ATTRITION AND IT'S ASSOCIATED FACTORS AMONG CLIENTS NOT ON ANTRETROVIRAL TREATMENT REGISTERED IN CARE AND TREATMENT CENTRES IN MOROGORO REGION

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By

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CERTIFICATION

The undersigned certifies that has read and hereby recommends for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled **Attrition and its associated factors among clients not on antiretroviral treatment registered in care and treatment centres in Morogoro region** in partial fulfilment of the requirements for the degree of Master of science in Applied epidemiology of the Muhimbili University of Health and Allied Sciences.

_____

Gideon Kwesigabo MD, MSc,MEd,PhD

(Supervisor)

Date: _____

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ABSTRACT

Pre ART attrition and its associated factors among Pre ART clients registered in care and Treatment centres in Morogoro

Background

Despite significant success in scaling up care and treatment programmes in Tanzania, still the majority of people living with HIV (PLHIV) do not access HIV care and treatment. Successfully enrolled PLHIV in care and treatment are lost at every step along the continuum of care, particularly in the period between HIV diagnosis and initiation of ART. This study aims at determining factors associated with attrition among Pre Art adults in HIV/AIDS care and treatment centres (CTC)

Methods

We conducted a clinic based retrospective cohort study that involves review of data from Pre ART adult clients (≥ 15years) register and client treatment card number 2 (CTC 2 card) at three CTCs in Morogoro from July, 2010 to July 2011. Client baseline characteristics and clinic attendance status at three months interval for a period of 1 year were abstracted using semi structured questionnaire. Pre ART clients who were not in care at their original sites at 1 year of follow up were traced through home based care volunteers and phone calls. Correlates of loss to care were evaluated using logistic regression analysis. Epi info statistical software was used for analysis.

Results

A total of 369 clients were enrolled in CTC in July 2010 of whom 351 were enrolled in the study. Majority 190(54.1%) of study participants were not ART eligible at enrolment to CTC and only 92(57.1%) of the161 (45.9%) ART eligible clients were initiated on ART. Only 67(28.7%) of the 234 Pre ART clients were still in care at 1 year of follow up. Overall Pre ART attrition from mortality, opted out of care clients and lost to follow up was 87 (37.2%). Controlling for age and sex referral to CTC by health care provider (AOR = 2.5, 95%CI: 1.26 – 5.02) and self stigma (AOR = 5.9, 95%CI; 2.82 – 12.7] were independent risk factors for Pre ART attrition while Client CD4 count check as scheduled

on last visit was protective against Pre ART attrition. Other factors were not statistically significant in multivariate analysis.

Conclusion

Attrition due to mortality and opt out of care is high among CTC enrolled clients. Majority of death were among ART eligible clients who were not initiated treatment.

Self stigma and patients referred to CTC by health care providers were risk for attrition among Pre ART adults enrolled at participated CTCs. Strengthening of CD4 count check to monitor clients as they become eligible for ART as well as prioritizing ART initiation for those clients who are ART eligible in order to minimise Pre ART attrition from mortality and drop out is recommended. Also improvement in linkage between CTC to reduce silent transfers and counselling to PLHIV to disclose their HIV status as this will reduce self stigma is also recommended.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
HIV	Human Immunodeficiency Virus
MoHsw	Ministry of Health and Social Welfare
NACP	National AIDS Control Program
TACAIDS	Tanzania Commission for AIDS
PLHIV	People living with HIV/AIDS
WAVIU	Watu wanaoishi na Virusi vya UKIMWI (PLHIV in Kiswahili)
CTC	Care and Treatment centres
CTC 2 card	Care and Treatment card number 2
ART	Antiretroviral Therapy
CDC	Centre for Disease Control and Prevention
IeDEA	International Epidemiologic database to evaluate AIDS
HSHSP	Health Sector HIV Strategic Plan
LTF	lost to follow up
HBC	Home based care
Huwanyu	Huduma za wagonjwa majumbani (HBC in Kiswahili)

DEFINITION OF TERMS

Censored observation – an observation with unknown status at the end of study period

Enrolment in care – Active (intentional) registration by patient for Pre ART care before or after staging

Loss to follow up (LTF) –

Missed appointment – missed scheduled appointment for 30 days or more but before qualifying as LTF.

Pre ART care - services provided at care and Treatment centre between testing positive for HIV and dispensing 1st ART dose

Pre ART Attrition (Loss to care) – discontinuation of active engagement in Pre ART care for any reason including death and care refusal.

Retention in care – patient generally maintains expected schedule for visits, laboratory tests, etc. Until initiation of ART without long interruptions (remains in care continuously).

Staging – determination of whether newly diagnosed patient should be in Pre ART care or on ART basing on WHO staging criteria

CHAPTER 1: INTRODUCTION

1.1Background

Acquired immunodeficiency syndrome (AIDS) is a disease of the human immune system caused by the human immunodeficiency virus (HIV). AIDS interferes with the immune system making an individual more susceptible to infections including opportunistic infections and tumours that usually do not affect people with working immune systems. These opportunistic infections susceptibility increases as the disease worsen. Human immunodeficiency virus (HIV) is a virus that can be transmitted through contact with infected blood or sexual fluids. The infected fluids or blood need to come into contact with mucus membranes or open wounds in order for the virus to get into a susceptible host.HIV is transmitted primarily via unprotected sexual intercourse, contaminated blood and blood products, sharing of needles and other sharp instruments as well as from mother to child during pregnancy, delivery or breastfeeding [1] other body fluids like saliva or tears do not transmit HIV [2]Currently there is no cure or effective vaccine for HIV/AIDS however antiretroviral treatment can slow the course of the disease and reduces the risk of death and complications from the disease. Early in the AIDS epidemic, most HIV-infected people died within ten years of infection until in 1996 when highly active antiretroviral therapy (ART) became available for people in developed countries, since then HIV infection became a chronic condition. Unfortunately, ART was extremely expensive, and HIV/AIDS remained a fatal illness for people living in developing countries. In 2003, governments, international agencies, and funding bodies began to implement plans to increase ART coverage in resource-limited countries. By the end of 2009, about a third of the people in these countries who were eligible for ART were receiving treatment. [3]

Public health importance of HIV/AIDS

HIV/AIDS is a major public health problem in many parts of the world, and it is considered a pandemic disease since it is present over a large area of the world and is actively spreading.

In Sub Saharan Africa most of the available epidemiological data indicate that the extensive spread of HIV started in the region in the late 1970, unlike in United states were AIDS was first recognised by the Centres for Disease Control and Prevention (CDC) in 1981and its cause HIV was identified in the early 1980s.Since its recognition in 1981, AIDS has led to nearly 30 million deaths (as of 2009) and at the end of 2010 an estimated 34 million people mostly living in low and middle income countries were living with HIV worldwide and this can be attributed by large number of New HIV infections and a significant expansion of access to Antiretroviral therapy which has effective in reducing AIDS related death especially in recent years. The number of people dying of AIDS-related causes fell to 1.8 million [1.6 million–1.9 million] in 2010, down from a peak of 2.2 million [2.1million–2.5 million] in the mid-2000s. In low and middle income countries a total of 2.5 million deaths have been averted since 1995 due to introduction and accessibility of antiretroviral therapy. [5]

Sub-Saharan Africa remains to be the most HIV affected region, 68% of the global PLHIV resided in sub Saharan Africa in 2010, a region with only 12% of the global population. Sub-Saharan Africa also accounted for 70% of all new HIV infections in 2010, although there was a notable decline in the regional rate of new infections. [5]

In Tanzania mainland, the number of people living with HIV is estimated at 1,434,003 (Year 2012), which is a small increase from the estimated 1,428,512 in 2010 [6]. HIV prevalence among adults 15-49 years of age has reduced form the estimated 5.7% [7] in 2010[7] to 5.1% in 2012, according to Tanzania HIV/AIDS and Malaria indicator survey of 2011/2012 (THMIS, 2011/2012)

Care and treatment programme in Tanzania

In Tanzania the HIV/AIDS National care and treatment programme was approved by the Government in October 2003 and the roll out of the programme began in 2004 with the aim of providing HIV care and treatment to all eligible patients. The Implementation of HIV care and treatment services is guided by the Health Sector HIV Strategic Plan two (HSHSP II) for 2008 through 2012. Among the main focus of HSHSP II (2008-12) is scale up HIV care and treatment services, and strengthening ART adherence.

By the end of 2010, a total of 1100 public and private health facilities had began providing care and treatment services. Of those, 220 are hospitals and the remaining 880 are primary health facilities. Current 17% (909**)** of all public health facilities are providing and reporting HIV care and treatment services country wide [8]
Currently the cumulative number of clients registered in care and treatment is at 57 % (740,040) of the country estimated people living with HIV/AIDS (PLHIV)

The cumulative number of clients enrolled in HIV care and treatment increased from 403,378 in 2008 to 594,651 in 2009 to 740,040 in 2010. Similarly, cumulative number of clients on ART has increased from 202,181 in 2008 to 384,816 in 2010.Despite this increase of PLHIV who are on ART only 63 – 83% of ART eligible clients are on ART [8]

In Tanzania Clients diagnosed to be HIV positive are referred to care and treatment centres where they are registered for HIV care and treatment clinics for either Pre ART care or ART care and treatment, Clients who have just been enrolled in HIV care (Pre ART clients) progress is monitored by clinical and laboratory parameters as they become eligible for ART.
ART eligibility in Tanzania is as recommended by WHO, that HIV infected patients be initiated on ART based on WHO clinical stage and CD4 cells count level. Therefore there are two classes of patients that are eligible to begin treatment as follows

1. All patients in WHO stage 3 and 4 clinical criteria, regardless of CD4 cell count

2. All adolescences and adults including pregnant women with a CD4 count < 350cells/mm3, regardless of clinical symptoms

Standardised patients monitoring tools which include Care and treatment cards (CTC cards) which documents individual clients clinical information on each visit, Pre ART registers which documents all clients in a facility who are on Pre ART care and ART registers for registering cohort of clients initiated on ART each month at the clinic, these patients monitoring tools are in use in all HIV care and treatment sites countrywide.

1.2 Problem statement

Attrition from Pre ART care has been a challenge to most HIV programs in Africa. In sub-Saharan Africa only about one third of patients who test positive for HIV but are not yet eligible for antiretroviral treatment remain in care until they become eligible and start treatment. Also despite significant success in scaling up care and treatment programmes In Tanzania, PLHIV who are successfully enrolled in care and treatment clinics are lost at every step along the continuum of care often in a pre ART phase.

Review of adults clients from 42 clinics in 5 regions of Tanzania done by the Tanzania National AIDS control program revealed that among nearly 36,000 pre-ART clients enrolled in June 2010, 38% of Clients with unknown eligibility, 27% of ART ineligible and 19% of ART eligible were lost from care after one year. Distance to health care centres, transportation costs, male gender, younger age, unemployment, and lower levels of education were the contributing factors for attrition in pre-ART care. Another common barrier was stigma and fear of disclosure of HIV status

Despite attrition occurring at each stage along the continuum of care, very few studies have demonstrated attrition in each stage to provide a complete picture hence very limited information on the magnitude of the problem. Also it has now been recognized that clients' attrition in care – especially in the pre-ART period can be a major driver for poor care and treatment programme performance and increased PLHIV morbidity and mortality.

This study described client's attrition during Pre ART period and studied factors associated with pre ART attrition in three care and treatment sites within Morogoro region.

1.3 Study Justification

In order for HIV/AIDS patients and programs outcomes to be improved and succeed more in Tanzania, all individuals testing positive for HIV must receive successful linkage to HIV/AIDS care and treatment centres for continuous pre-ART care, that includes proper patient monitoring both clinically and by laboratory makers to ensure general client wellbeing and timely ART initiation as soon as they become eligible for treatment. Therefore before interventions can be developed to achieve this aim, it is necessary to understand where, when and why patients are lost to pre-ART care. Since findings from various studies suggest that there is a substantial loss of HIV-positive patients at every stage of pre-ART care, 1.meaning some patients receiving a positive HIV test never return for enrolment at CTC, 2.some disappear between being enrolled in CTC and becoming eligible for ART, 3.and others fail to initiate ART after having been found eligible for treatment.

This study Investigated on attrition at two stages in pre ART care (stage 2 & 3) as well as factors associated with Pre ART attrition and also sought outcome of those who were no longer in care at their original sites in three selected care and treatment centre in Morogoro Region

The findings from this study have provided information on

1. Numbers – proportion of clients enrolled in these sites who are continuously in care from HIV test to the next step within continuum of HIV care, how many interrupt and return to care, and how many are lost. These numbers gives insights on the magnitude of Pre ART attrition in our setting for rational program planning.
2. Reasons – findings from this study provides information on the factors with positive as well as negative influence on clients attrition from Pre ART care which will help in feasible interventions settings in retaining clients in care for better outcome of the PLHIV and Care and treatment program.
3. Interventions – findings from this study also highlight on facility interventions which best address loss to care and recommend on radical changes needed basing on the reasons identified for Loss to care in order to come up with interventions which are feasible and effective for reducing such losses

1.4 OBJECTIVES

1.4.1 Broad Objective

To determine magnitude of attrition among pre ART patients and its associated factors among Pre ART adults clients registered in HIV/AIDS care and treatment centres in Morogoro region

1.4.2 Specific objectives

1. To describe clinical and socio demographic characteristics of pre ART enrolee in CTC
2. To assess magnitude of attrition among Pre ART clients registered in care and treatment centres
3. To identify factors associated with Pre ART attrition in HIV care and treatment

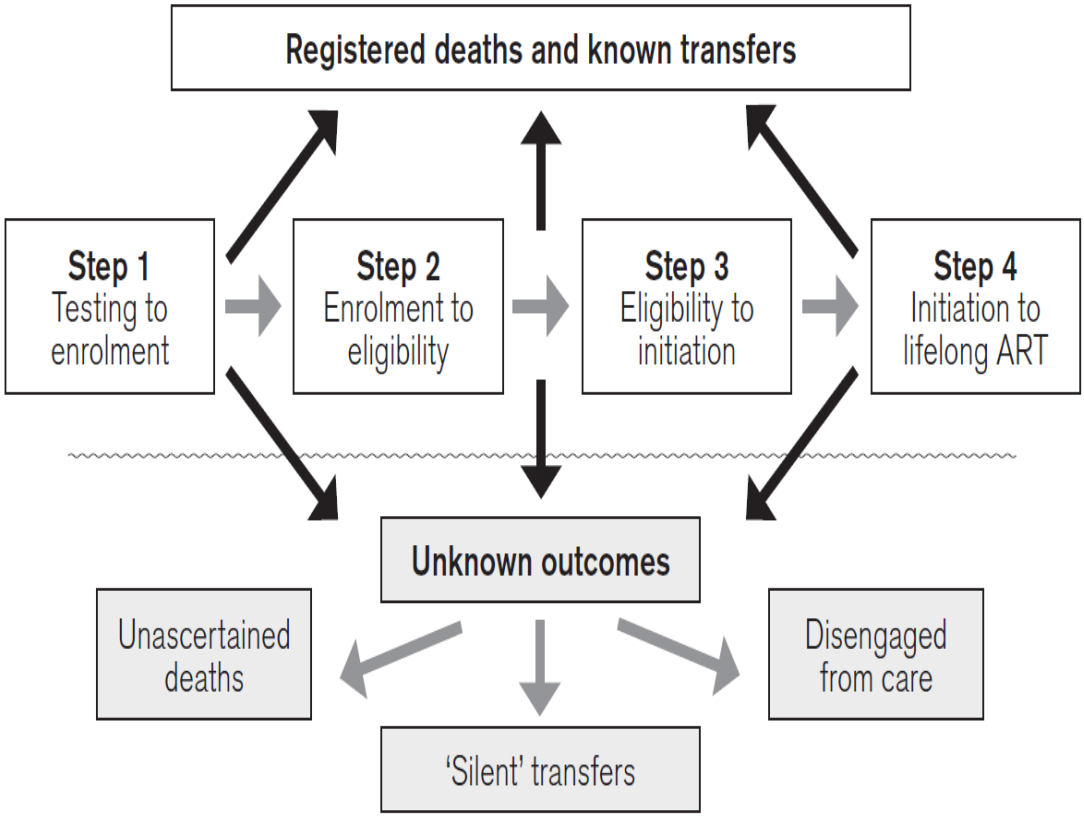
CHAPTER 2: Literature Review

2.1: HIV/AIDS continuum of care

Studies shows that Patient attrition from care and treatment centres can occur at any of the steps in continuum of care

The figure below demonstrates 4 steps within continuum of care where client attrition can occur.

Fig 1: The 4 steps along the continuum of HIV care and treatment. Patient attrition may occur at any of the 4 steps along this continuum.



Source: Retention in HIV programmes, Geneva meeting report, Sept 2011

- Step 1 – HIV testing to enrolment into care services
- Step 2 – enrolment in care to ART eligibility (may be very short if person has WHO clinical stage 3 or 4 or a low CD4, or may be years for someone with a high CD4 count)
- Step 3 – eligibility to initiation of ART
- Step 4 – initiation to lifelong ART

Despite attrition occurring at each stage along the continuum of care starting from a positive HIV test to enrolment in care, enrolment in care to ART eligibility, ART eligibility to initiation of ART, and finally continuation of lifelong ART, This study addressed attrition within two levels along 2 levels of continuum of care and that is Attrition from enrolment in care to ART eligibility and Attrition from ART eligibility to ART initiation. Various studies have addressed Pre ART attrition at different levels, though very few studies have been able to demonstrate attrition at all levels of continuum in care. [10]

2.2: Positive HIV testing to enrolment in care

The first stage from testing to linkages to care and treatment centres though not part of this study is the most problematic to describe and document, as people can be tested in a large number of different settings both in the community and in clinical facilities. Linking people to ongoing care from clinical settings may be easier to facilitate and document than from community settings which may not have effective links to services or efficient ways of tracking and documenting linkages.

A prospective cohort study in McCord hospital and St Mary Hospital in Durban South Africa show that of 712 persons who underwent HIV testing and received their test result from November 2006 to May 2007, 454 (64%) were HIV-positive. Of those, 206 (45%) had Pre treatment Loss to care. Infected patients were significantly more likely to have Pre treatment loss to care if they lived ≥10 kilometres from the testing centre (RR = 1.37; 95% CI: 1.11–1.71), had a history of tuberculosis treatment (RR = 1.26; 95% CI: 1.00–1.58), or were referred for testing by a health care provider rather than self-referred (RR = 1.61; 95% CI: 1.22–2.13). [11]

A survey was conducted on patients who arrived for HIV counselling and testing at primary health care clinic. CD4 blood samples taken and patients were required to return in a week for results. 344 patients were enrolled A sub-analysis revealed that only 65% (107/225) returned to collect CD4 result with a mean CD4 of 338 cells/mm^3 995% CI 298-3780. [12]

2.3: Enrolment in care to ART eligibility

Studies done in various parts of Africa show attrition to be particularly challenging among pre ART clients who are not yet eligible for ART registered for care in care and treatment centres.

In a retrospective cohort study done in Themba Lethu Clinic (TLC) at Helen Joseph Hospital (HJH) in Johannesburg SA , which studied a total of 356 of whom 128 (36%) presented with a CD4 count 350 cells ⁄ ml (median [IQR] = 296 [278–313]). These patients were counselled to return within 3 months for their first medical visit. 8 (crude proportion 6%; 95% CI 2.3%–11.5%) completed the visit within 4 months of staging, 45 (crude proportion 35.2%; 95% CI 27.3%–43.7%) returned within 1 year, and the remaining 75 (crude proportion 59%; 95% CI 50.0%–67.0%) did not return within a year.

The other 228 patients (64%) enrolled with a CD4 count >350 cells ⁄ ml (median [IQR] = 458 [394–585]), this patients were counselled to return within 6 months for their initial medical visit. Of these, 33 (crude proportion 14.5%; 95%CI10.3%-19.5%) completed the visit within 9 months, 26 (crude proportion 11.4%; 95% CI 7.7%–16.0%) Within a year and the remaining 169 (crude proportion 74%; 95% CI 68.1%–79.5%) did not return within a year. [13]

In a follow up study done at Hlabisa care and treatment centre in kwaZulu- Natal south Africa, which involved 3370 HIV infected clients in the area only 49.4% of individual with an initial CD4 cell count >200/cm3 returned for a subsequent CD4 measurement within the next 13 months [14]

A community based follow up study for late patients enrolled in HIV care and treatment in Lusaka Zambia findings shows that among 1343 patients who missed a visit, only 11% of the Pre -ART patients returned whereas 39% of the patients on ART returned [15] where as in a follow up study done in western Kenya from 2001 to 2007 which involved 50,275 HIV clients in a HIV care and treatment in western Kenya showed that Overall, 8% of individuals attended no follow-up visits and Among the 92% who attended at least one follow-up visit, the incidence of loss to follow-up on Pre ART and on ART was 27.2 and 14.0 per 100 person-years, respectively which shows that The risk of being lost to follow-up was high, particularly before starting ART. [16]

2.4: ART eligibility to ART initiation

Among Pre ART patients who are eligible for ART but not yet on ART attrition has also been found to be a problem in some studies in Africa. In McCord Hospital in Durban, South Africa, 16% of patients with clear indications for ART were lost before they could initiate ART [17]

Another study done in South Africa on pre Treatment Mortality and probability of starting ART shows that among over 22,000 patients with CD4 levels <200/cm3 enrolling in the Free State ART program, 13% were lost to care before ART initiation [18]. The risk of death in ART eligible patients is high and reaches 28%–34% at 1 year in these studies, hence failures of retention in this group are likely to have a marked impact on survival.

In a follow up study at Chiradzulu, Malawi, over 3 years 52.5% of pre-ART patient who were not distinguished by ART eligibility criteria failed to be retained compared to16.1% of patients who had initiated ART [19]. These estimates, however, do not distinguish retention in program and retention in care. This is due to lack of tracking mechanism of clients who are continuing in care at another facility but counted as lost at their initial registered site .

A follow up study done in Jinja Uganda found that among 2483 patients in Pre ART with CD4-based indications for ART in Jinja (a semi-rural area in Eastern Uganda), 88% returned for a second visit and overall 74% returned for a third visit and started ART. This occurred in a community that was highly sensitized to the beneficial effects of ART. An important strength of this study was that investigators sought outcomes among those lost to follow-up in order to obtain true outcomes. Of the 637 patients who did not start ART, investigators found that 189 (28%) had started ART with a different provider. Therefore, retention in care among pre-ART patients was higher than thought, but overall, nearly 30% of eligible patients did not start ART [20]

Evaluation of adults patients who enrolled in care between 0ctober 2007 to October 2009 at Mbarara clinic in Uganda showed that of 1772 clients who had CD4 – based indication for ART, 514 (28.9%) were lost to follow up before ART initiation. [21]

In a systematic review of study finding done on Pre ART patients, Tanzania was found to have only 68%(63% -73%) of pre ART clients retained in care 6 months since being enrolled in care and staging to ART eligibility [3]

2.5: Factors associated with Pre ART client's attrition in HIV care

Studies done in Africa show that factors associated with poor retention among pre ART clients do resemble, though there were findings that differ from one country to another for example Low and higher CD4 counts have both been associated with worse retention. In 11 cohorts in West Africa, the Retention probability was lower for patients with low CD4 counts baseline CD4 count <50 cells/mm3 (HR=2.27; CI=1.96–2.64; P<0.001) compared to CD4 >200 cells/mm3 [22]. While a study done in Kenya showed that among 50,275 pre-ART patients with high CD4 counts, a CD4 >200/cm3 increased the risk of non-retention by 3.49-fold [14].

Distance to clinic and transportation has been found to be among the major barriers to retention in care in a wide variety of settings in Africa, in a study done in Rural Uganda among 111 patients lost to follow-up, the most common reasons for absence were lack of transportation in 50% and excessive distance in 42% [23]. While in rural Malawi 35% of patients who were lost and traced cited the high cost of transport to the clinic as the reason for absence [24]. The International Centre for AIDS Care and Treatment (ICAP) performed a multisite analysis in Western, Eastern, and Southern Africa using a 6-month absence as the outcome. The study found that if travel time to clinic exceeded 2 hours, the risk of non-retention was doubled [25]

Financial constraints was also prominently associated with attrition, lost patients consistently report finances as a limiting factor, among poor families, work and childcare responsibilities can compete with Pre ART care attendance, in over 50,000 patients in the academic Model Providing Access to Healthcare (AMPATH) programs in Kenya, 21% of women cited family commitments for missing a clinic appointment and 24% of men cited work commitments [16]

Lack of social support in CTC was found to be associated with Attrition especially in youth, In a study from Kenya, a targeted program providing social support for youths found attrition was low at the intervention clinic with 70% remaining in active care versus 55% at the general site for the same age group [27]

Figure 2 below show various factors which are associated with poor retention in HIV care among Pre ART clients as has been pointed out from various studies done in Africa.

Fig 2: factors associated with attrition from studies conducted in sub-Saharan countries

Key issues	Retention challenges
Common to most areas	• *Poverty related* – including taking time off work and caring for family, transport costs • *Logistics* – distances, opening hours • *Health service delivery factors* – perceived poor quality of services, health workers attitudes • *Monitoring* – poor monitoring and tracking of patients
Step 1 – **Testing to enrolment in care**	• *Psychosocial factors* – stigma and discrimination, denial of positive status, not ready to accept HIV infection or embark on life long care • *Health service delivery factors* – poor links/referrals from testing to services (may be a particular issue for people who receive diagnoses in community settings, as part of a campaign and in non-clinical settings, though also a significant problem in some antenatal settings), poor/no counselling or support after a positive diagnosis
Step 2 – **Enrolment in care to eligibility testing**	• *Health service delivery factors* – delays in receiving CD4 test results/lack of CD4 testing (including point of care technology), crowded clinics, long lines and distances to clinics • *Psychosocial issues* – lack of understanding or information, especially among those feeling well
Step 3 – **Eligibility to initiation on ART**	• *Perceptions* – disbelief in effectiveness of ART, fear of ART side effects • *Psychosocial factors* – lack of support, non-disclosure • *Health service delivery factors* – waiting lists

Source: Retention in HIV programmes, Geneva meeting report, Sept 2011

CHAPTER 3: METHODS

3.1: Study design

A clinic based retrospective cohort study was conducted, clinic records of a cohort of HIV/AIDS adult clients who were registered in care and treatment in July 2010 was selected and their outcome at 3 month interval until July 2011 were recorded, this makes a follow up time of 1 year. A cohort of July 2010 was conveniently selected since this was the month which enrolled large number of clients in care.

3.2: Study Area

A retrospective cohort study was conducted in three care and treatment centres in Morogoro region, a region with HIV prevalence of 5.1%[7], probability sampling was used to select these three sites which they all provides ART, Pre ART and Home based care services (HBC) as per government system. From a list of 57 CTC in Morogoro region 3 CTCs were randomly selected by simple random sampling.

Morogoro regional hospital Care and treatment centre (MRH CTC)

- Is located within the government owned Regional hospital in Morogoro
- It is situated at Morogoro municipal (Urban)
- The hospital is predominantly serving the urban population within the Morogoro municipality, but since it is the regional hospital it also serves clients from other areas and districts of Morogoro. This wide diversity of population served by the hospital also applies to the MRH CTC
- MRH CTC was established in October 2004 and its one of the first CTC to start providing care and treatment in Morogoro region
- MRH CTC represent sites with large number of clients others being St Francis in Kilombero and Lugala hospital in Ulanga
- Cumulatively it has 6893 clients in care and 3988 on ARV According to physical count exercise of 2010 of all records of clients who have ever been registered since care and treatment services were initiated in this CTC.
- MRH CTC is a pilot site for lost to follow up tracing program under International epidemiological database on HIV/AIDS (IeDea)

Mtibwa sugar care and treatment centre (Mtibwa CTC)

- It is located in Mtibwa sugar Hospital under the management of Mtibwa Sugar Company in Mvomero district.
- Though the hospital is mainly for serving company workers, the CTC is accessible to the general public.
- Mtibwa CTC started it services in April 2006 and represents medium sized sites
- According to the CTC data base the site has 477 cumulative clients on ART and 756 cumulative on Pre ART and 574 cumulative clients with unknown status.
- The centre being in semi urban area its surrounding population are mainly farmers and animal keepers

St Kizito Care and treatment centre

- Located at St Kizito hospital in Mikumi, a catholic church owned hospital within semi urban area at Kilosa district.
- The hospital serves the general population and the same applies to the CTC services
- CTC services started in 2008, and cumulatively it has 1016 clients on ART and 634 Pre ART clients and 674 clients with unknown status by September 2010
- The CTC receives nutrition support for its eligible clients who are in care and treatment from CUAMM which is an Italian organisation for health system support.

3.3: Study Population

The study population was limited to individuals (male/female) 15 years of age and above who are HIV positive and were newly registered in care and treatment in July 2010 in any of the three selected study sites and their records are available on CTC 2 cards and Pre ART registers regardless of their HIV/AIDS clinical staging, CD4 count and ART eligibility. Cut off point of 15 years was selected since in AIDS care and Treatment client of less than 15 years are regarded as paediatric HIV which is not part of this study.

3.3.1: Inclusion criteria

1. Enrolled client who has been confirmed to be HIV positive with confirmation date indicated on the CTC 2 card

2. Adults who by the time of enrollement in HIV/AIDS care and treatment centre was 15 years of age or above

3. Study participants were limited to clients newly enrolled in HIV care in July 2010 in any of the 3 selected study sites

3.3.2: Exclusion criteria

Transfer in patients, who were enrolled in care at another facility before 2010 and then transferred in with or without records to a selected study site in July 2010 since this study aimed at studying only clients who were newly enrolled in care in July 2010and has not been in care anywhere else so as to have the same follow up time of 1 year for all study participants.

3.4: Sample size calculation

Sample size calculation for a single proportion

From the equation

$$n = [DEFF*Np(1-p)]/ [(d^2/Z^2_{1-\alpha/2}*(N-1)+p*(1-p)]$$

n - Sample size
N – Population size
P - Frequency of outcome factor in the population
d - Desired precision
DEFF - Design effect

Where by

N = 999999
D = 10

P = 30% – Amuron B et al, mortality and loss to Follow up during Pre treatment period in ARV program in Uganda,2009.
DEFF= 3
Confidence level = 95%
Therefore;
Minimum required Sample size = 245

3.5Sampling technique

In order for the sample size of 245 Pre ART clients to be reached, all clients who were enrolled in care in July 2010 and were recorded in the pre ART register without ART start date were listed to be included in the study. Clients CTC2 cards were then retrieved from medical records, out of the 369 files retrieved from all three sites, 351 files met the inclusion criteria and were used for data abstraction for this study.

3.6: Data collection instrument and questionnaire pre-testing

Semi structured questionnaire was used for data collection, the questionnaire had part A and B, Part A of the questionnaire was used for filling data abstracted from CTC2 client card with personal identifiers, baseline clinical characteristics, and client attendance status. Information from 351 files which met the inclusion criteria were recorded in part A of the questionnaire. Part B of the questionnaire was used for interviews with only Pre ART clients or their treatment supporters both attending and the non attending to ascertain reasons for attending/not attending and if they have been receiving care anywhere else during their absence from their original clinic.

Both part A and B of the questionnaire was originally written in English corresponding to the language which was initially used in CTC 2 cards were data abstraction was relied and it was then translated to Swahili for easy communication between interviewers and the interviewee who mostly are fluently in Swahili.

Prior to the main study, pretesting of the questionnaire was done to 19 randomly selected participants at MRH CTC in Morogoro Municipal. Pretesting of questionnaires was useful as some of the unclear questions of the questionnaire were reworked.

3.7: Ethical considerations

Ethical approval was obtained from the Muhimbili University of Health and allied sciences IRB, for conduct of the study. Written informed consent was obtained from patients/clients who were interviewed. Permission to use facility CTC medical records and to interview the CTC clients was obtained from the selected hospital management.

3.8: Data collection

A list of all HIV infected adults of 15years of age and above who were enrolled in care in July 2010 in three selected sites who met the inclusion criteria for this study were obtained from Pre ART registers, medical files of the listed clients were retrieved from medical records using unique CTC identification number and facility number as identified from the Pre ART register. Retrospective medical record review was performed using designed semi structured questionnaire. Records were reviewed for baseline socio demographic, baseline clinic characteristics, client's clinic attendance status at month 1, 3, 6, 9 and 12 was also determined. Client Attendance status included whether the client had initiated ART, died, transferred out, opted out of care, Pre ART still attending and unrecorded/unknown for those with missed appointments, or undocumented status at their scheduled appointment date.

If the client had remained in care for 1 year either at original site or another CTC or had missed appointment due to failure to keep their scheduled appointment and come at later days before the end of follow up time were termed as still in care .For those Pre ART clients who had unknown status until December 2012, they were phoned at a minimum of three times if not reachable then treatment supporter contact details provided by the client to the clinic was used to trace whereabouts of the client. For clients who could not be reached and those without phone contacts then home based care volunteers and back to care program initiatives were used to trace those clients who are no longer in care to ascertain for their status, interview them for the reasons which made them not to proceed with care at CTC, and were also advised to return to care. After being traced up clients were designated as deceased, changed service provider Pre ART, changed service provider ART, unreachable, opted out, or reached and promise to return. Finally all those Pre ART clients who were still attending either at the original site or another CTC and the missed

appointment who by the end of follow up had a status of attending were termed as still in care (retained in care), and all those who had status of deceased, opted out before and after trace back and those who were reached during trace back and promise to return to care were termed as Not retained in care. Those clients who started ART during the period of 1 year follow up and those who were traced back and reported to be on ART with another provider were designated as on ART and that was the end of their follow up for this study.

3.9: Data entry and Management

Data were entered in Epi info statistical software, to reduce the possible errors made during data entry process, Check codes and legal values were used, open ended questions were coded for analysis. Furthermore, data cleaning was done to rectify data entry errors.

3.10: Study outcomes

1. The primary outcome of the study was pre ART Attrition at 1 year follow up since enrolment to HIV/AIDs Care and treatment centre which for this study was defined as failure to be in Pre ART care either at original site or another CTC at 1 year period of follow up. This included outcome of both initial recorded outcome and the trace back outcome of client being deceased(dead), opted out of care(opt out) and those who when traced back were not in care with none of the care and treatment centre and promised to get back to care.(promise to return).
2. clients who were in care either at their original site or who transferred out and were still in Pre ART care at 1 year follow up period and those who initially were termed as unknown status due to missed appointment and later came to attend because of different clinic schedule and at the end of 1 year their status was attending, for this study were termed as retained (still attending)
3. Clients who initiated ART either at original site or they transferred out and initiate ART at another CTC, or who were traced back and reported to been ART with another CTC then for this study were regarded as On ART and were not included in analysis
4. Clients who by the end of the study they could not be traced back or their status could not be determined were not included in the final analysis.

3:11 Data Analysis

3.11.1: Attrition magnitude

Status of all clients who were enrolled to this study were studied cross sectionally at 3 months interval i.e. at 1, 3 6, 9 and final outcome at 12 month to determine the attrition rate.

3.11.2: Measures of Central tendencies

Mean, median and mode for continuous variables i.e age, CD4, duration from HIV testing to enrolment in care, duration from eligibility to ART initiation were determined before they were grouped for bivariate analysis

3.11.3: Univariate analysis

Univariate analysis to describe socio demographic and baseline clinical characteristics of the Pre ART clients (Not retained and retained) was done**.**Also univariate analysis was done for factors in the retained and not retained groups which was then subjected to bivariate analysis to obtain correlates of Loss to care crude measure of association. Baseline cohort characteristics of the in care and Pre ART loss groups were compared using Chi – square test for categorical data. Bivariate analysis was used to examine correlates of attrition during the study period. Variables compared included socio demographic, clinical and clinic and geographical factors, Variables exhibiting association with outcomes at bivariate (Crude ratio) of 1.1 to 0.5 or a P value of 0.25 were further advanced into multivariate models to determine independent correlated of Pre ART loss. Association were examined at 0.05 significance level (2 sided)

3.11.4: Multivariate analysis

Variables exhibited association with P value of 25% were advanced into multiple logistic regressions to control for confounding and to estimate the independent correlates of Pre ART attrition.

CHAPTER 4: RESULTS

4.1: Cohort description

4.1.1: Demographic

A total of 369 adults of 15years of age and above were enrolled in care and treatment in July 2010 in three study selected sites namely Morogoro Regional hospital CTC, Mtibwa Hospital CTC and St Kizito CTC, records of 351clients out of the 369 enrolled clients met the inclusion criteria for the study and were used for analysis of this study. Overall 243(69.2%) of the 351 recruited participants were females, overall participants age ranged from 15 – 67 years, Most of the clients were enrolled in care at the age between 25 -39 Years where by 72(20.1%) were 25-29 years, 67(19.1%) were 30 -34years and 60(17.1%) were 35-39 years. median age was 34 years.

Marital status of 13(3.7%) study participants was not recorded in the client CTC2 card, MRH CTC accounted for 8(61.5%) of clients with no marital status and St Kizito had only 1 client with no marital status at enrolment. Of the remaining 338 clients who had their marital status recorded at enrolment in CTC shows that 185 (54.7%) were married.

Place of residence of the clients were categorised as whether the person were leaving on the same district as the CTC they have been registered for care and treatment or not, Data shows that 185(52.7%) clients were leaving on the same district as the CTC they have been registered in at enrolment.Mtibwa CTC had all its 107 enrolled clients living on the same district as the CTC (Table 1).

Table1: Study population demographic characteristics (n351),July 2010. Morogoro

Variables	Overall	%	MRH CTC	%	Mtibwa CTC	%	St Kizito CTC	%
Total	351	100	122	34.8	107	30.4	122	34.8
Sex								
female	243	69.2	78	32.1	76	31.3	89	36.6
Male	108	30.8	44	40.7	31	28.7	33	30.6
Age								
15 -24	40	11.4	14	35	11	27.5	15	37.5
25 - 29	72	20.1	31	43.1	15	20.8	26	36.1
30 - 34	67	19.1	22	32.8	20	29.9	25	37.3
35 - 39	60	17.1	19	31.7	21	35	20	33.3
40 - 44	40	11.4	12	30	13	32.5	15	37.5
45 - 49	38	10.8	12	31.6	20	52.6	6	15.8
50 - 54	12	3.4	3	25	2	16.7	7	58.3
55+	22	6.3	9	40.9	5	22.7	8	36.4
Marital status								
Never married	82	23.4	36	43.9	7	8.5	39	47.6
Married	185	52.7	49	26.5	67	36.2	69	37.3
Cohabiting	7	2	4	57.1	1	14.3	2	28.6
Divorced	44	12.5	18	40.9	21	47.7	5	11.4
widowed	20	5.7	7	35	7	35	6	30
Not indicated	13	3.7	8	61.5	4	30.8	1	7.7
Place of Residence								
Same as CTC	291	82.9	79	27.1	107	36.8	105	36.1
Not same as CTC	60	17.1	43	71.7	0	0	17	28.3

4.1.2: Cohort clinical characteristics

Overall of the 351 recruited study population only 254(72.3%) had their CD4 checked within 1 month since being enrolled to CTC, of the three sites Mtibwa CTC had the least number 60(23.6%) of clients who had their CD4 checked within 1 month since enrolment.

Median CD4 for those who had their CD4 checked was 277 cells/ml with a range of 2cellc/ml to 1580cells/ml. 150(59.1%) clients had CD4 more than 200cells/ml at enrolment with CD4 more than 350cell/ml accounting for 103(40.6%) of the overall 254 clients with CD4 count. Of the three sites St Kizito CTC had more clients 47(45.6%) with CD4 >350cell/ml while MRH CTC had more clients 33(57.9%) with CD4 ≤ 100cells/ml at enrolment. (Table 2)

All 351 respondents had their WHO clinical stage recorded of whom 188 (53.5%) clients were on clinical stage 3 and 4 at the time they were enrolled in CTC. Overall most clients 142(40.5%) were in Clinical stage 3. Of the three sites Mtibwa CTC had more clients 54(61.4%) who were in clinical stage 1 at enrolment. (Table 2)

ART eligibility basing on either CD4 count ≤200 or WHO stage 4 or Both CD4 count and WHO clinical staging showed that 161clients were ART eligible at time they were enrolled in CTC.(Fig3)

Overall 321(91.5%) clients had a working functional status at the time of their enrolment in CTC and only 7(2%) were bedridden, MRH CTC had no client who were bedridden at the time of enrolment where by St Kizito CTC had no clients on Ambulatory state at their enrolment in July 2010 (Table 2)

Table 2, Study population clinical characteristics (n =351), July 2010,Morogoro

Variables	Overall	%	MRH CTC	%	Mtibwa CTC	%	KIZITO CTC	%
Total	351	100	122	34.8	107	30.5	122	34.8
CD4 Checked								
Yes	254	72.3	95	37.4	60	23.6	99	39
No	97	27.7	27	27.8	47	48.8	23	23.7
CD4 Count (n=254)								
≤ 100	57	22.4	33	57.9	7	12.3	17	29.8
101-200	47	18.5	18	38.3	14	29.8	15	31.9
201-350	47	18.5	15	31.9	12	25.5	20	42.6
≥351	103	40.6	29	28.2	27	26.2	47	45.6
WHO Staging								
Stage 1	88	25.1	17	19.3	54	61.4	17	19.3
Stage 2	75	21.4	33	44	18	24	24	32
Stage 3	142	40.5	58	40.8	20	14.1	64	45.1
Stage 4	46	13	14	30.4	15	32.6	17	37
Fuctional status								
Working	321	91.5	105	32.7	97	30.2	119	37.1
Bedridden	7	2	0	0	4	57.1	3	42.9
Ambulatory	19	5.4	16	84.2	3	15.8	0	0
Not recorded	4	1.1	1	25	3	75	0	0
Comorbidities								
Yes	218	62.1	78	35.8	55	25.2	85	39
No	133	37.9	44	33.1	52	39.1	37	27.8

4.2: Cohort attrition status

4.2.1: Cohort 1 year follow up outcome

Findings of the 351 clients who were studied for a period of 1year at three months interval shows that at three months since clients enrolment to CTC 19(5.4%) clients had died 27(7.7%) transferred out to another CTC and 72 (20.5%) initiated ART.

At 12 months of follow up findings shows that only 67(19.1%) clients were still in Pre ART care at the original site where they were enrolled. Status of 103(29.3%) clients could not be determined (table 3).

Table 3: Cohort 1 year follow up outcome (July2010-July2011), n=351,Morogoro

Follow up outcome	Transfer out	Opted out	Died	start ART	Unknown status	Pre ART attending
Follow up timing						
At 3 month	27(7.7)	3(0.9)	19(5.4)	72(20.5)	89(25.4)	141(40.2)
at 6 month	36(10.2)	3(0.9)	25(7.1)	81(23.1)	92(26.2)	114(32.5)
At 9 Month	44(12.5)	5(1.42)	30(8.5)	85(24.2)	100(28.5)	87(24.8)
At 12 month	53(15.1)	6(1.7)	35(10)	87(24.8)	103(29.3)	67(19.1)

4.2.2: Cohort trace back outcome

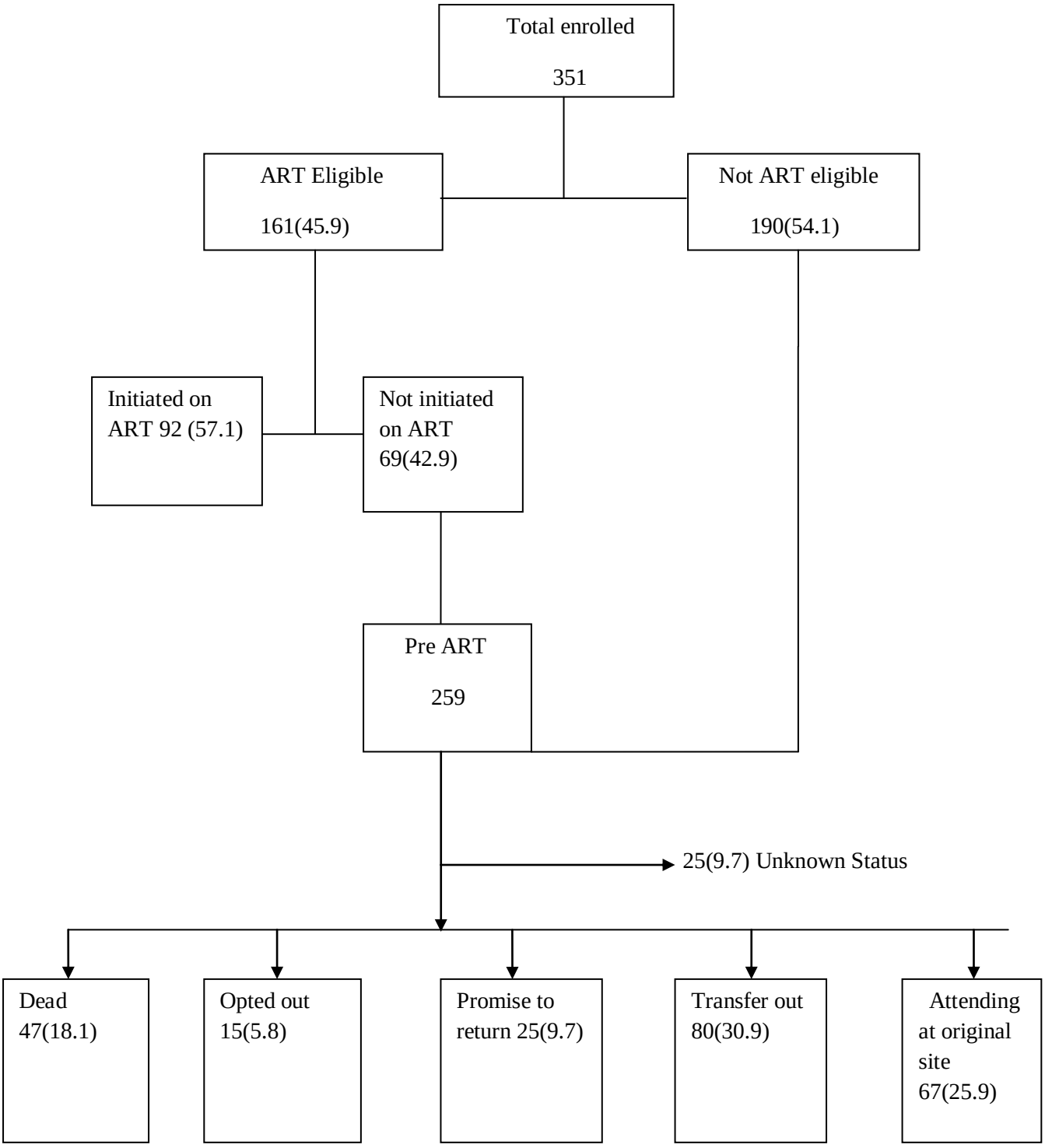
Tracing back of the 103 clients who their attendance status could not be determined was done through home based care providers and telephone calls and information on 78 clients was obtained whereby 27(26.2%) clients were silent transfers to other CTCs, 5(4.9%) had initiated ART with another CTC provider and status of 25(24.3%) clients could not be ascertained. (Table 4)

Table 4: Lost to follow up clients trace back outcome (n=103)

outcome	n	%
Transfer out	27	26.2
opted out	9	8.7
Died	12	11.6
Start ART	5	4.9
promise to return to care	25	24.3
could not be reached	25	24.3
	103	100

Overall outcome of the 351 clients after trace back of clients with unknown status Study revealed that of the 351 clients who were enrolled in care in July 2010, 190(54.1%) clients were ART ineligible as compared to161(45.9%) clients who were ART eligible by CD4 count of ≤200cell/ml or WHO stage 4 or both CD4 and WHO staging as per National guideline for ART eligibility**.** Of the 161 ART eligible clients 92 (57.1%) were initiated ART while 69 (42.9%) clients were not initiated ART despite being Eligible. Overall 256 clients had not initiated ART at 1 year of follow up but only 67(25.9%) of the Pre ART clients were still attending care and treatment at their original CTC where they were enrolled in July 2010 and status of 25 (9.7%) of the Pre ART clients were loss to follow and their status could not be determined. (Fig 3)

Fig 3: Attrition among Clients enrolled in CTC, July 2010



4.3: Univariate analysis

4.3.1: Socio demographic characteristics of the 234 Pre ART clients

Since follow up status of 25 clients out of 256 Pre ART clients could not be obtained only 234 Pre clients were included for Pre ART analysis. 67 (28.6%) Pre ART were still in care at their original site while 80(34.2%) Pre ART clients were in care with another Care and treatment provider making a total of 147(62.8%) Pre ART clients who were still in care either at original site or with another CTC provider and 87(37.2%) pre ART Clients were no longer in care at the end of 12 months of follow up. Among the 234 Pre ART clients only 63(26.9%) were males of whom 26(41.3%) were no longer in care at 1 year of follow up as compared to 61(35.7%) of females who were no longer in care at the same period of follow up. Age group of 25-29 years and 30-34 years were the most frequent recorded age at enrolment in both attrition and non attrition categories accounting for 53(22.6%) and 52(22.2%) respectively. Only 4(1.7%) pre ART clients were enrolled in care at the age between 50-54Years in both attrition and non attrition group.

Married clients accounted for 136 (58.4%) of all Pre ART clients of whom 53(39%) were no longer in care as compared to 83(61) of the clients who were still in care at one year of follow up. Clients who have never been married accounted for 51(21.9%) where by 14(27.5%) were no longer in care at 1 year of follow up as compared to 37(72.5%) of those who were still in care , 26(11.1%) clients were divorcee with no difference between the attrition and non attrition group as each accounted for 13(50%).Most of the respondents were peasant 70(29.9%) with no difference between the attrition and the non attrition group as each accounted for 35(50%) of the clients.15 (27.8%) of clients who were formally employed and 12(42.9%) of self employed clients were no longer in care at 1 year follow up. Clients with primary education level were 112 (47.9%) of whom 46(41.1%) were no longer in care at 1 year of follow up. (Table 5)

Table 5: Socio demographic characteristics of the Pre ART clients n 234

variables	Attrition (n87)	Non Attrition (n147)	Total
Sex			
Male	26(41.3%)	37(58.7%)	63(26.9)
Female	61(35.7%)	110(64.3%)	171(73.1)
Age (yrs)			
15-19	3(33.3%)	6(66.7%)	9(3.8%)
20-24	7(33.3%)	14(66.7%)	21(9.0%)
25-29	16(30.2%)	37(69.8%)	53(22.6%)
30-34	25(48.1%)	27(51.9%)	52(22.2%)
35-39	14(33.3%)	28(66.7%)	42(17.9%)
40-44	8(34.8%)	15(65.2%)	23(9.8%)
45-49	8(40%)	12(60%)	20(8.5%)
50-54	2(50%)	2(50%)	4(1.7%)
55andabove	4(40.0%)	6(60%)	10(4.3%)
Marital status			
never married	14(27.5%)	37(72.5%)	51(21.9%)
Married	53(39.0%)	83(61.0%)	136(58.4%)
Cohabiting	0	5(100%)	5(2.1%)
Divorced	13(50%)	13(50%)	26(11.1)
Widowed	3(37.5%)	5(62.5%)	8(3.4%)
Not indicated	4(50%)	4(50%)	8(3.4%)
Education			
No formal education	19(45.2%)	23(54.8%)	42(17.9)
Primary education	46(41.1%)	66(58.9)%	112(47.9)
secondary education	15(32.6%)	31(67.4%)	46(19.7)
post secondary	7(20.6%)	27(79.4%)	34(14.5)
Occupation			
Student	1(12.5%)	7(87.5%)	8(3.4)
Petty business	14(40.0%)	21(60.0%)	35(15.0)
Peasant	35(50%)	35(50%)	70(29.9)
Animal keeping	2(15.4%)	11(84.6%)	13(5.6)
Formal employment	15(27.8%)	39(72.2%)	54(23.1)
Self employed	12(42.9%)	16(57.1%)	28(12)
Housewife	8(30.8%)	18(69.2%)	26(11.1)
	87	**147**	**234**

4.3.2: Baseline clinic characteristics of the Pre ART clients

A total of 131(56%) pre ART clients were in WHO stage 1 and 2 at enrolment in CTC of whom 41(31.3%) were no longer in care at one year of follow up. Only 25(10.7%) of the pre ART clients were in WHO stage 4 of whom 18(72%) were not retained in care at 1 year of follow up.

Overall most Pre ART clients were enrolled in care while at stage 1 and 3 accounting for 78(33.3%) each.Only 20(13.8%) Pre ART clients were enrolled in care with CD4 ≤100cells/ml, 11(55%) of whom were no longer in care at 1 year of follow up. Most of the pre ART clients 83(57.2%) were enrolled in care with CD4 ≥351 of whom 25(30.1%) were no longer in care at 1 year of follow up. Overall of the 111(76.6%) Pre ART clients with CD4 ≥201cells/mls, 33(29.7%) were no longer in care as compared to 78(70.3%) of those who were still in care. (Table 6). Median CD4 for attrition group was 369cell/ml and median CD4 for the retained group was 411cells/ml.

Only 99(42.3%) clients had not reported other health condition at the time they were enrolled in care of whom 29(29.3%) were no longer in care at one year of follow up. 25(10.7%) were TB suspects and 18(7.7%) had TB at the time they were enrolled in CTC where by 9(36%) and 8(44.4%) respectively were no longer in care at 1 year of follow up. 216(92.3%) Pre ART clients had working functional status when enrolled at CTC, 73(33.8%) where from the not retained group and 143(82.3%) in retained group. (Table 6)

Table 6: Baseline clinical characteristics of the Pre ART clients (n 234)

variables	Not retained(n87)	Retained(n147)	Total(234)
Clinical stage			
Stage 1	24(30.8))	54(69.2)	78(33.3)
Stage 2	17(32.1)	36(67.9)	53(22.6)
stage 3	28(35.9)	50(64.1)	78(33.3)
stage 4	18(72.0)	7(28.0)	25(10.7)
	87(37.2)	147(62.8)	234
CD4 count(n145)			
≤100	11(55)	9(45)	20(13.8)
101-200	4(28.6)	10(71.4)	14(9.7)
201-350	8(28.6)	20(71.4)	28(19.3)
≥351	25(30.1)	58(69.9)	83(57.2
	48(33.1)	97(66.9)	145
Co morbidities			
None	29(29.3)	70(70.7)	99(42.3)
PCP	0(0.0)	1(100)	1(0.4)
PTB	8(44.4)	10(55.6)	18(7.7)
others	20(48.8)	21(51.2)	41(17.5)
Pregnancy	15(39.5)	23(60.5)	38(16.2)
TB suspect	9(36)	16(64)	25(10.7)
Fevers	6(50)	6(50)	12(5.1)
	87(37.2)	147(62.8)	234
Functional status			
Working	73(33.8)	143(66.2)	216(92.3)
Bedridden	3(60)	2(40)	5(2.1)
Ambulatory	10(100)	0(0.0)	10(4.3)
not recorded	1(33.3)	2(66.7)	3(1.3)
	87(37.2)	147(62.8)	234

4.3.3Clinic characteristics

Self referral which also include VCT was the main entry point to CTC 107(46%) for both attrition and non attrition group clients accounting for 76(71%) and 31(29) respectively. clients who had Inpatient 22(9.4%) and PLHIV 5(2.1%) as their entry point accounted for 14(63.6%) and 3(60%) respectively of those who were no longer in care at one year of follow up. (Table 7)

Only 122(52.1%) clients were referred to other units on the first day of their enrolment to CTC of whom 75 (61.5) were referred to nutrition support unit.25 (33.3%) of those who were referred for nutrition support were not retained in care. among the 122 clients who were referred to other units on the first day of their enrolment to CTC, all 9(7.3%) pre ART clients who were referred to PLHIV support group, medical specialist and Family planning services were not retained in care at 1 year of follow up.(Table 7)

Out off 234 Pre ART client only 213 (91%) had records of their CD4 check status on their last CD4 check schedule of whom 134(63) had their CD4 checked while 79(37%) did not, 48(35.8%) of those with CD4 checked and 38(48.1%) were not in care at one year of follow up.

Clinic schedule of the respondents range from one week to 6 months, 24(10.3%) clients were scheduled at $\leq$ 1 month of whom 14(66.6%) were not retained in care at one year of follow up. 97(41.5%) clients were scheduled at 1 month,69(29.5%) at 3 months and 20(8.5%) at 6 months where by only 38(39.2%),27(39.1%) and 2(10%) respectively were no longer in care at the same period of follow up.(Table 7)

Table 7: Pre ART clients Clinic characteristics, (n 234) Morogoro,2010

	Not retained	Retained	Total
Referral from n233			
Inpatient	14(63.6)	8(36.4)	22(9.4)
OPD	11(50)	11(50)	22(9.4)
TB clinic	4(36.4)	7(63.6)	11(4.7)
RCH/PMTCT	18(34.6)	34(65.4)	52(22.3)
PLHIV	3(60)	2(40)	5(2.1)
self referral	31(29)	76(71)	107(46)
others	5(35.7)	9(64.3)	14(6)
	86	**147**	**233**
Last CD4 check(n213)			
Yes	48(35.8)	86(64.2)	134(63)
No	38(48.1)	41(51.9)	79(37)
	86	**127**	**213**
Referred To(n122)			
PMTCT	1(50)	1(50)	2(1.6)
HBC	10(43.5)	13(56.5)	23(18.9)
PLHIV	1(100)	0	1(0.8)
Medical speciality	7(100)	0	7(5.7)
Nutritional support	25(33.3)	50(66.6)	75(61.5)
TB clinic	3(27.3)	8(72.7)	11(9)
FP services	1(100)	0	1(0.8)
Others	0	2(100)	2(1.6)
	48(39.3)	**74(60.7)**	**122**
clinic schedule			
<1month	14(66.6)	10(33.3)	24(10.3)
monthly	38(39.2)	59(60.8)	97(41.5)
2 monthly	1(7.1)	13(92.9)	14(6)
3 Monthly	27(39.1)	42(60.9)	69(29.5)
4 monthly	5(50)	5(50)	10(4.3)
6 monthly	2(10)	18(90)	20(8.5)
	87(37.2)	**147(62.8)**	**234**

4.3.4: Pre ART Client geographic characteristics

Most of the Pre ART clients190 (81.2%) were found to be living within the same district as the CTC they have been registered for care. Among them 77(40.5%) were not retained in care at one year of follow up. Distance from place of residence to the clinic to 109(46.6%) was within 5km but 43(45%) clients could not be retained in care at a follow up period of 1 year. Public transport was the mostly used mode of transport for both the attrition and the non attrition group accounting for 118(50.4%) to go for CTC services. (Table 8)

Table8: Pre ART clients geographic factors (n234), Morogoro, 2010

	Not retained	**Retained**	**Total**
Distance			
<5km	33(39.3)	51(60.7)	84(35.9)
5km	10(40)	15(60)	25(10.7)
6-10km	34(43.6)	44(56.4)	78(33.3)
>10km	10(21.3)	37(78.7)	47(20.1)
	87	147	234
Transport			
By foot	15(27.8)	39(72.2)	54(23.1)
Bicycle	13(36.1)	23(63.9)	36(15.4)
Motorcycle	11(52.4)	10(47.6)	21(9.0)
Public transport	46(39.0)	72(61.0)	118(50.4)
Others	2(40)	3(60)	5(2.1)
	87	147	234
Same district as the CTC			
Yes	77(40.5)	113(59.5)	190(81.2)
No	10(22.7)	34(77.3)	44(18.8)
	87(37.2)	147(62.8)	234

4.3.5Behavioural factors

On disclosure of HIV status only 80(59.7%) clients have disclosed their HIV status of whom 15(18.8%) were not in care at one year of follow up as compared to 72(46.8%) among the attrition group of clients who had not disclosed their status. 212(90.6%) of the pre ART clients have joined community support group of whom 132(62.3%) were still in care at 1 year of follow up.

Table 9: Pre ART clients behavioural characteristics (n234),Morogoro,2010

Behavioural factors			
Status disclosure			
No disclosure	72(46.8)	82(53.2)	154(65.8)
disclosure	15(18.8)	65(81.2)	80(59.7)
	87(37.2)	147(62.8)	234
Community support			
Yes	80(37.7)	132(62.3)	212(90.6)
No	7(31.8)	15(68.2)	22(9.2)
	87(37.2)	147(62.8)	234

4.4: Bivariate analysis

4.4.1: Socio-demographic factors

None of the socio-demographic factors were statistically significant for Pre ART attrition though Age above 45years (OR 1.46, 95%CI 0.7-3.14, p = 0.32), male sex (OR1.26, 95%CI 0.7-2.28,P = 0.43) and lack of formal education (OR1.5,95%CI 0.77-2.9,p=0.23) were found to be risk factors for Pre ART attrition while being formally employed (OR 0.57,95%CI 0.29-1.12, p=0.10) was protective against Pre ART attrition(Table 10).

4.4.2: Baseline clinical characteristics

On baseline clinical characteristics it was observed being at an advanced stage of HIV/AIDS in terms of Low CD4 count, WHO stage 3&4 , being bedridden or ambulatory and having co morbidities at the time of CTC enrolment were risk factors for Pre ART attrition and were statistically significant. Findings shows that Clients who were Pre ART loss were 2.9 times more likely to have CD4 less than 100cell/ml (95%CI 1.11-7.59, p=0.02). It was also seen that Pre ART clients who were in WHO stage 3 & 4 were 2 times more likely to have Pre ART Attrition from care (95%CI 1.03-3.02, p0.03) as compared to those who were in Stage 1 and 2. findings also shows that clients who were ambulatory at

the time CTC enrolment were 6.8 more likely to have Pre ART attrition as compared to those who had working functional status(95%CI 2.17-21.57,p 0.0002. It was also observed that Pre ART clients who were enrolled in CTC while having other health condition/co morbidities were 1.8 times more likely for Pre ART attrition as compared to those with no co morbidities at enrolment (95%CI 1.04- 3.15,p 0.03 (Table 10).

4.4.3: Clinic factors

Comparison of clinic factors among attrition and Non attrition clients group revealed that Pre ART clients who their point of entry at CTC were through Health care providers(HCPs) were 1.9 more likely (OR 1.9 p=0.01) to have pre ART attrition as compared to those who were self referral. clinic visit schedule of monthly or less for Pre ART care was found to be a risk factor for Pre ART attrition though not statistically significant where by Pre ART clients who their clinic appointment were scheduled monthly or less were 1.69 times more likely to have Pre ART attrition as compared to those with schedule of more than one month(95%CI 0.98 -2.87,p 0.05).Findings also shows that clients having CD4 check service as scheduled was protective against Pre ART Attrition though not statistically significant where by clients who had their CD4 count checked at their last CD4 check schedule were 0.6 more likely not to have pre ART Attrition as compared to those who didn't get the service as scheduled (Table 10).

4.4.4: Geographic factors

On geographical factors findings shows that living at a distance of more than 10Km was protective against Pre ART attrition, whereby Clients who were living at distance of more than 10km were 0.38 times protected from Pre ART attrition as compared to those who lived at less than 10km(95%CI 0.18 – 0.82,p 0.01) Table 10.

4.4.5Client's behavioural factor

Findings shows that failure to disclose HIV status is a risk factor for Pre ART attrition whereby Clients who have not disclosed their status were 3.8 more likely to have Pre ART attrition as compared to those who have disclosed their HIV status(95%CI 1.99-7.24,p 0.00002) Table 10

Table 10: Bivariate analysis of the factors among attrition and non attrition group

Variables	Attrition	Non attrition	OR	P	C I
sociodemography					
Age					
>45	14 (45.2)	17 (54.8)	1.46	0.32	0.68-3.14
≤45	73 (36)	130 (64)			
Sex					
Male	26 (41.3)	37(58.7)	1.26	0.43	0.70-2.28
Female	61 (35.7)	110(64.3)			
Marital status					
Single/divorced/separated	34(36.6)	59(63.4)	0.95	0.87	0.55-1.64
Married/Cohabiting	53(37.6)	88(62.8)			
Education					
No formal education	19(45.2)	23(54.8)	1.5	0.23	0.77-2.96
Formal education	68(35.4)	124(64.6)			
Employment					
formal employment	15(27.8)	39(72.2)	0.57	0.1	0.29 -1.12
No Formal employment	72(40)	108(60)			
CD4count**					
≤100	11(55)	9(45)	2.9	0.02	1.11-7.59
>100	37(29.6)	88(70.4)			
Clinical Stage**					
Stage 3&4	46 (47.7)	57(55.3)	1.77	0.03	1.03-3.02
Stage 1&2	41(31.3)	90(68.7)			
Functional status**					
Ambulatory/bedridden	14(77.8)	4(22.2)	6.8	0.0002	2.17-21.57
Working	73(33.8)	143(66.2)			
Co morbidities**					
Yes	58(43.0)	77(57.0)	1.81	0.03	1.04-3.15
No	29(29.3)	70(70.7)			

Table 10 continue

Variables	Attrition	Non attrition	OR	P	CI
Geographical Factors					
Distance**					
>10km	10(21.3)	37(87.7)	0.38	0.01	0.18 – 0.82
≤10km	77(88.5)	110(58.8))			
Transport					
Paying	46(39.0)	72(61.0)	1.16	0.56	0.68-1.98
Non paying	41(35.3)	75(64.7)			
Clinic factors					
CTC entry point**					
Referred by HCP	56(44.1)	71(55.9)	1.9	0.01	1.12-3.33
Self referral	31(29.0)	76(71.0)			
Last CD4 check					
Yes	48(35.8)	86(64.2)	0.6	0.07	0.34-1.05
No	38(48.1)	41(51.9)			
clinic schedule					
≤monthly	52(43)	69(57)	1.69	0.05	0.98-2.87
> monthly	35(31)	78(69)			
Behavioural factors					
Status disclosure**					
No disclosure	72(46.8)	82(53.2)	3.8	0.00002	1.99-7.24
Disclosure	15(18.8)	65(81.2)			
Community support					
Yes	80(37.7)	132(62.3)	1.2	0.58	0.62-2.23
No	7(31.8)	15(68.2)			

**** -statistically significant**

4.5:Multivariate analysis

Factors which had a P value of 0.20 in bivariate analysis were advanced into logistic regression where it was found that controlling for age and sex, being referred to CTC by HCP (Adjusted OR 2.5 (1.26-5.02) and failure to disclose HIV status (Adjusted OR5.9 (2.82-12.7) were independent risk factors for Pre ART attrition while receiving CD4 count check as scheduled was protective against Pre ART attrition (Table 11)

Table 11: Independent predictors for Pre ART attrition

	Crude			**Odds**			**P-**
Variables	**OR**	**95%**	**CI**	**Ratio**	**95%**	**C.I.**	**Value**
Referred to CTC by HCP	1.9	1.12	3.33	2.5236	1.2676	5.0242	0.0084
Functional status	6.8	2.17	21.57	0.1862	0.0514	0.6738	0.0104
clinic schedule	1.69	0.98	2.87	0.5186	0.2663	1.0099	0.0535
HIV status not disclosed	3.8	1.99	7.24	5.9983	2.8286	12.7198	0
Sex	1.26	0.7	2.28	1.0647	0.517	2.1924	0.8649
CD4checked on last schedule	0.6	0.34	1.05	0.5046	0.2597	0.9806	0.0436
CONSTANT				*	*	*	0.1245

CHAPTER 5: DISCUSSION

Overall study of 351 clients who were enrolled in CTC in July 2010 and their attendance status reviewed at 3 months for a period of 1 year revealed that only 92 (26.2%) were initiated on ART while 234(66.7%) were on Pre ART care while status of 25(7.1%) could not be determined.

To determine Pre ART attrition magnitude among 234 Pre ART clients it was found that only 67clients (28.6%) were still attending Pre ART care at the original CTC were they were first enrolled while 80(34.2%) had transferred out to other CTC 27(33.8%) among the transfers being silent transfer. It was also observed that 87(37.2%) of the clients were no longer in care at 1 year of follow up, 47(54%) of the 87 Pre ART attrition were due to recorded death 19(40%) of which occurred within the first three months since clients were enrolled in care. This early Pre ART loss can be supported by the finding from this study was clients were seen to be enrolled in care while already at an advanced stage of the disease which can lead to early mortality. This finding is also supported by findings from other studies were it was observed that advanced disease stage which includes Low CD4 count less than 100 and being ambulatory with co morbidities when enrolled in care were significantly associated with Pre ART attrition.[17]

Most studies on Pre ART loss were not seeking outcome of clients with unknown follow up outcome at their original clinic, these led to either underestimation or overestimation of the magnitude of attrition among Pre ART clients as was pointed out in a study by Elvin Geng et al in rural Uganda, where it was found that61% to 80% of 111 patients lost between 2004 and 2007 were found alive and in care elsewhere as defined by both seeing an HIV provider and some had initiated on ART.[23] In Kampala , Uganda investigators found that 505 of patients lost from the infectious disease institute, a large central clinic were in care elsewhere[29].

This study seek outcome of those 103 clients who at 1 year since their enrolment to CTC their status were unknown either due to silent transfers, death and other reasons which were not known to their clinic. This was done via HBC volunteers, phone calls to clients or client's treatment supporter who their contacts details were available at the clinic, and via back to care program initiated by Tunajali program which as the name implies seek clients are no longer in care and treatment in 3 regions under their support . Outcome of this trace back revealed that of the 103 clients with unknown status 32(31.1) were silent

transfers of who 5 were on ART, 9(8.7) opted out of care, 12(11.7) were deceased, 25(24.3) were reached and promise to return to care, outcome of 25(24.3) clients could not be ascertained. These findings shows if it was not for tracing back those 32 clients who are still in care with other providers could have been labelled as they are no longer in care while in real sense they are still in care. Among the reasons as to why they had silent transfers include loss of CTC cards so they went to another CTC and register as a new client. Others decided to move to nearby facilities once CTC services started to be provided at nearby area, others were diagnosed with HIV while receiving care for other ill health conditions and got registered in those CTC but when they were discharged they decided to go to other CTC which are closer to where they live. This could explain why this study found that those clients who reported to be leaving more than 10km had likelihood of being retained in care compared to those who lived at ≤ 10km in contrary to findings from other studies such as the one done by Losina et al in Durban SA where it was found that, nearly half of the 454 newly diagnosed HIV infected persons had Pre treatment loss to care were by patients who lived within 10km form the CTC (RR=1.37,95%CI: 1.11 were more likely to have Pre treatment attrition [11].

On socio demographic factors associated with pre ART attrition it was observed that among the 234 pre ART clients only 63(26.9%) were males of whom 26(41.3%) were no longer in care at 1 year of follow up as compared to 61(35.7%) females at the same period of follow up. This finding shows that not only few males are enrolled in care but also those few males who are enrolled are not retained in care. Despite this finding not being statistically significant in this study, Male sex is among socio demographic risk factors for Pre ART attrition which has been revealed by other Pre ART attrition studies in Africa, losina at al [11]

On marital status/living arrangements, findings from this study shows that living single which includes those who have never been married, widowed, and separated is protective against Pre Attrition though not statistically significant. This finding is different with finding from other studies where being single was found to be a risk factor for Pre ART attrition. This could be explained by the fact that HIV status disclosure has been a challenge to most PLHIV and its even worse for married/cohabiting couples who have not disclosed his/her status to their spouses as they will be afraid to attend CTC appointments without being noticed by a spouse especially in our African setting unlike those who are

single who are more free to attend clinic without such fear. This finding should not be taken as an encouragement for HIV Pre ART clients to remain single but PLHIV should be encouraged to disclose their status at least to their spouses.

Among major contributory factors to the high Pre ART loss is presentation of the clients to CTC at an advanced HIV stage in terms of both WHO clinical stage and /or CD4 count also when serious co morbidities are present. It's unfortunate that not all clients who are enrolled in care have a chance of getting CD4 check services, in this study it was found that that 89 (38.0%) did not have baseline CD4,some of the pointed out reason for not having baseline CD4 despite presence of CD4 machines in these 3 sites were, unavailability of CD4 testing reagents and presence of CD4 machines which are not serviced or are out of order, clients not showing up at their scheduled visit for CD4 testing and some of them not returning to CTC for subsequent visits. It was found that of 145 Pre ART clients who had their CD4 checked 34(23.4%) had CD4 less than 200cells/ml 15(31.25%) being from attrition group as compared to 19(19.6) from non attrition group. It was also observed that 103 clients (44.0%) were at clinical stage 3 and 4 of whom 46(52.9%) were among the attrition group and 57(44%) being retained. CD4 $\leq$ 200cells/ml, WHO clinical stage 4 and CD4 $\leq$ 350cells/mls and clinical stage 3 were the criteria for initiating ART [8] by 2010. These findings shows that most clients were enrolled in care when already eligible for ART which not only leads to high mortality among Pre ART clients but also mortality shortly after ART initiation[11]. In this study it was found that patients who had CD4 count 100or less were twice more likely to have pre ART attrition as compared to those with CD4 counts more than 100cells/ml. This finding corresponds to other studies done in Africa [17] [28]. Late presentation to the clinic is also associated with presence of serious morbidities such as PCP, PTB and others, in this study it was found that clients with morbidities at enrolment were 1.5 more likely to have pre ART attrition as compared to those without morbidities therefore Interventions facilitating early HIV diagnosis and linkages to care are of paramount importance to improving patient linkage and preventing deaths.

A finding from this study also showed that referral to CTC by HCP is an independent predictor for Pre ART loss twice as much compared to self referred. This suggest that patients referring themselves for an HIV test and later to CTC are likely to be more motivated to follow-up with subsequent care and be retained in care for longer whereas

those referred by physicians may need time to come to terms with the diagnosis and are therefore less prepared to deal with the consequences of knowing their HIV-positive status which also include lifelong enrolment in care and treatment. In addition clients who are referred to CTC by a health care provider may be sicker than self-referred patients and therefore more likely to die and hence high Pre ART loss.

Unemployment and paying for transport to the clinic are among the factors which were found to be associated with Pre ART loss in this study and other studies in low and middle income countries, Ingrid Basset et all findings showed that 59.8% of the Pre ART loss clients were not employed with P = 0.02[17], in this study most clients 168(76.1) were not formerly employed engaged mainly in farming, animal keeping, petty business and others were housewives. Findings show that being formerly employed was protective against Pre ART attrition though not statistically significant. Among the formerly employed only 15(27.8%) clients had attrition as compared to 39(72.2%) of the retained. this can be explained by the fact that clients who are self employed devote most of their time in their daily activities to earn their living while those who are formally employed can take few hours of their work schedule and still their sure of their income.

Distance to the clinic of 47(20.1%) of the clients was more than 10km and this was found to be protective against pre ART attrition , which is different from findings from other studies where short distance was found to be protective. This can be explained by the fact that clients tend to attend at CTC which are not closer to where they live because of stigma.

Most of the clients 118(50.4%) were using public transport to attend their clinic schedule. And paying for transport to the clinic was found to be a risk factor for pre Art attrition not only in this study but other study done in different part of Africa. This can be explained by the fact that extra cost of paying for transport fee to the already financial burdened who are mostly farmers or animal keepers could explain the 1.3 likelihood of them not being retained in care as compared to those who were formerly employed. This could also be explained by the increased likelihood of 1.6 among clients scheduled to attend clinic monthly not to be retained as compared to those scheduled at more than monthly schedule as less frequent clinic schedule reduce transport cost.

Failure of disclosing HIV status (self stigma) was also found to be an independent risk factor for Pre ART attrition. This can be explained by the fact that clients who have not

disclose their status are less likely to receive financial support to support them with extra cost which are incurred by the clients going to the clinic, also those who have not disclosed their status are less likely to attend clinic freely and lack encouragement to attend clinic as compared to their counterparts. It was also observed that being in community supportive group was protective against Pre ART loss so for those who have not disclosed their status are less likely to join this support group hence increased likelihood of not being retained.

CHAPTER 6: Conclusion and Recommendation

6.1Conclusion

Pre ART attrition in clinic is higher that pre ART attrition from care as clients might be accessing care at wide range of Care and Treatment centres. Therefore more studies that focuses on Pre ART attrition from care as opposed to pre ART attrition from clinic to be conducted and used as a proxy to estimate the magnitude of attrition from Pre ART care.

Self stigma and Clients enrolment in care when already at an advanced disease stage are factors which was found to play a major role in Pre ART attrition and highlight the need for intervention that create awareness on the importance of voluntary HIV counselling and testing which should also includes HIVstatus disclosure and early linkage to HIV care and treatment as soon as the client has been diagnosed with HIV/AIDS.

Improvement in patients monitoring in terms of CD4 count check as scheduled and less frequent clinic appointment as per national guideline on management of HIV/AIDS should be adhered by CTCs as these factors were found to be protective against Pre ART attrition.

6.2Recommendations

1. Establishment of Interventions that improve male enrolment and adherence to CTC after HIV positive test.
2. PLHIV should be encouraged to disclose their status during counselling sessions. Status disclosure may facilitate psychological, financial and community support which encourages the clients to retain in care.
3. Transfers and follow up between clinics should be strengthened to minimise silent transfers.
4. Pre ART patients monitoring in terms of CD4 count check and care should be adhered by the clinic as scheduled and as directed by National guideline for management of HIV/AIDS.

HCP should adhere to scheduling Pre ART Clinic appointments as recommended in national guideline for management of HIV/AIDS to reduce frequent visit of Pre ART clients to CTC which costs clients time and money

6.3Limitations

This study had the following limitations.

1. Study relied on record review which had missed some of the required information for example to some clients marital status was not recorded, WHO staging not matching with associated co morbidities for example in some records client were staged as stage 4 without presence of any co morbidities/opportunistic infections which is not the reality as for a client to be stage 4 needs presence of opportunistic infections. Also some clients who had their CD4 checked the CD4 counts were not recorded in CTC 2 cards on the date when sample was taken instead result slip were attached with the file and if gets loose they can easily get lost leaving no record to the CTC2 card and the client may be regarded as no CD4 check was done. In other CTC2 cards client status were not updated despite the information being in data base or client hospital record. Also some clients appeared as Pre ART with no ART initiation status but once file is traced client was seen to have initiated ART.
2. Part B of data collection tool for this study involved interview with the respondent and the study relied on self reported information including distance from place of residence to the clinic, education level, and status of those who were traced. For deceased clients information were obtained from relatives and/or treatment supporter. Or at times this information could not be obtained. This introduced information bias in the study and may have affected direction of the association between the groups.
3. Stigma posed a great challenge in tracing clients who were lost to follow up. It was challenging tracing outcome of the clients with unknown status, as some of the clients when reached were even refusing their names either doing it intentionally to avoid being interviewed or the name written on the cards are not their real names. Some of the clients had given different personal identification information to the CTC they have moved to. Some of the contact numbers were picked by a different person claiming not to know the person we were looking for. Some of the contact numbers could not be reached and this could mean incorrect contact details, lost telephones, disconnected phone lines and this brought difficulties in seeking status of clients.

4. It was impossible for this study to determine attrition among Pre ART clients at the period between testing positive to enrolment since clients had tested at different testing sites and some took a couple of months before they decide to enrol in care and this study looked at the clients who were already enrolled in care so only the duration elapsed between confirmation to enrolment could be established.
5. Client follow up was done cross-sectionally at 3 months interval therefore relative risk could not be calculated instead OR of the correlates were determined.
6. Findings of this study may apply to settings similar to the three sites in Morogoro sites however it may not be possible to generalize the findings to all sites in Morogoro.

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APPENDICES

Appendix 1: Data collection questionnaire for attrition among Pre ART clients.

Questionnaire – Attrition in HIV/AIDS care among clients not yet on ARV

Questionnaire no----------

Facility Name ---------- District----------

PART A: FROM CTC2 CARD

Client's information

1. Client Unique ID number ----------
2. Gender
   a) Male
   b) Female
3. Place of residence ----------District----------Village
4. Date of birth -- /-- /----
5. Marital status
   a)Single
   b) Married
   c)Cohabiting
   d) Divorced/separated
   e) Widowed

   Baseline information at enrollement in care
5. Date confirmed HIV positive -- /-- /----
6. Age at enrollement in HIV Care - - (in Years)
7. Date enrolled in care -- /-- /----
8. Referred from
   a) Inpatient
   b) OPD
   c) STI
   d) TB clinic

e) RCH/PMTCT
f) PLHIV Group
g) Self referral
h) Others (specify)----------

9. If transfer in to the facility while in Care, was it
   a) With records
   b) Without records
10. Does the client have a treatment supporter?
   a) Yes
   b) No
11. Is the client joined in any support group
   a) Yes
   b) No
12. Huwanyu/HBC Number if available ----------
13. Previous ARV exposure
   a) None
   b) PMTCT monotherapy
   c) PMTCT combination therapy
   d) PEP
14. Functional status at enrolment
   a) Working
   b) Bed ridden
   c) Ambulatory

15. Clinical stage at enrolment
   a) Stage 1
   b) Stage 2
   c) Stage 3
   d) Stage 4
16. Baseline CD4 Count -------g/cm3 at enrolment

17. Presence of co morbidities/opportunistic infection at enrolment
    a) None
    b) PCP
    c) PTB
    d) HIV encephalitis
    e) Others (specify)----------
18. Was the client referred to other units on the first day of enrolment?
    a) Yes
    b) No
19. Was the client ARV eligible at enrolment?
    a) Yes
    b) No (if no skip to Qsn 23)
20. If yes, was the client initiated on ARV? (within 2 weeks since eligibility)
    a) Yes
    b) No (if no skip to Qsn 23)
21. Date initiated on ARV -- /-- /----
22. If no in Qsn 20 above, what was the reason?
    a) No ARV available
    b) Client not willing to start
    c) On TB treatment
    d) Awaits Lab results
    e) Too sick to start

Adherence status

23. Clinic Attendance

Date scheduled	**Date attended/recorded outcome**
1. ----------	----------
2. ----------	----------
3. ----------	----------
4. ----------	----------
5. ----------	----------
6. ----------	----------
7. ----------	----------
8. ----------	----------
9. ----------	----------
10. ----------	----------

Outcome (indicate the most recent outcome)

24. Attending this clinic?	a) Yes	b) No
25. Missed 2 recent appointments	a) Yes	b) No
26. Transfer out (if recorded)	a) Yes	b) No
27. Death	a) Yes	b) No
28. Lost to follow up(missed ≥ 3appointments	a) Yes	b) No

Part B (Interview)

29. What is the highest level of education reached

a) No formal education
b) Adult education
c) Primary education
d) Secondary education
e) Post secondary

30. What is your occupation
    a) Student
    b) Petty business
    c) Peasant
    d) Animal keeping
    e) Formal employment
    f) Others (Specify) ----------
31. Number of Household members ----------
32. Does any of your household members aware of your HIV status?
    a) Yes
    b) No
33. If yes who?
    a) Parents
    b) Spouse
    c) Siblings
    d) Others (specify)----------
34. Do you have any family member who is also confirmed HIV positive in your household?
    a) Yes
    b) No
35. If yes in Qsn 27 above, what is your relationship with him/her?
    a) Parents
    b) Spouse
    c) Siblings
    d) Others (specify)----------
36. Does the infected household member also registered in care and treatment centre?
    a) Yes
    b) No
    c) I don't know
37. Are you registered in any of the support group at the community
    a) Yes
    b) No

38. If no in Qsn 32 above, give reason why? ----------

39. If yes in Qsn 32 above how does the group support you? ----------

40. What is the estimated distance from your residence to the clinic?
    a) Less than 5 Km
    b) More than 5 km

41. Mode of transport you commonly use from your residence to the clinic?
    a) By foot
    b) Bicycle
    c) Motorcycle
    d) Public transport
    e) Others (Specify)

42. How often are you scheduled to attend clinic?
    a) Once a month
    b) Once in 3 months
    c) Once in 6 Months

43. What is an average time spent at the clinic on a regular visit? ----------

44. Does the CD4 count check services available at this facility?
    a) Yes
    b) No

45. If No, where do you go for your CD4 count check?
    a) Never checked since enrollement
    b) Go to another CTC for CD4
    c) Sample drawn by HCP and sent to a nearby facility
    d) Others (specify).....

46. The last time you were scheduled for CD4 count check, did you get the service?
    a) Yes
    b) No

47. If No in question 38 above what was the reason?
    a) Client didn't show up for the service
    b) Client Came late for the service
    c) Machine not working

d) Reagent not available
e) HCP not available
f) Others (Specify)----------

48. Are there any reasons that made you choose to attend this clinic?
    a) It's the only option available
    b) Satisfied with the service provided
    c) Others (list ----------

For those who have been traced back after LTF only

49. During your absence from this clinic were you receiving care anywhere else?
    a) Yes
    b) No
50. If Yes where
    a) Another CTC
    b) Traditional healer
    c) Spiritual healer
    d) Others (specify.....
51. What made you stop attending this clinic?
    Give reasons----------

Appendix 2. Consent form

English version:

Consent form

A STUDY TO DETERMINE FACTORS ASSOCIATED WITH ATTRITION AMONG PRE ART CLIENTS REGISTERED IN HIV/AIDS CARE AND TREATMENT CENTRES IN MOROGORO.

Foreword

I am Dr Herilinda Temba, from Muhimbili University of Health and Allied Sciences. Currently am conducting a study to determine Pre ART clients' attrition and its associated factors from HIV care and treatment centres here in Morogoro.

Purpose of the study

The findings from the study will provide important information to the regional Health management team, council health management team, health care providers and policy makers at the Ministry of Health on the magnitude of the attrition as well as its associated factors among Pre ART clients in our CTC and come up with recommendations on effective ways to retain clients in HIV care for the better outcome of PLHIV as well as good outcome of Care and treatment programmes in our region.

How to participate in this study

We ask for your participation in the study because you are among the clients receiving care at this facility and therefore you can provide us with valuable information which will assist us fulfilling our goal towards retaining clients in care and better outcome of PLHIV. If you are willing to participate in this study, you will be interviewed several questions enquiring your personal social economical factors, your own perception of clinic services provided, factors which influence your attendance to the clinic.

Confidentiality

All information obtained from you will be confidential and will be used only for the intended purposes of this research. The research team will compile a report that will contain information about all clients interviewed while maintaining confidentiality.

Risks

We do not expect any harm to you as a result of your participation in the study.

Rights to participate in the study

You have the right to participate or not to participate in the study without giving any reason for your decision. When you have decided to participate you are also free to terminate your participation at any time in the course of the study.

Who to contact

If you have any questions about this study you are free to contact, **Dr Herilinda Temba** who is the principal investigator, 0784 841160 or herilindatemba@yahoo.com

If you have any questions/concerns about your rights as a participant in this study you may contact **Prof M. Aboud**, Chairman of MUHAS Research and Publications Committee. P.O.BOX 65001 Dar es Salaam. Telephone number: 2150302-6

If you agree to this interview, please sign this consent form.

I …… have read and understood the content of the consent form and my questions have been suffiently answered . I therefore consent for the interview regarding the study.

Signature of the interviewee ……..... Date ……

Signature of the interviewer ……...……. Date ……

Swahili version : FOMU YA RIDHAA YA KUSHIRIKI KATIKA UTAFITI

UCHUNGUZI WA SABABU ZINAZOPELEKEA WAGONJWA WALIOANDIKISHWA KWENYE VITUO VYA MATUNZO NA MATIBABU YA UKIMWI (CTC) KUTOENDELEA NA HUDUMA HIYO KWA MUDA MREFU KATIKA VITUO HIVYO MKOANI MOROGORO.

Utangulizi

Jina langu ni Dk Herilinda Temba, mtafiti kutoka chuo Kikuu cha Afya na Tiba Muhimbili. Kwa sasa ninafanya uchunguzi wa tatizo la wagonjwa kutoendelea na huduma za matunzo na matibabu kabla ya kuanza dawa za kurefusha maisha na sababu zinazopelekea wagonjwa hao walioandikishwa kwenye vituo vya matunzo na Matibabu ya UKIMWI kutoendelea na huduma hiyo kwa muda mrefu katika vituo vyetu hapa Morogoro.

Dhumuni la utafiti

Utafiti huu utatusaidia kutoa taarifa na uelewa zaidi kuhusu ukubwa na sababu zinazopelekea tatizo hili la kutoendelea na huduma ya matunzo na matibabu na hivyo kusaidia watoa huduma za afya katika vituo vya huduma, wilaya , mkoa na pia watunga Sera kutoka Wizara ya Afya kuwa na mipango thabiti ya Kuondoa Tatizo hili na hivyo kuboresha matokeo mazuri ya huduma za Matunzo na Matibabu na WAVIU

Jinsi ya kushiriki

Unaombwa kushiriki katika utafiti huu kwa sababu wewe ni mmoja kati ya watu wanaopata/waliowahi kupata huduma katika kituo hiki na hivyo unaweza kutupatia maelezo muhimu katika kufanikisha dhumuni letu la kuhakikisha wateja wetu wanaendelea kupata huduma katika vituo vyetu kwa muda mrefu kwa matokeo mazuri ya Afya za WAVIU. Ukiridhia kushiriki katiki katika utafiti huu utaulizwa maswali kuhusiana na taarifa zako za hali ya maisha,jinsi unavyoridhishwa/kutoridhishwa na huduma unazopata katika kituo, na sababu zinazopelekea wewe kuendelea/kutoendelea na huduma katika kituo.

Usiri

Taarifa yoyote utakayotupatia itakuwa ni siri na itatumika kwa ajili ya utafiti huu tu. Timu inayohusika na utafiti huu itakusanya taarifa zako na za washiriki wengine wa utafiti huu na kuzihifadhi kwa usiri na ripoti ya matokeo ya utafiti huu haitahusisha utambulisho wa moja kwa moja wa mshiriki wa utafiti huu kama vile majina au anuani.

Madhara

Sitegemei kama kutakuwa na madhara yoyote tatakayotokana na kushiriki kwako katika utafiti huu.

Haki ya kushiriki

Ushiriki wako katika utafiti huu si lazima. Una hiari ya kukubali au kukataa bila kutoa sababu zozote za kufanya hivyo. Na ukikubali, unaweza kubadili uamuzi wako wakati wowote

Mawasiliano

Ukiwa na maswali yoyote kuhusu utafiti huu, uwe huru kuwasiliana nami, Dk Herilinda Temba 0784 841160. Kama utakuwa na maswali kuhusu haki zako kama mshiriki, unaweza kumpigia Prof M. Aboud, ,Mwenyekiti wa kamati ya utafiti chuo cha Afya na Tiba Muhimbili. Simu namba 2150302-6

Kama umekubali kuhojiwa, tafadhali saini hapa:

Mimi……nimesoma na kuelewa kilichoelezwa kwenye fomu hii na maswali yangu yamejibiwa kiufasaha. Hivyo ninakubali kuhojiwa kwa ajili ya utafiti huu.

Sahihi ya mhojiwa …….. Tarehe ……..

Sahihi ya mhoji…… Tarehe…….

Appendix 3: sample CTC 2 card (Front)

CTC2: Front

THE UNITED REPUBLIC OF TANZANIA — MINISTRY OF HEALTH AND SOCIAL WELFARE

CTC 2: PATIENT RECORD FORM — NATIONAL HIV CARE AND TREATMENT

CTC 2 Card No: ____

FACILITY NAME ____
UNIQUE CTC ID NUMBER ____
NAME (first, middle, last) ____
DATE OF BIRTH * ____
AGE ____ (Years/month)
HEIGHT ____ cm (Adults)

FACILITY CODE ____ DISTRICT ____
HEALTH FACILITY FILE NUMBER ____
SEX Female ☐ Male ☐
MARITAL STATUS (see code 1) ____

DRUG ALLERGIES:

PRIOR ARV EXPOSURE (tick appropriate)

- ☐ NONE
- ☐ PRIOR THERAPY (transfer in without records)
- ☐ PMTCT MONOTHERAPY
- ☐ PMTCT COMBINATION THERAPY
- ☐ PEP

TB REGISTRATION No. ____
HUWANYU / HBC NUMBER ____

PATIENT REFERED FROM (tick appropriate)

- ☐ OPD / INPATIENT
- ☐ STI
- ☐ TB DOTS
- ☐ RCH / PMTCT / EID
- ☐ PLHIV GROUP
- ☐ SELF REFFERAL (incl.VCT)
- ☐ HOME BASED CARE
- ☐ OTHER (specify) ____

PATIENT ADDRESS

DISTRICT / DIVISION / WARD ____
STREET / VILLAGE ____
STREET / VILLAGE / CHAIRMAN ____
NAME OF TEN CELL LEADER ____
NAME OF HEAD OF HOUSEHOLD ____
CONTACT OF HOUSEHOLD HEAD ____
PATIENT'S TELEPHONE No. ____

DATE CONFIRMED HIV+ ____
DATE ENROLLED IN CARE ____
DATE MEDICALLY ELIGIBLE ____ *WHY ELIGIBLE:* WHO STAGE (1 - 4) ☐ CD4 COUNT / % ☐
DATE ELIGIBLE & READY ____
DATE START ART ____

TRANSFER IN (tick those applicable)

- ☐ WITH RECORDS (refferal and CTC 1 forms)
- ☐ NO RECORDS AVAILABLE
- ☐ IN CARE
- ☐ ON ART

PATIENT SUPPORT

NAME OF TREATMENT SUPPORTER ____
TELEPHONE No. OF TREATMENT SUPPORTER ____
PATIENT JOINED COMMUNITY SUPPORT ORGANISATION Yes ☐ No ☐
NAME OF ORGANISATION / GROUP ____

STATUS AT START ART: WHO STAGE (1 - 4) ☐ CD4 COUNT / % ☐ FUNCTIONAL STATUS (see codes 4) ☐ BODY WEIGHT ☐

VISIT DATE (dd/mm/yy)	VISIT TYPE (code 2)	WEIGHT (kilograms)	LENGTH / HEIGHT (in cm) (<15YRS)	WHO CLINICAL STAGE (1 - 4)	CD 4 Count / %**	SIGNS and SYMPTOMS & OIs (code 3)	FUNCTIONAL STATUS (code 4)	PREGNANT Y/N (if Y, insert EDD & ANC # if N, insert code 5)	TB Screening and Dx (code 6)	TB Rx / IPT (code 7)	ARV Status (code 8)	ARV Reason (code 9)
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ARV COMBINATION REGIMEN (code 10+ number of days dispensed	ARV ADHERENCE STATUS (code 11; if poor, give reasons)	OI RX PROPHYLAXIS, & OTHER MEDICINES (code 12)	HB (g/dL)	ALT (mmol/L)	ANY OTHER DIAGNOSTIC (LAB, CXR or OTHER)	NUTRI-TIONAL STATUS (code 13)	NUTRITIONAL SUPPLEMENT (code 14)	REFERRED TO (code 15 enter all that apply)	NEXT VISIT DATE	FOLLOW UP STATUS (code 16)	Name of Clinician
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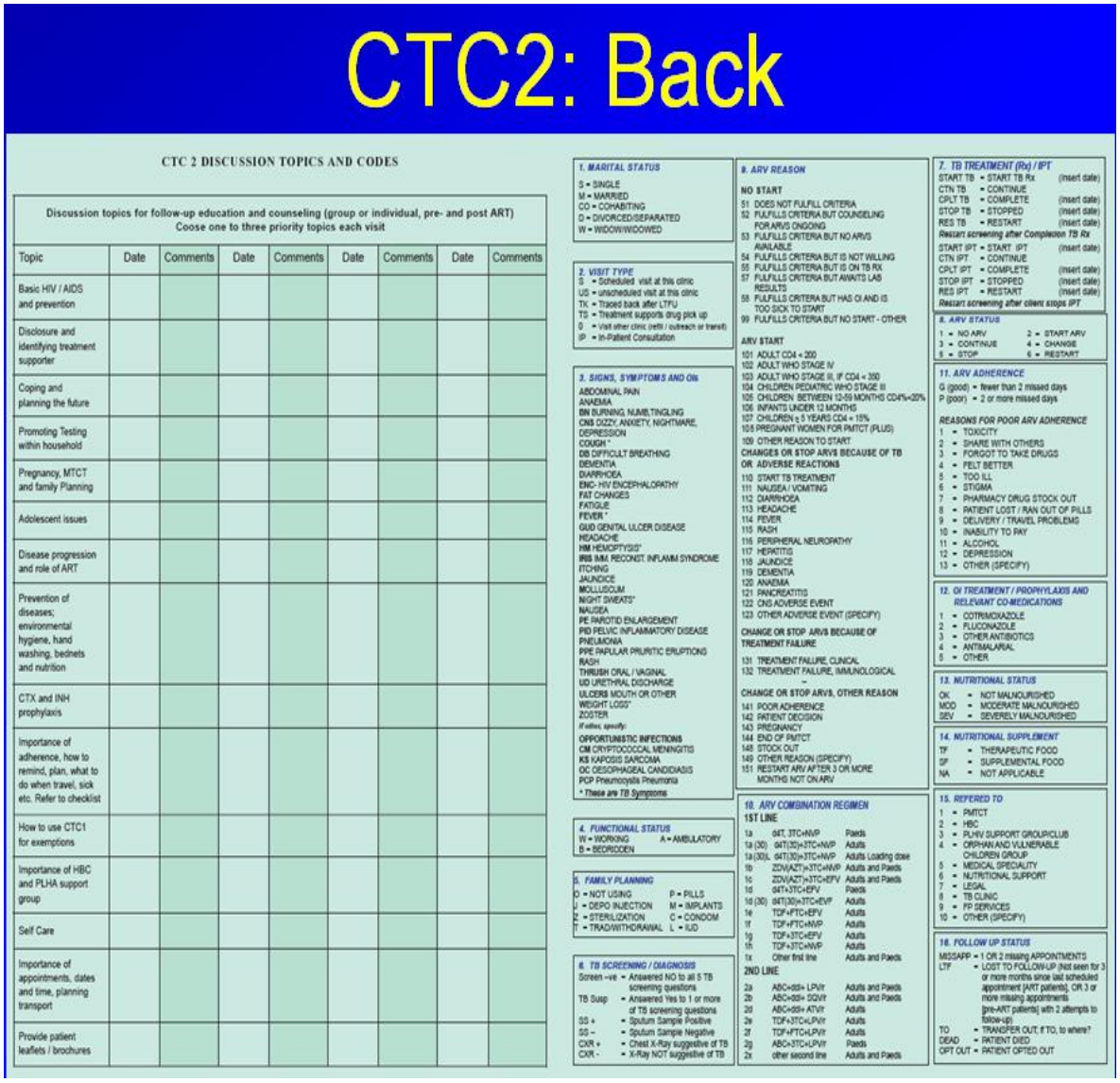
* see training manual on how to estimate date of birth when not known (dd/mm/yy)

** for children ≤5 YRS CD4%, otherwise CD4 count

Revised November, 2010

Appendix 4: sample CTC 2 card (Back)



CTC2: Back

CTC 2 DISCUSSION TOPICS AND CODES

Discussion topics for follow-up education and counseling (group or individual, pre- and post ART)
Coose one to three priority topics each visit

Topic	Date	Comments	Date	Comments	Date	Comments	Date	Comments
Basic HIV / AIDS and prevention								
Disclosure and identifying treatment supporter								
Coping and planning the future								
Promoting Testing within household								
Pregnancy, MTCT and family Planning								
Adolescent issues								
Disease progression and role of ART								
Prevention of diseases; environmental hygiene, hand washing, bednets and nutrition								
CTX and INH prophylaxis								
Importance of adherence, how to remind, plan, what to do when travel, sick etc. Refer to checklist								
How to use CTC1 for exemptions								
Importance of HBC and PLHA support group								
Self Care								
Importance of appointments, dates and time, planning transport								
Provide patient leaflets / brochures								

1. MARITAL STATUS
S = SINGLE
M = MARRIED
CO = COHABITING
D = DIVORCED/SEPARATED
W = WIDOW/WIDOWED

2. VISIT TYPE
S = Scheduled visit at this clinic
US = unscheduled visit at this clinic
TK = Traced back after LTFU
TS = Treatment supporte drug pick up
O = Visit other clinic (refill / outreach or transit)
IP = In-Patient Consultation

3. SIGNS, SYMPTOMS AND OIs
ABDOMINAL PAIN
ANAEMIA
BN BURNING, NUMB,TINGLING
CNS DIZZY, ANXIETY, NIGHTMARE, DEPRESSION
COUGH *
DB DIFFICULT BREATHING
DEMENTIA
DIARRHOEA
ENC- HIV ENCEPHALOPATHY
FAT CHANGES
FATIGUE
FEVER *
GUD GENITAL ULCER DISEASE
HEADACHE
HM HEMOPTYSIS*
IRIS IMM. RECONST. INFLAMM SYNDROME
ITCHING
JAUNDICE
MOLLUSCUM
NIGHT SWEATS*
NAUSEA
PE PAROTID ENLARGEMENT
PID PELVIC INFLAMMATORY DISEASE
PNEUMONIA
PPE PAPULAR PRURITIC ERUPTIONS
RASH
THRUSH ORAL / VAGINAL
UD URETHRAL DISCHARGE
ULCERS MOUTH OR OTHER
WEIGHT LOSS*
ZOSTER
If other, specify:
OPPORTUNISTIC INFECTIONS
CM CRYPTOCOCCAL MENINGITIS
KS KAPOSIS SARCOMA
OC OESOPHAGEAL CANDIDIASIS
PCP Pneumocysts Pneumonia
* These are TB Symptoms

4. FUNCTIONAL STATUS
W = WORKING A = AMBULATORY
B = BEDRIDDEN

5. FAMILY PLANNING
O = NOT USING P = PILLS
J = DEPO INJECTION M = IMPLANTS
Z = STERILIZATION C = CONDOM
T = TRAD/WITHDRAWAL L = IUD

6. TB SCREENING / DIAGNOSIS
Screen –ve = Answered NO to all 5 TB screening questions
TB Susp = Answered Yes to 1 or more of TB screening questions
SS + = Sputum Sample Positive
SS – = Sputum Sample Negative
CXR + = Chest X-Ray suggestive of TB
CXR - = X-Ray NOT suggestive of TB

8. ARV REASON
NO START
51 DOES NOT FULFILL CRITERIA
52 FULFILLS CRITERIA BUT COUNSELING FOR ARVS ONGOING
53 FULFILLS CRITERIA BUT NO ARVS AVAILABLE
54 FULFILLS CRITERIA BUT IS NOT WILLING
55 FULFILLS CRITERIA BUT IS ON TB RX
57 FULFILLS CRITERIA BUT AWAITS LAB RESULTS
58 FULFILLS CRITERIA BUT HAS OI AND IS TOO SICK TO START
99 FULFILLS CRITERIA BUT NO START - OTHER

ARV START
101 ADULT CD4 < 200
102 ADULT WHO STAGE IV
103 ADULT WHO STAGE III, IF CD4 < 350
104 CHILDREN PEDIATRIC WHO STAGE III
105 CHILDREN BETWEEN 12-59 MONTHS CD4%<20%
106 INFANTS UNDER 12 MONTHS
107 CHILDREN ≤ 5 YEARS CD4 < 15%
108 PREGNANT WOMEN FOR PMTCT (PLUS)
109 OTHER REASON TO START

CHANGES OR STOP ARVS BECAUSE OF TB OR ADVERSE REACTIONS
110 START TB TREATMENT
111 NAUSEA / VOMITING
112 DIARRHOEA
113 HEADACHE
114 FEVER
115 RASH
116 PERIPHERAL NEUROPATHY
117 HEPATITIS
118 JAUNDICE
119 DEMENTIA
120 ANAEMIA
121 PANCREATITIS
122 CNS ADVERSE EVENT
123 OTHER ADVERSE EVENT (SPECIFY)

CHANGE OR STOP ARVS BECAUSE OF TREATMENT FAILURE
131 TREATMENT FAILURE, CLINICAL
132 TREATMENT FAILURE, IMMUNOLOGICAL

CHANGE OR STOP ARVS, OTHER REASON
141 POOR ADHERENCE
142 PATIENT DECISION
143 PREGNANCY
144 END OF PMTCT
148 STOCK OUT
149 OTHER REASON (SPECIFY)
151 RESTART ARV AFTER 3 OR MORE MONTHS NOT ON ARV

10. ARV COMBINATION REGIMEN

1ST LINE

1a	d4T, 3TC+NVP	Paeds
1a (30)	d4T(30)+3TC+NVP	Adults
1a (30)L	d4T(30)+3TC+NVP	Adults Loading dose
1b	ZDV(AZT)+3TC+NVP	Adults and Paeds
1c	ZDV(AZT)+3TC+EFV	Adults and Paeds
1d	d4T+3TC+EFV	Paeds
1d (30)	d4T(30)+3TC+EVF	Adults
1e	TDF+FTC+EFV	Adults
1f	TDF+FTC+NVP	Adults
1g	TDF+3TC+EFV	Adults
1h	TDF+3TC+NVP	Adults
1x	Other first line	Adults and Paeds

2ND LINE

2a	ABC+ddI+ LPVr	Adults and Paeds
2b	ABC+ddI+ SQVr	Adults and Paeds
2d	ABC+ddI+ ATVr	Adults
2e	TDF+3TC+LPVr	Adults
2f	TDF+FTC+LPVr	Adults
2g	ABC+3TC+LPVr	Paeds
2x	other second line	Adults and Paeds

7. TB TREATMENT (Rx) / IPT
START TB = START TB Rx (insert date)
CTN TB = CONTINUE
CPLT TB = COMPLETE (insert date)
STOP TB = STOPPED (insert date)
RES TB = RESTART (insert date)
Restart screening after Completion TB Rx
START IPT = START IPT (insert date)
CTN IPT = CONTINUE
CPLT IPT = COMPLETE (insert date)
STOP IPT = STOPPED (insert date)
RES IPT = RESTART (insert date)
Restart screening after client stops IPT

8. ARV STATUS
1 = NO ARV 2 = START ARV
3 = CONTINUE 4 = CHANGE
5 = STOP 6 = RESTART

11. ARV ADHERENCE
G (good) = fewer than 2 missed days
P (poor) = 2 or more missed days

REASONS FOR POOR ARV ADHERENCE
1 = TOXICITY
2 = SHARE WITH OTHERS
3 = FORGOT TO TAKE DRUGS
4 = FELT BETTER
5 = TOO ILL
6 = STIGMA
7 = PHARMACY DRUG STOCK OUT
8 = PATIENT LOST / RAN OUT OF PILLS
9 = DELIVERY / TRAVEL PROBLEMS
10 = INABILITY TO PAY
11 = ALCOHOL
12 = DEPRESSION
13 = OTHER (SPECIFY)

12. OI TREATMENT / PROPHYLAXIS AND RELEVANT CO-MEDICATIONS
1 = COTRIMOXAZOLE
2 = FLUCONAZOLE
3 = OTHER ANTIBIOTICS
4 = ANTIMALARIAL
5 = OTHER

13. NUTRITIONAL STATUS
OK = NOT MALNOURISHED
MOD = MODERATE MALNOURISHED
SEV = SEVERELY MALNOURISHED

14. NUTRITIONAL SUPPLEMENT
TF = THERAPEUTIC FOOD
SF = SUPPLEMENTAL FOOD
NA = NOT APPLICABLE

15. REFERED TO
1 = PMTCT
2 = HBC
3 = PLHIV SUPPORT GROUP/CLUB
4 = ORPHAN AND VULNERABLE CHILDREN GROUP
5 = MEDICAL SPECIALITY
6 = NUTRITIONAL SUPPORT
7 = LEGAL
8 = TB CLINIC
9 = FP SERVICES
10 = OTHER (SPECIFY)

16. FOLLOW UP STATUS
MISSAPP = 1 OR 2 missing APPOINTMENTS
LTF = LOST TO FOLLOW-UP (Not seen for 3 or more months since last scheduled appointment [ART patients], OR 3 or more missing appointments [pre-ART patients] with 2 attempts to follow-up)
TO = TRANSFER OUT, If TO, to where?
DEAD = PATIENT DIED
OPT OUT = PATIENT OPTED OUT