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Reasons for Loss to Follow-Up and Perspectives of People Living with HIV Who Have Returned to ART Services in Cambodia

November 2025

National Center for HIV/AIDS, Dermatology and STD

Acknowledgments

We gratefully acknowledge the US-CDC Cambodia for providing technical and financial support to document "Reasons for Loss to Follow-Up and Perspectives of People Living with HIV Who Have Returned to ART Services in Cambodia". This document helps us in deepening our understanding of the factors contributing to loss to follow-up (LTFU) and provides critical insights into the experiences of patients re-engaging with antiretroviral therapy (ART). These findings provide vital evidence-based decision-making for NCHADS through the HIV-Care and treatment working group to develop targeted interventions to improve patient retention.

We extend our sincere appreciation to the NCHADS leadership and technical management team, with special thanks to Deputy Directors Dr. Samreth Sovannarith and Dr. Ngauv Bora. We are also deeply grateful to the Research Unit team—specifically Dr. Khol Vohith, Dr. Chhay Mengsomanyth, and Ph. Heang Sophea for their dedication.

Special recognition is also to the members of the HIV/AIDS Care Technical Working Group for their technical guidance and contributions to the study design, process, and analysis. Finally, we thank all participating ART sites for their invaluable support in facilitating data collection and ensuring the successful completion of this documentation.

Phnom Penh, 17 November 2025

Director of National Center for HIV/AIDS,
Dermatology and STD

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List of Abbreviations

Abbreviation	Definition
3TC	Lamivudine
ABC	Abacavir
AIDS	Acquired Immunodeficiency Syndrome
AHD	Advanced HIV Disease
AOR	Adjusted Odds Ratio
ART	Antiretroviral Therapy
ARV	Antiretroviral (Drug)
ATV/r	Atazanavir/Ritonavir
BP	Blood Pressure
CD4	T-CD4+ Lymphocyte
DTG	Dolutegravir
HICs	High-Income Countries
HTN	Hypertension
INSTI	Integrase Strand Transfer Inhibitors
LTFU	Loss to Follow-Up
L&R	Lost and Return
LMICs	Low- and Middle-Income Countries
MOH	Ministry of Health
NCDs	Non-Communicable Diseases
NCHADS	National Center for HIV/AIDS, Dermatology, and STD
OI	Opportunistic Infection
PAC	Pediatric AIDS Care
PASP	Provincial AIDS and STD Program
PCP	Pneumocystis Pneumonia
PEPFAR	U.S. President's Emergency Plan for AIDS Relief
PI	Protease Inhibitor
PLHIV	People Living with HIV
RH	Referral Hospital
SAGE	Strategic Advisory Group of Experts on Immunization
SD	Standard Deviation
SOP	Standard Operating Procedure
T2D/T2DM	Type 2 Diabetes Mellitus
TDF	Tenofovir Disoproxil Fumarate
TB	Tuberculosis
US-CDC	United States Centers for Disease Control and Prevention
VL	Viral Load
WHO	World Health Organization
WOPS	Well-Being of Older People Study
YLWH	Years Living with HIV

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Reasons for Loss to Follow-Up and Perspectives of People Living with HIV Who Have Returned to ART Services in Cambodia

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Research Abstract

Background: Despite significant advancements in antiretroviral therapy (ART) and a global push for universal coverage, loss to follow-up (LTFU) remains a critical challenge, particularly in low- and middle-income countries. LTFU among people living with HIV (PLHIV) compromises treatment effectiveness, increases the risk of HIV transmission, and leads to poorer health outcomes. While Cambodia is on track to meet ambitious HIV treatment targets, some of PLHIV are still LTFU, underscoring an urgent need for effective re-engagement strategies.

Objective: This documentation aims to identify and analyse the socio-demographic, clinical, and systemic factors contributing to LTFU among PLHIV and to understand the experiences and motivations of those who have successfully re-engaged in ART services.

Methods: We used a descriptive documentation design with a sample of 76 PLHIV from 13 ART clinics in seven provinces and Phnom Penh city who were lost to follow-up in the third quarter of 2024 and subsequently returned to care. Data were collected through a review of patient charts and face-to-face interviews using a pre-designed questionnaire. The interviews explored reasons for LTFU, motivations for returning, and the interventions received to facilitate re-engagement. Data were analysed using Stata 16.0, with continuous variables summarized using means and standard deviations and categorical data using frequencies and proportions.

Results: The mean age of participants was 39 years, with males making up 59.2% of the cohort. Socioeconomic factors were the most prevalent reasons for loss to follow-up (LTFU), with financial constraints (59.2%) and work commitments (40.8%) cited most frequently. Personal and psychological barriers, such as forgetting appointments (59.2%) and a lack of awareness regarding the risks of discontinuing antiretroviral therapy (ART) (50.0%), were also significant. Other notable barriers included stigma and discrimination (46.1%) and transportation difficulties (44.7%). Most participants (60.5%) returned to care within 1-3 months. The primary motivations for re-engagement were government financial assistance (69.7%), improved service quality and provider behaviour (69.7%), and fear of HIV progression or death (57.9%). Provider-led interventions, primarily SMS messages and phone calls, played a crucial role in facilitating return.

Conclusion: The findings indicate that LTFU among PLHIV is driven by a complex interplay of socioeconomic, personal, and health system-related barriers. In contrast, re-engagement is primarily motivated by a combination of financial support, improved service quality, and effective provider outreach. These results underscore the need for a comprehensive strategy that addresses systemic barriers, such as financial and transportation issues, while also leveraging simple, technology-based outreach to enhance patient retention in care and ultimately contribute to ending the HIV epidemic.

I. Introduction

Human immunodeficiency virus (HIV) remains a significant global public health challenge, with an estimated 39.9 million (36.1 million to 44.6 million) people living with HIV (PLHIV) at the end of 2023 [1]. The rapid scale-up of universal antiretroviral therapy (ART) coverage through the "test-and-treat" strategy—emphasizing early detection of the disease and immediate ART initiation regardless of disease stage—has expanded ART coverage to 30.7 million PLHIV worldwide (27 million to 31.9 million) [2, 3]. This approach has significantly improved health outcomes, reducing mortality and morbidity while enhancing the overall quality of life for millions of PLHIV [4]. The successful implementation of this strategy has enabled PLHIV to live longer, more productive lives, transforming HIV into a manageable chronic condition [5].

Effective ART is the cornerstone of HIV management, as it suppresses viral replication, improves immune function, and significantly reduces morbidity and mortality. Consequently, PLHIV who adhere to ART can achieve life expectancy comparable to those of the general population.

Furthermore, ART plays a crucial role in preventing new HIV infections by reducing viral load to undetectable levels. This strategy, commonly known as "Undetectable equals Untransmittable" (U=U), advocates for early HIV testing, timely access to treatment, and sustained viral suppression through continuous follow-up care [6]. Numerous studies have demonstrated the effectiveness of ART in preventing HIV transmission, reinforcing its central role in public health efforts to curb the epidemic.

Despite the substantial successes of ART, patient attrition and loss to follow-up (LTFU) remain significant barriers threatening the long-term success of ART scale-up efforts. These challenges are particularly pronounced in low- and middle-income countries (LMICs), where gaps in patient retention and continuity of care hinder progress. Cambodia, for instance, is on track to meet the ambitious 95-95-95 HIV global targets by 2025, which aim for 95% of PLHIV to know their HIV status, 95% of those diagnosed to be on lifesaving ART, and 95% of those on ART to achieve viral suppression [7]. However, a majority of PLHIV are LTFU, highlighting the urgent need for effective strategies to re-engage them in continuous care and treatment services. Preventing LTFU among ART patients is critical for sustaining the progress achieved and for realizing the goal of ending AIDS by 2030 [8, 9].

The study in rural Mozambique revealed key barriers to care by interviewing individuals who had dropped out of HIV treatment. These barriers reflected intricate social and psychological issues, such as distrust in the HIV diagnosis, a belief in being in good health, and concerns about potential mistreatment by healthcare providers [10].

The study conducted in Pakistan identified several reasons for disengagement from care, including distance from the treatment center or insufficient resources (45%), injection drug use (19%), side effects of antiretroviral therapy (9%), misinformation (9%), and lack of a male family member to accompany female patients after their husband died (3%). No specific reason was provided in 15% of cases [11].

In Cambodia, the National Center for HIV/AIDS, Dermatology, and STD (NCHADS) has developed guidelines to define LTFU and procedures for re-engaging PLHIV in care. According to NCHADS, LTFU refers to a patient who misses scheduled clinical visits or medication pickups and remains out of care for more than 28 days beyond their appointment date. To address this issue, NCHADS has implemented a Standard Operating Procedure to re-engage these individuals, emphasizing the importance of bringing PLHIV back into treatment services to enhance health outcomes and reduce transmission risks [12].

II. Rationale

Despite significant advancement in antiretroviral therapy (ART) and global initiatives aimed at achieving universal coverage, loss to follow-up (LTFU) among PLHIV continues to pose a substantial challenge, particularly in low- and middle-income countries. Factors contributing to LTFU include geographical barriers, resource constraints, substance use, ART side effects, misinformation, and lack of social support. These factors can vary based on the specific circumstances surrounding each instance of LTFU. Notably, LTFU is linked to diminished treatment effectiveness, an increased risk of HIV transmission, and poorer health outcomes.

In Cambodia, however, research exploring the specific factors leading to LTFU and the perspectives of patients who have returned to ART services is limited. This documentation aims to identify and analyse the determinants of LTFU among PLHIV while also examining the experiences of those who have successfully re-engaged with ART services after a period of disengagement. Gaining insight into these complex factors is crucial for developing targeted interventions that improve patient retention in care, support ongoing ART adherence, and ultimately contribute to national and global efforts to end the HIV epidemic.

III. Literature review

Social barriers are a primary cause of people being lost to follow-up (LTFU) in HIV care. Stigma, financial constraints, and limited social support are significant factors affecting adherence to treatment and clinic visits for people living with HIV[13]. Several studies corroborate these findings. A study of pregnant and breastfeeding women with HIV highlighted that stigma is a major contributor to their disengagement from care. For this group, reasons for LTFU fall into three categories: health-related factors (e.g., medication side effects, absence of disease symptoms), psychological factors (e.g., loss of hope, fear of side effects), and socioeconomic factors (e.g., financial constraints, lack of partner support, family conflicts) [14]. Similarly, a study in the northernmost region of South Africa identified barriers such as lack of confidentiality, misunderstanding of antiretroviral treatment, traditional/religious beliefs, fear of disclosure, and perceived physical well-being [15]. A study in Sub-Saharan Africa found that adolescents and young adults (ages 15–24) face unique challenges, including fear of stigma, concerns about HIV disclosure, high transportation costs, long waiting times, and travel distances. Additionally, denial of HIV status and the absence of AIDS symptoms were identified as obstacles [16]. A study in rural Uganda, which tracked 381 PLHIV who had missed a scheduled appointment, found that 70% of those followed returned to care [17]. Of this group, 42% reported missing visits due to traveling away from home, with 67% of these individuals being women. Additionally, 43% reported socio-structural barriers such as forgetting appointments, long distances to the clinic, tight work schedules, stigma, ART side effects, inadequate drug supplies, and lack of food [17].

Demographic and economic factors also predict LTFU. For example, younger patients and those with lower educational attainment were found to be more likely to experience early LTFU when initiated on second-line antiretroviral therapy [18]. Similarly, a study in Nairobi, Kenya, found that a patient's age and socioeconomic status significantly impacted their retention in care [19]. The perspectives of PLHIV on returning to care are also important. For instance, one publication found that women who returned to care after being LTFU were primarily motivated by personal health concerns and the desire to protect their children from HIV transmission [14].

IV. Objectives

4.1 General objective:

This documentation aims to identify and analyze the factors contributing to loss to follow-up (LTFU) among PLHIV. Additionally, it seeks to gain insights into the experiences of patients who have returned to ART services after disengagement.

4.2 Specific objectives:

4.2.1 To identify the socio-demographic characteristics of people living with HIV who were lost to follow-up (LTFU) and subsequently returned to care.
4.2.2 To describe the clinical characteristics of PLHIV who were LTFU and subsequently returned to care.
4.2.3 To determine the reasons for loss to follow-up among PLHIV who later returned to care.
4.2.4 To identify the reasons for returning to ART care among PLHIV who were lost to follow-up (LTFU) and subsequently re-engaged.
4.2.5 To identify and assess the specific interventions received by PLHIV that facilitated their successful return to ART services.

Research question:

What are the common reasons for lost to follow-up among PLHIV?
What measures are commonly used to reengage PLHIV who have been lost to follow-up and returning to ART services?

V. Methods

5.1 Study design

This documentation employed a descriptive design to address its stated objectives. Data on 'lost and returned' patients, stored within the NCHADS' database and at studied sites, were systematically reviewed the information of variables of interest. Subsequently, face-to-face interviews were conducted using a pre-designed questionnaire. These interviews aimed to explore the reasons for LTFU among PLHIV on ART and captured the factors that motivated their return to care, as well as the interventions they received for re-engagement in treatment services.

5.2 Sampling and sample size

We selected seven provinces and Phnom Penh city from Cambodia's 25 provinces and cities for our documentation. Within these areas, we identified 13 ART clinics that reported five or more PLHIV who were LTFU and had returned to care in the third quarter of 2024 (Q3-2024) for inclusion in the documentation (See Table 1).

Table 1: Selected Provinces and ART Sites

No.	Province/City	No.	Site Name
1	Banteay Meanchey	1	Poipet RH
2	Battambang	2	Battambang PH
		3	Thmor Kol RH
3	Kampong Cham	4	Kampong Cham PH
4	Phnom Penh	5	Chhouk Sar Association
		6	National Pediatric Hospital
		7	NCHADS ART Clinic 1
		8	NCHADS ART Clinic 2
		9	NCHADS AHF ART Clinic 3
5	Preah Sihanouk	10	Preah Sihanouk PH
6	Pursat	11	Pursat PH
7	Siem Reap	12	Siem Reap PH
8	Tboung Khmum	13	Preah Norodom Sihanouk Tbong Khmum RH

5.3 Study population

Include all PLHIV who were LTFU and returned to care in the third quarter of 2024 (Q3-2024).

5.4 Data collection

A chart review of the selected "lost and returned" patients was conducted to collect socio-demographic and clinical characteristics. Concurrently, face-to-face interviews were conducted using pre-designed questionnaires to gather additional data on socio-demographics, reasons for LTFU, motivations for return, and the interventions patients received to facilitate their re-engagement in care (See Table 2).

Table 2: Summary of tools for data collection

Specific objective	Method of data collection	Tool
4.2.1, 4.2.2	chart review	Pre-Designed abstract form
4.2.3, 4.2.4, 4.2.5	Face-to-Face Interviews	Pre-Designed Questionnaires

5.5 Data Management and Quality Assurance

Collected data were stored in a secure, web-based platform, and maintained in a confidential, protected location accessible only to the documentation team. The research team cleaned the data and performed subsequent analyses to address the study's objectives. Data quality was ensured throughout all stages of the documentation process.

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5.6 Data Analysis Plan

Statistical analyses were conducted using Stata software version 16.0. Continuous variables, such as age, CD4 count, and viral load (VL), were summarized using means and standard deviations.
Proportions and frequency distributions were used to analyze categorical data. For descriptive statistics, the demographic and clinical characteristics of the study population were summarized, including the proportion of individuals who were lost to follow-up and subsequently returned (L&R) by selected ART site. The denominator for this proportion was the total number of individuals lost to follow-up in Q3 2024.

VI. Timetable

6.1 Work plan

Table 3: Project Timeline

No	Description	Q2-2025	Q3-2025	Q4-2025
1	Protocol Development	■		
2	Submit to NECHR	■		
3	Data Collection		■	■
4	Analysis & Report Writing			■
5	Dissemination			■

VII. Ethical consideration

7.1 Human Subjects Research Protections

Ethical clearance for this documentation was approved by the National Ethics Committee for Health Research (NECHR) at the Ministry of Health, Cambodia (No. 067 NECHR). All eligible participants were fully informed about the documentation's purpose and procedures in Khmer. Written informed consent was obtained prior to data collection. Participants had the right to refuse participation or withdraw at any time without any negative consequences or penalty. Face-to-face interviews and discussions were conducted in a private setting. Each participant was assigned a unique code number to ensure anonymity, and personal identifying information was stored separately from the documentation data. All data were password-protected, with access restricted to authorized personnel only.

7.2 Ethics Committee Review

The documentation protocol and related documents, including the informed consent form and any subsequent modifications, were reviewed and approved by the NECHR. This ensured scientific validity and compliance with relevant research regulations and ethical guidelines concerning human subjects.

7.3 Confidentiality

Names and other identifying information of participants were kept private and confidential at NCHADS. All local electronic databases used for documentation data entry were secured with password-protected access systems. No patient names were entered into the documentation's electronic database; instead, data were anonymized by assigning unique codes to each participant. The Principal Investigator was responsible for ensuring data protection and secure storage. Participants were not personally identified in any published results or presentations.

7.4 Risks or discomforts

Participation in this documentation was considered to pose minimal risk. The primary risk associated with participation was the potential breach of confidentiality, and measures to mitigate this risk were outlined above. In the event of any inadvertent disclosure of personally identifiable information, it was promptly reported to the Principal Investigator (PI) and the documentation sponsor. An investigation was conducted to determine the cause of the disclosure, and appropriate recommendations were made to prevent future occurrences.

7.5 Benefits of Participants

No direct benefit was anticipated for study participants. However, the findings from this documentation are expected to significantly contribute to the improvement of HIV care for PLHIV, maximizing retention in care and minimizing LTFU cases. This will potentially benefit both the participants and others in similar circumstances.

7.6 Informed Consent Process

All participants were provided with a participant information sheet, and written informed consent, either through a signature or thumbprint, was obtained before data collection. The consent script was read aloud to ensure that participants fully understood the information. The consent form outlined the documentation's purpose, potential risks and benefits, confidentiality, and the voluntary nature of participation. Participants were informed of their right to refuse participation or to decline to answer any specific questions. Both the interviewer and the participant signed or provided a thumbprint on the consent form. The consent forms followed standardized templates approved for use in Cambodia. The Principal Investigator and documentation staff were responsible for obtaining informed consent and ensuring that participants understood that refusing to participate would not affect their quality of care. The consent form was provided in Khmer and stored in each participant's documentation file. A copy of the signed consent form was given to all participants who consented to the documentation.

VIII. Results

8.1 Identify the socio-demographic characteristics of people living with HIV who were lost to follow-up (LTFU) and subsequently returned to care

The mean age of the studied participants was 39 years, with a standard deviation (SD) of 12 years. Analysis by age group revealed that individuals aged 30–39 years represented the largest proportion (34.2%), while those in the 20–29 and 40–49 age brackets each accounted for 22.4%. Males constituted most participants (59.2%) compared to females (40.8%).

In terms of education, nearly half of the participants (43.4%) had completed primary school, while a significant proportion (28.9%) had attained secondary education. Notably 7.9% reported having no formal schooling. Marital status varied across the group, with the largest proportion being single (36.8%), followed closely by those who were married (31.6%), and about a quarter identified as widowed, divorced, or separated (25%). Regarding employment, majority of participants (57.9%) were formally employed in either civil or corporate sectors, while a quarter (25%) were self-employed. Smaller proportions reported being unemployed (7.9%) or retired (6.6%).

The majority of participants lived in urban areas (75%), while the remaining 25% resided in rural settings. Most worked in urban centers (43.4%) or close to their homes (38.2%), with smaller proportions employed in rural areas (17.1%) or abroad (1.3%). Among specific locations, the largest group was from Phnom Penh (39.5%), followed by Battambang (21.1%), with Kampong Cham and Siem Reap each accounting for 9.2% of participants.

The distance to Antiretroviral Therapy (ART) care varied among participants, with a substantial proportion traveling 5–9 km (36.8%) or more than 20 km (31.6%) to access services. A smaller group (13.2%) reported travelling less than 5 km. The primary mode of transport to the clinic was a personal vehicle (64.5%), followed by ride-hailing services (25%).

Before being lost to follow-up (LTFU), most participants (64.5%) described their follow-up as "not very regular," while 27.6% reported regular follow-up and 7.9% reported irregular follow-up (See table 4).

Table 4: Demographic and Background Characteristics of PLHIV Who Were Lost and Returned to ART Services

Characteristic	Category	Frequency (n=76)	Percentage (%)
***Mean Age in years* (±SD)**		39 (±12)	
Age Group			
	20–29	17	22.4
	30–39	26	34.2
	40–49	17	22.4
	50–59	11	14.5
	60+	5	6.6
Gender			
	Male	45	59.2
	Female	31	40.8
Education Level			
	No schooling	6	7.9
	Primary	33	43.4
	Secondary	22	28.9
	High school	9	11.8
	College/University	6	7.9

Marital Status			
	Single	28	36.8
	Married	24	31.6
	Partner	5	6.6
	Widowed/Divorced/Separated	19	25
Occupation (Simplified)			
	Employed (Civil/Company)	44	57.9
	Self-Employed	19	25
	None	6	7.9
	Retired	5	6.6
	Other	2	2.6
Workplace Location			
	Near home	29	38.2
	Urban	33	43.4
	Rural	13	17.1
	Abroad	1	1.3
Place of Residence			
	Urban	57	75
	Rural	19	25
Province/City			
	Phnom Penh	30	39.5
	Battambang	16	21.1
	Kampong Cham	7	9.2
	Siem Reap	7	9.2
	Tboung Khmum	4	5.3
	Banteay Meanchey	4	5.3
	Pursat	5	6.6
	Preah Sihanouk	3	3.9
Distance to ART Care			
	<5 km	10	13.2
	5–9 km	28	36.8
	10–20 km	14	18.4
	>20 km	24	31.6
Transport to Clinic			
	Own vehicle	49	64.5
	Ride-hailing (e.g., Grab)	19	25
	Bicycle/Walking	5	6.6
	Public transport	3	3.9
Pre-LTFU Follow-up Experience			
	Regular	21	27.6
	Not very regular	49	64.5
	Irregular	6	7.9

8.2 Describe the clinical characteristics of PLHIV who were LTFU and subsequently returned to care

The duration of loss to follow-up (LTFU) showed that 60.5% of participants returned to care within 1–3 months. Longer periods of disengagement were observed in 27.6% of participants (4-6 months) and 11.8% (more than 6 months) (See Table 5).

Comorbidities

Analysis of individual comorbidities revealed that Tuberculosis (TB) was the most prevalent 14.5%, followed by kidney disease 11.8% and Diabetes 10.5%. Heart disease was reported by 6.6% of participants, hypertension by 5.3% and other comorbidities were present in 9.2%. Among the 30 participants diagnosed with at least one comorbidity, the majority (67.7%) had a single comorbidity, while 22.6% had two, and 9.7% had three comorbidities.

Satisfaction with HIV care and Support

Most participants were highly satisfied with their HIV care, with 98.7% expressing satisfaction and only 1.3% reporting dissatisfaction. In contrast, the availability of psychological and psychosocial support was limited. A large majority of participants (92.1%) had not received such support, while only 7.9% reported receiving it. Similarly, participation in support groups or outreach activities was low, with just 9.2% of participants reporting involvement.

Lifestyle Factors

Regarding lifestyle behaviours, 13.2% of participants were current smokers. Alcohol consumption was reported as "occasional" by 53.9%, while 43.4% reported no alcohol use, and 2.6% consumed alcohol daily. Drug use was extremely rare, with only 1.3% of participants reporting use. In terms of physical activity, 50% of participants exercised a few times per week, 43.4% reported no exercise, and 6.6% exercised daily (See Table 5).

Table 5: Clinical characteristics of PLHIV Who were lost and returned to ART services

Variable	Category	Frequency (n=76)	Percentage (%)
Duration Lost to Follow-Up			
	1–3 months	46	60.5
	4–6 months	21	27.6
	>6 months	9	11.8
Individual Comorbidities			
	None	45	59.2
	TB	11	14.5
	Kidney disease	9	11.8
	Diabetes	8	10.5
	Heart disease	5	6.6

	Hypertension	4	5.3
	Other comorbidities	7	9.2
Number of Comorbidities (n = 30)			
	One comorbidity	21	67.7
	Two comorbidities	7	22.6
	Three comorbidities	3	9.7
Satisfaction with HIV Care			
	Yes	75	98.7
	No	1	1.3
Received Psychological/Psychosocial Support			
	Yes	6	7.9
	No	70	92.1
Involvement in Support Group/Outreach			
	Yes	7	9.2
	No	69	90.8
Current Smoking Status			
	Yes	10	13.2
	No	66	86.8
Alcohol Consumption			
	Daily	2	2.6
	Sometimes	41	53.9
	No	33	43.4
Drug Use			
	Yes	1	1.3
	No	75	98.7
Exercise Frequency			
	Daily	5	6.6
	Few times a week	38	50
	No	33	43.4

8.3 Determine the reasons for loss to follow-up among PLHIV who later returned to care

The analysis revealed that the reasons for loss to follow-up (LTFU) among participants were multifaceted. These contributing factors were systematically categorized into six overarching thematic areas: (1) *healthcare system and service-related barriers, (2) socioeconomic and work-related barriers, (3) personal and psychological factors, (4) lack of social support, (5) transportation barriers, and (6) other external factors.*

Healthcare System and Service-Related Barriers: *These include issues with the healthcare system itself, such as appointment scheduling conflicts or poor communication from staff.*

Healthcare system-related barriers were a prominent factor in lost to follow-up (LTFU). The most frequently cited reasons were directly linked to the healthcare system and its service delivery. Notably, 14.5% of participants reported *"extended waiting periods for medical consultation"* as a major issue. Furthermore, 15.8% of the cohort faced challenges related to *"issues with ART service/hospital hours"* A notable finding was that 42.1% of participants indicated they r*eceived a doctor-prescribed antiretroviral therapy regimen for less than 3 months"*. Other factors had a minimal impact; for example, only 2.6% of participants mentioned *"receiving less medication than prescribed by doctor"*.

Socioeconomic and Work-Related Barriers: *Factors in this category pertain to a participant's financial situation or employment, such as inability to take time off work for appointments.*

Socioeconomic factors and employment-related challenges were identified as substantial barriers contributing to loss to follow-up (LTFU). *"Financial constraints"* were the most frequently reported obstacle, cited by 59.21% of participants.

Work-related issues also presented a significant barrier. A significant portion of the cohort reported that work commitments, either "within the country" (40.80%) or "internationally" (15.80%), hindered their ability to attend appointment. Furthermore, specific workplace obstacles were key contributing factors: 27.63% of participants reported that their employers did not permit clinic visits, and 18.42% were unable to leave work early.

Personal and Psychological factors: *This section addresses personal beliefs, awareness, and mental health issues that may prevent a participant from continuing their involvement.*

Analysis of the data indicated that personal and psychological barriers were significant contributors to patients being lost to follow-up (LTFU). The most common barrier, *"forgetting appointments",* was reported by 59.2% of participants. The next most common issue was a *" lack of awareness regarding the risks of discontinuing ART",* affecting 50.0% of the cohort. Other significant challenges included *"discomfort or a lack of confidence in continuing ART"* (26.3%) and *"mental health issues"* that impacted adherence (19.7%). In contrast, *"side effects from ARV drugs"* were a minimal factor, cited by only 2.6% of participants.

Lack of Social Support, Transportation barriers, and Other External Factors: This includes stigma/discrimination related or lack of reliable transportation to appointments, and insufficient support from family and friends to encourage continued participation.

Analysis of external factors revealed that stigma and transportation difficulties were the primary barriers contributing to patients being lost to follow-up (LTFU). *"Stigma and discrimination related to HIV"* were cited by 46.1% of participants. Similarly, *"Transportation difficulties"* were reported by 44.7% of the cohort, underscoring the practical challenges of accessing healthcare.

Other factors, while less common, also played a role. *"A lack of support or motivation from friends and relatives"* was a factor for 23.7% of participants, while 14.5% *"obtained antiretroviral therapy (ART) from* *an outside source"*. The impact of other external factors, such as *"imprisonment"* was minimal, cited by only 2.6% of the cohort (See Table 6).

Table 6: Reasons for Loss to Follow-Up Among PLHIV (N=76)

Reason of Loss to Follow-Up	Yes (n)	Percentage (%)
Healthcare System and Service-Related Barriers		
Extended waiting periods for medical consultation	11	14.5
Issues with ART service/hospital hours	12.0	15.8
Doctor prescribed medication <3 months	*32*	*42.1*
Dispensed less than prescribed ARVs	*2*	*2.6*
Socioeconomic and Work-Related Barriers		
Financial constraints	45	59.21
Working/doing business in the country	31	40.80
Working/doing business abroad	12	15.80
Workplace did not allow permission	21	27.63
Workplace did not allow to leave early	14	18.42
Personal and psychological factors		
Forgetting appointments many times	45	59.21
Lack of awareness regarding the risks of discontinuing ART	38	50.0
Discomfort or a lack of confidence in continuing ART	20	26.3
Mental health issues affecting adherence	15	19.7
Side effects from ARV drugs	2	2.6
Lack of Social Support, Transportation, and Other External Factors		
Stigma/discrimination related to HIV	35	46.05
Transportation difficulties	34	44.74
Lack of support or motivation from friends and relatives	18	23.68
Obtained antiretroviral therapy (ART) from an outside source	11	14.47
Imprisonment	2	2.63

8.4 Identify the reasons for returning to ART care among PLHIV who were lost to follow-up (LTFU) and subsequently re-engaged

This documentation identified the factors motivating 76 individuals living with HIV to return to antiretroviral therapy (ART) after previously disengaging from treatment. The findings reveal a multifaceted reason, which can be grouped into five primary categories: *(1) Financial Accessibility and*

Policy Support, (2) Social Support Networks, (3) Service Quality and Trust, (4) Individual Motivation and Clinical Status, (5) Active Outreach and Provider-Led Initiatives.

Financial Accessibility and Policy Support: Financial accessibility was identified as the most significant factor influencing re-engagement. A substantial majority of respondents cited government financial assistance for treatment (69.7%) and awareness of national social security funds (NSSF) or equity funds (48.7%) as key motivators.

Social Support Networks: Social support played a crucial role in patient re-engagement. Family encouragement (51.3%) and support from friends (26.3%) were identified as strong drivers for returning to care.

Service Quality and Trust: Among the 76 individuals who returned to care, the primary reason cited was the *"better quality of HIV treatment services,"* reported by 69.7% of respondents. A substantial number of individuals (57.9%) were also influenced by the *"better behavior of ART providers"*. Additionally, *"reliable examination and treatment"* was a major contributing factor for over half of the respondents (51.3%).

Individual Motivation and Clinical Status: While other factors were more prominent, individual motivation and clinical status were still significant. A fear of HIV progression or death (57.9%) and a worsening clinical status (26.3%) served as powerful personal drivers for re-engagement.

Active Outreach and Provider-Led Initiatives: Initiatives such as home visits were identified as important but secondary drivers (13.2%) compared to other categories. Although these methods are effective intervention tools, others such as SMS messaging (30.3%) and telephone contact (19.7%) were regarded as primary drivers (See Table 7).

Table 7: Reasons for Returning to ART Care Among PLHIV (N=76)

Reason for Returning to ART Care	Yes (n)	Percentage (%)
Financial Accessibility and Policy Support		
Government financial help for treatment	53	69.7
Knowing about NSSF or equity fund	37	48.7
Social Support Networks		
Family encouragement and support	39	51.3
Friend encouragement and support	20	26.3
Service Quality and Trust		
Better behaviour of ART providers	44	57.9
Reliable examination and treatment	39	51.3
Better quality of HIV treatment services	53	69.7
Individual Motivation and Clinical Status		
Fear of HIV progression or death	44	57.9
Worsening Clinical Status	20	26.3

Active Outreach and Provider-Led Initiatives		
SMS	23	30.3
Telephone contact from provider	15	19.7
Provider outreach (home visit)	10	13.2
Other	13	17.1

8.5 Identify and assess the specific interventions received by PLHIV that facilitated their successful return to ART services.

This documentation presents a descriptive analysis of a health outreach program involving a cohort of 76 participants. The findings were systematically organized into three key domains: the overall reach of the outreach efforts, the specific communication methods used by providers, and patient receptiveness to these interventions.

Outreach efforts and Contact Methods: The program successfully contacted 47.4% of the target population. However, more than half (52.6%) were not reached, indicating a significant gap in the initial outreach efforts. Among those successfully contacted (n=36), SMS messages were the most utilized method (63.9%). This was followed by phone calls (41.7%), and home visits (27.8%).

Patient Receptiveness: Patient receptiveness to the outreach program was exceptionally high. A substantial majority of participants (88.2%, n=67) reported being satisfied with the communication methods used "*how they were reached (e.g., phone call, SMS, Home visit or other)*" (See Table 8).

Table 8: The specific Interventions Received by PLHIV to Return to ART Services

Intervention	Frequency (n=76)	Percentage (%)
Outreach Efforts (N=76)		
Contacted by healthcare providers	36	47.4
Not contacted by healthcare providers	40	52.6
Contact Methods Used (Among Contacted, n=36)		
SMS messages	23	63.9
Phone calls	15	41.7
Home visit	10	27.8
Other	13	36.1
Patient Receptiveness to Outreach (N=76)		
Satisfaction with contact method		
Yes	67	88.2
No	9	11.8

Agreement to provider home visit		
Yes	70	92.1
No	6	7.9

IX. Discussion

This documentation provides a comprehensive look into the complex factors surrounding loss to follow-up (LTFU) and subsequent return to care among people living with HIV in Cambodia. The findings reveal a multifaceted issue influenced by a combination of socio-demographic, clinical, and systemic factors, consistent with similar research globally and regionally.

Socio-Demographic and Clinical Characteristics

The socio-demographic profile of the returning PLHIV cohort aligns with findings from other studies on ART adherence. The majority of participants were male and consisted of 56.6% who were in their prime working age (20–39 years**)** and resided in urban areas, particularly Phnom Penh.This suggests that employment-related factors are a significant barrier, as further evidenced by the high percentage of participants who reported work-related reasons for LTFU. The findings on education level, with nearly half having only primary schooling, highlight a potential link between lower educational attainment and challenges in health literacy and adherence, which has been observed in other contexts [20].

Clinically, the documentation found that most individuals returned to care relatively quickly (within 1-3 months). This is a positive indicator and suggests that timely interventions can be highly effective. The high prevalence of comorbidities like Tuberculosis, kidney disease, and diabetes among the returning cohort underscores the need for integrated care models that address both HIV and other chronic conditions. While patient satisfaction with HIV care was very high, the glaring lack of psychological and psychosocial support is a critical finding. This deficit may contribute to personal and psychological barriers to adherence, such as mental health issues and a lack of confidence in continuing ART, as cited by a significant portion of participants. This is supported by a 2023 study in South Africa which identified psychological distress and mental health issues as key drivers of treatment non-adherence among PLHIV [21].

Reasons for Loss to Follow-Up

The reasons for LTFU were diverse, but several key themes emerged. Socioeconomic barriers, particularly *"financial constraints"* and *"work-related issues,"* were the most prominent. This is consistent with a 2018 systematic review which identified financial burden and work-related conflicts as major drivers of non-adherence and LTFU among PLHIV [22, 23].

The analysis of patient behaviour prior to the loss to follow-up (LTFU) event reveals that LTFU is frequently the culmination of a gradual disengagement process, rather than an abrupt incident. The majority of participants were already experiencing unstable engagement with the clinic, indicating that the path to dropping out is typically marked by prior adherence issues. Specifically, less than one-third of participants (27.6%) reported a *"Regular follow-up experience"* immediately before being lost. Conversely, the overwhelming majority were already struggling with adherence: 64.5% described their follow-up as *"Not very regular,"* and an additional 7.9% reported completely *"Irregular"* attendance. Collectively, over 72% of the participants exhibited compromised or inconsistent attendance patterns before they were formally classified as lost to care. The high percentage of participants who reported "*forgetting appointments"* and a "*lack of awareness"* about the risks of discontinuing ART highlights the importance of patient education and reminder systems. This finding is consistent with a study in South Africa highlighted that a lack of understanding of the lifelong nature of ART and a belief that medication is unnecessary when feeling physically well are major reasons for non-retention, directly mirroring the findings on *"lack of awareness" and "forgetting appointments"* in this documentation [15].

The documentation also confirmed the persistent role of *"stigma and discrimination,"* a well-documented barrier to care engagement in many countries, including Cambodia [24]. The finding that nearly half of the participants cited stigma is a powerful call for continued public health campaigns to reduce discrimination. The high proportion of individuals who received less than a 3-month supply of ART is a significant health systems-related barrier, as it increases the frequency of clinic visits and associated costs, potentially leading to LTFU. This issue has been addressed by some national programs through multi-month dispensing (MMD) to improve adherence [25].

Reasons for Return to Care and Effective Interventions

The factors facilitating a return to care provide a strategic framework for evidence-based interventions. Notably, the finding that state-sponsored social health protection—specifically the National Health Equity Fund (HEF) and the National Social Security Fund (NSSF)—serves as a primary driver of re-engagement underscores the efficacy of macro-level policy initiatives. Furthermore, the significant weight attributed to ART provider conduct and perceived clinical reliability suggests that the interpersonal quality of care is as vital to retention as clinical outcomes. To optimize long-term engagement, health administrators must prioritize the expansion of financial coverage alongside the institutionalization of patient-centered service standards.

Individual motivation, such as a *"fear of HIV progression or death",* was a strong personal driver for re-engagement, suggesting that health education emphasizing the long-term consequences of non-adherence is vital. The documentation also confirms the effectiveness of provider-led outreach, with SMS and phone calls being key drivers for return [26]. While home visits were less frequently cited, the high rate of agreement for future home visits (92.1%) indicates their potential utility and patient receptiveness to these more intensive interventions.

X. Limitation

While this documentation provides valuable insights, it is important to acknowledge its limitations:

Retrospective and Cross-Sectional Nature: The documentation relies on retrospective data and a cross-sectional design, which limits the ability to establish causality. The reported reasons for LTFU and return to care are based on participant recall, which may be subject to recall bias. It is possible that individuals may not accurately remember or may not wish to disclose the full reasons for their disengagement from care.

XI. Conclusion and recommendation

Conclusion

This documentation successfully identified the socio-demographic and clinical characteristics of PLHIV who were LTFU and returned to care. It also provided crucial insights into the barriers to sustained engagement and the facilitators of re-engagement. The findings highlight that LTFU is not a result of a single factor but a complex interplay of socioeconomic, personal, and systemic challenges. A key conclusion is that the reasons for return often mirror the solutions to the reasons for LTFU. The effectiveness of financial support, improved provider-patient relationships, and targeted outreach interventions, such as SMS and phone calls, is a testament to the power of a comprehensive, patient-centered approach. The data strongly suggest that addressing systemic barriers, such as providing multi-month dispensing and enhancing psychosocial support, alongside continued patient education and outreach, is paramount for improving ART retention rates.

Recommendations

Based on the findings of this documentation, the following recommendations are proposed to improve ART retention and facilitate the return to care for PLHIV who are LTFU:

Strengthen Socioeconomic and Policy Support: Advocate for and expand government financial assistance programs and social security funds for PLHIV to mitigate financial barriers to care. Implement policies that promote multi-month dispensing (MMD) of ART to reduce the frequency of clinic visits and associated costs.

Strengthen Prescribing and Dispensing Practices:

- **Prioritize Multi-Month Dispensing (MMD):** Healthcare leadership should **mandate** and monitor the scale-up of 3-to-6-month multi-month dispensing for all clinically stable patients. This practice is Nationally recognized as reducing clinic visits, improving adherence, and lowering LTFU rates.
- **Address Prescribing Capacity:** Investigate the underlying reasons for short dispensing periods (e.g., stock-outs, restrictive policies, or physician hesitation) and ensure proper training and drug supply chain management to facilitate routine MMD.
- ***Reinforce Dispensing Protocol Training:*** Provide continuous supportive supervision and training to pharmacy staff to ensure that they strictly adhere to doctor's orders regarding the quantity of medication dispensed, confirming that all patients receive the full amount prescribed, especially as **Multi-Month Dispensing (MMD)** scales up.

Standardize Early Intervention Protocols:

- **Deploy Telephonic Outreach*:*** Standardize a protocol for telephonic outreach and personalized appointment reminders for all patients flagged as High-Risk. This outreach should focus on empathetic inquiry into emerging barriers (e.g., work conflicts, transportation) before they escalate.
- **Strengthen Counselling Focus:** Ensure adherence counseling, especially for High-Risk patients, is focused not just on taking medication but on clinic attendance habits and logistical planning to maintain regularity.

Enhance Patient-Provider Communication and Relationships: Invest in training for healthcare providers to improve their communication skills and foster a patient-centered, non-judgmental approach. A focus on respectful and empathetic behaviour from providers can significantly enhance patient trust and motivation to stay in care.

Develop and Scale Up Targeted Outreach Programs: Implement a robust, multi-channel patient follow-up system that includes SMS and phone call reminders for appointments. Given the high receptiveness to home visits, develop a protocol for provider-led home visits for high-risk patients who have been LTFU for an extended period.

Address Stigma and Improve Health Literacy: Launch targeted public health campaigns to reduce HIV-related stigma and discrimination. At the clinic level, provide clear and simple education to patients about the importance of consistent ART adherence and the risks of discontinuation, which can combat a "lack of awareness" and empower patients to take ownership of their health.

Conduct Further Research: Future studies should explore the effectiveness of specific interventions, such as a pilot program for MMD or a structured psychological support program, on retention rates. Qualitative research could also provide a deeper understanding of the lived experiences of patients with comorbidities and the specific psychological factors affecting their adherence decisions.

XII. References

1. HIV.gov. *The Global HIV and AIDS Epidemic*. 2023 December 2, 2024; Available from: https://www.hiv.gov/hiv-basics/overview/data-and-trends/global-statistics.
2. WHO. *Guideline on when to start antiretroviral therapy and on pre-exposure prophylaxis for HIV.* 1 September 2015; Available from: https://www.who.int/publications/i/item/9789241509565.
3. WHO. *Global HIV Programme*. 2023; Available from: https://www.who.int/teams/global-hiv-hepatitis-and-stis-programmes/hiv/overview.
4. Gonzalo, T., M. García Goñi, and M.A. Muñoz-Fernández, *Socio-economic impact of antiretroviral treatment in HIV patients. An economic review of cost savings after introduction of HAART.* AIDS Rev, 2009. **11**(2): p. 79-90.
5. Nakagawa, F., M. May, and A. Phillips, *Life expectancy living with HIV: recent estimates and future implications.* Curr Opin Infect Dis, 2013. **26**(1): p. 17-25.
6. NCHADS. *Undetectable=Untransmittable is your key to a healthy and happy life if you are a person living with HIV.* 2021; Available from: https://www.nchads.gov.kh/wp-content/uploads/2024/07/UU-Campaign-Strategy-Printing-version.pdf.
7. NCHADS. *STANDARD OPERATING PROCEDURE FOR HIV SELF-TESTING IN CAMBODIA*. June, 2020; Available from: https://www.nchads.gov.kh/wp-content/ uploads/2023/11/HIVST-SoP_01JUL2020.pdf.
8. Granich, R., et al., *90-90-90 and ending AIDS: necessary and feasible.* Lancet, 2017. **390**(10092): p. 341-343.
9. WHO. *HIV/AIDS: Framework for action in the WHO African region*. 2022; Available from: https://www.afro.who.int/health-topics/hivaids.
10. Fuente-Soro, L., et al., *Loss to follow-up and opportunities for reengagement in HIV care in rural Mozambique: A prospective cohort study.* Medicine (Baltimore), 2020. **99**(20): p. e20236.
11. Shaimaa Elsfoury1, B.M., Muhammad S Pasha, *Community-led interventions to re-engage people living with HIV into care in Pakistan.* The Eastern Mediterranean Health Journal (EMHJ), 2024. **Volume 30 no. 11**(9).
12. NCHADS. *Standard Operating Procedure for Reengagement in Care of People Living with HIV* December, 2020; Available from: file:///C:/Users/hengp/Desktop/LTFU/SOP-Reengagement-in-Care-of-PLHIVs-EN.pdf.
13. Adelekan, B., et al., *Social barriers in accessing care by clients who returned to HIV care after transient loss to follow-up.* AIDS Res Ther, 2019. **16**(1): p. 17.
14. Sariah, A., et al., *Why did I stop? And why did I restart? Perspectives of women lost to follow-up in option B+ HIV care in Dar es Salaam, Tanzania.* BMC Public Health, 2019. **19**(1): p. 1172.
15. Modipane, M., L.B. Khoza, and K. Ingersoll, *Barriers Contributing to Loss to Follow-up among HIV-patients in Limpopo Province, South Africa: Patients' and Nurses' Perspectives.* 2023. **16**.

16. MacCarthy, S., et al., *"How am I going to live?": exploring barriers to ART adherence among adolescents and young adults living with HIV in Uganda.* BMC Public Health, 2018. **18**(1): p. 1158.

17. Nabaggala, M.S., et al., *Re-engagement in HIV care following a missed visit in rural Uganda.* BMC Research Notes, 2018. **11**(1): p. 762.

18. Berheto, T.M., D.B. Haile, and S. Mohammed, *Predictors of Loss to follow-up in Patients Living with HIV/AIDS after Initiation of Antiretroviral Therapy.* N Am J Med Sci, 2014. **6**(9): p. 453-9.

19. Odeny, B.M., et al., *The Stigma of Exclusive Breastfeeding Among Both HIV-Positive and HIV-Negative Women in Nairobi, Kenya.* Breastfeed Med, 2016. **11**(5): p. 252-8.

20. Agbaje, O.A., et al., *Socio-demographic factors associated with adherence to antiretroviral therapy among adults living with HIV/AIDS in Nigeria.* BMC Public Health, 2021.

21. Nyamukapa, N., et al., *Mental health and its association with adherence to antiretroviral therapy in people living with HIV in a South African setting.* PLOSOne, 2023.

22. Semaan, S.A., et al. , *Drivers of non-adherence to antiretroviral therapy among people living with HIV/AIDS: A systematic review.* AIDS and Behavior, 2018.

23. Matimbwa, H., et al., *Factors Contributing to Retention in Care and Treatment Adherence Among People Living With HIV Returning to Care in South-Eastern Tanzania: A Qualitative Study.* HIV AIDS (Auckl), 2025. **17**: p. 39-57.

24. Yi, S., et al., *AIDS-related stigma and mental disorders among people living with HIV: a cross-sectional study in Cambodia.* PLoS One, 2015. **10**(3): p. e0121461.

25. Tshabalala, G., et al. , *Multi-month dispensing of antiretroviral treatment to improve adherence and reduce loss to follow-up: A systematic review and meta-analysis.* Journal of Acquired Immune Deficiency Syndromes, 2020.

26. Saadick, S.M., et al., *Return to care of children and adolescents living with HIV who missed their clinic visits or were lost to follow-up: a continuous quality improvement study in Uganda.* BMJ Open Qual, 2025. **14**(2).