because of the gender norms related to masculinity (the qualities of femaleness and maleness), which play a critical role in men's relatively low HIV testing and linkage rates (Sikweyiya et al., 2015; Sileo et al., 2018). This masculinity perception leads to denial and delays in seeking HIV care among men. On the other side, women in these communities may be more exposed to health education during maternal health services, increasing their awareness and acceptance of HIV testing and treatment. These socio-cultural dynamics highlight the need for gender-sensitive interventions that target men with tailored messaging and improved access to testing and treatment services.

Furthermore, prior research has documented that linkage to care following community-based HIV testing, such as mobile clinics and home-based services, is often suboptimal (Maughan-Brown et al., 2019; Ruzagira et al., 2017; Sanga et al., 2019). This challenge disproportionately affects men, who are more likely to be diagnosed in such settings. The disconnect between the point of diagnosis and the treatment facility may lead to delays or failures in linkage due to transportation barriers, lack of follow-up, or low motivation (Cochran et al., 2022; Syed et al., 2013), especially among individuals who do not immediately perceive themselves to be ill (Sikweyiya et al., 2015; Sileo et al., 2018). These findings underscore the importance of strengthening follow-up mechanisms, integrating point of care ART initiation where possible, and addressing structural barriers like harmful gender norms in order to enhance continuity from diagnosis to treatment.

These findings imply that linkage strategies should be tailored to address gender-specific barriers, with particular emphasis on improving linkage pathways for men diagnosed through non-integrated testing sites. Strengthening male-friendly linkage approaches and integrating HIV services across various entry points could help close the gender gap in access to care and treatment services. In this evaluation, newly

diagnosed HIV-positive individuals who were married were more likely to be linked to care and treatment clinics compared to those who were single. This finding is consistent with previous studies that highlight the positive influence of marital relationships on health-seeking behaviours of chronic and sexually transmitted illnesses (Fox & Sheele, 2021; Pandey et al., 2019; Richardson et al., 2023). Married individuals may often benefit from greater emotional, moral and social support, shared decision-making, and partner involvement in healthcare, all of which facilitate timely linkage to HIV care (Sanga et al., 2019). Additionally, married individuals may experience less stigma in disclosing their HIV status, especially when their partner is also tested or involved in the counselling process. These dynamics may make it easier for them to navigate referral pathways and begin treatment without fear or hesitation.

Moreover, in the Tanzanian context, male involvement in antenatal care (ANC) has contributed to increased testing and linkage to care among couples (Sao et al., 2024). Married women are more likely to attend ANC services (Odeny et al., 2019) and when accompanied by their partners, both individuals may be tested and linked to care more smoothly. This joint engagement in health services is rarely seen among individuals who are single, as they may lack the motivation or social support necessary to pursue care. These findings suggest that promoting couple-based interventions and enhancing support systems for single individuals could improve overall linkage to HIV care following diagnosis.

These findings imply that marital status plays an important role in facilitating timely linkage to HIV care, highlighting the value of social and emotional support in health-seeking behavior. Interventions should therefore promote couple-based HIV testing and counselling approaches. Also, developing targeted support mechanisms such as peer navigation or community-based follow-up to assist single individuals who may lack partner support and are at higher risk of delayed linkage to care.

In this evaluation, clients whose phone numbers were recorded in the HIV Testing Services (HTS) register were significantly more likely to be successfully linked to care and treatment compared to those without contact information. This finding aligns with insights from qualitative interviews, where healthcare providers emphasised the importance of phone-based follow-up. The availability of clients' contact details enabled providers to reach out via phone calls shortly after diagnosis, which was reported to enhance clients' acceptance of referral and attendance at Care and Treatment Clinics (CTCs).

This approach is reinforced by findings from earlier studies, which show that gathering and using client contact details plays a vital role in facilitating effective follow-up, linkage to care, and retention in treatment (Baluku et al., 2021; Rosen & Ketlhapile, 2010). Prompt follow-up via phone communication not only assists clients in navigating the steps following diagnosis but also enhances the client-provider relationship and supports continuity of care (Baluku et al., 2021; Rosen & Ketlhapile, 2010; Sharkiya, 2023). These insights emphasize the importance of strengthening systems for collecting and using contact information as a routine component of HIV testing to improve linkage outcomes.

This evaluation found that newly diagnosed people living with HIV (PLHIV) who were tested at dispensary-level health facilities were more likely to be successfully linked to care and treatment compared to those diagnosed at hospitals and health centres. This finding is consistent with previous research conducted in Magu District, Mwanza, which also reported higher linkage rates among clients diagnosed at dispensaries (Harklerode et al., 2020). One possible explanation for this trend is that dispensaries are typically located closer to clients' homes, minimising travel distance and transport-related barriers (Bajaria et al., 2021; Sanga et al., 2019).

Both the current evaluation and previous studies have shown that long distances to health facilities and the high cost of transport can deter clients from initiating HIV care and treatment (Bajaria et al., 2021; Sanga et al., 2019; Uvila et al., 2019). In the quantitative analysis of this evaluation, newly diagnosed HIV individuals who lived less than five kilometres of the health facility/CTC were more likely to be linked into

care and treatment compared to those who lived more than five kilometres. Similarly, the distance factor was also revealed in the qualitative interviews, where healthcare providers reported that clients who tested at facilities far from their residence often struggled to return for enrollment at Care and Treatment Clinics (CTCs).

Moreover, dispensaries may have a lower patient volume and shorter waiting times compared to more congested health centres and hospitals (Alrasheedi et al., 2019; Biya et al., 2022), which could further facilitate timely linkage. In contrast, high client load and limited human resources at larger facilities may lead to long queues and delays in service delivery, discouraging some clients from completing the referral process. For instance, Sanga et al. (2019) highlighted that overcrowded CTCs and inadequate staffing contributed to long wait times, which served as a barrier to timely linkage among PLHIV. These findings collectively underscore the importance of considering both geographical accessibility and facility-level factors, such as patient volume and service efficiency, in strategies aimed at improving linkage to HIV care.

This evaluation found that individuals newly diagnosed with HIV during a return visit were more likely to be linked to care and treatment clinics than those diagnosed during a new visit. This indicates that prior interaction with the health system whether through testing, counselling, or other services may foster trust, familiarity, acceptance, or readiness that supports linkage to care. Return visits may reflect continued engagement with the health facility, possibly due to earlier exposure to health education or referral guidance, which could strengthen motivation and preparedness to enrol in HIV care. Conversely, individuals diagnosed during a new visit may face greater shock, denial, or uncertainty immediately following their diagnosis (Reniers & Eaton, 2009), potentially delaying their decision to pursue care and treatment services.

5.4 The Healthcare Workers' Experiences Related to Linkage of Newly Diagnosed HIV Clients to Care and Treatment in Morogoro Region

In-depth interviews with healthcare workers revealed several key facilitators towards successful linkage of newly diagnosed individuals living with HIV to care and

treatment services. One of the most consistently emphasised elements was the provision of high-quality pre- and post-test counselling. Healthcare workers noted that when clients receive clear, empathetic, and informative counselling, they are more likely to accept their HIV status and proceed with enrolment into care and treatment clinics. Effective counselling helps clients understand the importance of early treatment initiation and the long-term health benefits of being engaged in care (Dwomoh et al., 2024; Kway et al., 2022). This observation is strongly supported by previous studies, which highlight counselling as a pivotal component in the HIV care cascade (Dwomoh et al., 2024; Kway et al., 2022; Meehan et al., 2018; Watt et al., 2019). In particular, Dwomoh et al. (2024) emphasise that professional counselling services are indispensable in both the prevention and treatment continuum for persons living with HIV.

Beyond counselling, the quality of provider-client relationships also emerged as an important determinant of successful linkage to care. Healthcare workers described how respectful communication, compassionate attitudes, and the delivery of patient-centred services fostered trust and a sense of safety, which encouraged clients to engage with HIV care. The experience of healthcare providers indicated that positive interactions increased clients' confidence in the health system, which, in turn, promoted timely linkage. These findings align with those reported by Sanga et al. (2019) in Mbeya, where strong provider-client relationships and good customer care were shown to enhance linkage and continuity in HIV care. Conversely, negative attitudes and the use of abusive language by providers were cited as barriers, deterring newly diagnosed individuals from returning for care or enrolling in treatment (Sanga et al., 2019)

Another critical facilitator of linkage to care identified in this evaluation was the involvement of treatment advocates, including expert clients and mentor mothers, locally referred to as Mama Vinara. Healthcare providers reported that these individuals played a vital role in bridging the gap between diagnosis and treatment. Their lived experiences, shared in counselling or informal conversations, served as powerful testimonies that helped newly diagnosed clients accept their status and feel hopeful about living positively with HIV. This peer support mechanism aligns with

findings from Atwijukiire et al. (2022), who highlighted the role of HIV volunteers in promoting treatment initiation among HIV-positive clients. Similarly, Dwomoh et al. (2024) noted that volunteers and expert clients not only support behaviour change but also facilitate treatment adherence and long-term retention in care through emotional and psychosocial support.

These contributions are well documented in Tanzania and across sub-Saharan Africa, where the integration of expert clients and HIV counsellors into service delivery has been recognised as a best practice for improving outcomes across the HIV care continuum (Dwomoh et al., 2024; Kayabu et al., 2018). The insights from healthcare workers point to the importance of high-quality counselling, respectful and supportive client-provider interactions, and community-based peer support in enhancing linkage to HIV care. Strengthening these elements within HIV service delivery systems is critical for improving early treatment initiation and long-term health outcomes for newly diagnosed individuals.

Despite the provision of adequate pre- and post-test counselling, cultural beliefs were identified as significant barriers to linkage to care among newly diagnosed HIV clients in these Maasai pastoralist communities. Healthcare providers reported that among the Maasai, there is a strong belief that HIV cannot affect them, which often leads to outright rejection of HIV positive test results. This cultural perception undermines efforts to initiate care and treatment, as many newly diagnosed individuals refuse to accept their status or begin antiretroviral therapy.

Similar observations have emerged from Mbeya, where denial of HIV status was identified as a significant barrier to accessing care (Sanga et al., 2019). According to Sanga et al. (2019), clients often rejected their diagnosis and either postponed or entirely avoided engaging with care and treatment services. Similarly, Kayabu et al. (2018) noted that many individuals faced emotional challenges in accepting their status, with some questioning the accuracy of their test results, thereby further delaying their entry into care. These insights highlight the urgent need for culturally attuned interventions that confront denial and dispel harmful beliefs within affected communities.

This assessment also found that religious beliefs can pose substantial obstacles to linking newly diagnosed HIV clients to care and treatment. Some individuals opted not to initiate care, instead placing their trust in prayer and spiritual healing. Accounts from healthcare providers revealed that, even after receiving appropriate counselling, certain clients maintained strong faith-based beliefs that divine intervention would heal them, resulting in hesitancy or outright refusal to begin antiretroviral therapy (ART).

These findings align with those from other regions in Tanzania. For instance, Sanga et al. (2019) documented in Mbeya that spiritual beliefs and belief in witchcraft were notable obstacles to care. Some clients believed their illness was a result of being bewitched, and therefore felt that hospital-based treatment would not be effective (Sanga et al., 2019). In rural areas like these, pastoral Maasai communities often hold such beliefs, which can influence health-seeking behaviour, with clients favouring spiritual remedies such as prayers or the use of holy water over biomedical interventions (Sanga et al., 2019). These perspectives underscore the need for community-level education and engagement with religious and spiritual leaders to promote messages that support linkage to HIV care and the effectiveness of ART.

This evaluation identified the unavailability of Care and Treatment Clinic (CTC) services on weekends as a barrier to timely linkage to HIV care. Participants reported that most CTCs do not operate during weekends, resulting in missed opportunities to link clients diagnosed through weekend testing campaigns. Although HIV testing services, especially in laboratories and outpatient departments, are offered daily, participants indicated that clients diagnosed on Saturdays or Sundays are typically advised to return on Monday for enrolment into care. Some individuals do not return, resulting in failed or delayed linkage.

Similar observations were reported in Mbeya, Tanzania, where disorganised clinic procedures and scheduling were cited as barriers to effective linkage (Sanga et al., 2019). In that setting, health facilities maintained rigid schedules for testing and treatment registration, which required patients to make several visits (Sanga et al., 2019). For instance, a client diagnosed on a Friday morning might be given a referral

to return the following Tuesday for registration, followed by separate appointments for CD4 testing and result collection (Sanga et al., 2019). These procedural delays may contribute to reduced linkage, especially for clients with limited time or transport resources.

HIV related stigma was also identified as a significant barrier to effective linkage to care and treatment in this evaluation. Stigma manifests at both the individual and community levels, often impeding clients' willingness to engage with care services. Participants reported that some newly diagnosed individuals experienced challenges with self-acceptance, resulting in denial of their HIV status and refusal to initiate treatment. Others avoided linkage out of fear of being recognised while accessing services at CTCs, especially when these clinics are located near high-traffic areas such as outpatient departments, reproductive and child health units, or laboratories, where there may be more movements. This fear of being seen and judged by others contributes to delays or complete avoidance of care.

Findings from this study align with previous research in Tanzania and other sub-Saharan African contexts, where stigma has been consistently associated with poor linkage and retention in HIV care (Bajaria et al., 2021; Maughan-Brown et al., 2019; Remien et al., 2009; Sanga et al., 2019; Uvila et al., 2019). As highlighted by Remien et al. (2009), strong cultural taboos around HIV/AIDS persist, largely due to its association with behaviours considered immoral or sinful, such as homosexuality, extramarital sex, and drug use, thereby reinforcing stigma and discouraging individuals from seeking timely care as they avoid judgment.

CHAPTER SIX

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

6.1 Summary

Linkage to HIV care and treatment following diagnosis is a critical step in the HIV care continuum, enabling timely antiretroviral therapy (ART) initiation, improving individual outcomes, and reducing onward transmission. The Tanzania Ministry of Health, through the NASHCoP, implements the NASHCoP 2022-2026 Strategic Plan 1. The Strategic Plan outlines different initiatives and strategies with an ambitious target of 100% same-day linkage for all newly identified people living with HIV in all testing modalities. No evidence existed on the performance of these initiatives. Therefore, this evaluation was conducted in Morogoro Municipal Council and Kilosa District Council in Morogoro region to assess the performance and contextual drivers of linkage among newly diagnosed HIV clients between January 2024 and February 2025.

The key findings showed that 90.05% of newly diagnosed HIV clients were successfully linked to care and treatment, with 95% of those linked doing so on the same day of diagnosis. Female and married clients, those diagnosed during return visits, and clients whose phone contacts were recorded had higher odds of successful linkage. Diagnosis at dispensaries (versus hospitals or health centers) was also associated with better linkage.

From the qualitative component, major facilitators included high-quality pre- and post-test counselling, positive provider-client relationships (customer care), active follow-up via phone calls, support from treatment advocates (expert clients and mentor mothers), and regular coordination meetings among providers. Key barriers included cultural denial, particularly among pastoralist Maasai, who deny their seropositive results, religious/spiritual beliefs favouring prayer or witchcraft explanations over biomedical treatment, unavailability of CTC services on weekends, stigma, and logistical challenges such as distance to facilities.

6.2 Conclusion

While linkage performance in Morogoro region was relatively strong compared to some prior regional reports, it fell short of the universal same-day linkage target that desires 100% same-day linkage. Key facilitators included quality counselling, strong provider-client relationships, follow-up via phone contacts, and support from expert clients and mentor mothers, while barriers included cultural and religious denial, weekend service gaps, stigma, and distance to facilities. These findings highlight the need for strengthened, community-tailored, and health system interventions to address persistent socio-cultural and operational barriers to achieve universal same-day linkage to HIV care.

6.3 Recommendations

Ministry or National Level Recommendations

1. Expand ART Access Windows. Revise service delivery policy to support extended CTC operating hours, including weekends or same-day initiation pathways, to reduce missed linkage opportunities from weekend diagnoses.
2. Scale up structured deployment of expert clients and mentor mothers as core linkage facilitators with clear roles, supervision, and support mechanisms.
3. Establish a biometric fingerprint in HTS intervention for easy detection of all known cases

Regional/Council Health Management Team (R/CHMT) and Facility Level

1. Provide regular on-job training and mentorship to ensure counselling is comprehensive, culturally sensitive, and equips clients with understanding and readiness for linkage.
2. Improve customer care and provider-client interaction. Institutionalise patient-centred communication skills training, monitor staff attitudes, and institute feedback mechanisms to reinforce respectful, trust-building interactions.

3. Address structural stigma at facility level. Reassess and, if possible, reconfigure CTC location/layout to enhance privacy (this should include avoid clustering near high-traffic units) and visibly normalize HIV services within general care to reduce client visibility concerns.
4. Collaborate with local community and religious leaders to conduct facility linked education sessions that address specific local beliefs (e.g., witchcraft, faith healing) undermining linkage.
5. Support for expert clients and mentor mothers. Integrate treatment advocates into routine linkage workflows, provide them with refresher orientation, and recognize their contributions to sustain motivation.

6.4 Policy Implications

1. Reinforcing and Operationalize Same-day Linkage Policy: The gap between current performance 90.05% and the 100% same-day linkage target implies the need for stronger policy enforcement, clear operational standards, and routine accountability mechanisms to ensure immediate linkage after HIV diagnosis.
2. Expanding Service Availability Beyond Weekdays: The absence of CTC services on weekends creates missed opportunities; policy should support extended or more flexible ART initiation windows (including weekend linkage or rapid linkage pathways) to capture clients diagnosed outside typical operating hours.
3. Incorporating Cultural Competence in HIV Service Delivery Guidelines: National policy should require culturally sensitive counselling and community engagement strategies that acknowledge and address harmful beliefs (e.g., denial among specific ethnic groups or reliance on spiritual healing), including formal collaboration with community gatekeepers.
4. Strengthening the Role and Support of Treatment Advocates: Policies should formally recognize, train, supervise, and incentivize expert clients and mentor mothers as integral linkage facilitators, with defined scopes of practice and integration into routine service delivery.

6.5 Study Limitations and Areas for Further Research

6.5.1 Potential Study Limitations and Mitigation Procedures

Data quality and completeness. Reliance on routine registers and programmatic records (example HTS register, referral forms, and CTC2 cards) introduces risks of missing, incomplete, or inaccurately recorded data, which could bias estimates of linkage and timeliness. To mitigate this, files with missing records were excluded in the study. Moreover, information on one source were compared with another source for consistency and accuracy.

Selection bias. Clients who never presented for follow-up or who were lost before appearing in any register may have been systematically excluded, potentially overestimating linkage performance (survivor bias). To minimize this, cross checking of records across data sources was done to ensure no potential participant was left on the sampling and selection stage.

Information and social desirability bias. In-depth interviews with healthcare providers may reflect social desirability, with participants emphasizing positive practices or underreporting system failures. Their perspectives do not include the clients' viewpoints, limiting a full understanding of demand-side barriers. To avoid this, clear elaboration has been provided in the methods section to clarify the focus of the particular study objective.

Translation and interpretation. Qualitative data were collected in Kiswahili and translated into English for analysis. Nuances or culturally embedded meanings may have been altered or lost in translation, affecting interpretation. To mitigate this, cross checking of the transcripts and back translation were done by the principal investigator and the research assistant to ensure that the English transcripts contained the original words and fillers of the participants.

6.5.2 Areas for Further Research

1. Research to test the effectiveness and feasibility of digital health solutions such as SMS reminders, tele-counseling, mobile health platforms which may

be used in improving timely linkage and follow-up, especially in remote or mobile populations.

2. Conduct qualitative study (among clients who fail to link to care or delay to link to care) to explore the client perspectives on linkage to care. This will enable understanding of their experience and perspectives related to being linked to HIV treatment.

REFERENCES

- Aggarwal, R., & Ranganathan, P. (2019). Study designs: Part 2 - Descriptive studies. In *Perspectives in Clinical Research* (Vol. 10, Issue 1, pp. 34-36). Wolters Kluwer Medknow Publications. https://doi.org/10.4103/picr.PICR_154_18
- Alrasheedi, K. F., AL-Mohaithef, M., Edrees, H. H., & Chandramohan, S. (2019). The Association Between Wait Times and Patient Satisfaction: Findings from Primary Health Centers in the Kingdom of Saudi Arabia. *Health Services Research and Managerial Epidemiology*, 6. <https://doi.org/10.1177/2333392819861246>
- Atwijukiire, H., Nalubega, H. J., Byaruhanga, V., Atwiine, P., Muhame, K., Mpumwire, P., Muhindi, E. B., & Niyonzima, V. (2022). Stigma and Discrimination of HIV/AIDs Recipients of Care in Western Uganda: Experiences and Roles of Expert Clients. *HIV/AIDS - Research and Palliative Care*, 14. <https://doi.org/10.2147/HIV.S387599>
- Bajaria, S., Exavery, A., Toroka, N., & Abdul, R. (2021). Poor Linkage to Care for HIV-Positive OVC with Disabled Caregivers: a Longitudinal Study in Tanzania. *BMC Public Health*, 21(1). <https://doi.org/10.1186/s12889-021-10415-6>
- Baluku, J. B., Kabamooli, R. A., Kajumba, N., Nabwana, M., Kateete, D., Kiguli, S., & Andia-Biraro, I. (2021). Contact Tracing is Associated with Treatment Success of Index Tuberculosis Cases in Uganda. *International Journal of Infectious Diseases*, 109. <https://doi.org/10.1016/j.ijid.2021.06.049>
- Bernadette Capili. (2021). Overview: Cross-Sectional Studies. *The American Journal of Nursing*, 121(10).
- Bertolino, D., Baim-Lance, A., D'Aquila, E., Coren, F., & Abraham, B. (2023). Immediate Initiation of Antiretroviral Treatment: Knowledge, Attitudes,

- and Practices among Clinic Staff in New York City. *BMC Health Services Research*, 23(1). <https://doi.org/10.1186/s12913-023-09896-5>
- Biya, M., Gezahagn, M., Birhanu, B., Yitbarek, K., Getachew, N., & Beyene, W. (2022). Waiting Time and its Associated Factors in Patients Presenting to Outpatient Departments at Public Hospitals of Jimma Zone, Southwest Ethiopia. *BMC Health Services Research*, 22(1). <https://doi.org/10.1186/s12913-022-07502-8>
- Bronfenbrenner. (1979). The Ecology of Human Development: Experiments by Nature and Design. Cambridge. *Encyclopedia of Quality of Life and Well-Being Research*.
- Cochran, A. L., McDonald, N. C., Prunkl, L., Vinella-Brusher, E., Wang, J., Oluyede, L., & Wolfe, M. (2022). Transportation Barriers to Care among Frequent Health Care Users during the COVID Pandemic. *BMC Public Health*, 22(1). <https://doi.org/10.1186/s12889-022-14149-x>
- Dawadi, S., Shrestha, S., & Giri, R. A. (2021). Mixed-Methods Research: A Discussion on its Types, Challenges, and Criticisms. *Journal of Practical Studies in Education*, 2(2). <https://doi.org/10.46809/jpse.v2i2.20>
- Dwomoh, F., Douglas, M., Charles-Unadike, V. O., Komesuor, J., & Manu, E. (2024). Motivation, Responsibilities, and Experiences of HIV/AIDS counselors in the Volta Region of Ghana: A Descriptive Phenomenological Study. *AIDS Research and Therapy*, 21(1). <https://doi.org/10.1186/s12981-024-00648-x>
- Fox, H. T., & Sheele, J. M. (2021). Association of Marital Status in the Testing and Treatment of Sexually Transmitted Infections in the Emergency Department. *Cureus*. <https://doi.org/10.7759/cureus.17489>
- Garbarino, J. (1980). The Ecology of Human Development: Experiments by Nature and Design. *Children and Youth Services Review*, 2(4). [https://doi.org/10.1016/0190-7409\(80\)90036-5](https://doi.org/10.1016/0190-7409(80)90036-5)

- Harklerode, R., Todd, J., de Wit, M., Beard, J., Urassa, M., Machemba, R., Maduhu, B., Hargreaves, J., Somi, G., & Rice, B. (2020). Characterizing a Leak in the HIV Care Cascade: Assessing Linkage Between HIV Testing and Care in Tanzania. *Frontiers in Public Health*, 7. <https://doi.org/10.3389/fpubh.2019.00406>
- Kajamaa, A., Mattick, K., & de la Croix, A. (2020). How to ... Do Mixed-Methods Research. *Clinical Teacher*, 17(3). <https://doi.org/10.1111/tct.13145>
- Kayabu, D. E., Ngocho, J. S., & Mmbaga, B. T. (2018). Effective Linkage from Point of HIV Testing to Care and Treatment in Tanga region, Tanzania. *PLoS ONE*, 13(8). <https://doi.org/10.1371/journal.pone.0201644>
- Kway, A., Sabi, I., Olomi, W., Mcharo, R. D., Sanga, E., William, W., Chimbe, O., Ntinginya, N. E., & Maganga, L. (2022). HIV Testing and Linkage to Care A Case of a Mobile Diagnostic and Counseling Service in Mbeya, Tanzania: A Quantitative Study. *PLOS Global Public Health*, 2(8). <https://doi.org/10.1371/journal.pgph.0000448>
- Maughan-Brown, B., Harrison, A., Galárraga, O., Kuo, C., Smith, P., Bekker, L. G., & Lurie, M. N. (2019). Factors Affecting Linkage to HIV Care and ART Initiation Following Referral for ART by a Mobile Health Clinic in South Africa: Evidence from a Multimethod Study. *Journal of Behavioral Medicine*, 42(5). <https://doi.org/10.1007/s10865-018-0005-x>
- Mboma, Z. M., Dillip, A., Kramer, K., Koenker, H., Greer, G., & Lorenz, L. M. (2018). For the Poor, Sleep is Leisure': Understanding Perceptions, Barriers and Motivators to Mosquito Net Care and Repair in Southern Tanzania. *Malaria Journal*, 17(1). <https://doi.org/10.1186/s12936-018-2528-6>
- Meehan, S. A., Sloat, R., Draper, H. R., Naidoo, P., Burger, R., & Beyers, N. (2018). Factors Associated with Linkage to HIV Care and TB Treatment at

- Community-Based HIV Testing Services in Cape Town, South Africa. *PLoS ONE*, 13(4). <https://doi.org/10.1371/journal.pone.0195208>
- MoH. (2024). DHIS2 Program Data. Retrieved at <https://dhis.moh.go.tz/dhis-web-data-visualizer/index.html> retrieved on 13 December 2024.
- MoH. (2019). National Guidelines for the Management of HIV and AIDS 7th Edition. *Development*, 7(5,371,780,231.09).
- MoH. (2022). *NASHCoP Strategic Plan I 2022-2026*. Dodoma
- Morse, J. M. (2000). Determining Sample Size. In *Qualitative Health Research* (Vol. 10, Issue 1). <https://doi.org/10.1177/104973200129118183>
- Odeny, B., McGrath, C. J., Langat, A., Pintye, J., Singa, B., Kinuthia, J., Katana, A., Ng'Ang'A, L., & John-Stewart, G. (2019). Male Partner Antenatal Clinic Attendance is Associated with Increased Uptake of Maternal Health Services and Infant BCG Immunization: A National Survey in Kenya. *BMC Pregnancy and Childbirth*, 19(1). <https://doi.org/10.1186/s12884-019-2438-9>
- Pandey, K. R., Yang, F., Cagney, K. A., Smieliauskas, F., Meltzer, D. O., & Ruhneke, G. W. (2019). The Impact of Marital Status on Health Care Utilization among Medicare Beneficiaries. *Medicine (United States)*, 98(12). <https://doi.org/10.1097/MD.00000000000014871>
- Pathmanathan, I., Nelson, R., De Louvado, A., Thompson, R., Pals, S., Casavant, I., Cardoso, M. J. A., Ujamaa, D., Bonzela, J., Mikusova, S., Chivurre, V., Tamele, S., Sleeman, K., Zhang, G., Zeh, C., Dobbs, T., Vubil, A., Auld, A., Briggs-Hagen, M., ... MacKellar, D. (2021). High Coverage of Antiretroviral Treatment with Annual Home-Based HIV Testing, Follow-up Linkage Services, and Implementation of Test and Start: Findings from the Chókwè Health Demographic Surveillance System, Mozambique, 2014-2019. *Journal of Acquired Immune Deficiency Syndromes*, 86(4). <https://doi.org/10.1097/QAI.0000000000002583>

- Ranganathan, P., & Aggarwal, R. (2019). Study Designs: Part 3 - Analytical Observational Studies. *Perspectives in Clinical Research*, 10(2), 91-94. https://doi.org/10.4103/picr.PICR_35_19
- Remien, R. H., Chowdhury, J., Mokhbat, J. E., Soliman, C., El Adawy, M., & El-Sadr, W. (2009). Gender and Care: Access to HIV Testing, Care, and Treatment. In *Journal of Acquired Immune Deficiency Syndromes* (Vol. 51, Issue SUPPL. 3). <https://doi.org/10.1097/QAI.0b013e3181aafd66>
- Reniers, G., & Eaton, J. (2009). Refusal Bias in HIV Prevalence Estimates from Nationally Representative Seroprevalence Surveys. *AIDS*, 23(5). <https://doi.org/10.1097/QAD.0b013e3283269e13>
- Rentsch, C. T., Wringe, A., Machemba, R., Michael, D., Urassa, M., Todd, J., Reniers, G., & Zaba, B. (2018). Linkage to Care and Antiretroviral Therapy Initiation by Testing Modality among Individuals Newly Diagnosed with HIV in Tanzania, 2014–2017. *Tropical Medicine and International Health*, 23(12). <https://doi.org/10.1111/tmi.13153>
- Richardson, C. L., Saeed, M., Sharp, L., & Todd, A. (2023). The Association between Marital Status and Treatment Initiation in Lung Cancer: A Systematic Review and Meta-Analysis of Observational Studies. In *Cancer Epidemiology* (Vol. 87). <https://doi.org/10.1016/j.canep.2023.102494>
- Rosen, S., & Ketlhapile, M. (2010). Cost of Using a Patient Tracer to Reduce Loss to Follow-up and Ascertain Patient Status in a Large Antiretroviral Therapy Program in Johannesburg, South Africa. *Tropical Medicine and International Health*, 15(SUPPL. 1). <https://doi.org/10.1111/j.1365-3156.2010.02512.x>
- Rosenstock, I. M. (1974). Historical Origins of the Health Belief Model. *Health Education & Behavior*, 2(4), 328–335. <https://doi.org/10.1177/109019817400200403>

- Ruzagira, E., Baisley, K., Kamali, A., Biraro, S., Grosskurth, H., Wringe, A., Celum, C., Barnabas, R. V., van Rooyen, H., Genberg, B. L., Braitstein, P., Ndege, S., Nakigozi, G., Parker, L. A., Labhardt, N. D., Naik, R., Becker, S., Hoffmann, C. J., Iwuji, C. C., & Larmarange, J. (2017). Linkage to HIV Care after Home-Based HIV Counselling and Testing in Sub-Saharan Africa: A Systematic Review. In *Tropical Medicine and International Health* (Vol. 22, Issue 7). <https://doi.org/10.1111/tmi.12888>
- Ryan, F., Coughlan, M., & Cronin, P. (2007). Step-by-step Guide to Critiquing Research. Part 2: Qualitative Research. In *British journal of nursing (Mark Allen Publishing)* (Vol. 16, Issue 12). <https://doi.org/10.12968/bjon.2007.16.12.23726>
- Sallis, J. F., Owen, N., & Fisher, E. B. (2008). Ecological models of health behavior Theory, Research, and Practice. *Health Behavior and Health Education: Theory, Research, and Practice*.
- Sanga, E. S., Lerebo, W., Mushi, A. K., Clowes, P., Olomi, W., Maboko, L., & Zarowsky, C. (2017). Linkage into Care among Newly Diagnosed HIV-Positive Individuals Tested through Outreach and Facility-Based HIV Testing Models in Mbeya, Tanzania: A Prospective Mixed-method Cohort Study. *BMJ Open*, 7(4). <https://doi.org/10.1136/bmjopen-2016-013733>
- Sanga, E. S., Mukumbang, F. C., Mushi, A. K., Lerebo, W., & Zarowsky, C. (2019). Understanding Factors Influencing Linkage to HIV Care in a Rural Setting, Mbeya, Tanzania: Qualitative Findings of a Mixed Methods Study. *BMC Public Health*, 19(1). <https://doi.org/10.1186/s12889-019-6691-7>
- Sao, S. S., Coleman, J. N., Minja, L., Mwamba, R. N., Kisigo, G. A., Osaki, H., Renju, J., Mmbaga, B. T., & Watt, M. H. (2024). Who is Most Vulnerable? Factors Associated with Presenting to Antenatal Care without a Male Partner in Northern Tanzania. *Midwifery*, 132. <https://doi.org/10.1016/j.midw.2024.103962>

- Savenye, W. C., & Robinson, R. S. (2005). Using Qualitative Research Methods in Higher Education. *Journal of Computing in Higher Education*, 16(2). <https://doi.org/10.1007/BF02961475>
- Sharkiya, S. H. (2023). Quality Communication Can Improve Patient-Centred Health Outcomes among Older Patients: A Rapid Review. *BMC Health Services Research*, 23(1). <https://doi.org/10.1186/s12913-023-09869-8>
- Sikweyiya, Y. M., Jewkes, R., & Dunkle, K. (2015). Impact of HIV on and the Constructions of Masculinities among HIV-Positive Men in South Africa: Implications for Secondary Prevention Programs. *Global Health Action*, 8(1). <https://doi.org/10.3402/gha.v7.24631>
- Sileo, K. M., Fielding-Miller, R., Dworkin, S. L., & Fleming, P. J. (2018). What Role Do Masculine Norms Play in Men's HIV Testing in Sub-Saharan Africa?: A Scoping Review. In *AIDS and Behavior* (Vol. 22, Issue 8). <https://doi.org/10.1007/s10461-018-2160-z>
- Snyder, K., Hulse, E., Dingman, H., Cantrell, A., Hanson, C., & Dinkel, D. (2021). Examining Supports and Barriers to Breastfeeding through a Socio-Ecological Lens: A Qualitative Study. *International Breastfeeding Journal*, 16(1). <https://doi.org/10.1186/s13006-021-00401-4>
- Syed, S. T., Gerber, B. S., & Sharp, L. K. (2013). Traveling towards Disease: Transportation Barriers to Health Care Access. In *Journal of Community Health* (Vol. 38, Issue 5). <https://doi.org/10.1007/s10900-013-9681-1>
- TACAIDS. (2023). *Tanzania HIV Impact Survey*. Dodoma
- The United Republic of Tanzania. (2022). The 2022 Population and Housing Census: Administrative Units Population Distribution Report: Tanzania Mainland, December 2022. In *Ministry of Finance and Planning, Tanzania National Bureau of Statistics and President's Office - Finance and Planning, Office of the Chief Government Statistician, Zanzibar*.

UNAIDS. (2023). *The Path that Ends AIDS: UNAIDS Global AIDS Update 2023*. <http://www.wipo.int/amc/en/mediation/rules>

Uvila, S. R., Mtuy, T. B., Urassa, M., Beard, J., Mtenga, B., Mahande, M., & Todd, J. (2019). Enrollment in HIV Care and Treatment Clinic and Associated Factors among HIV Diagnosed Patients in Magu District, Tanzania. *AIDS and Behavior*, 23(4). <https://doi.org/10.1007/s10461-018-2338-4>

Watt, M. H., Knippler, E. T., Minja, L., Kisigo, G., Knettel, B. A., Ngocho, J. S., Renju, J., Osaki, H., Mwamba, R., Rogathi, J. J., & Mmbaga, B. T. (2019). A Counseling Intervention to Address HIV Stigma at Entry into Antenatal Care in Tanzania (Maisha): Study Protocol for a Pilot Randomized Controlled Trial. *Trials*, 20(1). <https://doi.org/10.1186/s13063-019-3933-z>

APPENDICES

Data Collection Tool

Appendix 1: Questionnaire/Survey

Instruction: Select a correct response (circle) and fill the blanks provided

Sn	Question	Response
1.	What is participant's age?	Write age in years.....
2.	What is participant's sex?	0. Male
		1. Female
3.	What is participant's marital status?	0. Married
		1. Single
4.	What is participant's pregnant status?	0. Urban
		1. Rural
5.	Is client phone number available?	0. Yes
		1. No
6.	What is the name of health facility?	Write facility name.....
7.	What is the type of health facility?	0. Dispensary
		1. Health centre
		2. Hospital
8.	Where is health facility located?	0. Urban
		1. Rural
9.	How many kilometers (distance) from client residence to CTC?	0. Within 5 km (near CTC)
		1. above 5km (far from CTC)
10.	Which council belongs to this facility?	0. Morogoro MC
		1. Kilosa DC
11.	What is the visit type?	0. New visit (MP)
		1. Return visit (HM)
12.	Is pre-testing counseling conducted?	0. Yes
		1. No
13.	Is post-test counseling conducted?	0. Yes
		1. No
14.	What is client's TB status?	0. Positive
		1. Negative
15.	Where is testing setting conducted?	0. Facility
		1. Community
16.	What type of testing modality/approach was applied?	0. PITC
		1. CITC
		2. Self-testing
17.	Which type of testing point was client referred from?	0. OPD
		1. IPD
		2. Index
		3. RCH
		4. CBHTS
		5. TB
		6. STI

		7. VMMC
18.	What is the professional of tester?	0. Nurse
		1. Counselor
		2. Clinician
		3. Lab technologist
19.	Is he/she index contact?	0. Yes
		1. No
20.	When was client-diagnosed HIV positive?	Write full date eg 21/03/2024....
21.	Is client linked to CTC?	0. Yes
		1. No
22.	When was client enrolled in care?	Write full date..... (for all with Yes response in Qn 20)
23.	How many days taken in linkage to CTC?	Write in terms of days..... (for all with Yes response in Qn 20)
24.	Is referral form documented?	0. Yes (for all with Yes response in Qn 20)
		1. No (for all with Yes response in Qn 20)
25.	Is retesting for verification conducted to client?	0. Yes
		1. No
26.	When retesting for verification conducted to client?	Date for retesting for verification..... (for all with response “Yes” in Qn 24)
27.	Has client-initiated ART?	0. Yes (for all with Yes response in Qn 20)
		1. No (for all with Yes response in Qn 20)
28.	Date initiated ART	Write full date..... (for all with Yes response in Qn 17)
29.	Name of evaluator/data collector	Write name.....

Appendix 2: Interview guide

Informed Consent

Warmly welcome to this conversation, my name is Boniface Germanus Centa, a Master student of Science in Health Monitoring and Evaluation at Mzumbe University, I am conducting an evaluation, investigating Outcome Evaluation of Differentiated HIV Testing Services on Linkage of Newly Diagnosed Clients to Care and Treatment in Selected Health Facilities in Morogoro region. This is an evaluation of the strategic area 1 within the NASHCOP strategic plan of 2022-2026, with strategic outcome or targets of ensuring 100% of newly identified PLHV regardless of testing modality are successful linked in care, treatment, supportive services and maintain through 2025 that aims to control transmission of new HIV infection as well as to control morbidity and mortality related to HIV/AIDS which resulted to free HIV society that will lead to growth of person well-being and development of the nation. We thank you for agreeing to be a part in this study. Our conversation is expected to last for 45 minutes, I ensure confidentiality of your information's which will be taken for academic purpose even be published anywhere. Feel free to respond during the discussion, you may choose not to respond to some of the questions if you don't wish to answer and you may choose to stop at any time during this conversation. We value your time and the information you provide us will help the stakeholders including R/CHMT, implementing partners and the Ministry of Health through NASHCOP to restructure/strengthen strategies towards achieving the goal of the NASHCOP strategic plan of 2022-2026.

Provider signature..... Date.....

Evaluator name..... Signature..... Date.....

Interview Questions

1. What do you understand about linkage of newly diagnosed clients to HIV care and treatment?
2. Are you trained for provision of HIV testing services?
3. What is importance of linkage of newly diagnosed clients to HIV care and treatment?
4. Which mechanism does your entry points used in linking newly diagnosed clients to care and treatment?
5. Based on your experience what can be the factors that promote linkage?
6. Based on your experience what do you think are the issues hindering linkage?
7. Can you share with me a vivid example of a typical experience you had in linking a diagnosed HIV client to care and treatment site?
8. Which suggestions do you have toward improving linkage of newly diagnosed clients to care and treatment clinics at your facility?
9. Do you have anything to add regarding linkage of newly diagnosed clients to care and treatment clinics in this facility?

Preliminary information of HCW's

FGD	Sex	Age	Professional	Other title	Working experience (years)	Entry point	Facility type	Facility ownership

Work Plan and Budget

Table of Work Plan

It aiming to show the tasks will be conducted, responsible person and the timeliness

Task	Responsible	Timeliness												
		2024					2025							
		A	S	O	N	D	J	F	M	A	M	J	J	A
Request NASHCOP SP document and discuss with them the reasons of evaluate the Intervention	Evaluator													
Read the NASHCOP SP then asking them a technical question and select the Intervention to evaluate	Evaluator													
Writing a concept note and share to Supervisors for inputs and discussion	Evaluator & Supervisors													
Writing a proposal with chapter one and share to Supervisors for inputs and discussion	Evaluator & Supervisors													
Writing a proposal with chapter three and share to Supervisors for inputs and discussion	Evaluator & Supervisors													
Writing a proposal with chapter two, data collection tools (questionnaire & interview guide)	Evaluator & Supervisors													

and share to Supervisors for inputs and discussion															
Prepare a proposal presentation and share to Supervisors for inputs and discussion	Evaluator & Supervisors														
Submit full proposal to Supervisors and presenting a proposal to Mzumbe University Pannel for the review and comments	Evaluator, Supervisors & Pannel														
Refine the proposal and data collection tools	Evaluator														
Conducting pilot testing data collection at Mzumbe Health Centre	Evaluator														
Refine data collection tools after pilot testing	Evaluator														
Conducting actual data collection activity at selected health facilities in Morogoro MC and Kilosa DC	Evaluator														
Prepare a dataset and conducting a data cleaning and analysis	Evaluator														
Prepare a presentation based on findings from collected data and share to	Evaluator & Supervisor														

