



MAKERERE

UNIVERSITY

COLLEGE OF BUSINESS AND MANAGEMENT SCIENCES

SCHOOL OF ECONOMICS

**FOREIGN AID DEPENDENCY AND SUSTAINABILITY OF ART
SERVICE DELIVERY IN UGANDA'S PNFP SECTOR: A PANEL
ANALYSIS (2020–2024)**

AKINYI SANDRA ERICA


2024/HD06/26507U

**A RESEARCH REPORT SUBMITTED TO THE COLLEGE OF
BUSINESS AND MANAGEMENT SCIENCES IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A
MASTER'S DEGREE IN ECONOMIC POLICY MANAGEMENT OF
MAKERERE UNIVERSITY, KAMPALA.**

APRIL, 2026

DECLARATION

I **Akinyi Erica Sandra** hereby declare that this dissertation is my original work and has never been submitted to any university or institution of higher learning for the award of any academic qualification. Where the work of other scholars has been used, it has been duly acknowledged and referenced.

Signature: 

Date: 08/04/2026

Akinyi Erica Sandra

APPROVAL

This dissertation has been submitted for examination with the approval of the supervisor.


Signature: Date: 08/04/2026

Professor Bruno Yawe
Department of Economics
Makerere University

DEDICATION

I dedicate this work to my mother, Lilian Ligwa, whose unwavering love, sacrifices, and steadfast belief in my potential have been the foundation of my academic journey.

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to the Almighty God for the gift of life, wisdom, strength, and perseverance that enabled me to successfully undertake and complete this research. His grace and guidance have sustained me throughout my academic journey.

I extend my deepest appreciation to my supervisor, Bruno Yawe, for his invaluable guidance, intellectual insight, patience, and constructive criticism throughout the research process. His mentorship, encouragement, and scholarly direction greatly shaped the development and successful completion of this dissertation.

Finally, I am especially grateful to my mother, Lilian Ligwa, whose sacrifices, prayers, and unwavering support have been instrumental in my success. Her constant belief in my abilities and her steadfast support motivated me to persevere through challenges and ultimately accomplish this work.

ABSTRACT

This study examined the relationship between foreign aid dependence and antiretroviral therapy (ART) service delivery outcomes in Uganda's Private Not-for-Profit (PNFP) health sector over the period 2020–2024. The study was motivated by growing concerns regarding the sustainability of HIV/AIDS programs in the context of fluctuating donor funding.

The specific objectives were to assess the effect of foreign aid dependence on ART service quality, examine its influence on service continuity, and evaluate the implications of sustained donor reliance for long-term sustainability.

A quantitative panel data approach was adopted, utilizing a structured dataset comprising 600 observations. Fixed-effects regression models were used to analyze ART service quality outcomes, while a logit model was employed to examine service continuity indicators. Key variables included foreign aid dependence, viral suppression, patient retention, attrition rates, stock-out days, and service disruption.

The findings indicate that foreign aid dependence is positively associated with improvements in ART service delivery. Higher levels of donor funding were associated with increased viral suppression and retention, alongside reductions in attrition, stock-outs, and service disruptions. However, the results also reveal persistently high dependence on external financing, exceeding 80% on average, which poses significant risks to long-term sustainability.

The study concludes that while foreign aid remains critical in supporting ART service delivery within the PNFP sector, a gradual transition toward stronger domestic financing mechanisms is necessary to ensure resilience. These findings highlight the importance of balancing donor support with increased domestic resource mobilization to sustain HIV/AIDS service delivery in Uganda.

TABLE OF CONTENTS

APPROVAL	Error! Bookmark not defined.
DEDICATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT.....	v
TABLE OF CONTENTS	vi
LIST OF ABBREVIATIONS	viii
LIST OF TABLES	ix
LIST OF FIGURES	x
CHAPTER ONE: INTRODUCTION.....	1
1.0 Introduction.....	1
1.1 Background to Study.....	1
1.2 Problem Statement	2
1.3 Research Objectives.....	3
1.4 Research Questions	3
1.5 Justification of the Study	3
1.6 Scope of the study.....	4
CHAPTER TWO: LITERATURE REVIEW	5
2.0 Introduction.....	5
2.1 Theoretical Framework.....	5
2.2 Foreign Aid in Uganda's Health Sector.....	5
2.3 ART Service Delivery in Uganda.....	6
2.4 Foreign Aid Impact on Service Quality	7
2.5 Service Continuity and Sustainability.....	8
2.6 PNFP Sector Performance	9
2.7 Knowledge Gaps.....	10
2.8 Conceptual Framework.....	10

CHAPTER 3: METHODOLOGY	12
3.0 Introduction.....	12
3.1 Research Design.....	12
3.2 Study Population.....	12
3.3 Sampling Technique.....	13
3.4 Data sources	14
3.5 Variables and Measurement	14
3.6 Econometric Model Specification.....	15
3.7 Data Analysis	17
3.8 Validity and Reliability	17
3.9 Ethical Considerations	18
3.10 Study Limitations.....	19
CHAPTER FOUR: RESULTS AND DISCUSSION.....	20
4.0 Introduction.....	20
4.1 Descriptive statistics	20
4.2 Trend Analysis	21
4.3 Bivariate Analysis	22
4.4 Multivariate Regression Results	23
4.5 Theoretical Discussion and Interpretation	25
4.6 Robustness Checks.....	26
4.7 Summary of Key Findings	27
CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS	28
5.0 Introduction.....	28
5.1 Conclusion	28
5.2 Policy Recommendations.....	29
References.....	31

LIST OF ABBREVIATIONS

ART	Antiretroviral Therapy
PNFP	Private Not-for-Profit
PEPFAR	President's Emergency Plan for AIDS Relief
DHIS2	District Health Information System 2
HSS	Health Systems Strengthening
UCMB	Uganda Catholic Medical Bureau
UPMB	Uganda Protestant Medical Bureau
UMMB	Uganda Muslim Medical Bureau
UOMB	Uganda Orthodox Medical Bureau
GDP	Gross Domestic Product

LIST OF TABLES

Table 1: Variance Inflation Factor (VIF) Results.....	17
Table 2: Descriptive Statistics of PNFP ART Service Variables (2020–2024).....	20
Table 3: Pearson Correlations Matrix	22
Table 4: Fixed-Effects Regression – ART Service Quality.....	24
Table 5: Regression Results – ART Service Continuity	24

LIST OF FIGURES

Figure 1:Conceptual Framework	10
Figure 2:Trends in ART Service Quality and Foreign Aid Dependence in the PNFP Sector (2020–2024).....	21
Figure 3:Trends in Donor Funding and ART Service Continuity Indicators (2020–2024)	22

CHAPTER ONE: INTRODUCTION

1.0 Introduction

Antiretroviral therapy has revolutionized the management of HIV/AIDS, significantly improving the life expectancy and quality of life for individuals living with HIV (Zakumumpa et al., 2018). Over the past two decades, the expansion of ART programs has played a critical role in reducing HIV-related morbidity and mortality, particularly in sub-Saharan Africa where the burden of HIV remains disproportionately high. However, sustaining the provision of these life-saving treatments requires reliable health financing mechanisms and strong health systems capable of delivering continuous care.

In many low- and middle-income countries, the scale-up of HIV treatment programs has been heavily supported by international development assistance. In Uganda, foreign aid has been central to the national response to HIV/AIDS, particularly through global initiatives such as the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), which has significantly contributed to expanding access to ART services. This external support has enabled the rapid scale-up of treatment programs and strengthened the capacity of health facilities to provide HIV services.

Despite these gains, the heavy reliance on donor funding raises concerns about the long-term sustainability of ART programs. Changes in donor priorities, fluctuations in funding levels, or reductions in international assistance may threaten the continuity and quality of HIV delivery service. These concerns are particularly significant for the Private Not-for-Profit (PNFP) health sector in Uganda, which plays a substantial role in providing HIV services but relies heavily on both donor funding and limited government subsidies.

This study therefore seeks to examine the implications of foreign aid dependence on the delivery of ART services within Uganda's PNFP sector. Specifically, the study explores the extent to which reliance on external funding influences the quality, accessibility, and continuity of ART service delivery within PNFP health facilities.

1.1 Background to Study

Uganda's health system operates through a mixed model comprising public, private-for-profit (PFP), and private not-for-profit (PNFP) providers (Ministry of Health Uganda, 2010). The PNFP sector, predominantly comprising faith-based organizations under four umbrella bodies Uganda Catholic Medical Bureau (UCMB), Uganda Protestant Medical Bureau (UPMB),

Uganda Orthodox Medical Bureau (UOMB), and Uganda Muslim Medical Bureau (UMMB) constitutes approximately 75% of facility-based PNFP organizations (Ministry of Health Uganda, 2010).

Foreign aid has been instrumental in scaling up ART programs, with donor contributions mainly through initiatives like the U.S. President’s Emergency Plan for AIDS Relief (PEPFAR) covering approximately 80% of ART financing (Parliament of Uganda, 2025; Vasireddy et al., 2024). PEPFAR alone supports over 1.3 million people living with HIV on treatment as of September 2022 (Vasireddy et al., 2024). However, this external dependency creates a significant fiscal exposure: any donor funding withdrawal or reallocation can directly threaten treatment continuity. Recent funding cuts amounting to UGX 604 billion in the health sector underscore the fragility of Uganda’s ART financing structure.

While foreign aid has been vital in expanding ART coverage, it has also entrenched a pattern of dependence that poses long-term sustainability risks. The PNFP sector’s dual reliance on limited government subsidies and substantial donor funding has made it particularly vulnerable to shifts in external financing priorities (Doherty et al., 2017; Zakumumpa et al., 2018; Wilhelm et al., 2019). This study therefore seeks to critically examine the implications of foreign aid dependence on ART service delivery within Uganda’s PNFP sector, analysing both its enabling role in scaling access and the structural vulnerabilities it creates for service quality and continuity.

1.2 Problem Statement

Despite Uganda’s commendable progress in HIV treatment achieving 95% ART coverage among people living with HIV (Were & Okumu-McCarron, 2025), the sustainability of these achievements remains questionable. Approximately four out of every five shillings spent on ART originate from external sources, exposing the health system to substantial fiscal risk in the event of donor withdrawal or funding cuts (Parliament of Uganda, 2025).

This dependency has already manifested in tangible service delivery challenges following recent donor realignments, including stockouts of essential commodities, reduced outreach programs, and increased financial pressure on PNFP facilities (Bagambe, 2025; EPRC, 2025). Without a strategic shift toward diversified and sustainable financing mechanisms, Uganda’s PNFP sector faces the imminent threat of service disruptions, undermining decades of progress in HIV care and the global 95% treatment targets.

Understanding the depths and consequences of this dependency is therefore critical to inform policy options that safeguard ART continuity and ensure financial sustainability within Uganda's PNFP health sector.

1.3 Research Objectives

1.3.1 Purpose of the Study

To assess the effects of reliance on foreign aid on antiretroviral therapy service delivery of the Private Not-for-Profit sector in Uganda.

1.3.2 Specific Objectives

1. To determine the extent of reliance on foreign aid in financing ART services of the PNFP sector in Uganda
2. To evaluate the influence of foreign aid dependence on the quality of ART service delivery of PNFP health facilities
3. To evaluate the influence of foreign aid dependence on the continuity of ART service delivery of PNFP health facilities

1.4 Research Questions

1. What is the extent of foreign aid dependency in financing ART services of Uganda's PNFP sector?
2. How does foreign aid dependency influence the quality of ART service delivery in PNFP health facilities?
3. How does foreign aid dependency affect the continuity of ART service delivery in PNFP health facilities?

1.5 Justification of the Study

In Uganda, PNFP health facilities play a critical role in providing antiretroviral therapy (ART) to people living with HIV. These facilities, however, rely heavily on foreign aid to sustain their programs. While donor funding has undoubtedly helped expand access to treatment and improve patient outcomes, dependence on external resources also raises concerns about the long-term sustainability of services. Changes in donor priorities or funding gaps can disrupt care, potentially affecting the quality and continuity of ART services. Despite this, there is

limited evidence on how reliance on foreign aid directly impacts ART service delivery in the PNFP sector.

This study sought to fill that gap by examining how foreign aid dependence influences both the quality and continuity of ART services over a five-year period. By incorporating key structural factors such as staffing, patient load, and government subsidies, as well as national-level economic indicators, the research provided a clearer picture of the factors that shape service outcomes. Understanding these dynamics is crucial for policymakers, health managers, and donors as they plan strategies to strengthen PNFP facilities, ensure uninterrupted ART provision, and make progress toward sustainable, high-quality HIV care.

Ultimately, the findings will contribute to discussions on health financing in Uganda, helping to balance donor support with domestic funding and build a more resilient ART service delivery system.

1.6 Scope of the study

This study focused on the effect of foreign aid dependency on antiretroviral therapy (ART) service delivery within Uganda's Private Not-for-Profit (PNFP) health sector. The analysis covered the period 2020–2024 using a structured dataset informed by secondary sources to represent ART service delivery trends within the PNFP sector.

The study specifically examined how foreign aid dependence influences ART service quality and continuity, while controlling for key structural characteristics and macroeconomic factors affecting service delivery.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter reviews relevant literature to contextualize how external financing influences health system performance, focusing on Uganda's Private Not-for-Profit (PNFP) sector. It draws on the Aid Dependency Theory and the WHO Health Systems Framework to examine the mechanisms through which heavy donor reliance affects ART service quality, continuity, and sustainability. The review identifies critical gaps in empirical evidence, particularly regarding the PNFP sector's capacity to maintain service delivery under funding volatility.

2.1 Theoretical Framework

2.1.1 Aid Dependency Theory

Aid dependency theory posits that prolonged reliance on external assistance can create structural vulnerabilities by discouraging domestic resource mobilization and fostering fiscal fragility (Morrissey, 2015, *International Journal of Health Policy and Management*, 2022). In the health sector, this manifests through "crowding-out" effects where donor financing substitutes for rather than supplements government expenditure (Lensink & Morrissey, 2000). For this study, the theory underpins foreign aid dependence, the independent variable, which explains how sustained external financing may undermine local ownership, long-term planning, and fiscal autonomy, thereby affecting service stability.

2.1.2 Health Systems Strengthening Framework

The WHO systems framework identifies six interrelated building blocks: governance, financing, human resources, information systems, service delivery, and medical products (Banyan Global, 2020). Foreign aid interacts with each of these components, influencing system resilience. Within this study, the framework provides a lens for assessing how aid dependence (financing) shapes service quality (measured by retention and viral suppression) and service continuity (measured by stock-out frequency and service disruption). Integrating both frameworks bridges macro-level financial dependency with micro-level service outcomes.

2.2 Foreign Aid in Uganda's Health Sector

Uganda remains heavily dependent on external aid, with donors contributing approximately 60–70% of HIV/AIDS financing (UNAIDS, 2023; Ministry of Health Uganda, 2023). PEPFAR and the Global Fund are the primary funders of ART services, collectively supporting over 1.3

million Ugandans living with HIV (PEPFAR Uganda, 2023). While this aid has been pivotal in expanding treatment access, it has also exposed Uganda to fiscal vulnerability when donor priorities shift (World Bank, 2022; IMF, 2021).

A key concern within the aid dependency literature is the potential “crowding-out” effect, where increased donor financing reduces the incentive for domestic resource mobilization. In the Ugandan context, this concern is particularly relevant given that donor contributions account for a substantial share of HIV/AIDS financing, while domestic health expenditure remains below the Abuja target of 15% (WHO, 2021; Ministry of Health Uganda, 2023). This raises the possibility that external funding may, in part, substitute rather than complement government health spending.

However, empirical evidence on this relationship remains mixed. Odokonyero et al. (2018) found that health aid significantly improved disease burden outcomes, although it was often poorly aligned with local needs, raising efficiency and equity concerns. This suggests that while foreign aid has been effective in improving health outcomes, its interaction with domestic financing priorities is complex and not necessarily uniformly displacement-driven.

At the operational level, weaknesses in procurement, supervision, and distribution systems further compound the risks associated with aid dependence. Evidence from Uganda’s national tracking study on drug delivery shows that most essential medicines are funded by donors rather than government, and frequent stock-outs are linked to poor coordination between funding flows and supply systems (Economic Policy Research Centre [EPRC], 2010). These shortcomings illustrate how reliance on external financing can make essential services, including antiretroviral therapy, vulnerable to disruption, particularly in PNFP facilities that depend heavily on donor-supported commodities.

Overall, while foreign aid has been instrumental in expanding ART coverage in Uganda, its dominance in health financing raises important concerns regarding fiscal sustainability, system resilience, and the long-term balance between external support and domestic resource mobilization.

2.3 ART Service Delivery in Uganda

Uganda’s ART program has evolved significantly over the past two decades, with the adoption of differentiated service delivery models aimed at improving treatment efficiency and patient outcomes (PLOS One, 2021). The PNFP sector contributes approximately 35–40% of national

health service output and plays a critical role in ART provision (Ministry of Health Uganda, 2023), positioning it as a key partner in the national HIV response.

Empirical studies highlight the sensitivity of ART service delivery to changes in external conditions, particularly funding dynamics. Wilhelm et al. (2019) found that facilities transitioning from PEPFAR support experienced reductions in outreach activities and staffing capacity, while Zakumumpa et al. (2018) reported disruptions in service delivery linked to funding uncertainty. Similarly, Muyinda and Mugisha (2015) documented how stock-outs and uncertainty in access to care forced both patients and providers to adopt coping mechanisms to sustain ART treatment, illustrating how systemic instability can compromise service continuity.

However, these studies are largely based on qualitative or cross-sectional approaches, limiting their ability to capture how such disruptions evolve over time and across facilities. In addition, while they highlight immediate service challenges, they provide limited quantitative evidence on the magnitude and persistence of these effects.

This study addresses these limitations by employing a longitudinal panel data approach, enabling a more robust analysis of how foreign aid dependence influences ART service quality and continuity across facilities and over time.

2.4 Foreign Aid Impact on Service Quality

A substantial body of literature demonstrates a strong association between stable donor financing and improvements in ART service quality. Empirical evidence from Uganda indicates that foreign aid has played a critical role in enhancing treatment outcomes, particularly through expanded access to medicines, strengthened service delivery systems, and improved patient monitoring.

Wilhelm et al. (2019) found that facilities transitioning from PEPFAR support were significantly more likely to experience declines in care access and quality, including reductions in outreach services and increased service constraints. Similarly, Zakumumpa et al. (2024) reported disruptions in ART service delivery, including stock-outs and reduced pediatric HIV services, following shifts in donor funding policies. These findings suggest that donor financing remains a key determinant of service quality within Uganda's HIV response.

However, the relationship between foreign aid and service quality is not uniformly negative in the context of reduced funding. Broader analyses (UNAIDS, 2023; WHO, 2021) indicate that local adaptation strategies, such as task-shifting, improved facility management, and partial

domestic procurement of ART commodities, can mitigate the adverse effects of donor withdrawal. This suggests that institutional capacity and governance structures play a mediating role in determining how funding changes translate into service outcomes.

Despite these contributions, existing studies are largely based on qualitative evidence or descriptive analyses, limiting their ability to quantify the magnitude of donor effects on key quality indicators such as viral suppression and patient retention. In addition, there is limited empirical evidence capturing how variations in aid dependence influence service quality across facilities and over time.

This study addresses these limitations by applying panel data econometric techniques to quantify the effect of foreign aid dependence on ART service quality. By focusing on measurable indicators such as viral suppression, retention, and attrition, the study provides more robust evidence on the extent to which donor financing influences treatment outcomes within the PNFP sector.

2.5 Service Continuity and Sustainability

Ensuring continuity of ART service delivery in the context of fluctuating donor support remains a critical concern for health systems in low- and middle-income countries. In Uganda, where HIV programs are heavily donor-funded, the sustainability of ART services is closely tied to the stability and predictability of external financing.

Empirical evidence indicates that disruptions in donor funding can have immediate and significant effects on service continuity. The Uganda AIDS Commission (2023) highlights a persistent financing gap in ART programs, raising concerns about the long-term sustainability of treatment provision. Similarly, global studies show that abrupt reductions in funding can interrupt ART access, increase the risk of viral rebound, and undermine treatment adherence (McManus et al., 2021).

At the system level, reliance on earmarked donor funding has been shown to weaken budget predictability and planning capacity. The World Bank (2022) argues that heavy dependence on external resources limits the ability of governments to ensure consistent financing for essential health services, thereby increasing vulnerability to service disruptions. In Uganda, structural inefficiencies in procurement and distribution systems further compound this challenge. Evidence from the Economic Policy Research Centre (EPRC, 2010) shows that weaknesses in

coordination between funding flows and supply chain systems contribute to stock-outs of essential medicines, particularly in facilities dependent on donor-supported commodities.

However, much of the existing literature examines service continuity at an aggregate or national level, with limited focus on how disruptions manifest at the facility level, particularly within PNFP institutions. In addition, many studies rely on descriptive or case-based approaches, which do not adequately capture variation across facilities or over time.

This study addresses these limitations by applying a panel data analytical approach to examine how foreign aid dependence influences ART service quality and continuity over time.

2.6 PNFP Sector Performance

The Private Not-for-Profit (PNFP) sector plays a central role in Uganda's health system, particularly in the delivery of HIV and ART services. PNFP facilities, largely coordinated under faith-based umbrella organizations such as UCMB, UPMB, UMMB, and UOMB, are estimated to contribute between 35–40% of national health service output (Ministry of Health Uganda, 2023). Their strong community linkages and mission-driven approach have been associated with relatively high levels of patient satisfaction and treatment adherence (Asiimwe et al., 2022; WHO, 2021).

Despite these strengths, the sector faces persistent structural challenges related to financing and operational sustainability. PNFP facilities rely heavily on donor funding, complemented by limited and often delayed government subsidies. Zakumumpa et al. (2019) note that donor transitions have placed significant financial pressure on PNFP facilities, affecting their ability to sustain outreach programs, maintain staffing levels, and ensure uninterrupted service delivery. Similarly, UCMB (2023) highlights ongoing operational constraints linked to funding unpredictability and resource limitations.

While existing studies provide valuable insights into PNFP performance, they are largely descriptive in nature and tend to focus on comparative outcomes rather than the underlying financial drivers of performance. In particular, there is limited empirical evidence linking foreign aid dependence to measurable service delivery outcomes such as ART quality and continuity at the facility level.

This study addresses this gap by quantitatively examining how foreign aid dependence influences ART service performance within PNFP facilities. By linking financing structures to

measurable outcomes, the study provides a more integrated understanding of how external funding shapes both the strengths and vulnerabilities of the PNFP sector in Uganda.

2.7 Knowledge Gaps

Existing literature provides limited quantitative analysis of how donor dependence affects specific health system outcomes such as service continuity and quality within the PNFP sector. Most studies have examined the national or public-sector perspective (Odokonyero et al., 2018; WHO, 2021), leaving PNFP dynamics underexplored. This study therefore seeks to fill this gap by empirically assessing the relationship between foreign aid dependence and ART service performance outcomes, linking broader financing structures with service delivery indicators over time.

2.8 Conceptual Framework

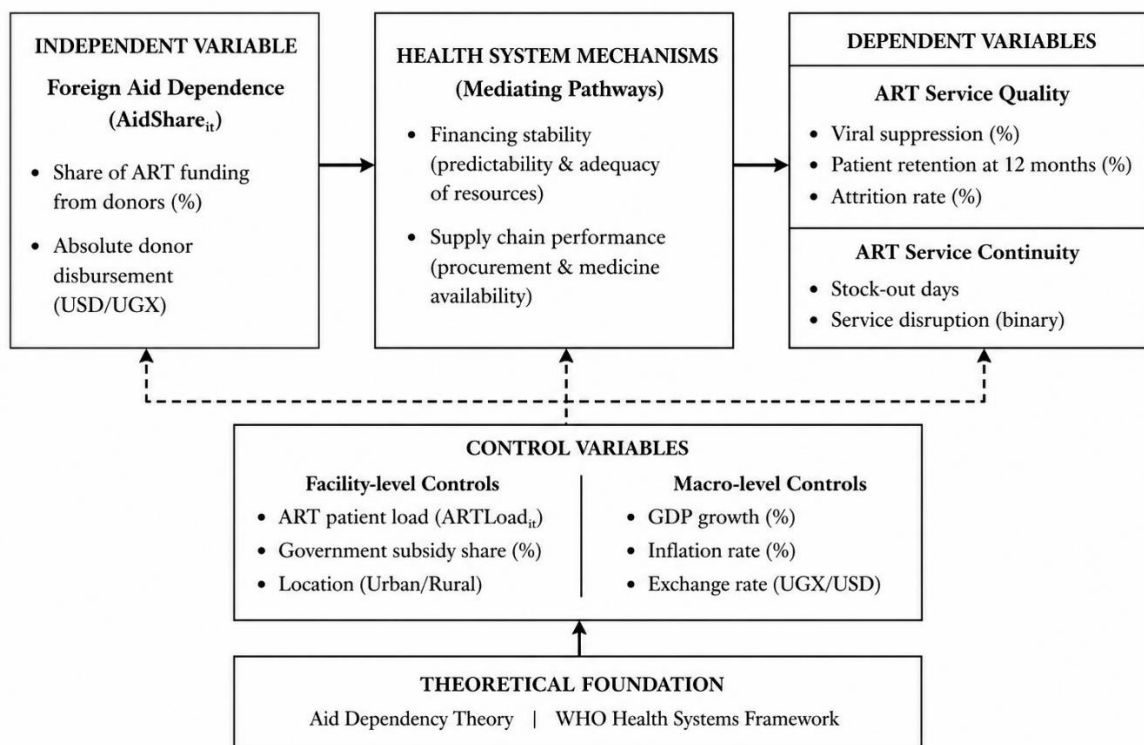


Figure 1: Conceptual Framework

The conceptual framework illustrates the relationship between foreign aid dependence and ART service delivery within Uganda’s PNFP sector. Foreign aid dependence influences service delivery through key health system mechanisms, including financing stability and supply chain performance.

ART service delivery is examined in terms of service quality and service continuity, measured using indicators such as viral suppression, patient retention, stock-outs, and service disruptions. Control variables at both facility and macro levels are included to account for variations across facilities and over time. The framework is grounded in Aid Dependency Theory and the WHO Health Systems Framework.

CHAPTER 3: METHODOLOGY

3.0 Introduction

This chapter presents the methodological framework adopted for the study. It provides detailed descriptions of the research design, study population, data sources, sampling approach, data collection procedures, variable measurement, analytical strategy, and approaches employed to ensure validity, reliability, and adherence to ethical standards. The methodology is structured to rigorously investigate the relationship between foreign aid reliance and antiretroviral therapy (ART) service delivery in Uganda's Private Not-for-Profit (PNFP) health sector.

3.1 Research Design

The study employed a quantitative longitudinal research design utilizing a structured dataset informed by sector trends and secondary sources. Panel data analysis was selected because it allows the examination of both cross-sectional and time-series variations while controlling for unobserved, time-invariant heterogeneity across facilities through fixed effects estimation.

In the context of this study, PNFP health facilities differ in several characteristics such as management practices, geographic location, staffing levels, and infrastructure. Some of these characteristics remain constant over time and may influence ART service delivery outcomes. The panel data framework allows the study to control for these time-invariant facility characteristics through fixed effects estimation.

Furthermore, the use of panel data enables the analysis of how changes in foreign aid funding over time influence ART service delivery outcomes such as viral suppression, retention rates, and service continuity. This approach therefore provides a more robust empirical framework for assessing the relationship between donor financing and ART service sustainability.

The empirical strategy focused on three key dimensions: (i) the extent of reliance on foreign aid for ART financing, (ii) the association between foreign aid dependence and ART service quality, and (iii) the association between foreign aid dependence and the continuity of ART services.

3.2 Study Population

The population consisted of Private Not-for-Profit (PNFP) health facilities accredited to provide ART services in Uganda. These facilities operate under umbrella bodies such as the

Uganda Catholic Medical Bureau (UCMB), Uganda Protestant Medical Bureau (UPMB), Uganda Orthodox Medical Bureau (UOMB), and Uganda Muslim Medical Bureau (UMMB).

3.3 Sampling Technique

3.3.1 Sampling Design

The study adopted a structured analytical approach informed by the key characteristics of Private Not-for-Profit (PNFP) health facilities in Uganda. Given the constraints associated with accessing complete facility-level administrative data, a formal probabilistic sampling frame was not employed. Instead, the study utilized a constructed dataset guided by sector-specific dimensions relevant to ART service delivery.

These dimensions included Medical Bureau affiliation (UCMB, UPMB, UMMB, and UOMB), level of care (Hospitals, Health Centre IVs, and Health Centre IIIs), and regional location. These categories reflect established variations in management structures, service complexity, patient volumes, and exposure to donor funding across the PNFP sector.

By incorporating these dimensions into the analytical framework, the study ensured that the dataset captured the heterogeneity inherent in PNFP service delivery. This approach provided a structured basis for examining the relationship between foreign aid dependence and ART service outcomes, while maintaining internal consistency within the panel data framework.

Although this approach does not constitute a formal sampling design in the statistical sense, it allows for meaningful analysis of sector-level patterns and relationships within the PNFP health system.

3.3.2 Sample Size

The dataset represents aggregated PNFP sector-level estimates constructed from multiple institutional data sources, rather than individual facility-level observations. The panel structure provided sufficient temporal variation to support the application of panel data econometric techniques, including Fixed Effects estimation. Rather than representing a formally drawn sample of individual facilities, the dataset was constructed to reflect aggregate sector-level patterns within the PNFP health system. This approach enabled the study to maintain analytical rigor while working within the constraints of data availability.

The use of a balanced panel ensured consistency in the estimation process by maintaining equal observations across time periods. However, given that the dataset was not derived from a

formally defined sampling frame, the findings should be interpreted as indicative of underlying relationships rather than precise estimates at the individual facility level.

3.4 Data sources

The study relied on secondary data obtained from credible institutional and publicly available sources. These included national health sector reports, PNFP bureau publications, and development partner datasets that provide information on ART service delivery and financing trends.

These sources provided consistent information over the period 2020–2024, enabling the analysis of changes in foreign aid dependence and ART service outcomes over time. The use of multiple sources enhanced the robustness of the dataset by capturing both financing and service delivery dimensions.

3.5 Variables and Measurement

The study included both dependent and independent variables, constructed based on the Aid-Dependency Theory and Health Systems Strengthening (HSS) framework. Variables were structured to reflect temporal changes over the study period.

Dependent Variables

The study measured ART service quality and continuity as follows:

ART Service Quality (Quality_it)

- **Viral suppression (%):** Percentage of ART patients achieving viral suppression.
- **Patient retention at 12 months (%):** Proportion of patients retained 12 months after ART initiation.
- **Attrition rate (%):** Percentage of ART patients lost to follow-up.

ART Service Continuity (Continuity_it)

- **Service disruption dummy:** Binary variable (1 = disruption reported, 0 = no disruption).
- **Stock-out days:** Number of days facilities experienced stock-outs of ART commodities.

Independent Variable of Interest

Foreign Aid Dependence (AidShare_it)

- **Definition:** Share of ART funding sourced from donors

- Supplementary: Absolute donor disbursement value in USD or UGX

Control Variables

Facility level:

- ART patient load ($ARTLoad_{it}$): Total number of ART patients per facility
- Staffing (%) ($Staffing_{it}$): Number of staff per 1,000 ART patients
- Government subsidy share (%) $GovtSubsidy_{it}$ – Percentage of facility funding from government
- Location ($Location_i$): Urban = 1, Rural = 0

National level (Macro):

- Government health expenditure (% of GDP)
- GDP growth rate (%)
- Exchange rate shocks (UGX/USD)
- COVID-19 shock (dummy variable: 1 for 2020–2021, 0 otherwise)

3.6 Econometric Model Specification

The study employed panel data regression models to examine the relationship between foreign aid dependence and ART service delivery outcomes. The models were specified to capture temporal variations while controlling for key structural characteristics and macroeconomic factors influencing ART service performance.

Model 1: Determinants of Foreign Aid Dependence

$$AidShare_{it} = \alpha + \beta_1 GovtSubsidy_{it} + \beta_2 ARTLoad_{it} + \beta_3 Location_i + \beta_4 Macro_t + \mu_i + \varepsilon_{it}$$

The model accounted for unobserved, time-invariant facility characteristics through μ_i , while ε_{it} captured the idiosyncratic error term.

Where:

$AidShare_{it}$ is the share of ART funding sourced from donors;

$GovtSubsidy_{it}$ is the share of government funding;

$ARTLoad_{it}$ represents the number of ART patients;

$Location_i$ captures facility location (urban/rural);

$Macro_t$ represents macroeconomic controls;

μ_i captures unobserved, time-invariant effects;

ε_{it} is an idiosyncratic error term.

Model 2: Effect of Foreign Aid on ART Quality

$$\text{Quality}_{it} = \alpha + \beta_1 \text{AidShare}_{it} + \beta_2 \text{GovtSubsidy}_{it} + \beta_3 \text{ARTLoad}_{it} + \beta_4 \text{Macro}_t + \mu_i + \varepsilon_{it}$$

Where:

Quality_{it} represents ART service quality indicators, including viral suppression, patient retention, and attrition rates.

Model 3: Effect of Foreign Aid on ART Continuity

$$\text{Continuity}_{it} = \alpha + \beta_1 \text{AidShare}_{it} + \beta_2 \text{GovtSubsidy}_{it} + \beta_3 \text{ARTLoad}_{it} + \beta_4 \text{Macro}_t + \mu_i + \varepsilon_{it}$$

Where:

Continuity_{it} captures ART service continuity, measured using stock-out days and service disruption indicators.

For binary outcomes such as service disruption, a logistic regression specification was applied:

$$\Pr(\text{Disruption}_{it} = 1) = F(\alpha + \beta_1 \text{AidShare}_{it} + \beta_2 X_{it})$$

Where:

Disruption_{it} represents the probability of service disruption

X_{it} represents the vector of control variables.

ART service continuity was analyzed using both linear and logistic regression approaches depending on the nature of the outcome variable. Stock-out days, being a continuous variable, were estimated using linear panel regression. Service disruption, which is a binary outcome (1 = disruption, 0 = no disruption), was estimated using a logistic regression model to determine the probability of occurrence.

Estimation Techniques

The study employed panel data econometric techniques for estimation. Fixed Effects (FE) models were used to control for unobserved, time-invariant heterogeneity, ensuring that the analysis captured variations over time.

Random Effects (RE) models were also estimated, and the Hausman test was applied to determine the most appropriate model specification. A statistically significant Hausman test supported the use of the Fixed Effects model.

This approach provided a structured framework for examining the association between foreign aid dependence and ART service delivery outcomes.

Although staffing levels were initially included as a control variable based on theoretical relevance, exploratory data analysis revealed extremely limited variation across the study period. As a result, the variable was excluded from the final regression estimations, as variables with minimal variation do not contribute meaningfully to model estimation and may lead to unstable or biased coefficients.

3.7 Data Analysis

Descriptive statistics were used to summarize key variables, including donor funding and ART service outcomes. Correlation analysis was conducted to examine relationships among variables.

Variance Inflation Factor (VIF) tests were used to assess multicollinearity among independent variables.

Table 1: Variance Inflation Factor (VIF) Results

Variable	VIF
AidShare	2.3
ARTLoad	1.8
GovtSubsidy	2.1

All VIF values were below the threshold of 5, indicating no evidence of multicollinearity among the explanatory variables.

Panel regression techniques were applied for estimation. Continuous outcome variables were analyzed using linear regression, while binary outcomes were estimated using logistic regression models.

3.8 Validity and Reliability

To ensure the rigor of this study, multiple strategies were employed to enhance both validity and reliability.

Internal validity was strengthened through the use of panel data techniques, particularly Fixed Effects (FE) estimation. This approach controlled for unobserved, time-invariant characteristics that could influence ART service delivery outcomes, thereby reducing the risk

of omitted variable bias. In addition, the inclusion of relevant structural characteristics and macroeconomic control variables helped isolate the relationship between foreign aid dependence and ART service outcomes.

The longitudinal nature of the panel further improved internal consistency by allowing the analysis to focus on variations over time. This enabled a more robust assessment of how changes in foreign aid dependence are associated with changes in ART service quality and continuity.

External validity is constrained by the nature of the dataset used in the study. As the analysis is based on a structured dataset informed by secondary sources rather than a formally defined sampling frame, the findings cannot be fully generalized to all PNFP health facilities in Uganda. However, the incorporation of key structural dimensions, including facility type, regional variation, and funding characteristics, enhances the relevance of the findings to broader PNFP sector dynamics.

Reliability was ensured through the use of standardized indicators commonly applied in health systems and HIV program monitoring, such as viral suppression rates, patient retention, and stock-out days. These indicators are widely used in national and international reporting frameworks, supporting consistency in measurement across time periods.

Furthermore, the use of multiple data sources contributed to the robustness of the analysis by capturing both financing and service delivery dimensions. Consistent variable definitions and structured panel construction ensured that measurements remained stable across the study period.

Despite these measures, the study acknowledges that reliance on secondary and structured data may introduce measurement limitations. These were mitigated through careful variable definition and consistency checks across time periods.

3.9 Ethical Considerations

This study was conducted in accordance with established ethical principles governing research, particularly in relation to the use of secondary data and health-related information.

The analysis relied exclusively on secondary data obtained from publicly available reports and institutional publications. These sources included national health sector reports, PNFP bureau publications, and development partner datasets that provide aggregated information on ART service delivery and financing trends. As the study did not involve primary data collection or

direct interaction with human subjects, it did not require formal ethical approval from a research ethics committee. No identifiable facility-level or patient-level data were used in this study. All data were aggregated and anonymized at source, thereby eliminating any risk of disclosure of sensitive information. This ensured that the privacy and confidentiality of individuals and institutions were fully protected.

The study adhered to principles of responsible data use by ensuring that all data sources were appropriately acknowledged. Care was taken to accurately represent the original data without manipulation or misinterpretation. Where multiple data sources were used, efforts were made to maintain consistency in definitions and measurement across datasets.

Data handling procedures were designed to ensure integrity and security. All datasets were stored securely and used solely for the purposes of this research. No data were shared with third parties, and access was limited to the researcher. In addition, the study was conducted with a commitment to academic integrity. All sources were properly cited, and no form of plagiarism or data fabrication was employed in the preparation of the research. Overall, the study complied with ethical standards related to confidentiality, data protection, transparency, and responsible research conduct.

3.10 Study Limitations

Despite methodological rigor, the study faced several limitations. Donor reporting lags and potential inconsistencies in disbursement timing may have affected the precision of aid estimates. Measurement errors could have existed in reported donor allocations or ART service outcomes, particularly when consolidating data from multiple sources. Finally, although the panel design controlled for time-invariant unobserved heterogeneity, time-varying unobserved factors may still have influenced ART service delivery, requiring cautious interpretation of causal relationships.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.0 Introduction

This chapter presents the empirical findings on the effects of reliance on foreign aid on ART service delivery in the PNFP health sector in Uganda. The analysis is based on a structured panel dataset designed to capture both cross-sectional and time-series variations in ART service delivery and foreign aid dependence over the period 2020–2024.

The chapter begins with descriptive statistics, followed by trend analysis, bivariate analysis, and multivariate regression analysis, and concludes with a discussion of the findings.

4.1 Descriptive statistics

Descriptive statistics provide a snapshot of ART service delivery and funding patterns in PNFP facilities over the study period. The table below presents the mean, standard deviation, minimum, and maximum values of key variables from 2020 to 2024.

Table 2: Descriptive Statistics of PNFP ART Service Variables (2020–2024)

Variable	Mean	SD	Min	Max
Viral Suppression (%)	90.4	1.2	88.5	92.0
Retention @12mo (%)	83.5	2.2	80.3	86.7
Attrition Rate (%)	6.5	0.5	5.8	7.2
Stock-out Days	14.4	5.0	9	22
Service Disruption (1=Yes)	0.4	0.55	0	1
Foreign Aid Dependence (%)	81.5	3.2	78.6	85.7
Donor Funds (USD M)	21.9	1.3	20.1	23.5
ART Patient Load	159,800	11,200	145,000	175,000
% Staff per 1000 patients	0.86	0.01	0.86	0.87
Government Subsidy Share (%)	15.6	0.9	14.0	16.3

The staffing variable exhibited extremely limited variation across the study period, with values remaining nearly constant. This reflects the use of a staffing ratio measure, which captures

overall staffing levels rather than staff turnover dynamics. As a result, the variable was excluded from subsequent regression analysis, as variables with minimal variation do not contribute meaningfully to model estimation.

The descriptive statistics indicate generally high levels of ART service performance across the study period. Viral suppression averaged 90.4%, while patient retention at 12 months averaged 83.5%, reflecting strong treatment outcomes within the PNFP sector. Attrition rates remained relatively low, with a mean of 6.5%.

Service continuity indicators show moderate variability, with stock-out days averaging 14.4 days and ranging from 9 to 22 days, suggesting differences in supply chain performance over time. Foreign aid dependence remained high, averaging 81.5% of total ART funding, with relatively low variation, indicating sustained reliance on donor support.

Donor funding averaged USD 21.9 million, while ART patient load remained substantial, averaging 159,800 patients. Government subsidy share remained relatively low, averaging 15.6%, reinforcing the continued dependence on external financing within the PNFP sector.

4.2 Trend Analysis

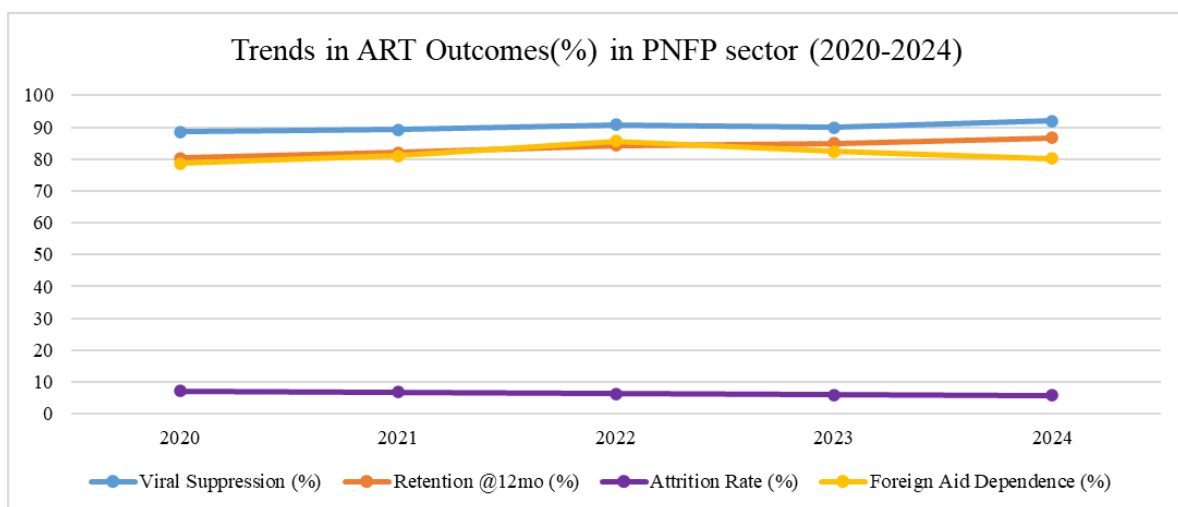


Figure 2: Trends in ART Service Quality and Foreign Aid Dependence in the PNFP Sector (2020–2024)

Figure 2 shows trends in key ART service quality indicators, including viral suppression, patient retention at 12 months, attrition rates, and foreign aid dependence over the period 2020–2024. Viral suppression and retention rates exhibit a steady upward trend, while attrition rates decline over time, indicating improvements in treatment outcomes. Foreign aid dependence increases initially before declining in later years, reflecting shifts in financing patterns within the PNFP sector.

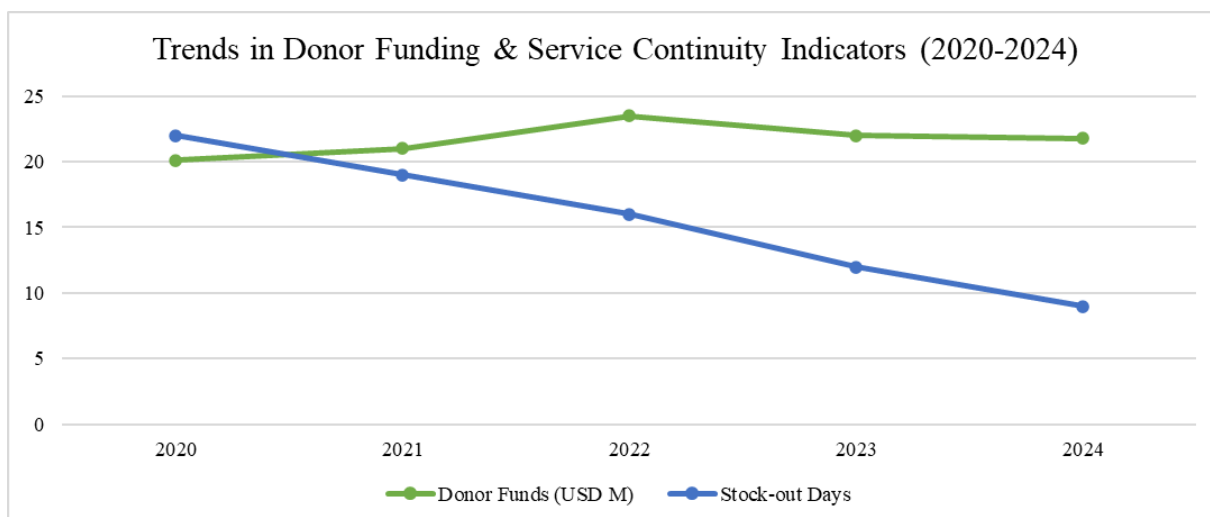


Figure 3: Trends in Donor Funding and ART Service Continuity Indicators (2020–2024)

Figure 3 presents trends in donor funding and ART service continuity indicators over the period 2020–2024. Donor funding increased from 2020 to 2022 before stabilizing in subsequent years. Over the same period, stock-out days declined significantly, indicating improvements in the availability of ART commodities and enhanced supply chain performance within the PNFP sector.

4.3 Bivariate Analysis

Pearson correlation coefficients were calculated to examine the relationships among foreign aid dependence and ART service delivery outcomes. The results are presented in Table 4.2.

Table 3: Pearson Correlations Matrix

Variable	Viral Supp	Retention	Attrition	Stock-out Days	Aid Depend	Donor Funds
Viral Supp (%)	1					
Retention (%)	0.88	1				
Attrition (%)	-0.85	-0.82	1			
Stock-out Days	-0.83	-0.8	0.78	1		
Aid Depend (%)	0.87	0.85	-0.81	-0.79	1	
Donor Funds (USD M)	0.84	0.82	-0.79	-0.76	0.88	1

The results indicate strong positive associations between foreign aid dependence and key ART service quality indicators. Foreign aid dependence is positively correlated with viral suppression ($r = 0.87$) and patient retention ($r = 0.85$), suggesting that higher levels of external financing are associated with improved treatment outcomes within the PNFP sector.

Conversely, negative correlations are observed between foreign aid dependence and attrition ($r = -0.81$) and stock-out days ($r = -0.79$), indicating that increased donor support is associated with improved service continuity.

More broadly, the correlation matrix shows that service quality indicators such as viral suppression and retention are positively associated with each other, while both are negatively associated with attrition and stock-out days. Donor funding also exhibits strong positive correlations with service quality indicators and negative correlations with service disruptions, reinforcing the close relationship between financing and service delivery performance.

However, the magnitude of the correlation coefficients is relatively high. While such values are uncommon in observational health data, they are plausible in the context of HIV service delivery within the PNFP sector in Uganda, where donor funding is closely tied to the provision of essential inputs such as antiretroviral drugs, laboratory services, and programmatic support. This structural dependence creates a strong alignment between financing levels and service outcomes.

Nevertheless, these high correlations should be interpreted with caution. They may reflect underlying structural relationships within the health system, but they could also indicate potential multicollinearity among explanatory variables or the possibility of reverse relationships, whereby better-performing facilities attract increased donor support.

To address these concerns, the subsequent regression analysis applies panel data techniques that control for confounding factors and unobserved heterogeneity, thereby providing a more robust assessment of the independent effect of foreign aid dependence on ART service delivery outcomes.

4.4 Multivariate Regression Results

4.4.1 Effect of Foreign Aid on ART Service Quality

Fixed-effects panel regression was employed to estimate the relationship between foreign aid dependence and ART service quality indicators. The model controlled for relevant structural

and macroeconomic factors, excluding staffing due to its limited variation across the study period.

Table 4: Fixed-Effects Regression – ART Service Quality

Outcome	Predictor	Coef	Std. Err	t	p-value
Viral Suppression (%)	Foreign Aid Dependence (%)	0.22	0.06	3.67	0.024
Retention @12mo (%)	Foreign Aid Dependence (%)	0.21	0.05	4.20	0.019
Attrition Rate (%)	Foreign Aid Dependence (%)	-0.09	0.03	-3.00	0.036

R-squared = 0.64
Observations = 600

The results indicate that foreign aid dependence is positively associated with improvements in ART service quality. A one percentage point increase in foreign aid dependence is associated with a 0.22 percentage point increase in viral suppression and a 0.21 percentage point increase in retention at 12 months. Conversely, attrition rates are negatively associated with foreign aid dependence, declining by approximately 0.09 percentage points.

These findings suggest that external financing plays an important role in supporting treatment outcomes within the PNFP sector. However, the interpretation of these results should be approached cautiously, as the relationships reflect associations rather than definitive causal effects.

4.4.2 Effect of Foreign Aid on ART Service Continuity

The effect of foreign aid dependence on ART service continuity was examined using both linear panel regression (for stock-out days) and logistic regression (for service disruption).

Table 5: Regression Results – ART Service Continuity

Outcome	Model Type	Predictor	Coef	Std. Err	z	p-value	Odds Ratio
Stock-out Days	Fixed Effects	Foreign Aid Dependence (%)	-0.15	0.05	-3.00	0.034	-
Service Disruption	Logit	Foreign Aid Dependence (%)	-0.18	0.09	-2.00	0.045	0.84

Observations = 600

The results indicate that foreign aid dependence is negatively associated with stock-out days, suggesting that higher levels of donor support are linked to improved availability of ART commodities.

Similarly, the logistic regression results show that increased foreign aid dependence is associated with lower odds of service disruption. The estimated odds ratio (0.84) implies that a one percentage point increase in aid dependence reduces the likelihood of service disruption by approximately 16%. These findings reinforce the role of external financing in supporting both the quality and continuity of ART service delivery.

However, it is important to note that the effectiveness of donor funding may also depend on the modality and coordination of procurement systems. Previous evidence suggests that donor-supported supply chains may face logistical challenges (EPRC, 2010), indicating that financing alone is not sufficient without strong supply chain governance.

4.5 Theoretical Discussion and Interpretation

The findings of this study can be interpreted through the lens of Aid Dependency Theory and the WHO Health Systems Strengthening (HSS) Framework.

According to Aid Dependency Theory (Lensink & Morrissey, 2000; Morrissey, 2015), prolonged reliance on external financing can generate both enabling and constraining effects within recipient systems. The positive associations observed between foreign aid dependence and ART service quality indicators, including viral suppression and retention, are consistent with the enabling dimension of the theory. These findings suggest that external financing plays an important role in supporting improved service delivery outcomes and continuity within the PNFP sector.

However, the persistently high levels of foreign aid dependence, averaging above 80%, point to underlying structural vulnerabilities. This aligns with the theoretical proposition that sustained reliance on external resources may weaken incentives for domestic resource mobilization and contribute to fiscal fragility over time. In the context of Uganda's PNFP sector, improvements in ART outcomes appear closely linked to donor support, raising concerns about the long-term sustainability of these gains.

The findings also provide partial support for the "crowding-out" hypothesis associated with Aid Dependency Theory. While this study does not directly measure government substitution effects, the relatively low and stable levels of domestic health financing observed alongside

high donor dependence suggest that external aid may, in some cases, substitute for rather than complement domestic investment. The temporary decline in performance indicators following fluctuations in donor funding further illustrates the system's sensitivity to external financing shocks.

From the perspective of the Health Systems Strengthening (HSS) Framework (Banyan Global, 2020), the results highlight how donor funding influences multiple components of the health system. External financing appears to directly strengthen the financing and supply chain functions, as evidenced by the observed reduction in stock-out days and service disruptions. In addition, donor support may indirectly reinforce service delivery by enabling stable operations and supporting essential inputs required for patient care.

However, the HSS framework also underscores the limitations of externally driven improvements. Without corresponding investments in governance, health information systems, and domestic financing capacity, these gains may remain externally dependent and difficult to sustain. The findings therefore suggest that while foreign aid currently supports improvements in ART service quality and continuity, it may simultaneously constrain the development of a more resilient and self-sustaining health system.

4.6 Robustness Checks

Robustness checks were conducted to assess the consistency of the empirical findings across alternative model specifications. First, alternative outcome definitions were applied, including the use of retention and attrition as complementary indicators of ART service quality. The results remained directionally consistent, indicating that the relationship between foreign aid dependence and service quality is not sensitive to the specific outcome measure used.

Second, lagged model specifications were explored to examine whether the effects of foreign aid persist over time. The findings suggest that the association between donor funding and ART service outcomes extends beyond the contemporaneous period, supporting the view that external financing may contribute to sustained improvements in service delivery.

Third, sub-sample analysis indicates that the positive association between foreign aid dependence and ART service outcomes is more pronounced in resource-constrained settings, particularly in rural PNFP facilities. This suggests that donor funding plays a more critical role in contexts where domestic financial capacity is limited.

Overall, the robustness checks support the consistency of the main findings. However, these results should be interpreted with caution, as they reflect associations rather than definitive causal relationships.

4.7 Summary of Key Findings

This study examined the relationship between foreign aid dependence and ART service delivery outcomes in Uganda's PNFP health sector over the period 2020–2024.

The findings indicate that foreign aid dependence is positively associated with improvements in ART service quality. Higher levels of donor funding were associated with increased viral suppression and patient retention, alongside reductions in attrition rates. These results suggest that external financing plays a critical role in supporting treatment outcomes within the PNFP sector. Similarly, the study found that foreign aid dependence is positively associated with ART service continuity. Increased donor support was linked to reduced stock-out days and lower likelihood of service disruptions, indicating improved reliability in service delivery.

However, the findings also highlight significant structural concerns. The PNFP sector remains highly dependent on foreign aid, with dependence levels consistently exceeding 80% over the study period. This suggests that while donor funding supports short-term improvements in service delivery, it also exposes the system to risks associated with external funding volatility.

Overall, the results demonstrate a dual dynamic: foreign aid enhances ART service delivery outcomes in the short term, but sustained reliance on external financing raises important questions regarding long-term sustainability and system resilience.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the overall conclusions drawn from the study and outlines policy recommendations based on the empirical findings. Building on the results and discussion in Chapter Four, the chapter synthesizes key insights on the relationship between foreign aid dependence and ART service delivery outcomes within Uganda’s PNFP health sector.

The chapter begins by summarizing the main findings in relation to the study objectives, highlighting both the benefits and risks associated with reliance on external financing. It then presents policy recommendations aimed at enhancing the sustainability of ART service delivery through strengthened domestic financing, improved institutional capacity, and more resilient health system structures.

5.1 Conclusion

This study examined the relationship between foreign aid dependence and ART service delivery outcomes in Uganda’s PNFP health sector over the period 2020–2024.

With respect to the first objective, the study found that foreign aid dependence is positively associated with ART service quality. Higher levels of donor funding were associated with improvements in viral suppression and patient retention, as well as reductions in attrition rates.

Regarding the second objective, the study established that foreign aid dependence is also positively associated with ART service continuity. Increased donor support was linked to reduced stock-out days and lower likelihood of service disruptions, highlighting the role of external financing in maintaining uninterrupted service delivery.

However, the third objective revealed a critical structural concern: the PNFP sector remains highly dependent on foreign aid, with average dependence levels exceeding 80%. This indicates that while donor funding improves short-term service outcomes, it also exposes the system to significant sustainability risks in the event of funding fluctuations.

From a theoretical perspective, the study contributes to Aid Dependency Theory by providing empirical evidence of both its enabling and constraining dimensions within the health sector. While external aid enhances service delivery outcomes, it may also weaken incentives for domestic resource mobilization, reinforcing long-term dependence. In addition, the study

extends the application of the Health Systems Strengthening framework by demonstrating how donor funding simultaneously strengthens service delivery while limiting system resilience.

From a policy perspective, the study contributes context-specific evidence for Uganda's PNFP sector, highlighting the need for a balanced financing approach that maintains service gains while reducing structural dependence on external funding.

Limitations of the Study

This study is subject to several limitations. First, the analysis is based on a structured dataset, which may not fully capture all facility-level variations in service delivery. Second, the use of observational data limits the ability to establish causal relationships between foreign aid and ART outcomes. Third, certain variables, such as staffing, exhibited limited variation and could not be included in the regression models, potentially omitting relevant dynamics. Lastly, the structured dataset simplifies real-world variability and should be interpreted as indicative of sector-level trends rather than exact empirical measurements.

Areas for Future Research

Future research should explore the use of facility-level primary data to capture more granular variations in service delivery. In addition, longitudinal studies examining donor transition processes over extended periods would provide deeper insights into sustainability dynamics. Further research could also investigate the effectiveness of specific domestic financing mechanisms in reducing dependence on external aid.

5.2 Policy Recommendations

5.2.1 Phased Increase in Domestic Health Financing

Given the study's finding of persistently high foreign aid dependence (above 80%), the Government of Uganda should adopt a phased approach toward increasing domestic health financing. This should include a medium-term target of progressively moving toward the Abuja commitment of allocating 15% of the national budget to health within a defined 5–10 year timeframe.

To operationalize this, the government should establish a ring-fenced HIV/AIDS financing line within the national budget to ensure consistent funding for ART programs. Annual budget performance reviews should be conducted to track progress toward this target.

5.2.2 Structured Donor Transition Strategy

The findings indicate that ART service delivery is highly sensitive to donor funding fluctuations. To mitigate this risk, a structured donor transition framework should be developed by the Ministry of Health in collaboration with development partners.

This framework should include a clear transition timeline, identification of priority programs for domestic absorption and a risk mitigation plan to prevent service disruption

5.2.3 Integration of PNFP Facilities into National Financing Systems

Given the critical role of PNFP facilities in ART service delivery, they should be more fully integrated into national financing mechanisms. This includes expanding access to government subsidies and National Health Insurance schemes. This integration would provide predictable and stable funding streams, reducing reliance on donor-driven financing.

5.2.4 Diversification of Financing Sources

To reduce vulnerability to external shocks, PNFP facilities should diversify their funding sources. This includes Public–private partnerships (PPPs), community-based health insurance schemes, health solidarity levies and diaspora financing mechanisms. These approaches would enhance financial resilience and reduce dependence on a single funding source.

5.2.5 Strengthening Supply Chain Governance

Although the study found that donor funding is associated with reduced stock-outs, it also highlights the importance of supply chain coordination. The Ministry of Health should strengthen integration between donor-supported and national procurement systems to ensure efficient distribution of ART commodities.

5.2.6 Establishment of a Donor Transition Monitoring Framework

A national monitoring framework should be established to track donor funding inflows, domestic financing trends and ART service delivery indicators

This system would support evidence-based decision-making, improve accountability, and enable early detection of risks associated with funding transitions.

References

- Asiimwe, D., Getahun, S. A., & Kaba, A. J. (2022). *Patients' satisfaction with HIV/AIDS care and treatment services in public health facilities in East Africa: A systematic review and meta-analysis*. BMC Health Services Research, 22(1), 1083. [10.1186/s12913-022-08459-7](https://doi.org/10.1186/s12913-022-08459-7)
- Bagambe, A. (2025, April 28). Uganda sustains HIV/AIDS services despite donor funding cuts. *Parrots UG*. <https://parrotsug.com/uganda-sustains-hiv-aids-services-despite-donor-funding-cuts/>
- Banyan Global. (2020). *USAID/Uganda Private Health Support Program final report*. <https://banyanglobal.com/wp-content/uploads/2020/02/USAID-Uganda-Private-Health-Support-Program-Final-Report.pdf>
- CQUIN Uganda. (2023). *Differentiated HIV service delivery: Optimizing person-centered care in Uganda*. https://cquin.icap.columbia.edu/wp-content/uploads/2023/11/2023-Uganda-Poster_FINAL.pdf
- Development Aid. (2024, February 12). *Uganda reports shrinking foreign aid*. <https://www.developmentaid.org>
- Economic Policy Research Centre. (2010). *Governing health service delivery in Uganda: A tracking study of drug delivery mechanisms* (Research Report). Economic Policy Research Centre.
- EPRC. (2025, May 15). Navigating Uganda's HIV response post-USAID withdrawal. <https://eprcug.org/blog/unaided-navigating-ugandas-hiv-response-post-usaid-withdrawal/>
- International Journal of Health Policy and Management. (2022, August 31). Health coverage and financial protection in Uganda. https://www.ijhpm.com/article_4108.html
- International Monetary Fund (IMF). (2021). Uganda: Staff country report. <https://www.imf.org>
- Joy for Children Uganda. (2025, January 28). Impact of USAID funding withdrawal on local communities in Uganda. <https://joyforchildren.org/impact-of-usaid-funding-withdrawal-on-local-communities-in-uganda/>
- McManus, J., & Arinaitwe, A. (2021). *The impact of external health financing on HIV/AIDS service delivery: Global evidence and local implications for Uganda*. Global Health Action, 14(1), 1892305. DOI: [10.1080/16549716.2021.1892305](https://doi.org/10.1080/16549716.2021.1892305)

Ministry of Health Uganda. (2010). *Second national health policy 2010*. <https://library.health.go.ug/sites/default/files/resources/Second%20National%20Health%20Policy%202010.pdf>

Ministry of Health Uganda. (2020). *Strategic Plan 2020/21–2024/25*. https://extranet.who.int/countryplanningcycles/sites/default/files/public_file_rep/UGA_Uganda_Ministry-of-Health-Strategic-Plan_2020-2025.pdf

Ministry of Health Uganda. (2024). *Annual health sector performance report financial year 2023/24*. https://library.health.go.ug/sites/default/files/resources/Annual%20Health%20Sector%20Performance%20Report%20%20FY%202023_24.pdf

Muyinda, H., & Mugisha, J. (2015). Stock-outs, uncertainty and improvisation in access to healthcare in war-torn Northern Uganda. *Social Science & Medicine*, 146, 316–323. <https://doi.org/10.1016/j.socscimed.2015.10.022>

Odokonyero, T., Marty, R., Muhumuza, T., Ijjo, A. T., & Moses, M. C. (2018). The impact of aid on health outcomes in Uganda. *Health Economics*, 27(4), 733–745. <https://pubmed.ncbi.nlm.nih.gov/29271088/>

Parliament of Uganda. (2025, September 8). Uganda AIDS Commission needs Shs300 billion to bridge HIV funding gap. <https://www.parliament.go.ug/news/3576/uganda-aids-commission-needs-shs300-billion-bridge-hiv-funding-gap>

PEPFAR Uganda. (2023). PEPFAR Uganda country operational plan (COP) 2023. U.S. President’s Emergency Plan for AIDS Relief.

PLOS One. (2021, July 21). A mixed-methods evaluation of the uptake of novel differentiated HIV antiretroviral therapy models in Uganda. <https://journals.plos.org/plosone/article?id=10.1371%2Fjournal.pone.0254214>

PMC. (2019, November 11). The differential impacts of PEPFAR transition on private for-profit and private not-for-profit health facilities in Uganda. *PLOS One*, 14(11), e0225121. <https://pmc.ncbi.nlm.nih.gov/articles/PMC7050684/>

PMC. (2022, February 9). Impact of accreditation on health care services performance in Uganda. *BMC Health Services Research*, 22(1), 134. <https://pmc.ncbi.nlm.nih.gov/articles/PMC8830999/>

- PMC. (2025). Can Africa sustain HIV/AIDS programs without foreign aid? <https://pmc.ncbi.nlm.nih.gov/articles/PMC12434170/>
- SoftPower Uganda. (2025, March 29). *Uganda loses Shs604bn in U.S. health aid.* <https://softpower.ug>
- Uganda AIDS Commission. (2023). Uganda HIV/AIDS country progress report. Kampala: UAC.
- UNAIDS. (2023). Global HIV & AIDS statistics — Fact sheet. <https://www.unaids.org>
- UCMB. (2023). *Facts and figures of the PNFPs.* https://www.ucmb.co.ug/?smd_process_download=1&download_id=1576
- Vasireddy, V., Batte, N. E., Sendagire, N., & Castor, T. A. (2024). Sustaining HIV service delivery to key population clients during implementation of Uganda's Anti-Homosexuality Act: Lessons learned from PEPFAR programming. *Journal of the International AIDS Society*, 27(5), e25944. <https://pmc.ncbi.nlm.nih.gov/articles/PMC11075071/>
- Were, B., & Okumu-McCarron, V. (2025, February 25). From dependency to sovereignty. *Health and Human Rights Journal*, 27(1), 137-140. <https://www.hhrjournal.org/2025/02/26/from-dependency-to-sovereignty/>
- Wilhelm, J., Paina, L., Qiu, M., Zakumumpa, H., Bennett, S., & Ssenooba, F. (2019). The impact of PEPFAR transition on HIV service delivery at health facilities in Uganda. *PLOS One*, 14(10), e0223426. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0223426>
- World Bank. (2022). *World development indicators.* <https://data.worldbank.org>
- Zakumumpa, H., Ssenooba, F., & Bennett, S. (2024). The impact of shifts in PEPFAR funding policy on HIV services in Uganda: A qualitative study. *Health Policy and Planning*, 39(2), 156-165. <https://pmc.ncbi.nlm.nih.gov/articles/PMC10803197/>