



The Incidence Rate and Health-Care Factors Associated with LTFU, among Adult Patients Initiated on ART in Nakuru West Sub-County Health Facilities, Kenya

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How to cite this paper: Kibet, G.J., Arudo, J., Ashivira, C., Lopar, S.K., Ogendo, R., Kabutbei, L. and Sakwa, G. (2022) The Incidence Rate and Health-Care Factors Associated with LTFU, among Adult Patients Initiated on ART in Nakuru West Sub-County Health Facilities, Kenya. *Open Access Library Journal*, 9: e8303.

<https://doi.org/10.4236/oalib.1108303>

Received: December 17, 2021

Accepted: January 26, 2022

Published: January 29, 2022

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Abstract

Background: The successful strengthening of antiretroviral therapy (ART) programmes globally has been reversed by loss to follow up (LTFU). The factors associated with LTFU still remain gainsay to many countries including Kenya, a critical barrier to effective scale-up of human immunodeficiency virus (HIV) services. Kenya is one of the four HIV high burden countries in Africa (alongside Mozambique and Uganda) with 29% adult HIV co-morbidities, overburdening the health care system and the country's economy. UNAIDS targeted to achieve 90% in three key areas of HIV: identification in HIV positive patients; prompt linkage to treatment; and viral suppression by the year 2020. The second and third have not been met in Nakuru West Sub-County. This study aimed at determining the incidence rate and health-care factors associated with LTFU, among adult patients initiated on ART in Nakuru West Sub-County health facilities. **Methods:** A retrospective cohort study design using mixed method of data collection was employed. Records of 1131 participants enrolled/initiated on ART within 1st January 2016 to 31st December 2018 in the County Referral Hospital, Kapkures and Rhonda health centers were examined for three years to determine their outcomes. Data was collected using abstraction form extracted from the standard ART cohort register and master facility register and from key informants. Recorded interviews were transcribed and analyzed using standard qualitative

method, to identify content and themes. A total of 9 key informants working in the CCC/HIV clinics were interviewed upon consenting. Kaplan-Meier technique was used to estimate time to LTFU after initiation of ART. **Results:** The overall incidence rate of 1611 (95% CI: 114.7 - 179.2) per 1000 person-years was revealed. In addition, the following variables were identified in the qualitative findings to be associated with LTFU: wrong/poor documentation, long waiting time, approaches in the implementation of the HIV/AIDS management policies (“Test and Treat” and “defaulter tracing”) and inadequate funds to support staffing and to manage support groups. **Conclusions and Recommendations:** In order to minimize LTFU and met UNAIDS targets, interventions should be geared towards close follow up supervision of all CCC patients by capturing correct contact addresses and updating patient records. In addition, this study recommends that, the Ministry of Health, Nakuru County Government, APHIA-PLUS and all other stakeholders should build capacity of health care personnel to improve provision of HIV care services, ensure availability of adequate resources and address challenges that impede the implementation of HIV and AIDS management policies, especially for newly enrolled patients who may not be prepared to start treatment or unwilling to disclose their status. This will, in turn, curb LTFU, enhance patient retention, patient survival and improve quality of life.

Subject Areas

HIV

Keywords

ART, LTFU, HIV, Follow-Up, Incidence, Nakuru-West, Kenya

1. Introduction

Once a person is infected with HIV, he or she is permanently infected [1]. The United Nations Program on HIV and AIDS (UNAIDS) inspires the world to achieve its shared vision of zero new HIV infection, zero discrimination and zero AID-related deaths and works towards ending the AIDS epidemic by 2030, as part of Sustainable Development Goals (SDGs) [2] has led to strengthening of antiretroviral therapy (ART) programmes globally [3] [4] [5]. The expansion of the ART programme has had a substantial impact on the outcomes of HIV-positive patients [6]. Effective management of AIDS through adherence in ART and close follow up of patients is essential to minimize loss to follow up and to attain the above set targets [7] [8] [9].

Failure to observe the appointment dates, leads to unscheduled visits [10], and subsequently loss to follow up (LTFU). This is mostly true if LTFU exceeds three months or longer from the last attendance for refill and where client is not yet classified as “dead” or “transferred-out” [3] [11]. Notably, the growing concern on the increasing rates of LTFU globally among people already on treatment has

raised greater concern [9]. According to the authors, the time event of LTFU increases as the time spent on ART increases. [3] revealed that the cumulative incidence of LTFU was 10.6 per 100 person-years. [12] found out the overall LTFU rate in South Africa of 7.9 per 100 person-years. LTFU further, compromises the long-term success of ART worldwide [3] and patients' survival [13]. Those affected, risk declining their personal health due to unchecked HIV status and at long last might increase the risk of HIV transmissions [14].

It is important to get on and stay on HIV treatment in order to protect own health [15]. HIV treatment is important because it helps the body fight HIV which can only be achieved with good adherence. Thus, client must stay on treatment plan [16]. Most people living with HIV who do not get treatment eventually develop AIDS [17]. Left untreated, HIV attacks immune system and can allow different types of life-threatening infections and cancers to develop especially if the CD4 cell count falls below a certain level [18]. Therefore, monitoring people on ART is important to ensure successful treatment, identify adherence problems and determine whether ART regimens should be switched in case of treatment failure thus, reducing the accumulations of drug resistance mutations and improving clinical outcomes [19].

Adherence to ART is critical if patients are to achieve and maintain undetectable VL and avoid preventable opportunistic infections [20]. This is because the virus has a very high replication and mutation rate. Non-nucleoside reverse transcriptase inhibitors (NNRTIs), the antiviral agents used to manage patients with HIV have broad class resistance and when resistance to one drug develops often resistance is developed to all the drugs in that class. On the other hand, protease inhibitors (PI) can retain activity to other drugs within the class following failure depending on how long the patient remains on the failing PI-containing regime [21].

According to [22], before initiating therapy, adherence must be made part of the patient's routine care. This will enable one to learn about patient's health history, beliefs and attitudes on HIV, which may be potential barriers to compliance [23]. In Sub-Saharan Africa, it has been observed that the successful scale-up of ART coverage [13] has vastly changed the outcomes of HIV, shifting the disease from once uniformly fatal to a chronic disease [14]. However, a critical barrier to effective scale-up of HIV programme has been identified as LTFU. LTFU has negatively impacted on the immunological benefit of ART, leading to drug toxicity, treatment failure and drug resistance leading to increased AIDS-related morbidity, mortality, and hospitalizations [3]. The factors associated with LTFU still remain a challenge in many countries [15]. Notably, factors that have been reported as major accelerators to LFTU are suboptimal quality of health care, poor documentation and record keeping problems which can be attributed to practitioners' increased workload [11]. Other studies also identified inadequate staffing, stigma and reduced funding to facilitate physical tracing, contributed to LTFU [5] [13].

Kenya is one of the four HIV high burden countries in Sub-Saharan Africa (alongside Mozambique and Uganda) [24]. The HIV prevalence in the country is at 5.9% with 29% adult HIV co-morbidities overburdening the health care system and economy [25]. The retention rate is at 81% [26] which is short of 90% as recommended by UNAIDS/WHO [27].

Nakuru County has been ranked number nine nationally, with an estimated 37,324 HIV positives adults on ART amounting to 76%, and HIV related deaths at 1204 [25] [28]. The county has had increasing incidences of HIV and AIDS morbidities, co-mortalities, with drug resistance leading to many patients being substituted to second-line drug regimen [29].

The incidence and health care factors associated with LTFU after initiation on ART among adult HIV patients has not been investigated in Nakuru County. A better understanding of these would be helpful in designing the interventions programs and to ensure its reduction and to attain 90% retention rates, recommended by UNAIDS/WHO. Therefore, this study, seeks to determine, the incidence rate and health care factors associated with LTFU, among adult patients initiated on ART in Nakuru West Sub-County health facilities.

2. Methodology

A retrospective cohort study design was adopted and both qualitative and quantitative data collection technique was employed during data collection. Data was extracted from the electronic master facility register and the ART cohort register.

2.1. Study Area

The study was conducted in Nakuru County, which is one of the 47 Counties in the Republic of Kenya lying within the Great Rift Valley about 90 km from Nairobi. The County headquarters is Nakuru Town. It has 11 Sub-counties with an estimated population of 2,821,237 people as at the year 2018. Thirty-three percent of the population lives below the poverty line. The population growth rate is estimated at 2.84% p.a. currently with a density of 290.4 persons per square km. The county has a total of 674 health facilities, including 26 hospitals, 630 primary care facilities and 2 community health units. There are 14 Comprehensive Care Centre (CCC) in Nakuru west Sub-County offering comprehensive HIV care services. Each center has specially trained team that provide the following services: *clinical care*, counselling and voluntary testing, enrollment to ART and follow-up, prophylaxis of opportunistic infection, management of HIV related illness such as opportunistic infections; *nutritional counseling*, malnourished patients are provided nutritional support; *psychological counselling and palliative care*, patients are offered psychological, spiritual counselling and palliative care; *referral*, the center acts as a referral center for all sites offering testing services; and *stress management*, to promote psychological wellbeing and adaptive coping among people living with human immunodeficiency virus/acquired im-

mune deficiency syndrome. Patients currently on ART as at July 2018 from the 14 health facilities were 10,296 among whom 93% were adult patients with over 80% attending CCC at County Referral Hospital (DHRIS, 2018).

2.2. Target Population

HIV and AIDS positive patients who were initiated on ART at Comprehensive Care Centre (CCC) clinics of Nakuru West sub-County MOH facilities were included in the study and the key informants working at the CCC/HIV clinics.

2.3. Sampling Method/Size

Stratified sampling method was initially used to group the facilities offering CCC services into urban or rural setting depending on their location. Purposively, County Referral hospital was identified to represent urban facilities for it has high volume of patients with over 80% of all HIV patients on ART in the county seeking services in the facility. Two rural facilities (Kapkures and Rhonda health centers) were also purposively selected as they were only rural facilities offering CCC services in the sub-county. Census inquiry method was used to select 1131 patients' records. These were patients who were initiated on ART from 1st January 2016 to 31st December 2018 and their attendance followed up for three-years. In addition, the heads of the departments represented in the CCC/HIV clinics were interviewed to represent the key informants.

2.4. Data Collection Procedure

A standardized data collection transcription form was prepared by the researcher and data extracted from the Electronic Master Facility Register (urban facility) and ART Cohort Register (rural facilities). Pilot test was conducted in the urban facility prior to the initiation of the study and the tool modified accordingly. The transcription form consisted of variables registered during ART initiation and followed up and included: sex, age, weight, BMI, residence, CD4 Count, VL, IPT provision, TB status, patient status, original drug regimen, current regimen, reasons for drug substitution, among others. Two research assistants were trained on how to extract data and ethical issues that were to be observed.

2.5. Ethical Consideration

The study proposal was approved by Masinde Muliro University of Science and Technology (MMUST) Institutional Ethics Review Committee (IERC). A research authorization permit was then obtained from National Commission for Science and Technology (NACOSTI) and an official data collection permission letter was obtained from the Chief Officer of Health (COH) Nakuru County through the respective institutional IERC.

The information collected was handled as private and confidential during all phases of research activities and stored safely in lockable cabinets. Soft copies were secured by the use of a password known by the researcher only.

2.6. Data Analysis

First, data were entered and cleaned using SPSS version 21.0. Survival data analysis was done using Cox regression analysis. Log rank test was used to select categorical predictors. Decision was based on a p-value of 0.07 in bivariate analysis for potential candidate variables selection to be considered in the final model. Variables with a p-value of less than 0.05 were considered as statistically significant predictors of LTFU after interaction effects and model diagnostics checked. Finally, the Adjusted Hazard Ratio and 95% CI were interpreted for the statistically significant predictors of LTFU in the final Cox model. The note written in interviews was analyzed using standard qualitative methods to identify content and themes. This process included open coding where central concepts and categories were identified.

3. Results

3.1. Baseline Characteristics of Study Participants

A total of 1131 cases, were reviewed over three years study period in the three health facilities. Among 1131 patients followed, majority were females 810 (71.6%) compared to their counterparts. Cases of LTFU were 337 (29.8%) out of 1131 patients (**Table 1**). Most of the LTFU (36.5%) among the males were aged 35 - 44 years while a higher proportion of females experiencing LTFU (46.8%) were younger and aged between 25 - 34 years. Median age for male was higher (39.5 years) than that of females (33.0 years). A comparatively higher proportion of females who were LTFU (43.4%) visited rural facilities compared to males (37.7%). On the contrary there were more males LTFU cases (30.1%) than females (21.7%) who visited urban facility.

Table 1. Baseline socio-demographic characteristics of patients.

Variables	Male		Female	
	LTFU	Non-LTFU	LTFU	Non-LTFU
Age group in years	n (%)	n (%)	n (%)	n (%)
15 - 24	5 (4.8)	12 (5.5)	28 (12.0)	54 (9.4)
25 - 34	31 (29.8)	57 (26.3)	109 (46.8)	222 (38.5)
35 - 44	38 (36.5)	79 (36.4)	61 (26.2)	192 (33.3)
45 - 54	18 (17.3)	50 (23.0)	30 (12.9)	66 (11.4)
≥55	12 (11.5)	19 (8.8)	5 (2.2)	43 (7.5)
Median age (Range)	39.5 (16.0 - 70.0)	40.0 (15.0 - 73.0)	33.0 (18.0 - 62.0)	35.0 (15.0 - 76.0)
Facility Type				
Urban	67 (30.1)	156 (69.9)	118 (21.3)	427 (78.7)
Rural	37 (37.7)	61 (62.3)	115 (43.4)	150 (56.6)

A total of 1131 cases, were reviewed over three years study period in the three health facilities.

3.2. Incidence Rate of LTFU among Adult Patients on ART

As shown in **Table 2**, the overall incidence rate of LTFU among 337/1131 patients confirmed LTFU, was 161.1 (95% CI: 144.7 - 179.2). Within the first year of ART initiation, 259/337 (76.9%) patients were LTFU contributing to an incidence rate of 418.7 (95% CI: 370.6 - 472.9) per 1000 person years of follow-up, suggesting a greater fallout rate of patient in the county's selected facilities soon after ART initiation. The proportion of LTFU declined with time in ART.

From **Figure 1**, the overall survival probability of ART patients during the start of ART in the study period was equal to 1. The figure shows a drastic fall of survival probability of patients within the first month and by the end of 3 months, 50% of them had experienced an event (LTFU). There was a decline in LTFU in the subsequent months reaching the lowest point a survival probability of 0.06.

3.3. LTFU Person-Years of Follow Up

Table 3 presents the incidence rate of LTFU per 1000 person years of follow-up in relation to different variables. The age group with the highest incidence rate was 25 - 34 years with 192.5 new cases per 1000 person years. The incidence rate by gender was higher among males (184.0 per 1000 person years) compared to females (152.6 per 1000 person years). Results also show lower incidence rate for urban patients (122.0 per person years) versus rural patients (264.0 per 1000 person years).

Equally, a higher incidence rate was posted among patients with WHO stage 3 and 4 (239.9 per 1000 person years) in contrast to those in stage 1 and 2. With regard to IPT, patients who were not on IPT registered a higher incidence rate (413.3 per 1000 years) than their counterparts on IPT (31.1 per 1000 person years). Patients with TB co-infection compared with those who had no TB were leading in LTFU incidence rate (206.2 per 1000 person years). Incidence rates for cases with low CD4 counts (225.8 per 1000 person years) or those who were on AF2B (TDF + 3TC + EFV) ART regimen (182.2 per 1000 person years) was higher than those of their counterparts. Conversely, incidence rates for cases with low BMI (124.4 per 1000 person years) or low VL (79.7 per 1000 person years) were lower than their counterparts.

3.4. Health System-Related Factors Associated with LTFU in ART

In-depth interview with the aid of key informant interview guide was used to evaluate the health system-related factors associated with LTFU, where the 9 Key informants working at CCC/HIV clinic were identified from the selected urban and rural facilities. The following variables were evaluated: documentation/waiting time; availability of ART; HIV and AIDS management policies and clinic resources.

Table 2. LTFU person-years of follow-up by year.

Year	N	LTFU Rate per 1000 PYs	95% CI
1	259	418.7	370.6 - 472.9
2	47	30.6	23.0 - 40.8
3	31	1.3	0.9 - 1.9
Overall LTFU	337	161.1	144.7 - 179.2

Table 3. LTFU person-years of follow-up.

Variable	N	LTFU Rate per 1000 PYs	95% CI	
			Minimum	Maximum
All cases of LTFU	337	161.1	144.7	179.2
Age groups				
15 - 24	33	181.1	128.8	254.8
25 - 34	140	192.5	163.1	227.2
35 - 44	99	141.0	115.8	171.7
45 - 54	48	152.9	115.3	203.0
≥55	17	101.7	63.2	163.6
Gender				
Male	104	184.0	151.8	223.0
Female	233	152.6	134.2	173.5
Facility Type				
Urban	185	122.0	105.6	140.9
Rural	152	264.0	225.2	309.4
WHO Staging				
III & IV	73	239.88	190.71	301.73
I & II	264	147.64	130.86	166.57
IPT				
Yes	43	31.1	23.1	42.0
No	294	413.3	368.7	463.4
TB Status				
Yes	13	206.2	119.7	355.1
No	324	159.6	143.2	178.0
BMI				
<18.4	106	124.4	102.8	150.5
≥18.4	231	186.3	163.7	211.9
CD4 Count				
<200	249	225.8	199.5	255.7
≥200	88	88.9	72.1	109.6
VL				
Low	109	79.7	66.0	96.1
High	228	314.8	276.5	358.4
ART Regimen				
AF2B	305	182.2	162.9	203.8
AF2E	11	34.1	18.9	61.51
Other	21	219.6	143.2	336.8

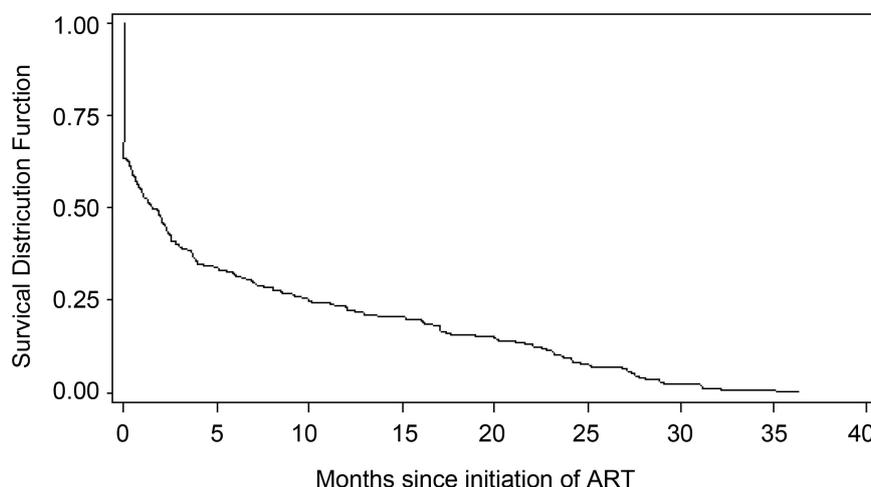


Figure 1. Overall Survival probability of patients initiated on ART and the event of occurrence.

3.4.1. Documentation

Overall, 1131 patients were enrolled and started on ART at the County Referral Hospital and the two rural facilities (Kapkures and Rhonda health center's) during the study period. Upon reviewing the Electronic Master facility and ART Cohort Registers, 407 patients were registered as LTFU. This means that, they were not able to be tracked by any means. The researcher tried to confirm the actual, "True" LTFU through telephone calling and the findings obtained were as presented in **Figure 2**. The researcher then used the actual "True" LTFU during data analysis.

Poor documentation led to some patients being incorrectly labeled as LTFU yet they were not. The researcher, made some confirmations by calling all the reachable LTFU patients to ascertain their whereabouts. Out of 407 LTFU cases identified and documented in the ART cohort register and the master electronic ART register, only 337 cases were confirmed "True" LTFU after mobile phone conversations with the patient and justified on **Figure 2**.

One of the key informers also confirmed that wrong documentation could lead to LTFU. For example;

"Rural facilities in the study sites operate during week days only. If the dates provided do not fall in the working days, patients tend to miss the appointments and later LTFU" Clinician 2.

3.4.2. Waiting Time

In this study, the key informants agreed that, unscheduled appointment made by patients, contributed to LTFU because it initiates long waiting time as suggested in below.

"Patients who do not follow their appointment visit end up increasing workload, promoting delays and demoralizing scheduled patient." clinician 2.

3.4.3. HIV and AIDS Management Policies

The policies include: "test and treat" and follow up, defaulter tracing.

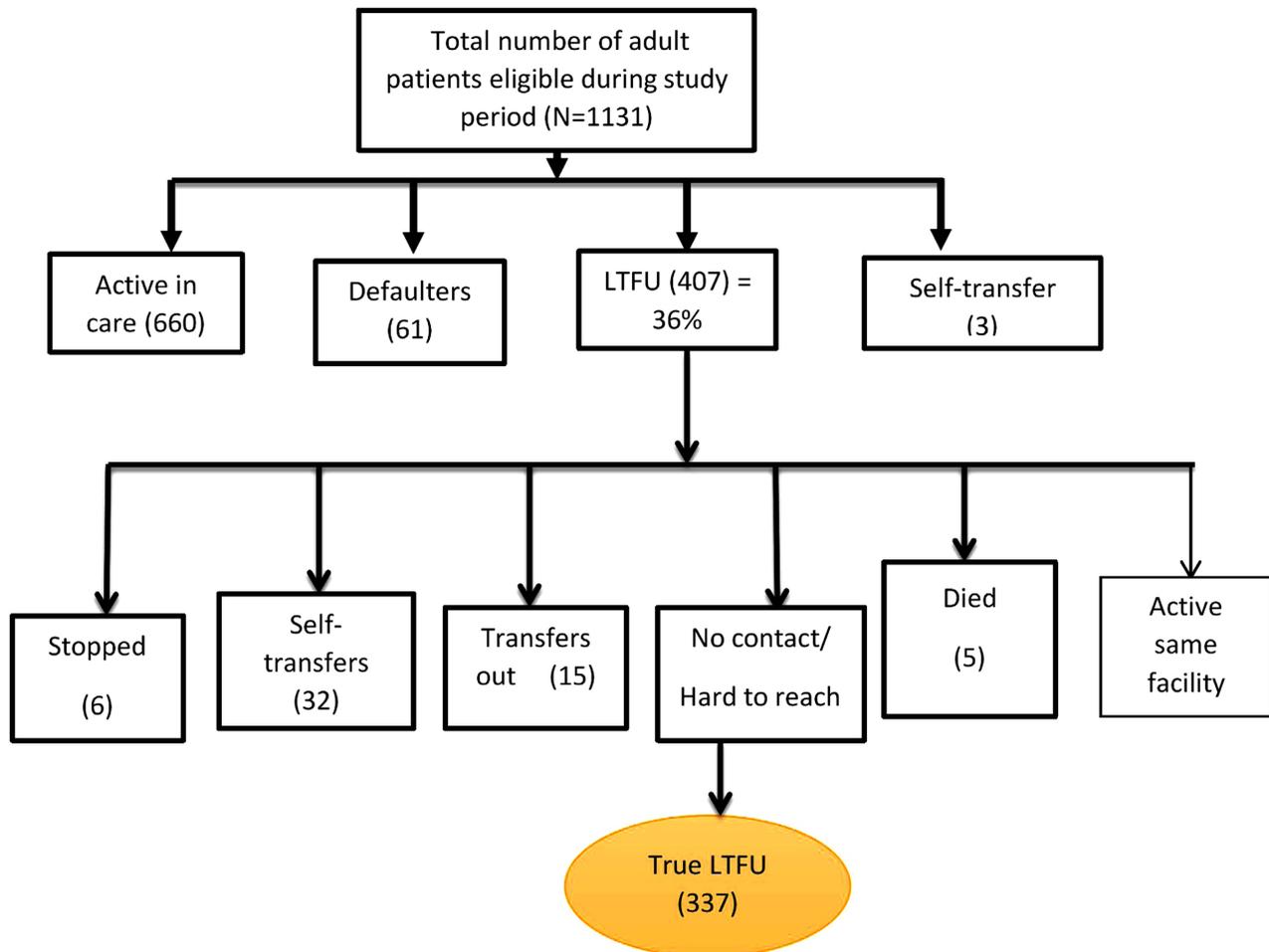


Figure 2. Flow diagram on patients' outcomes, documented vs. actual (true LTFU).

1) Test and treat policy challenges

A key informant believed that, the test and treat policy was the biggest contributor of LTFU. This is because some patients may experience self-stigma as not all patients might declare being ready to start ART.

“Most of the patients end up to be LTFU because, HIV test is a mandatory and a gateway to other services. Patients end up with results and being put on treatment while not being fully prepared for the long journey of follow up and complying with the scheduled appointments” Clinician 1.

2) The defaulter tracing policy challenges

A default tracer admitted that the policy regarding defaulter tracing was in place, but the implementation part was a bigger challenge. This was as a result of inadequate provision of funds to support the full implementation. Patients have also been blamed to non-implementation of this policy. It was noted that patients provide wrong contact location and/or mobile numbers, or refuse to provide any contact hence making it harder to trace them leading to such patients being considered as LTFU.

“Some of the patients do not provide their correct mobile phone numbers.

When we insist, they provide their contact numbers but immediately change the sim card and become untraceable’ Defaulter tracer 2.

3.4.4. Availability of ART

All the key informants revealed that, they have adequate supply of ART drugs in the facilities. The most commonly reported cause of LTFU in relation to ART, was the side effects of AF2B combination regimen. This was supported by the quantitative finding results that 97 (93.3%) of LTFU males were on AF2B as compared to those who were on another regimen (AF1A). In addition, 208 (89.3%) of LTFU females were also using AF2B while the remaining proportion were on another regimen.

3.4.5. Clinic Resources: Staffs, Funding and Support Groups

Another variable the researcher used to evaluate the health systems-related factor of LTFU was the clinic resources in terms of staffing, funding and support groups.

1) Availability of staffs

Key informants admitted that most of the CCC/HIV clinic health care practitioners were employed on contract by APHIA PLUS-NYOTA. Such contract employees are often equipped with current knowledge and updates on management of HIV and AIDS unlike the government healthcare workers deployed in CCC. However, when contract ends for the former, the government healthcare workers who are left to handle patients find it difficult to track patients.

2) Availability of funds/support groups

When the funds provided are inadequate to carry out planned activities, the implementation part becomes difficult to carry out. There is lack of funds to sustain the defaulter tracing policy. Staff working in CCC are required to call the patients and conduct physical tracing, with the assistance of the CHVs but this is not possible due to lack of funds. Even though, the CHVs work on voluntary basis they may need use their mobile phones to contact some of the LTFU patients. Key informants also mentioned that due to lack of funds they experience problems of coordinating support groups, despite the fact that it has contributed enormously in reduction of patients’ stigma and promote retention.

One of the key informants supported the idea that:

“For everything to be accomplished successfully, financial support is necessary. Patients attending support groups, come from far places hence may need a motivator (transport reimbursement)” Defaulter tracer 1.

3.5. Summary of This Chapter

The overall incidence rate of LTFU among 337/1131 patients confirmed LTFU, was 161.1 (95% CI: 144.7 - 179.2) per 1000 person years of follow-up. Greater proportion of LTFU patients, happen during the first year of ART initiation (76%) 259. Within the first month (2 weeks) after enrollment/starting ART, about 25% and 50% would end up to be LTFU (after 3 months elapsed) in rural

and urban facilities respectfully.

Variables identified by the key informants, included: wrong documentation; long waiting time conformed by unscheduled visit; the implementation of the HIV and AIDS management policies-both: “*Test and Treat*” and “*defaulter tracing*” and finally inadequate funds to support staffing (CHVs & defaulter tracers to facilitate defaulter tracing system) and to manage support groups was crucial.

In addition, the “*true*” LTFU confirmed through mobile phone calling, were 337 as opposed to 407 reviewed in the ART cohort register and in the electronic master facility register.

Finally, inadequate funds to support staffing (CHVs and defaulter tracers to facilitate defaulter tracing system) and to manage support groups is crucial.

4. Discussion

4.1. Incidence Rate of LTFU of the Study Participants

This study utilized; a total 1131 eligible patients initiated on ART. About 30% (337/1131) were confirmed and identified as “*true*” LTFU, by the end of the study period. This rate of LTFU was higher compared to other study findings and was within the global range of 0.3% to 50% [30] and [14]. Higher rates in the study area could be explained by employment of contractual staff who are not permanently stationed in CCC, lack of funds to facilitate defaulter tracing and lack of funds to sustain regular meetings of support groups. Lower findings were reported by [31] [32], reported 23.4% cases of LTFU respectively. These higher rates, may be explained by the variations in time duration used to define LTFU, where some studies used 2 months, or 3 months and even others 4 months. This study opted to define LTFU using 3 months from the last date of drug refill. Also, different study settings can contribute to higher LTFU rates. Further analysis revealed that, within the first year of ART initiation, 259/337 (76.9%) patients were LTFU, suggesting a greater fallout rate soon after ART initiation but declined with time of follow-up. This finding was supported by what the key informant reported: most of the patients disengage in treatment probably due to the implementation of *test and treat policy* and self-stigma related.

This study results further revealed an overall LTFU incidence rate in the first year of follow up time which is much higher compared to other studies, 161.1 (95% CI: 144.7 - 179.2), where the first year recorded 418.7 (95% CI: 370.6 - 472) per 1000 person-years of follow up time. A study conducted in South Africa by [32], reported an overall lower incidence rate of LTFU of 109 per 1000 person-years (95% CI: 92 - 128). A study conducted at the University of Gondar Ethiopia, reported an overall LTFU incidence rate of 12.3 per 100 person years (95% CI (10.61 - 14.18) relating it to inadequate counseling and high cost of calling the patients.

4.2. Health Systems Related Factors Associated with LTFU

From the study finding, poor or wrong documentation was found to be a strong

contributing factor of LTFU among adult patients initiated on ART. Several key informants pointed out that, incorrect return dates led to patients failing to honor the appointments which in turn leads to LTFU. The finding was supported by studies conducted in Northwest Ethiopia, Malawi and other parts of the country, where they reported that “LTFU happens when a clinician fails to record the next appointment date on the patient’s chart hence the probability of returning back to the ART clinic would be unlikely” [5]. The same finding was documented by [8] that, increased cases of LTFU occur due to poor adherence to clinic appointments, unclear or unjustified documentation.

This study finding established that, patients who come for unscheduled appointment creates inconveniences to other scheduled patients leading to long queues, and increasing waiting time. This leads to increased workload to health-care workers. The fatigued health-care workers may not be able to provide quality services to both scheduled and unscheduled patients further contributing to patients’ dissatisfaction of the services hence LTFU. This finding was supported by study conducted in Zambia by [33] who noted that, when ART center’s experience high patient load, they are subjected to long waiting times and in turn call for high defaulter rates.

HIV and AIDS management policies (*test & treat* and *follow up-defaulter tracing*) were equally found to be associated with LTFU in terms of the way these policies are implemented. Key informants were cognizant of the challenges in implementing “*test and treat*” policy on the newly diagnosed HIV positive patient who were not ready to be started on ART. This finding is unique to the study area as it has not been reported elsewhere. In the current study, majority of the patients default treatment soon after initiation which could be attributed to lack of preparedness to be started on treatment. In addition, the health facilities in the study area experience inadequate funds to aid in the implementation of HIV and AIDS management policies. The funds are needed to: support CHVs and defaulter tracers during physical tracing or airtime for making phone calls for patients who cannot be reached physically to remind them of their next appointment. Support groups also appear not to regular meet due to lack of money that would facilitate their travel to the meeting points. sed for calling patients as a reminder. This finding was supported by [13] by providing the fact that, inadequate staffing and funding to facilitate physical tracing would contribute to LTFU. Wrong patients’ contacts could also have contributed to higher LTFU incidences as they become untraceable.

5. Recommendation and Conclusion

5.1. Conclusions

This study revealed a higher overall incidence rate of LTFU (161.1 per 1000 person years) of follow-up in the study area as compared to other studies, a factor that could be contributing to poor performance of Nakuru County which is ranked 9th nationally. A higher proportion of patients at 25% and 50% (rural and

urban facilities respectfully) were also identified as LTFU within their initial visit of ART enrollment/initiation.

From qualitative data, wrong/poor documentation, long waiting time, approaches in the implementation of the HIV and AIDS management policies (“*Test and Treat*” and “*defaulter tracing*”) and inadequate funds to support staffing and to manage support groups contributed to higher rates of incidence of LTFU.

5.2. Recommendation

- The MOH, Nakuru County government, APHIAPLUS-NYOTA and all other stakeholders to build capacity of personnel working at the CCC/HIV clinic to improve provision of HIV care services in the sub-County. They need to address availability of resources and challenges that impede the implementation of HIV and AIDS management policies.
- Patients should be encouraged to provide their correct locations and mobile phone contacts, which should be updated with every visit.
- Referral planning should commence on enrolment and patients should be informed about the need to transfer to the nearest facilities for ease follow up.
- The study identified poor documentation; long waiting time, approaches used in the implementation of the HIV/AIDS management policies and inadequate clinic resources as contributors to increased incidence of LTFU. CCC/HIV clinics staffs should update the health data collection systems to capture correct patient contacts, deaths as they occur from the births and deaths notification office. This will help update any cases of mortality and better LTFU reported estimates. Notably, “*true*” LTFU confirmed through mobile phone calling, were 337 as opposed to 407 reviewed in the ART Cohort register and the Electronic Master Facility register. Much effort is required to weed out possible duplicates due to poor record keeping.
- Patients should be advised on the importance of following the schedule appointments to help decongest the clinics, reduce waiting time and improve on patient retention.
- Finally, further studies are recommended to identify the linkage of LTFU/self-transfer patients between County Referral Hospital and all other health facilities in Nakuru County.

Acknowledgements

My heartfelt thanks go to my supervisors, Mr. John Arudo and Mr. Gregory Sakwa, of Masinde Muliro University of Science and Technology for their guidance, support and supervision during the preparation of the manuscript. In addition, I would like to appreciate the contributions of the lecturers of the School of Nursing, Midwifery and Paramedical Sciences for their moral support. I do also appreciate my beloved husband Charles and the entire family for their consistent encouragement and financial assistance during period that the manu-

script was being prepared. Much gratitude to my colleagues led by Joseph Ngercia, for their ideas and advice we shared throughout the research period. Finally, most of appreciation to the County Government of Nakuru, through the Ministry of Health, APHIA-PLUS NYOTA, the entire CCC staff of Nakuru County Referral Hospital, Kapkures Health Center and Rhonda Health Center for allowing to collect data in the study site.

Conflicts of Interest

The authors declare no conflicts of interest.

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