

**ADDIS ABABA UNIVERSITY**  
**COLLEGE OF HEALTH SCIENCES**  
**SCHOOL OF NURSING AND MIDWIFERY**  
**POSTGRADUATE PROGRAM**

**LOSS TO FOLLOW-UP AND ITS PREDICTORS AMONG  
ADULT HIV PATIENTS ON RAPID INITIATION OF ANTI  
RETROVIRAL TREATMENT IN SELECTED  
GOVERNMENTAL HOSPITALS, SOUTHWEST ETHIOPIA,  
2019**

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A THESIS TO BE SUBMITTED TO NURSING DEPARTMENT,  
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SCIENCE IN ADULT HEALTH NURSING

**JUNE 2019**

**ADDIS ABABA, ETHIOPIA**

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**JUNE 2019**

**ADDIS ABABA, ETHIOPIA**

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## Abbreviations & Acronyms

AHR	Adjusted hazard ratio
BMI	Body Mass Index
CI	Confidence Interval
CPT	Cotrimoxazole Preventive Therapy
EPHI	Ethiopian Public Health Institute
ESA	Eastern and southern Africa
FHAPCO	Ethiopian Federal HIV/AIDS Prevention and Control Office
FMOH	Ethiopian Federal Ministry of Health
GSGH	Gebretsadik Shawo General Hospital
IPT	Isoniazid Preventive Therapy
LTFU	Loss to Follow Up
MTUTH	Mizan-Teppi University Teaching Hospital
OIs	Opportunistic Infections
PEPFAR	United States President's Emergency Plan for AIDS Relief
PLHIV	Peoples Living With HIV/AIDS
SNNPR	Southern Nation Nationalities Peoples Region
SPSS	Statistical Package for Social Sciences
SSA	Sub-Saharan country

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## Abstract

**Background:** Currently, lifelong anti-retroviral treatment were given for people living with HIV without considering their CD4 cell counts & WHO clinical staging in most countries of the World including Ethiopia. Even if there were no sufficient evidence on loss to follow up after the implementation of rapid initiation of anti retroviral treatment in Ethiopia, studies showed that rapid initiation of ART will increase the risk of loss to follow up especially in low level income countries.

**Objective:** The aim of this study was to assess loss to follow up and its predictors among adult HIV infected patients on rapid initiation of anti retroviral treatment in Gebretsadik Shawo General Hospital and Mizan-Tepi University Teaching Hospital.

**Methods:** Retrospective cohort study design was used to assess loss to follow up and its predictors among adult HIV infected patients on rapid initiation of anti retroviral treatment in Gebretsadik Shawo General Hospital and Mizan-Tepi University Teaching Hospital from October 2017 to December 31, 2018. A total of 318 patients card were retrieved by using checklists developed to assess loss to follow up from anti retroviral therapy clinics. Data were collected from March 20 through April 15, 2019, entered into Epi data 3.1 and exported to statistical package for social sciences (SPSS) version 24. Kaplan–Meier curve and log-rank test were used to compare survival experiences. Cox-regression was used to identify the predictors of loss to follow up at  $p \leq 0.05$ .

**Result:** All the 318 patients were followed for 2662 person-months and the overall incidence rate of loss to follow up were 3.5 per 100 person months (95% CI: 2.8, 4.2). Being male sex (AHR =4.33; 95%CI: 2.22, 8.43), unknown IPT status (AHR=5.49; 95%CI: 1.46, 20.59), not received IPT history (AHR=2.42; 95% CI: 1.49, 3.91), bedridden functional status (AHR=5.049; 95% CI: 2.34, 10.87) and non disclosures (AHR=2.28; 95% CI: 1.35, 3.83) were identified as independent predictors of time to LTFU.

**Conclusion:** high proportion of loss to follow up was recorded especially on the same day treatment. Therefore, proper counseling and tracing mechanisms were recommended for highly risky patients for loss to follow up.

**Keywords:** Rapid initiation of ART, Loss to follow up, Southwest Ethiopia.

# CHAPTER 1: INTRODUCTION

## 1.1 Background

HIV/AIDS remains a major public health problem across all continents causing the death of millions of peoples since the start of epidemic. Around 35.1 million adults people were living with HIV (PLHIV) globally by the end of 2017 (1). From this 66% of the total PLHIV in the World found in Eastern and southern African (ESA) regions including Ethiopia. AIDS-related death among adults in the World accounts 830 000 (590 000–1.2 million) at end of 2017 (2,3). The most causes of deaths were due to loss to follow up from ART clinics especially in African countries (4).

Globally, there was great struggle to end epidemics of HIV infection. In 2014 UNAIDS launched new targets named as 90-90-90 to help end AIDS epidemic which in turn prevents spread of HIV infection, HIV related illnesses and death in the World. In addition to this, WHO developed “Test and Treat for All” strategy which calls all people who tested positive for HIV to receive immediate treatment since 2015. This strategy focuses on rapidly treating all people who are conformed to HIV diagnosis irrespective of their CD4 count and WHO clinical stage. After one year development of treat for all guideline 18.2 million PLHIV gets rapid initiation ART and recently only 62% of PLHIV are on ART in the World (5). However, UNAIDS and WHO estimate that full implementation of both strategy will prevent 21 million people from dying and 28 million people from acquiring HIV infection by 2030 (6,7).

In Ethiopia, HIV has been recognized as major public health problem around a half a century ago. The country developed different efforts to control the spread of the infection. In 2003 fee based and in 2005 free ART was introduced. Similarly Ethiopia adopted WHO rapid initiation of ART policy since 2016 and after one year of adoption started to implement it (6,8). In addition to these, Ethiopia also follows UNAIDS 90-90-90 targets of 2020 to eliminate HIV epidemics by 2030. To achieve these both global HIV elimination strategies Ethiopia performed the following activities. ART delivery has been decentralized from high-burden hospitals to health centers. Currently about 1,117 health facilities (health centers and hospitals) are providing ART services in all regions of the country (9).

In order to achieve the global HIV elimination strategy and to maximize the individual and population level benefits of HIV treatment, it is essential that people on ART are retained in care by decreasing LTFU and properly adhere to the treatment. This study assessed LTFU and their predictors among adult HIV patients on ART after implementation of rapid initiation of treatment in GSGH and MTUTH.

## 1.2 Statement of the problem

The loss to follow up among HIV positive adults are a leading cause of morbidity, mortality, drug resistance, hospitalization and transfer of virus to uninfected sexual partners. In the ESA countries including Ethiopia HIV positive clients who were LTFU visits have increased the risk of opportunistic infections (OIs) due to high viral load and low CD4 count which causes the death of people with HIV/AIDS (6,10). It has also social, economic and political crisis as consequences. The common consequences are stigma, high susceptibility to other co-morbidities like mental disorders, cost for care, increased number of orphans and decreased productivity due to decreased immunity and absence from work place (11).

ART was given for the treatment and prevention purposes. It significantly reduced mortality and improved life expectancy of HIV-infected patients, and it also reduces the risk of transmitting the virus to their uninfected sexual partner up to 96% (12). However, the levels of LTFU among adults from ART increased throughout the time from 11.9% in 2004 to 24.5% in 2014 and urgent attention were needed to decrease the level of these burden (13). To tackle this big global issue WHO developed rapid initiation of ART policy and most of the countries including low level income countries (LIC) adopted to implement it. After the implementation of this guideline, studies showed that there were improved quality life of PLHIV, but LTFU from ART was increased in the first six months due to insufficient time to disclosure their status, un able to accept the condition and fear of drug adherence (14).

In Ethiopia, the national ART coverage for adult PLHIV were high (76%) compared with other ESA countries (68.6%) (2). But, patients who are initiated on ART do not adhere to treatment or remain in care. Evidence shows that more than 25% of patients LTFU after initiation of ART in Ethiopia. Large differences in the proportion of LTFU have been reported, ranging from 9.8% up to 31.4% in different parts of the country. It was high in hospitals than health centers and high in rural than urban setting. (15–18). The prevalence of LTFU in south nation nationalities and peoples regional state (SNNPR) after initiation of ART accounts 10.6% (19) and study showed that LTFU in south west Ethiopia was higher than regional level figure (20).

Currently Ethiopia expanding HIV care and treatment programmes to improve quality life of PLHIV by implementing UNAIDS 90 -90-90 targets and WHO rapid initiation of ART policy to end HIV epidemic. Almost all sectors in the country were participating and massive resources had been used to implement it. Beside of these all efforts the incidence & prevalence of HIV infection among adults increased dramatically within a few years recently (15,17).

Sustainable effort and up to date evidences particularly on LTFU and predictors after rapid initiation of ART are crucial. As new HIV infections are still occurring and spreading in the country, there is a great need to identify innovative strategies to prevent new infections and improve the quality of life to people who are infected with HIV. Available studies which assess the incidence and predictors of LTFU among adults HIV infected patients doesn't cover LTFU from ART after rapid initiation of treatment.

To date there is no published study in the country on LTFU after rapid initiation of treatment among adult patients on ART. The study area was also immediate nearest to Gambella region which was among regions with higher HIV infection in Ethiopia and from where also HIV patients come to the study area to get the care.

Therefore, this study was conducted to assess LTFU and predictors among adult patients on rapid initiation of ART treatment in GSGH & MTUTH, Southwest Ethiopia, 2019

### **1.3 Significance of the study**

Evidence on LTFU and predictors are one of the indicators for giving quality care to HIV infected patients. So, identifying predictors of loss to follow up among patients on rapid initiation of ART treatment helps health care providers to give effective care to the patient and it also gives ways to increase retention in care.

Finding from this study will have its own contribution for evidence-based intervention on rapid initiation of ART for HIV infected patients to achieve UNAIDS 90-90-90 targets by 2020 to eliminate HIV from World by 2030.

It provides information to stake holders and program planners to develop treatment strategies and to evaluate existing treatment program.

The study will also add relevant knowledge to the scientific community and fill the research gap of the study area to this particular issue.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.1 General over view**

To improve the achievement of ART program, WHO developed rapid initiation of ART treatment which was started to implementation since 2016. The main aims of introduction of rapid initiation of treatment were to improve quality life of PLHIV, to eliminate HIV infection and to increase retention on ART. But systematic review conducted on risks and benefits of rapid initiation of ART shows that there was an increased high risk of LTFU at six months of follow up specially peoples living in low level income countries. (RR 1.85, 95% CI 0.96–3.55) (14).

Another studies conducted in different parts of African countries shows that rapid initiation of ART improves the quality life PLHIV and decrease mortality rate by increasing CD4 cell count and suppressing viral loads (21–24).

### **2.2 Literature review on Loss to Follow Up**

Many HIV positive patients have benefited from ART. But still some patients did not continue with follow up visit for treatment schedules, and these results in the programme to fail to attain its goal of no death due to HIV/AIDS. Based on retrospective study conducted from 48 countries globally, 20% of patients were LTFU from ART clinic after one year of treatment which is higher than WHO recommended target (15%) (13). This figure were doubled in Sub Saharan African (SSA) region and loss to follow up were the commonest cause of death for PLHIV in the region (11,25). In similar way study conducted in Kenya showed that the incidence of LTFU among adult patients on ART were 52.9 per 100 person-years (PY) and 405 per 1000 PY in South Africa (26,27).

According to systematic review conducted in Ethiopia showed that 25% LTFU occurred among adult patients after initiation of ART at national level and the proportion were different in different regions of the country, and it accounts 10.3% in SNNPR (17,19). Different retrospective cohort studies conducted in different hospitals of the country shows that the incidence rates of LTFU among adult HIV infected patients after initiation of ART varies.

Accordingly, study conducted in Pawi General Hospital shows 11.6 per 100 adult-years and Karamara general hospital in Jijiga town shows 26.6% per 100 person months (28,29).

Even if, Ethiopia follows UNAIDS 90-90-90 targets and implementing rapid initiation of ART of WHO recommendation which targets to eliminate HIV infection currently the incidence of HIV increased rapidly within the few years (6,15,18).

### **2.3 Factors associated with LTFU among adult patients on ART**

Different studies at different area revealed variable findings in some extent. Determinant factors include socio-demographic, economic, clinical and behavioral are common factors.

#### **2.3.1 Socio-Demography factors**

Socio-demographic factors affect LTFU among adult HIV infected patients on ART. Based on different studies conducted in different parts of the world shows young age groups are higher risk to LTFU than old ages. Accordingly, study conducted in South Africa shows that those aged 18–35 were two times higher risk than age over 45 yrs and study conducted in Australia showed that younger age (15-25 years) had three times risk for LTFU than age above 55 years (30,31). Similarly, study at Pawi General Hospital shows that adults over 45 years of age category lowered with the risk of LTFU by 56% (HR = 0.44; 95% CI 0.24– 0.83) compared to those aged 15–28 years and study conducted in Oromia regional state shows that younger age group (15–24 years) were about 19 times higher risk than age above 55 yrs (AOR, 19.82; 95% CI: 6.80, 57.73) (29,32).

According to various studies conducted in different hospitals of Ethiopia showed that being a male sex had two and more folds higher risks to LTFU than female for LTFU among HIV infected patients after initiation of ART (18,28,32,33).

According to a case-control study conducted in Saudi Arabia unmarried patients had 3 times more LTFU than married patients, illiterate had three times higher risk for LTFU than secondary education and five times higher risk for LTFU than university education among adult patients on ART (34).

As systematic review study conducted in Ethiopia, unmarried had 1.5 times higher than married (OR = 1.4, 95%CI: 1.1–1.8), no literacy status had 1.5 times higher risk than literates (OR = 1.5, 95%CI: 1.1–2.1) and rural dwellings had two times higher risk for LTFU than urban among adults after initiation of ART.(OR = 2.1, 95%CI: 1.5–2.7,  $I^2 = 60\%$ ) (17).

As indicated in cohort study for eight years in South Africa, being self-employed had 14 times higher risk for LTFU than governmental employee (HR=13.92, 95 % CI: 2.81-69.06) (26).

### **2.3.2 Clinical and treatment factors**

A study conducted in Kenya shows that history of a current or past opportunistic infections (OIs) had 1.15 times higher risk for adult patients LTFU (  $p < 0.0284$ : 95%, CI:1.02–1.30) (35).

In Ethiopia, different studies show that LTFU among HIV positive patients has related with various patients' treatment and clinical factors. Accordingly, systematic review study conducted Ethiopia shows that the risk of discontinuation from ART among adult bedridden patients was two times higher when compared to the risk among working or ambulatory status (OR = 2.3, 95%CI: 1.5–3.4,  $I^2 = 37\%$ ), but discontinuation is not different by the history of CPT usage (Cotrimoxazole prophylaxis therapy or opportunistic infections prophylaxis) (17).

Another retrospective cohort study conducted in seven hospitals of Ethiopia shows ambulatory and bedridden patients had two times more risk for LTFU in ART than working patients (OR: 2.37; 95% CI: 1.54 -3.63), those patients with TB had two times higher risk for LTFU than TB negatives patients (OR: 1.97; 95% CI: 1.37 to 2.84), patients with WHO clinical stage III/IV had higher risk to LTFU in ART compared to those with WHO stage I/II (OR: 1.79; 95% CI: 1.21-2.37) and the odds of LTFU was double for patients who started ART with CD4 count < 50 cells/ $\mu$ l compared to those with >200 cells/ $\mu$ l (OR: 2.32; 95% CI: 1.28 to 4.19) (18).

Another case-control study conducted in Oromia regional state shows that those patients with baseline CD4 count of fewer than 350 cells/mL were two times more likely to be LTFU from

ART (AOR, 2.06; 95% CI: 1.36, 3.13) and those patients with WHO clinical stage IV had two times more risk to LTFU than WHO clinical stage I & II (AOR, 2.29; 95% CI: 1.45, 3.62), those patients with no history of Isoniazid prophylaxis therapy (IPT) were three times more likely to be LTFU from ART (AOR, 2.83; 95% CI: 1.91, 4.21) and those patients who were on TDF+3TC+EFV were about two times more likely to be LTFU from ART than those patients on AZT+3TC+NVP (AOR, 1.58; 95% CI: 1.02, 2.44) (32). Based on study conducted at Pawi hospital showed that patients with IPT status reduces the risk of LTFU from ART up to 89% as compared to their counterparts (HR = 0.11; 95% CI 0.06–0.18) (29).

### **2.3.3 Behavioral related factors**

#### **Disclosure status & HIV positive family member**

As indicated in the study conducted in South Africa, those patients with not disclosure status to their partner had three times more risk for LTFU from ART than who disclosed status with (AHR =2.88, 95 % CI 1.19-6.97) (26). Systematic review study conducted in Ethiopia shows that those patients with HIV positive family member was less risk for LTFU than their counterparts (OR = 0.4, 95%CI: 0.3–0.6,  $I^2 = 69%$ ) (17).

Based on study conducted in SNNPR, history of non-disclosure to their family had two times more likely to LTFU from ART and similar study conducted in Jijiga town also shows that clients who did not disclose their HIV/AIDS status were three times more likely risk for LTFU from the treatment program as compared to their counterparts (AHR: 2.8, 95% CI:2.22–5.23) (19,28).

In summary the finding regarding loss to follow up among HIV infected patients was diversified as indicated in studies conducted in different part of the world. Both the highest (31.4%) and lowest (9.8%) proportion of LTFU occurred in Ethiopia as literatures notified. Some of the associated factors include: being aged between 15 -30 years, having bed ridden functional status, low CD4 count, non exposure to IPT, being male sex and advanced WHO clinical stages.

## 2.4 Conceptual framework

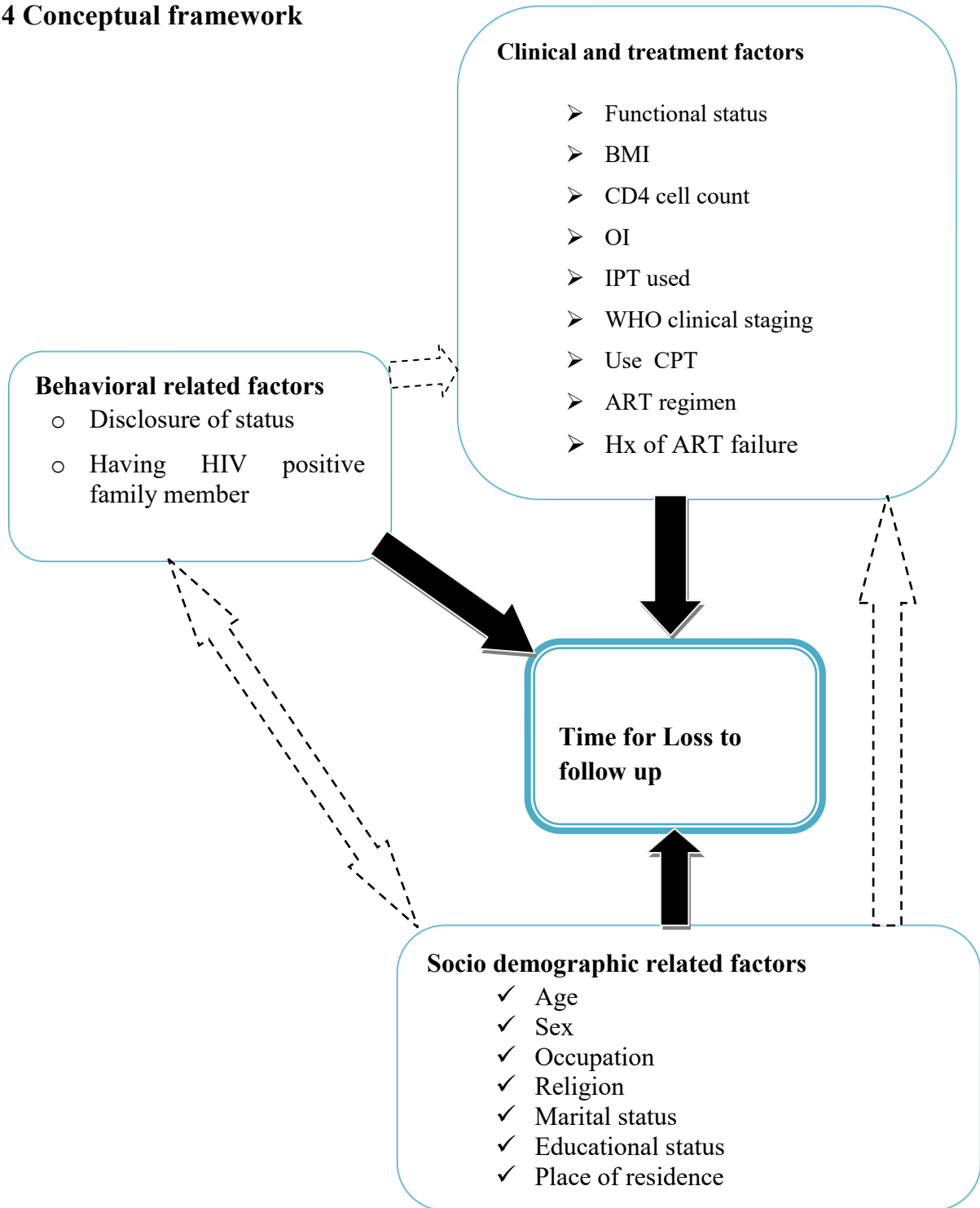


Figure 1: Conceptual framework of predictors of LTFU among adult patients on ART, developed after reviewing literature (14,26,29,33,36).

## **CHAPTER 3: OBJECTIVES**

### **3.1 General objective**

To determine loss to follow up and predictors among HIV infected adult patients on rapid initiation of ART treatment in Gebretsadik Shawo General Hospital and Mizan-Tepi University Teaching Hospital, Southwest Ethiopia, 2019

### **3.2 Specific objectives**

- ✚ To determine loss to follow up among adult HIV infected patients on rapid initiation of ART treatment.
- ✚ To identify predictors of loss to follow up among adult HIV infected patients on rapid initiation of ART treatment.

## **CHAPTER 4: METHODS AND MATERIALS**

### **4.1 Study area and study period**

This study was conducted in governmental hospitals of Kaffa zone and Bench Maji zone, namely Gebretsadik Shawo General Hospital (GSGH) and Mizan Teppi University Teaching Hospital (MTUTH) respectively.

GSGH is found in Kaffa zone Bonga town in SNNPR State, 449 Km away from Addis Ababa the capital city of the Ethiopia. The hospital had more than 212 clinical and 188 paramedical staffs. Currently four public health officers, one BSc nurse, four adherence supporters and two information technologists were serving together in ART clinic. This hospital was the only general hospital giving service for the Kaffa zone peoples and partly for peoples from Sheka zone.

MTUTH was also located in Bench Maji zone Mizan-Aman sub-city in SNNPR state which is 593 km to south-west of Addis Ababa, capital city of the country. The hospital had more than four hundred clinical staffs and more than five hundred supporting staffs. Currently one general practitioner, five public health officers, five clinical nurses, five adherence supporters and two information technologists were serving together in ART clinic. This hospital was serving as referral hospital for Bench Maji zone and partly for Kaffa, Sheka and Majang (Gambella region) zones.

In both hospitals, ART clinic is one of the service areas among different case teams found in the hospital. For every patient who started ART, his/her all information was kept both in computerized format and in national registers in addition to patient card and ART intake forms. Both hospitals had high patient flow in ART clinic and due to this the hospitals were selected as the study area. Patients enrolled to care from November 2017 to December 31 2018 were included.

## **4.2 Study design**

A retrospective cohort study design was used to assess LTFU and predictors among adult HIV adult patients on rapid initiation of ART treatment.

## **4.3 Population**

### **4.3.1 Source population**

All adult (age  $\geq 15$  yrs) HIV patients on ART receiving care from GSGH & MTUTH.

### **4.3.2 Study population**

All adult HIV patients on ART who received care from GSGH and MTUTH from October 2017 to December 2018, and fulfill inclusion criteria.

## **4.4 Eligibility criteria**

### **4.4.1 Inclusion criteria**

Age  $\geq 15$  years and at least one follow up.

Diagnosed for HIV & started ART from October 2017 to December 31 2018.

### **4.4.2 Exclusion criteria**

Incomplete registries, pregnant mothers, initiation of ART more than two weeks of HIV diagnosis and transfer in from other health facility will be excluded.

## 4.5 Sample size determination and sampling technique

### 4.5.1 Sample size determination

Sample size for two objectives was calculated by considering the study conducted in Jijiga town Karamara General Hospital in Eastern Ethiopia on “Predictors of loss to follow up among adult clients attending antiretroviral treatment.” In this study, the overall incidence of loss to follow up was reported 26.6 per 100 person months (28). For the first objective (incidence rate of LTFU), single mean population formula was used by the parameters of margin of error of 0.5 with 95% confidence interval. For the second objective the sample size was calculated by considering the common independent predictors of LTFU in different studies. For this study the independent predictors was also taken from the above study and calculated as the following by considering the parameters of power 80% and 95% confidence interval by using EPI info Version 7.2.2 (CDC Atlanta, USA).

Table 1: Sample size calculated based on objectives in GSGH and MTUTH, February 2019

Objective	Proportion	Calculated sample Size
Incidence of LTFU	incidence rate of LTFU was 26.6 % per 100 person months in Karamara General Hospital	296
	Male sex LTFU (65.8%) to Not LTFU (34.2%)	90
Significant Predictors	Next appointment recorded properly (17.4%) to not recorded properly (6.6%)	318
	Status disclosed to any one (7.0%) to not disclosed to any one (56.8%)	66

The maximum sample size was 318.

The sample size was proportionally allocated to the hospitals based on their source of population. Therefore, 212 patients card was retrieved from MTUTH and 106 patients card was retrieved from GSGH.

#### 4.5.2 Sampling procedure

Simple random sampling technique was employed. First, ART unique number of eligible subjects was listed and taken as sampling frame. Then the sampling frame was entered to SPSS and the required sample size was selected randomly by using select case procedure. Among the total 687 cases registered during the study period, 573 were eligible based on inclusion criteria and of which the total sample of 318 were included in this study (Fig. 2).

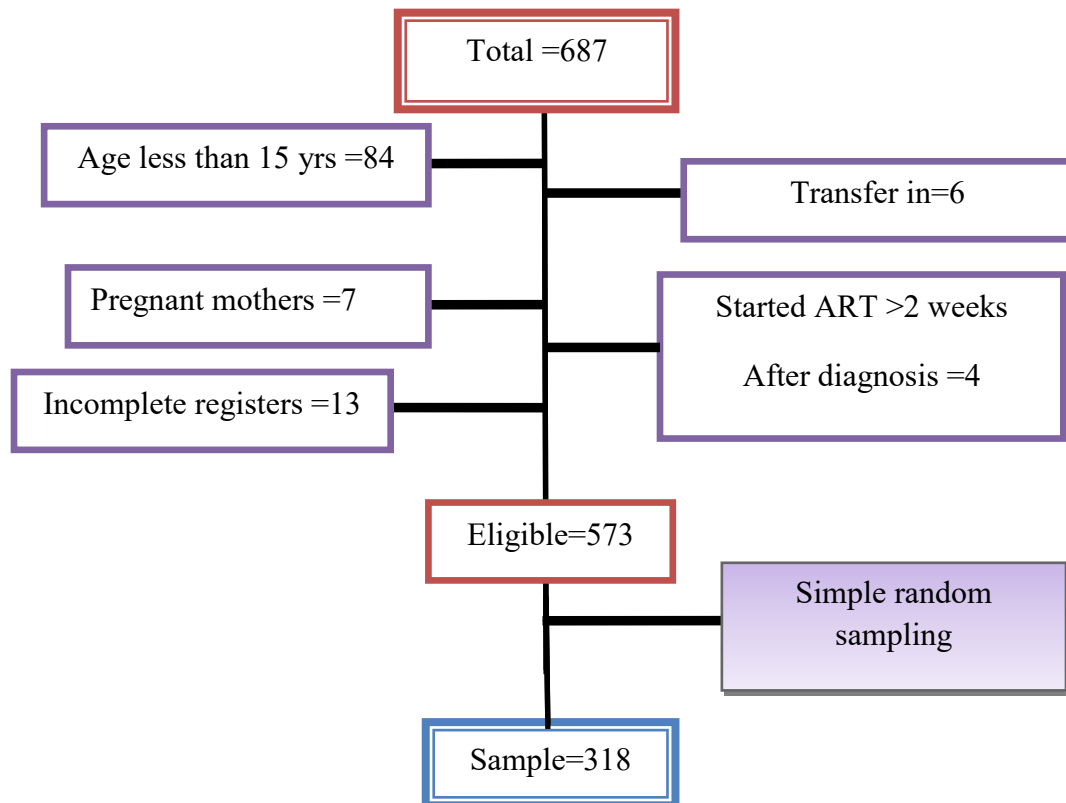


Figure 2: Schematic presentation of sampling procedure for LTFU and its predictors among adult patients on rapid initiation of ART in MTUTH & BGS GH, South West Ethiopia, October 2017- December 2018

## 4.6 Study variables

### 4.6.1. Dependent variable

- ❖ Time for Loss to follow up (LTFU)

### 4.6.2. Independent variables

#### ❖ Socio demographic and economic factors

- ✚ Sex

- ✚ Age

- ✚ Educational status

- ✚ Marital status

- ✚ Occupation

- ✚ Religion

- ✚ Place of residence

#### ❖ Clinical and treatment factors

- ✓ Functional status

- ✓ BMI

- ✓ CD4 count

- ✓ Opportunistic infection (OI)

- ✓ Use of Cotrimoxazole (CTX)

- ✓ WHO clinical stage

- ✓ ART Drug regimen

- ✓ HX of ART failure

- ✓ Use Isoniazid prophylaxis therapy (IPT)

#### ❖ Behavioral related factors

- ✚ Disclosure of status

- ✚ Having HIV positive family member

## **4.7 Data collection and its procedures**

### **4.7.1 Data collection**

Data abstraction tool or checklists was prepared by reviewing different literatures, ART registration book and intake forms, reporting formats and patient monitoring formats employed by the Federal ministry of health of Ethiopia. Initially, ART registers was used to identify the eligible patients of interest. Then, using the unique ART number from the register, other patient data that was not available on the register was retrieved from other formats, i.e, the patient follow-up form, the patient intake and monitoring formats.

### **4.7.2 Data collection procedures**

The purpose of the research was briefed to the administrative body of the GSGH and MTUTH, using co-operation letter from the ethical clearance committee of the school of Nursing and Midwifery, Addis Ababa University. Having permission to proceed, data collectors and supervisor with professional qualification of BSc nurse and public health officer respectively, with background of trainings on ART was selected and given training by the principal investigator for two consecutive days. The content of the training included the purpose of the study, which data should be extracted how and from what, how to ensure the confidentiality issue and the role of investigator, supervisor and data collectors. Data were collected from March 20 through April 15, 2019.

### **4.7.3 Data quality management**

For the assurance of data quality, 10% (32) of pre- test was performed to check the validity of data collection tool in MTUTH before the actual data collection period. Training was also given for data collectors and supervisors. Continuous and supportive supervision was given. Both the supervisor and principal investigator checked the completeness and consistency of collected data on daily basis. For additional better data quality management data was entered to Epi data 3.1 by preparing double entry verification.

## 4.8 Operational definitions

**Event** – Time for Loss to follow up

**Rapid initiation-** initiating of ART for peoples with HIV infection after diagnosis conformed without considering CD4 count and WHO clinical staging within two weeks of diagnosis if there is no clear contra indication (14).

**Censored** -patient doesn't developed the event (patients on follow up, transfer out, death)

**Loss to follow up** - the patient fails to visit ART clinics more than 90 days after the last appointment date by the Gregorian calendar and have not classified as “dead” or “transferring out” (37).

Patient status of “working” if daily activities of PLHIV were not altered due to illness, “ambulatory” if the patient was not fully working but was able to do minor tasks at home, and “bedridden” when the patient remained in bed most of the time (19).

**Incomplete registries-** patients with incomplete data on both electronic and paper based formats like HIV diagnosis date, ART starting date, and CD4 count.

**Transfer out-** is an official transferring of the patient to another ART clinic within or outside a catchment area (16).

**Death** - patients whose deaths were recorded on the medical files (28).

**Urban-** place where assigned as sub-city by the mayor office.

**Rural-** place where out of the assigned sub-city.

**Body mass index (BMI):** is a measure of body fat based on height and weight, and applied for adult person. Can be calculated as mass divided by square of body height.

Not malnourished ( $BMI > 18.5 \text{ kg/m}^2$ ), malnutrition ( $BMI \leq 18.5 \text{ kg/m}^2$ ) (38).

**Opportunistic infections (OIs):** is an infection occurs more frequently and sever in individuals with weakened immune system (39).

## **4.9 Data entry, processing and analysis**

Collected data was entered into Epi data 3.1 after coding and checking for completeness and consistency; and exported to Statistical Package for Social Sciences (SPSS) version 24 for analysis. Descriptive statistics like Mean, Median, frequency and percentage (%) and Analytics statistics like hazard ratio (HR) at 95%, confidence interval (CI) was calculated. Person-months of follow up was also calculated by assessing the date of enrollment for ART and lost follow up or censoring (death, transfer out or on care) at the end of study.

The incidence of LTFU was estimated and magnitude of LTFU among different groups of study subjects was compared by Log rank test.

A variable which was significant at P-value ( $P \leq 0.25$ ) in the bi variable analysis was selected as a candidate for multivariable Cox proportion hazard regression model. Kaplan-Meier survival method was used for comparison of survival curves for LTFU of PLHIV on rapid initiation of ART and was tested by Log rank test for significance difference of the curve. Multivariable Cox Regression Analysis was used to estimate the predictors by controlling confounding factors. A variable having P-value ( $P \leq 0.05$ ) in the final model was considered as a statistically significant. The model fitness test was checked by Cox-snell residual plot. Finally, the results were reported using text, tables and graphs.

## **4.10 Ethical consideration**

The ethical clearance was obtained from institutional review board of school of nursing and midwifery, Addis Ababa University. Support letter was obtained from school of Nursing and Midwifery of Addis Ababa University and given to GSGH and MTUTH clinical officer. Confidentiality was assured by using of data collector and supervisors working in ART clinics, also daily collected data was kept in locked cabinets until its final safe removal and data was entered to a password-protected computer. In addition, patients' identifiers (medical registration number and ART unique number) were replaced by new identification number during data entry.

#### **4.11 Dissemination of results**

Findings of this study will be disseminated to Addis Ababa University, school of Nursing and Midwifery, Kaffa zone and Bench Maji zone health department, GSGH and MTUTH. It was also will be presented to the scientific community of Addis Ababa University. In addition, the effort will be made to present it in various seminars and workshops and for publication on the peer-reviewed reputable journal.

## **CHAPTER 5: RESULT**

### **5.1 Baseline socio-demographic characteristics**

Records of 318 HIV positive adult patients started ART between October 2017 and December 2018 were included in the study from both hospitals (212 and 106 from MTUTH and GSGH respectively). The mean age of the participants was 28.6years (SD=8.47) and majority of them 182(57.2%) were found in age category of 15-28 years. Majority of the study participants were females 177(55.7%), married 176(55.3%) and had primary educational status 130(40.9%). Regarding to the occupation, 92(28.9%) and 52(16.4%) of the study participants were house wives and daily labor workers respectively. Majority of the study participant 188 (59.1%) live in urban area (table 2).

Table 2: Base line socio demographic characteristics of study subjects in MTUTH & GSGH, South West Ethiopia, October 2017- December 2018.

Socio demographic Characteristics (N=318)	Survival status		
	Censored N <sup>o</sup>	Event(LTFU) N <sup>o</sup>	Total N <sup>o</sup> (%)
Name of Hospital			
MTUTH	139	73	212(66.7%)
GSGH	87	19	106(33.3)
Sex			
Male	83	58	141(44.3%)
Female	43	34	177(55.7%)
Age categories in years			
15-28	124	58	182(57.2%)
29-34	41	16	57(17.9%)
35-44	47	18	65(20.4%)
≥45	14	0	14(4.4%)
Occupational status			
Daily labor worker	30	22	52(16.4%)
Farmer	24	5	29(9.1%)
Merchant	38	16	54(17%)
House wife	68	24	92(28.9%)
Gov't employed	23	8	31(9.7%)
Private org. employed	14	5	19(6%)
Student	21	7	28(8.8%)
Others	8	5	13(4.1%)
Marital background			
Never married	50	33	83(26.1%)
Married	137	39	176(55.3%)
Divorced & Widowed	39	19	59(18.6%)
Educational background			
No formal education	47	28	75(23.6%)
Primary (1-8)	103	29	132(41.5%)
Secondary (9-12)	44	24	68(21.4%)
College/university	32	11	43(13.5%)
Residence			
Urban	137	51	188(59.1%)
Rural	89	41	130(40.9%)

## **5.2 Base line clinical and treatment characteristics of study participants**

Majority of the study participants, 257 (80.8%) were started ART on the same day of their HIV diagnosis and nearly half 166 (52.2%) of the patients started ART with their CD4 cell count greater than 500 cells/mm<sup>3</sup>. Significant proportion of the patients 158 (59.7%) were on WHO clinical stage one and 215 (67.5%) patients were their BMI greater than 18.5 kg/m<sup>2</sup>.

Majority of the patients 274 (86.16%) were taking TDF+3TC+EFV based ART combination treatment and extremely high proportion of the study participants 311 (97.8%) had no history of ART failure. The history of Isoniazied prophylaxis therapy (IPT) use were about 192 (60.4%) and high proportion of the study participants 237 (67.5%) were working functional status. Table 3

Table 3: Clinical characteristics of study participants in MTUTH & GSGH, South West Ethiopia, October 2017- December 2018

Baseline characteristics (N=318)		<u>Survival status</u>		
		<u>Censored</u> N <sup>o</sup>	<u>Event(LTFU)</u> N <sup>o</sup>	<u>Total</u> N <sup>o</sup> (%)
ART initiation day	On the same day	182	75	257(80.8%)
	Within 2 weeks	44	17	61(19.2%)
Isoniazid prophylaxis therapy (IPT)	Not received	64	54	118(37.1%)
	Received	155	32	187(58.8%)
	Unknown	7	6	13(4.08%)
Cotrimoxazole prophylaxis therapy	Not receiving	111	41	152(47.8%)
	Receiving	106	45	151(47.7%)
	Unknown	9	6	15(4.7%)
Opportunistic infections (OI)	No OI	141	53	194(61%)
	Have OI	85	39	124(39%)
	AZT+3TC+NVP	7	6	13(4.08%)
ART regimen	AZT+3TC+EFV	10	9	19(6%)
	TDF+3TC+EFV	205	69	274(86.16%)
	Other	6	6	12(3.8%)
Functionality status	Working	190	47	237(74.5%)
	Ambulatory	28	27	55(17.3%)
	Bed Ridden	8	18	26(8.2%)
BMI category	≤ 18.5	60	43	103(32.4%)
	>18.5	166	49	215(67.6%)
WHO clinical stage	Stage I	129	29	158(49.7%)
	Stage II	38	11	49(15.4%)
	Stage III	53	43	96(30.2%)
	Stage IV	6	9	15(4.7%)
History of ART failure	No	223	88	311(97.8%)
	Yes	3	4	7(2.2%)
CD4 cell count (cells/mm <sup>3</sup> )	≤500 cells/mm <sup>3</sup>	97	55	152(47.8%)
	>500 cells/mm <sup>3</sup>	129	37	166(52.2%)

### **5.3 Behavioral related characteristics of study participants**

From the total study participants included in the study about 229(72%) disclosed their status to anyone and about 97(30.5%) study participants had HIV/AIDS positive family members.

### **5.4 Survival status of the study participants**

Three hundred eighteen participants were followed for total of 2662 person moths. There were 92(28.9%) of LTFU. The remaining 216(67.9%) were censored at the end of the follow up period.

Figure 3: The outcomes of HIV infected adult patients on rapid initiation of ART in MTUTH & GSGH, Oct 2017-Dec 2018

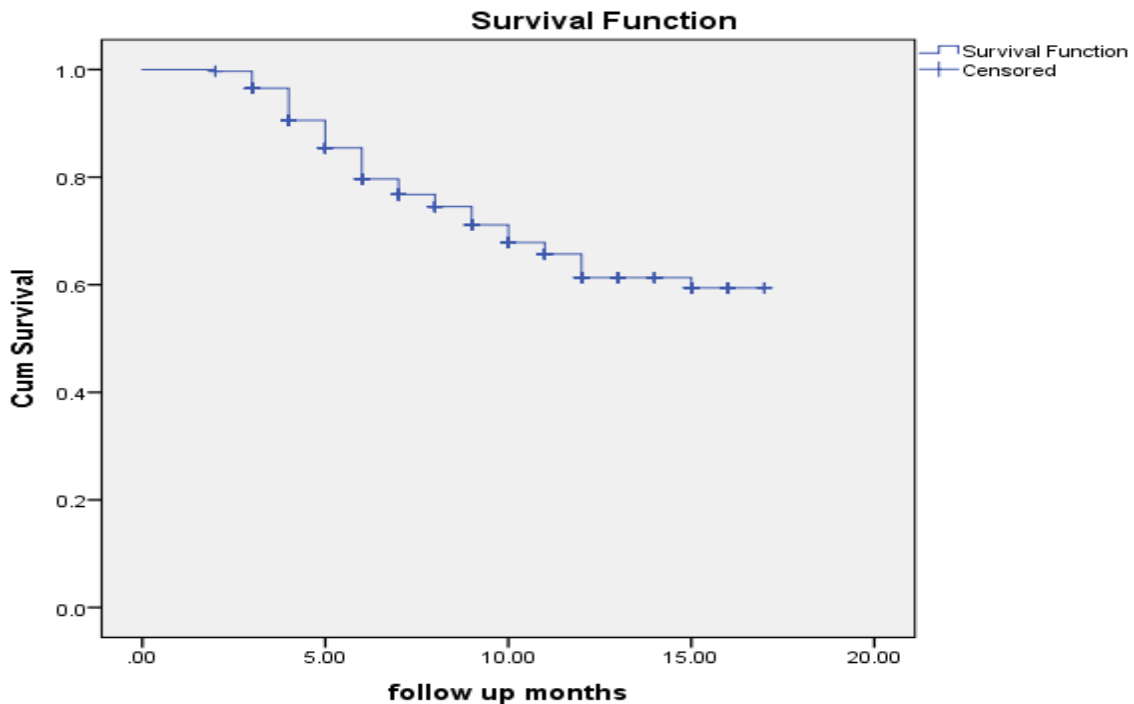
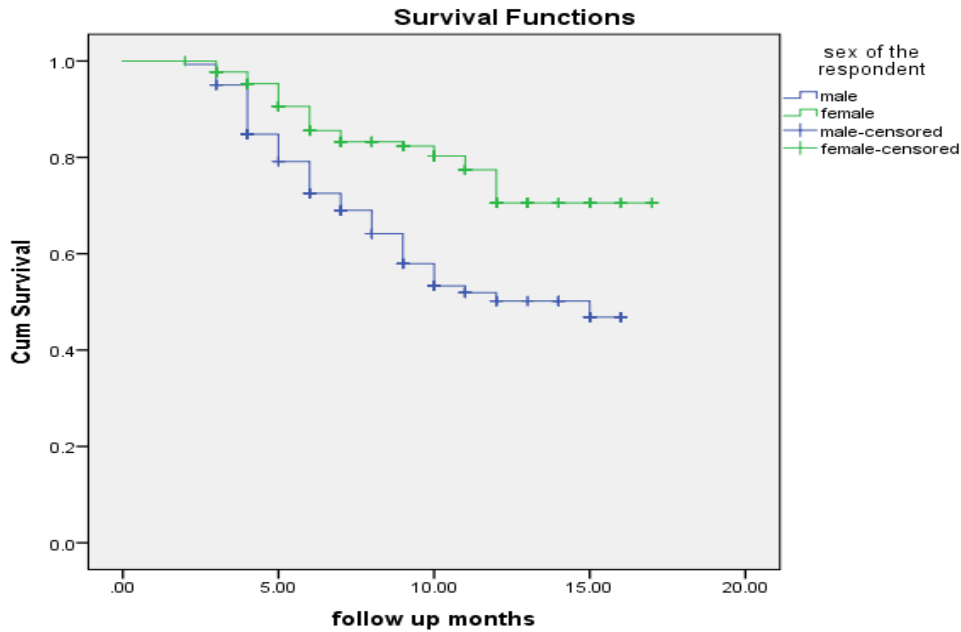


Figure 4: Overall survival function of HIV/AIDS infected patients on rapid initiation of ART in MTUTH & GSGH, South West Ethiopia, October 2017- December 2018.

The overall incidence rate of LTFU was 3.5 per 100 person months (95% CI: 2.8, 4.2). High proportions of LTFU 58 (63%) were occurred within the first six months of rapid initiation of ART.

The survival status of different categories of study participants was compared both graphically using Kaplan-Meier survival curve and statistically using Log rank test.

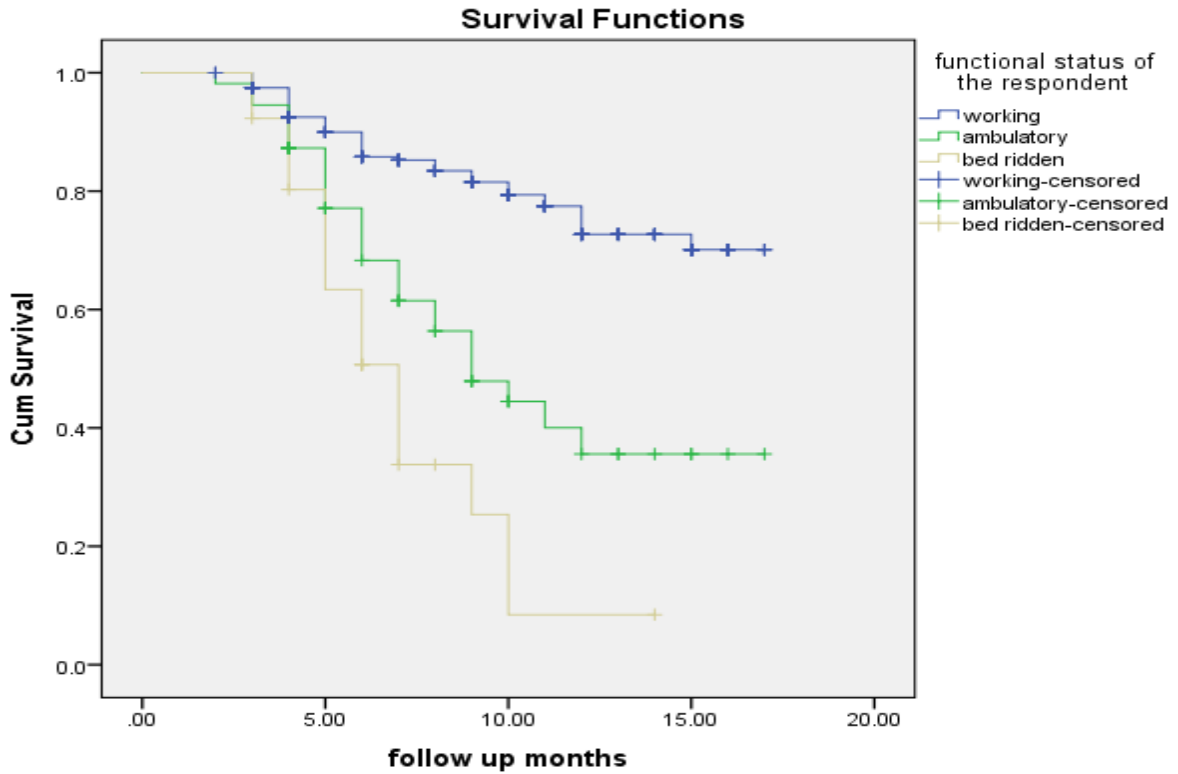
The mean estimate of LTFU time for male patients was shorter 11.2 (95% CI: 10.33, 12.15) months than females 14.25 (95% CI: 13.49, 15.08) months. The difference in mean time to LTFU for these two categories of patients was statistically significant ( $P < 0.001$ ) (Fig. 5).



Test of equality of LTFU distributions for the different levels of sex of the respondent.			
	Chi-Square	Df	Sig.
Log Rank (Mantel-Cox)	16.477	1	.000

Figure 5: Comparison of LTFU status of HIV infected patients on rapid initiation of ART based on sex category in MTUTH and GSGH, South West Ethiopia, Oct 2017-Dec 2018

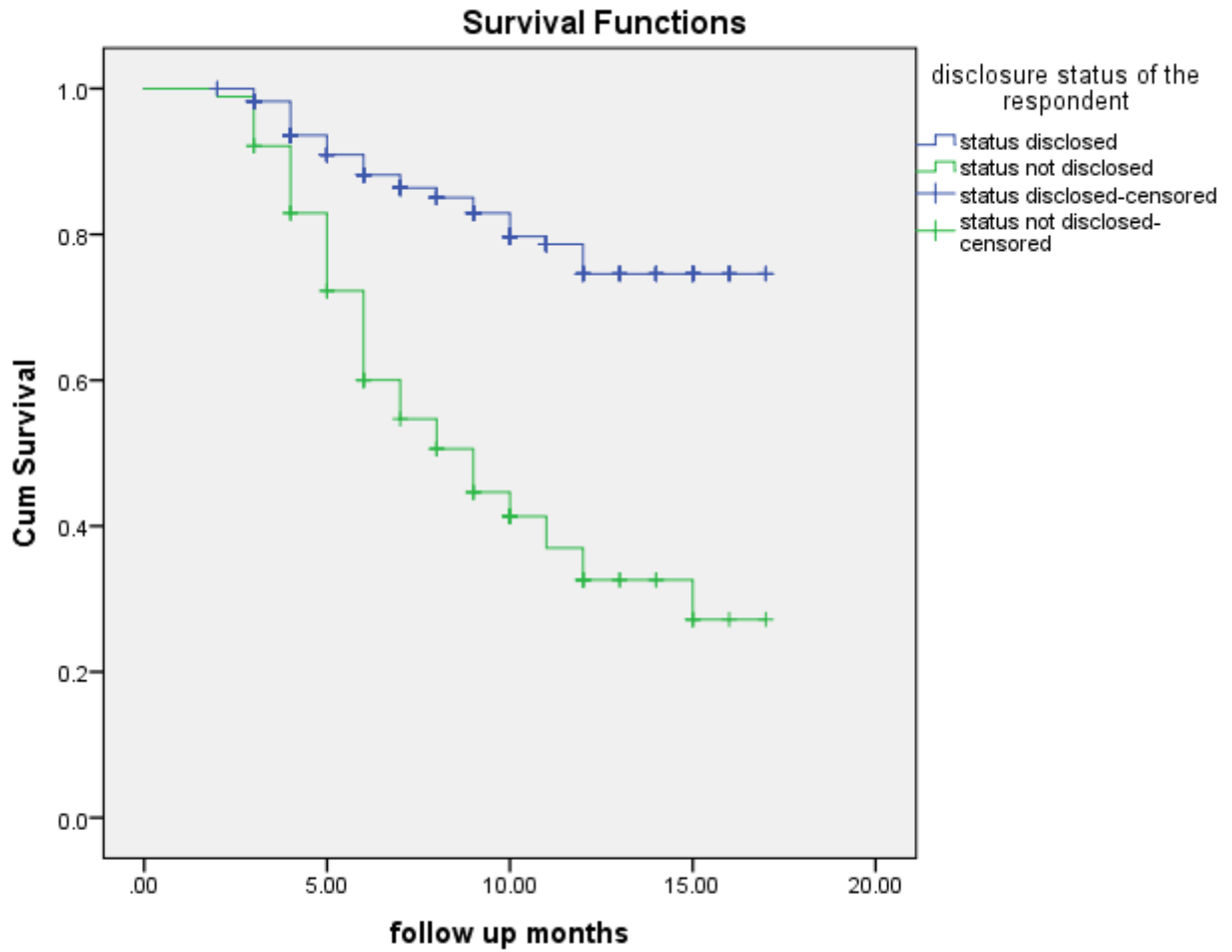
The mean estimate of LTFU time for patients with bed ridden functional status was 7.13 (95% CI: 5.18, 8.44) months. For patients with working functional status was 14.31(95% CI: 13.63, 14.98) months and observed difference in LTFU time between these categories of patients was statistically significant ( $P < 0.001$ ) (Fig.6).



Test of equality of LTFU distributions for the different levels of functional status of the respondent.			
	Chi-Square	Df	Sig.
Log Rank (Mantel-Cox)	54.028	2	.000

Figure 6: Comparison of survival status of HIV infected patients on rapid initiation of ART based on functional status category in MTUTH and GSGH, South West Ethiopia, Oct 2017- Dec 2018

The mean time to LTFU of patients who had disclosed their status to any one was 14.56(95%CI: 13.89, 15.23) months. For those who didn't disclose their status was 9.86(95% CI: 8.67, 11.05) months and observed difference in LTFU time between these categories of patients was statistically significant ( $P < 0.001$ ) (Fig.7).



Test of equality of LTFU distributions for the different levels of disclosure status of the respondent.			
	Chi-Square	Df	Sig.
Log Rank (Mantel-Cox)	48.938	1	.000

Figure 7: Comparison of survival status of HIV infected patients on rapid initiation of ART based on disclosure status category in MTUTH and GSGH, South West Ethiopia, Oct 2017- Dec 2018.

## 5.5 Factors associated LTFU

First of all further analysis of association, the proportional hazard assumption was checked using Schoenfeld residuals (ph test) and none of the covariates were found to be time dependent. In bivariate analysis of time to LTFU, the following variables ( $P \leq 0.25$ ) were identified as candidates for multivariable analysis. These variables included: being male sex, no formal education, daily labor workers, not used status IPT, history of ART failure, WHO clinical staging, not disclosing their status, absence of HIV positive family member, BMI less than  $18.5 \text{ Kg/m}^2$  and CD4 count  $\leq 500 \text{ cells/mm}^3$ .

In multivariable cox regression the interaction was checked and there was no significant interaction. Finally, being male sex, unknown IPT status, not received IPT history; bedridden functional status and non-disclosure status were independent predictors of LTFU.

Among adult HIV infected patients who started rapid initiation of ART, being male sex was four times (AHR =4.33, 95%CI: 2.22, 8.43) more likely to LTFU than their counterpart from ART clinic. Patients who had unknown IPT received status was more than five times (AHR=5.49; 95% CI: 1.46, 20.59) risky for LTFU and patients who didn't received IPT were more than two times (AHR=2.42; 95% CI: 1.49, 3.91) more likely to LTFU during rapid initiation of ART treatment compared to those who had history of IPT use.

Bedridden patients had five times more risk of LTFU compared to those who had working functional status (AHR=4.32; 95% CI: 2.34, 10.87) during ART treatment. Individuals who didn't disclose their HIV status had two times (AHR=2.02; 95% CI: 1.35, 3.83) higher risk to LTFU from ART clinics than those who disclose their HIV status (Table 4).

Table 4: Cox regression analysis for predictors of LTFU among adult HIV infected patients on rapid initiation of ART in MTUTH & GSGH, South West Ethiopia, Oct 2017- Dec 2018

Variables	Category of Variables	CHR	95% CI		P value	AHR	95% CI		P value
<b>Sex</b>	Male	2.300	1.506	3.513	0.000**	4.331	2.22	8.43	0.000***
	Female*	1				1			
<b>Educational status</b>	No education	1.64	0.82	3.31	0.16**	3.133	0.78	12.59	0.108
	Primary	0.84	0.42	1.68	0.62				
	Secondary	1.34	0.65	2.74	0.41				
	Tertiary*	1				1			
<b>Occupation</b>	Daily labor worker	1.65	0.73	3.72	0.22**	0.791	0.17	3.678	0.765
	Farmer	0.59	0.19	1.89	0.362				
	Merchant	1.05	0.45	2.46	0.902				
	House wife	1.049	0.471	2.336	0.906				
	Gov't employed*	1				1			
	Private org. employed	1.123	0.367	3.434	0.839				
	Student	0.893	0.324	2.463	0.827				
<b>IPT use</b>	Others	1.331	0.435	0.070	0.616				
	Not received	2.905	1.897	4.449	0.000**	2.42	1.49	3.91	0.000***
	Received	1				1			
<b>WHO clinical stages</b>	Unknown	4.119	1.256	13.50	0.019**	5.497	1.46	20.59	0.011***
	One*	1				1			
	Two	0.224	0.106	0.475	0.000**	0.627	0.28	1.37	0.242
	Three	0.277	0.114	0.670	0.004**	0.722	0.35	1.486	0.377
<b>Functional status</b>	Four	0.582	0.283	1.196	0.141**	0.685	0.22	2.05	0.50
	Working*	1				1			
	Ambulatory	0.181	0.104	0.315	0.000**	1.745	0.91	3.317	0.090
<b>Hx of ART failure</b>	Bedridden	0.539	0.296	0.983	0.044**	5.049	2.34	10.87	0.000***
	No*	1				1			
	Yes	1.934	0.709	5.272	0.198**	2.794	0.39	19.87	0.305
	TDF+3TC+E	1				1			
	FV*								
<b>ART regimen</b>	AZT+3TC+E	2.548	1.026	6.327	0.044**	1.349	0.45	4.003	0.59
	FV								

	AZT+3TC+	1.826	0.912	3.654	0.089**	0.949	0.40	2.21	0.903
	NVP	1.942	0.844	0.470	0.119**	0.18	0.03	1.045	0.068
	Other								
<b>Disclosure of status</b>	Yes*	1				1			
	No	3.819	2.526	5.774	0.000**	2.283	1.35	3.83	0.002***
<b>BMI</b>	≤18.5 kg/m <sup>2</sup>	2.083	1.381	3.141	0.000**	1.437	0.84	2.45	0.184
	>18.5 kg/m <sup>2</sup>	1				1			
<b>Family hx of HIV</b>	Yes*	1				1			
	No	2.938	1.634	5.283	0.000**	1.93	0.95	3.93	0.067
<b>CD4 count in cells/mm<sup>3</sup></b>	≤500	1.748	1.152	2.653	0.009**	0.86	0.47	1.54	0.615
	>500*	1				1			

\* Reference category, \*\* statistically significant at  $p \leq 0.25$ , \*\*\* statistically significant at  $p < 0.05$ , CHR-crude hazard ratio, CI-confidence interval, AHR-adjusted hazard ratio, CPT-Cotrimoxazole preventive therapy, CD4- Cluster of differentiation four, IPT-Isoniazid prophylaxis therapy, OIs-opportunistic infections, BMI-body mass index, WHO-world health organization, ART-anti retroviral therapy

## CHAPTER 6: DISCUSSION

Now a day Ethiopia gives more attention for quickly initiation of ART after HIV diagnosis without considering the patients CD4 cell count and WHO clinical staging to implement WHO “TREAT FOR ALL” strategy and to achieve 90-90-90 targets of elimination of HIV epidemic by 2030. Even if rapid initiation of ART has many benefits for the patients especially for people with advanced disease stage, it is critical issue to initiate lifelong ART on the same day of their HIV diagnosis.

In this study more than half 166(52.2%) study participants started ART with their CD4 cell count greater than 500 cells/mm<sup>3</sup> and around half 158(49.7%) of the patients are asymptomatic (WHO clinical stage one).

Among all the 92 LTFU patients 58(63%) lost occurred within the first six months of their follow up time. This is comparable with systematic study conduct on risks and benefits of rapid initiation of ART showed that the risk of LTFU was high within six months of rapid initiation of ART especially in low level income countries (14).

From all LTFU patients, high proportion 76(82.60%) of lost from ART clinics occurred on those patients who started ART on the same day of their HIV diagnosis. This is suggestive for patients’ lack of sufficient time to accept their status and fear of drug adherence.

From all 318 study participants followed for seventeen months follow up time high proportion 92(28.93) of patients lost to follow up their ART treatment. This is fairly comparable with 2016 WHO global report on early warning indicators of HIV drug resistance showed that 20% of patients LTFU from ART treatment occurred within one year and this figure doubled for sub-Saharan African countries (13).

Study conducted from different parts of Ethiopia; Benishangul Gumuz, Jijiga, SPNNPR and Aman showed that the proportion of LTFU was 22.6%, 14.8%, 20.6%, 26.7% respectively which is lower compared with current findings (19,20,28,29). This might be due to difference in study period, inclusion criteria and difference study area and current ART initiation policy

of Ethiopia. The former studies follow regular ART policy and current study focused on rapid initiation of ART policy.

Being male sex, bedridden functional status, not disclosing HIV status, unknown IPT status and not received IPT history were identified as predictors of LTFU.

Being male sex had more than four times (AHR =4.33, 95%CI: 2.22, 8.43) higher risk for LTFU than their counter parts. This is comparable with study conducted in other parts of Ethiopia shows that being male sex has two and more folds to LTFU than females (18,28,33). Males who had high number of LTFU in this study were daily labor workers in their occupation. This is suggestive for daily labor workers easily moves from place to place and unable to attend ART clinics as scheduled permanently. The study area has also border to traditional gold mining area and most participates in mining area are males and daily labor workers.

Patients who had unknown IPT status had more than five times (AHR=5.49; 95% CI: 1.46, 20.59) risky to LTFU and patient who didn't received IPT history had two times (AHR=2.42; 95% CI: 1.49, 3.91) higher risk of LTFU than patients who received IPT. This is fairly comparable with study conducted in Benishangul Gumuz and Aman which showed that IPT status was significant predictors of LTFU (20,29). This is suggestive for IPT recommended by national ART guidelines to prevent tuberculosis infection which is one of the causes for morbidity which may leads the patient to LTFU(8)

Concerning functional status, bedridden patients were more than four times (AHR=4.32; 95% CI: 2.34, 10.87) risky to LTFU than those who had working functional status. This is similar with findings of systematic study conducted in Ethiopia (AOR =2.3,95%CI: 1.5,3.4) (17). This may be due to patient's self-care activity interruption to follow ART clinic as scheduled. This finding is contrary with the finding of the seven university teaching hospitals, Ethiopia there was no statistical significance difference (18). This could be due the difference in medical service given to the patient in urban areas.

Failure to disclose status puts patients on ART for higher risk of LTFU from ART clinics than those who disclosed their status to anyone. In addition to this it prevents other at risk family members from being tested(40). In current study, patients who didn't disclose their HIV status

to anybody were about two times (AHR=2.02; 95% CI: 1.35, 3.83) higher risk to LTFU than those who disclosed their status. This is in line with the finding of the study done in Kenya and Jijiga, Ethiopia (27,28). This might be due to patients who didn't disclose their status wouldn't visit ART clinics as expected, would not be comfortable to take their medications appropriately, and couldn't get important family supports; which might contribute to LTFU other unwanted effects like ART treatment failure. One of the main reasons for non-disclosure of the status is fear of stigmatization and this need sustainable awareness creation in the community to bring positive attitudes toward HIV infected patients on ART treatment.

In this study WHO clinical stage and CD4 cell count was not significant predictor in final model, but it significantly predicts LTFU among adult patients on ART indifferent studies (18–20,27,29,32,36). This difference may be the effect of rapid initiation of ART treatment. Rapid initiation of ART improves quality of PLHIV by increasing CD4 cell count and decreasing viral loads (14,41). In this study majority 166(52.2%) of study participants had their CD4 cell counts of greater than five hundred cells/mm<sup>3</sup> and 158(49.7%) of the patients are in asymptomatic (WHO clinical stage one).

## **CHAPTER 7: STRENGTH AND LIMITATION OF THE STUDY**

### **7.1 Strength of the study**

The strength of this study was the involvement of data collectors and supervisors who had back grounding of training on ART and working at ART clinics.

### **7.2 Limitation of the study**

This study has limitations. First of all secondary data were used with incomplete base line information like base line viral load and hemoglobin level was not included in the analysis because many patients' cards have no viral load and hemoglobin test result. Secondly, due to poor tracing and documentation system in ART clinics patients who were leveled as LTFU might have been died or self-transfer out to other health facility. This could have led to over estimation of LTFU incidence in the study.

## **CHAPTER 8: CONCLUSION AND RECOMMENDATIONS**

### **8.1 Conclusion**

In conclusion, significantly high proportion of LTFU occurred in the patients who started ART on the same day of their HIV diagnosis. This study has identified the independent significant determinants of LTFU among adult HIV infected patients on rapid initiation of ART. Those include being male sex, unknown IPT status, not received IPT history, bedridden functional status and non-disclosure status identified as predictors of LTFU.

### **8.2 Recommendations**

Based on the finding of this study the following were major recommendations to concerning bodies.

#### **To health facilities providing ART services (MTUTH & GSGH)**

HIV infected patients shall be critically counseled and followed closely during rapid initiation of ART especially for male patients and patients who started treatment on the same day of HIV diagnosis.

IPT has unreserved advantages for HIV infected patients it shall be given for eligible patients as per WHO recommendations and the IPT status should be recorded on the patients registries properly.

Similarly, priority consideration shall be given for bedridden patients and the patients shall be encouraged to disclose their HIV status to their families and others.

#### **Federal Ministry of Health (FMOH)**

FMOH shall strengthen differentiated care approach and tracing mechanisms to increase retention rate and to enhance treatment effect.

#### **Research community**

By taking this study as one input research communities are encouraged to undertake further prospective and qualitative studies to have strong evidences on predictors of LTFU on rapid initiation of ART.

1. WHO. 2018 GLOBAL HIV STATISTICS, 2018. Available from: [www.who.int/mediacentre/factsheets/fs360/en/](http://www.who.int/mediacentre/factsheets/fs360/en/).
2. UNAIDS. Global AIDS monitoring, 2018. [www.who.int/hiv/mediacentre/news/global-aids-update-2018-news/en](http://www.who.int/hiv/mediacentre/news/global-aids-update-2018-news/en)
3. WHO. World Health Statistics 2018. [cited 2018 November 22]. Available from: [www.who.int/gho/hiv/en/](http://www.who.int/gho/hiv/en/).
4. Kathrin Zucher, Ane Mooser NA et al. Outcomes of HIV-positive patients lost to follow-up in African treatment programmes. *Int J Med Res Prof.* 2017;22(4):375–87.
5. CDC. Achieving epidemic control and saving lives in the global fight against HIV [Internet]. 2018. Available from: <https://www.cdc.gov/globalhealth>
6. WHO. Prevent HIV, Test and treat all [Internet]. 2016. Available from: [http://www.unaids.org/sites/default/files/media\\_asset/AIDS-by-the-numbers-2016\\_en.pdf](http://www.unaids.org/sites/default/files/media_asset/AIDS-by-the-numbers-2016_en.pdf)
7. UNAIDS. 90-90-90 An ambitious treatment target to help end the AIDS epidemic. 2014.
8. FMOH. NATIONAL GUIDELINES FOR COMPREHENSIVE HIV PREVENTION , CARE AND TREATMENT. 5th ed. Kebede Worku, editor. FMOH; 2017. 87-112 p.
9. PEPFAR Ethiopia. Differentiated Care in Ethiopia The way forward. In 2017.
10. UNAIDS. GLOBAL AIDS UP. 2016;
11. Ammon N, Mason S, Corkery JM. Factors impacting antiretroviral therapy adherence among human immunodeficiency virus e positive adolescents in Sub-Saharan Africa : a systematic review. *Public Health* [Internet]. 2018;157(2):20–31. Available from: <https://doi.org/10.1016/j.puhe.2017.12.010>
12. Cohen MS, Smith MK, Muessig KE, Hallett TB, Powers KA, Kashuba AD. Antiretroviral treatment of HIV-1 prevents transmission of HIV-1 : where do we go from here? *AIDS Res Ther* [Internet]. 2013;382(2):1515–24. Available from: [www.thelancet.com](http://www.thelancet.com)
13. Michael R. Jordan DM. Global report on early warning indicators of hiv drug resistance. WHO. 2016.
14. Ford N, Migone C, Calmy A, Kerschberger B, Kanters S, Nsanzimana S, et al. Benefits and risks of rapid initiation of antiretroviral therapy. *AIDS Care.* 2018;32(1):17–23.
15. Girum T, Wasie A, Worku A. Trend of HIV / AIDS for the last 26 years and predicting

- achievement of the 90 – 90-90 HIV prevention targets by 2020 in Ethiopia : a time series analysis. *BMC Infect Dis* [Internet]. 2018;320(18):1–10. Available from: <http://aidsinfo.unaids.org>
16. Gesesew HA, Ward P, Woldemichael K, Mwanri L. Prevalence , trend and risk factors for antiretroviral therapy discontinuation among HIV-infected adults in Ethiopia in 2003-2015. *PLoS One*. 2017;12(6):1–16.
  17. Abrha H WP, Woldemichael K TG, Mohammadi L ML. Discontinuation from Antiretroviral Therapy : A Continuing Challenge among Adults in HIV Care in Ethiopia : A Systematic Review and. *PLoS One*. 2017;12(1):0–19.
  18. Telele NF KW, Marrone G, GebreSelassie S, Fekade D TB. Baseline predictors of antiretroviral treatment failure and lost to follow up in a multicenter countrywide HIV-1 cohort study in Ethiopia. *PLoS One*. 2018;7(2):1–10.
  19. Tesshome W. et al. Do loss to follow-up and death rates from ART care vary across primary health care facilities and hospitals in south Ethiopia ? A retrospective follow-up study. *HIV/AIDS – Res Palliat Care*. 2015;7(1):167–74.
  20. Berheto TM, Haile DB, Mohammed S. Predictors of Loss to follow-up in Patients Living with HIV / AIDS after Initiation of Antiretroviral Therapy. *J Infect Dis Immun*. 2014;9(6).
  21. R B, V F, T A, S L, A H, E T, et al. Retention in Care of Adult HIV Patients Initiating Antiretroviral Therapy in Tigray , Ethiopia : A Prospective Observational Cohort Study. *PLoS One* [Internet]. 2015;10(9):1–12. Available from: <http://dx.doi.org/10.1371/journal.pone.0136117>
  22. Webb S HJ. A retrospective notes-based review of patients lost to follow-up from anti-retroviral therapy at Mulanje Mission Hospital , Malawi. *MMJ*. 2018;24(2):3–6.
  23. Arnesen R, Anthony P S V. Predictors of loss to follow-up among patients on ART at a rural hospital in KwaZulu-Natal , South Africa. *PLoS One*. 2017;56(8):1–12.
  24. Naome M, Rugare L, Michele N, Natty C, Manda S SR. Determinants of loss to follow-up in patients on antiretroviral treatment , South Africa , 2004 – 2012 : a cohort study. *BMC Health Serv Res* [Internet]. 2015;259(15):1–11. Available from: <http://dx.doi.org/10.1186/s12913-015-0912-2>
  25. Agazhe M FK, T. A. Incidence and predictors of loss to follow up among HIV -

- infected adults at Pawi General Hospital , northwest Ethiopia : competing risk regression model. *BMC Res Notes* [Internet]. 2018;11(287):1–6. Available from: <https://doi.org/10.1186/s13104-018-3407-5>
26. Eguzu KN, Lawal AK, Umezuzurike CC EC. Predictors of Loss to Follow - up Among HIV - infected Patients in a Rural South - Eastern Nigeria Hospital : A 5 - year Retrospective Cohort Study. *Ann Med Heal Sci Res*. 2015;5(6):373–8.
  27. Mukumbang FC, Mwale JC, Wyk B Van. Conceptualising the Factors Affecting Retention in Care of Patients on Antiretroviral Treatment in Kabwe District , Zambia , Using the Ecological Framework. *AIDS Res Treat*. 2017;2234(6):1–9.
  28. Ojwang V, Penner J, Blat C et al. Loss to follow-up among youth accessing outpatient HIV care and treatment services in Kisumu, Kenya. *AIDS Care*. 2017;28(4):500–7.
  29. Tweya H, Oboho IK, Gugsa ST, Phiri S, Rambiki E, Banda R, et al. Loss to follow-up before and after initiation of antiretroviral therapy in HIV facilities in Lilongwe , Malawi. *PLoS One*. 2018;907:1–12.
  30. Vitoria M, Doherty M. Providing antiretroviral therapy to all who are HIV positive : the clinical , public health and programmatic benefits of Treat All. *J Infect Dis Immun*. 2018;21(8):17–9.
  31. Labhardt ND, Ringera I, Lejone TI, Klimkait T, Muhairwe J, Amstutz A, et al. Effect of Offering Same-Day ART vs Usual Health Facility Referral During Home-Based HIV Testing on Linkage to Care and Viral Suppression Among Adults With HIV in Lesotho The CASCADE Randomized Clinical Trial. 2018;1–10.
  32. Mccreesh N, Andrianakis I, Nsubuga RN, Strong M, Vernon I, Mckinley TJ, et al. Universal test , treat , and keep : improving ART retention is key in cost-effective HIV control in Uganda. *BMC Health Serv Res*. 2017;322(17):1–11.
  33. Fox MP, Rosen S. A new cascade of HIV care for the era of “ treat all .” *PLoS One*. 2017;
  34. Zaniewski E, Anderegg N, Ford N AD. Retention and mortality on antiretroviral therapy in sub-Saharan Africa : collaborative analyses of HIV treatment programmes. *Int AIDS Soc*. 2018;21:1–7.
  35. Seifu W, Ali W MB. Predictors of loss to follow up among adult clients attending antiretroviral treatment at Karamara general hospital , Jigjiga town , Eastern Ethiopia ,

- 2015 : a retrospective cohort study. *BMC Infect Dis.* 2018;18(280):1–8.
36. Hamish M, petoumenos K, Brown K, Baker D RD. Loss to follow-up in the Australian HIV Observational Database. *Int Med Press.* 2015;385(80):731–41.
  37. Megerso A, Garoma S et al. Predictors of loss to follow-up in antiretroviral treatment for adult patients in the Oromia region ,. *HIV/AIDS - Res Palliat Care.* 2016;8(6):83–92.
  38. Fayez A, Mahmoud M IH. Predictors of Loss to Follow-Up for HIV Adult Patients in Dammam Medical Complex , Saudi Arabia , 2017. *Int J Med Res Prof.* 2018;4(4):92–100.
  39. Mecha JO, Kubo N, Nganga LW, Muiruri PN, Lilian N, Mutisya I, et al. Trends , treatment outcomes , and determinants for attrition among adult patients in care at a large tertiary HIV clinic in Nairobi , Kenya : a 2004 – 2015 retrospective cohort study. *HIV/AIDS - Res Palliat Care.* 2018;10(1):103–14.
  40. Gesesew HA, Mwanri L, Ward P. Factors associated with discontinuation of anti-retroviral therapy among adults living with HIV / AIDS in Ethiopia : a systematic review protocol. Vol. 14. 2016.
  41. Kalibala S, Jani N, Kassa G. ALGORITHMS FOR HIV CARE AND TREATMENT IN ETHIOPIA. 2016. 23 p.
  42. CDC. Guidelines for the Prevention and Treatment of Opportunistic Infections in HIV-Infected Adults. 2018.
  43. PEPFAR Ethiopia. Ethiopia Country Operational Plan ( COP / ROP ) 2018 Strategic Direction Summary. 2018.
  44. WHO. GUIDELINES FOR MANAGING ADVANCED OF ANTIRETROVIRAL RAPID INITIATION HIV DISEASE AND THERAPY. 2017. 19-33 p.

## **ANNEX-A: INFORMED CONSENT**

**Addis Ababa University**

**College of Health Sciences**

**School of Nursing and Midwifery**

**Postgraduate program**

**Informed consent for administrative of GSGH & MTUTH (በመረጃ የተደገፈ ስምምነት ገብረጻድቅ ሻዎ አጠቃላይ ሆስፒታል እና ሚዛን ቴፒ ዩኒቨርሲቲ ትቴንግ ሆስፒታል አስተዳደር)**

### **Information sheet**

My name is **Usman Nuru** and I am master student of Adult Health Nursing in Addis Ababa University. I am doing this research on **“Loss to follow up and predictors among adult patients on rapid initiation of ART treatment in Gebretsadik Shawo General Hospital (GSGH) and Mizan Teppi University Teaching Hospital”** as one of the requirement for my graduation. ART was given for the patients in life long duration for the prevention and treatment purposes. In Ethiopia ART service was free and distributed throughout health facilities including health centers at lower level. As it can be noticed from different sources in spite of available effective free ART service at health facilities, most adults does not retained in ART care due to different factors. Loss to follow up from ART negatively affects socio-economic status of the country. This research will determine the incidence, trends and associated factors of loss to follow up among adult patients after initiation of ART. This will help all of us for provision of quality and standard care for HIV positive patients on ART. This will have its own contribution for ending the epidemics of HIV infections by 2030 for which currently both the international and national governments exerting great effort. I will use the data that were routinely collected by the hospital previously and all the data related activities will be highly confidential. The data collectors will be from ART clinics of these hospitals (GSGH & MTUTH), all the collected data will be kept at locked place daily, data entered

to computer will be password protected and the hard copies of collected data will be removed safely. Since the data will be collected from patients' medical cards, registrations and intake forms, one common number (patients' identification number) is needed to connect the data from those aforementioned sources. Patients' identification number will be with data only up to analysis stage and be removed then after (in short it will not be known that whose data is it). Finally the finding will also be disseminated to GSGH & MTUTH.

**የምርምር ማብራሪያ**

ስሜ ኡስማን ኑሩ ሲሆን በአዲስ አበባ ዩኒቨርሲቲ የ“Adult Health Nursing” ድገረ ምረቃ ተማሪ ነኝ። ይህንን “ክቲትል ማቋረጥ እና ተያያዥነት ያላቸው ምክንያቶችን ፀረ-ኤች አይ ቪ መድሃኒት የጀመሩ አዋቂ ታማሚዎች ላይ አስቸኳይ ህክምና አጀማመር በኋላ በገብረጻድቅ ሻዎአጠቃላይ ሆስፒታል እና ሚዛን ቴፒ ዩኒቨርሲቲ ትቺንግ ሆስፒታል” የተሰኘውን ምርምር እንደ አንዱ መመሪያ መስፈርት እየሰራሁ እገኛለሁ። ፀረ-ኤች አይ ቪ መድሃኒት የሚሰጠው ለማከም እና ለመከላከል አላማ ስሆን ታማሚዎች ግን መድሃኒቱን እድመ ልካቸውን መወሰድ ይኖርባቸዋል። ፀረ-ኤች አይ ቪ መድሃኒት በሀገራችን ውስጥ እስከ ዝቅተኛ ጤና ተቋም ማለትም እስከ ጤና አጠባበቅ ጣቢያ ድረስ በነፃ ይሰጣል። ከተለያዩ ምንጮች ማወቅ እንደምቻለው ፀረ-ኤች አይ ቪ መድሃኒቶች ምንም እንኳን በነፃ የሚታደሉ እና ውጤታማ የመከላከልና የማከም አቅም ቢኖሯቸውም ታማሚዎች በተለያዩ ምክንያቶች ክትትላቸውን ያቋርጣሉ። ይህ ደግሞ በሀገራችን ማህበራዊ እና እኮኖሚያዊ ጉዳዮች ላይ ከፍተኛ አሉታዊ ተጽኖ ያሳድራል። ይህ ጥናት ፀረ-ኤች አይ ቪ መድሃኒት የጀመሩ አዋቂ ታማሚዎች ላይ “መጠነ ክቲትል ማቋረጥን ይመረምራል፤ ያወዳድራል፤ ተያያዥነት ያላቸውን ምክንያቶችንም ይለያል። ይህም ሁላችን ፀረ-ኤች አይ ቪ መድሃኒት የሚወስዱ ታማሚዎች ጥራት ያለውና ደረጃውን የጠበቀ አገልግሎት እንድንሰጥ ይረዳናል። በአሁኑ ሰዓት መንግስታት በሀገር እና ዓለም አቀፍ ደረጃ ታላቅ ጥረት ለሚያደረጉለት ኤች አይ ቪ በሽታ ወረርሽኝን እኦኦ በ2030 ለማቆም የራሱ የሆነ አስተዋጽኦ ይኖረዋል። ቀደም ሲል ሆስፒታሉ በመደበኛነት የሰበሰባቸውን ጭብጥ (መረጃ) ለዚህ ጥናት የሚጠቅም ስሆን ከመረጃዎቹ ጋር የተገናኙ ሁሉም ስራዎች ምስጢራዊነታቸው በከፍተኛ ሁኔታ የተጠበቀ ይሆናል። መረጃ ሰብሳቢዎችም ከዚህ ሆስፒታል ፀረ ኤች አይ ቪ/ኤድስ ክሊኒክ ሲሆኑ በየቀኑ የሚሰበሰቡ መረጃዎችም ተቆልፈው ይቀመጣሉ፤ ወደ ኮንፒተር የገቡ መረጃዎችም በይላፍ ቃል ይጠበቃሉ፤ መረጃ የተሰበሰበባቸው ወረቀቶችም በጥንቃቄ ይወገዳሉ። መረጃዎቹ የሚሰበሰቡት

ከታካሚዎቹ ካርድ፣ ከመረጃ መሰብሰቢያ መዝገቦችና ቅጾች ስለሚሆን ከነዚህ ከተጠቀሱ ምንጮች የሚሰበሰቡ መረጃዎችን አንድ ላይ ለማገናኘት የሚያስፈልገው የጋራ የሆነ የታካሚዎች መለያ ቁጥር እስከ ትንተና ጊዜ ብቻ ከመረጃዎቹ ጋር ይቆይና ከዚያ በኋላ ከመረጃዎቹ ይለያል (በአጭሩ መረጃው የማን እንደሆነ አይታወቅም)። በመጨረሻም የምርምሩ ግኝት ለሆስፒታሎቹ የሚሰጥ ይሆናል።

**Consent form (የስምምነት መግለጫ / ማረጋገጫ)**

I undersigned, fully understand the information explained above and permit the data for extraction.

እነ ቀጥሎ ስሜና ኃላፊነቴ የተጠቀሰው ከላይ የተገለጸውን ማብራሪያ (መረጃ) በሙሉ የተረዳሁ ስሆን መረጃዎቹ እንዲሰበሰቡ መፍቀዴን በፍርማዬ አረጋግጣለሁ።

Name

(ስም) \_\_\_\_\_

Position (responsibility)/ኃላፊነት \_\_\_\_\_

Sign (ፈርማ) \_\_\_\_\_ Date (E.C.) (ቀን) \_\_\_\_\_

**Statement of the consent taker (የስምምነት ተቀባዩ መግለጫ)**

I confirm that I informed well all the issues related to this research and proceed only by the permission of the administrative of GSGH and MTUTH.

ከዚህ ጥናት ጋር የተገናኙ ጉዳዮችን በደንብ ማስረዳቴንና ቀጣይ ስራዎችም የተሰሩት በገብረጻድቅ ሸዎ አጠቃላይ ሆስፒታል ወይም ሚዛን ቴሌ ዩኒቨርስቲ ትቺንግ ሆስፒታል አስተዳደር ፈቃድ ብቻ መሆኑን አረጋግጣለሁ።

Name of the consent taker (የስምምነት ተቀባዩ ስም): Usman Nuru Abachebissa

Sign (ፈርማ) \_\_\_\_\_ Date (E.C.) ቀን \_\_\_\_\_

Phone (ስልክ) +251912863759

Email (ኢሜይል) usmannuru102@gmail.com

## ANNEX B: CHECKLISTS FOR DATA EXTRACTION

**Addis Ababa University**

**College of Health Sciences**

**School of Nursing and Midwifery**

**Postgraduate program**

Check list for data collection of Loss to follow up (LTFU) among adult patients on ART in Gebretsadik Shawo General Hospital and Mizan Teppi University Teaching Hospital

Name of health facility \_\_\_\_\_

Name of the data retriever: \_\_\_\_\_ Sign. \_\_\_\_\_

Name of the supervisor: \_\_\_\_\_ Sign. \_\_\_\_\_

Date of data retrieving \_\_\_\_\_ E.C MRN \_\_\_\_\_

Unique ART number \_\_\_\_\_

Ques. No.	Question	Response category	Skip	Remark
<b>Part I Socio demographic and economic variables</b>				
101	Age in years	_____		
102	Sex	1. Male 2. Female		
103	Educational status	1 No formal education 2 Primary (1-8) 3 Secondary (9-12) 4 Tertiary (college/university) 5 Other /Specify/ _____		
104	Marital status	1. Never married 2. Married		

		3. Divorced 4. Widowed		
105	Occupation	1. Daily labor worker 2. Farmer 3. Merchant 4. House wife 5. Government employed 6. Private organization employed 7. Student 8. Other/specify_____		
106	Place of residence	1. Urban 2. Rural		
107	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Other /specify_____		
<b>Part II Clinical and treatment factors</b>				
201	Date of HIV diagnosis (DD/MM/YY)	_____ E.C		
202	ART start date (DD/MM/YY)	_____ E.C		
203	Isoniazid prophylaxis therapy (IPT)	1. Not received 2. Received 3. Unknown		
204	Cotrimoxazole Preventive Therapy (CPT )	1. Not receiving 2. Receiving 3. Unknown		
205	Opportunistic infection (IO)	1. No OI 2. Have OI		
206	History of ART failure	1. No 2. Yes		

207	ART regimen	1. AZT+3TC+NVP 2. AZT+3TC+EFV 3. TDF+3TC+EFV 4. Other /Specify/ _____		
208	Functional status	1. Working 2. Ambulatory 3. Bed ridden		
209	Weight Kg	_____		
210	Height in meter	_____		
211	CD4 count (cells/mm <sup>3</sup> )	_____		
212	WHO Clinical stage	1. One 2. Two 3. Three 4. Four		
<b>Part III Behavioral related factors</b>				
301	Disclosure status	1. Status disclosed 2. Status not disclosed		
302	Having HIV positive family member	1. Yes 2. No		
<b>Part III Outcome of the patient</b>				
401	Outcomes of the patient	1. LTFU 2. On follow up 3. Transfer out 4. Death		
402	Date of out come	(DD/MM/YY) _____ E.C		

