The extent of loss to follow among patients initiated on antiretroviral treatment, Pakistan 2017-2018: a retrospective cross-sectional study

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Abstract

Background The HIV epidemic in Pakistan is concentrated in key populations and is one of the fastest growing epidemics in South Asia. Over the years the number of people infected with the human immunodeficiency virus initiated on antiretroviral therapy has gradually increased. The effectiveness of the treatment programmes depends on retention in care and treatment adherence. The aim of the study is to the explore the sociodemographic characteristics and magnitude of loss to follow-up in patients initiated on ART in three provinces of Pakistan.

Methods A retrospective cross-sectional study was conducted in the National AIDS Control Programme. Case-based data (n=5,215) of 16 treatment centres for all patients initiated on anti-retroviral therapy from 1 st January 2017 to 31 st December 2018 was extracted from the national management information system. Loss to follow-up was defined as a patient who has not visited/attended the ART clinic for >180 days (6 months) and has not been reported dead or transferred out to another ART clinic. Descriptive statistics were applied to study the sociodemographic characteristics and level of lost to follow up in patients initiated on treatment.

Results Of the 5,215 patients, 3,097 (59.4%) were aged between 15-49 years. About 4,069 (78%) were male. Around 1,686 (34.3%) of the patients on ART were defined as lost to follow up. Age, gender, and patients with undisclosed identity were identified as the key characteristics of patients lost to follow-up. A greater proportion of the patients were lost to follow-up within the first year of initiation of treatment.

Conclusions The loss to follow in the study is high. Efforts need to be focussed on linking people infected with human immunodeficiency virus to treatment, retaining them in care, and increasing patient time on treatment. Patient tracing mechanisms should be strengthened.

Background

HIV AIDS epidemic is fast becoming a major public health problem with catastrophic outcomes. Globally, in 2018 an estimated 37.9 million people are living with HIV (PLHIV). Out of these, 36.2 million are adults and 1.7 million are children less than 15 years. Approximately 23.3 million people have access to antiretroviral therapy (1). In the Asia Pacific region an estimated 5.9 million people are living with HIV with an adult (ages15−49 years) HIV prevalence of 0.2% (2). In the Asia Pacific region about 78% of children and 54% of adults are on antiretroviral treatment (2).

Pakistan has one of the fastest growing epidemics in the South Asia with a 29% increase in new infections over the last decade (2). The country continues to have a concentrated HIV epidemic with a prevalence of less than 0.1% among the general population (3). The epidemic is predominantly concentrated among key populations (KP) namely people who inject drugs (PWIDs), transgender sex workers (TGSW), men who have sex with men (MSM), male sex workers (MSW) and female sex workers (FSW) with evidence of spill over into the general population through bridging populations (3). Of the estimated 165,000 PLHIV in Pakistan only 11% are on treatment (4,5). National data shows treatment coverage among the registered PLHIV at 69% with a cumulative lost to follow-up of 37.5% (5). The country has seen an increase in PLHIV registration at the ART centres with the introduction of high impact key population specific HIV prevention programming, decentralized scale up of ART centres and introduction of WHO treatment for all guidelines.

HIV after diagnosis requires life-long antiretroviral therapy and thus sustained engagement with the ART centres. Retention in HIV care and adherence to HIV treatment is pivotal for achieving the Global 90−90−90 targets for ending the HIV AIDS epidemic (6). HIV retention and adherence are associated with viral load suppression, reduction in HIV transmission, a decline in cases of HIV drug-resistance, and disease associated morbidity and mortality (7). In 2013 as per a World Health Organization (WHO) report, an estimated 4.2 million deaths were averted in low and middle income countries (LMICs) due to HIV treatment (8). Patient retention in the HIV treatment cascade has become a challenge overtime with high rates of loss to follow up. Loss to follow-up (LTFU) is defined as a patient who has not visited/attended the ART clinic for >180 days (6 months) and has not been reported dead or transferred out to another ART clinic (9). LTFU has a negative impact on treatment outcomes and is associated with high rates of morbidity, mortality and HIV transmission (10).

Gaps in quality of data reporting, lack of standardized patient tracing mechanisms, challenges of devolution, weak linkages and information sharing between various stakeholders and capacity of HIV service providers make patient tracking and return to treatment difficult(11). Despite its importance to treatment success, data on rate and factors associated with LTFU of patients on ART in Pakistan is limited. This study aims to analyse the extent and characteristics that influence loss to follow up of PLHIV after ART initiation

Methodology

Study Design and Setting

A retrospective cross-sectional study was conducted in the National AIDS Control Program (NACP) with a review of the National HIV AIDS database. NACP plays a predominant role of coordination and providing technical, strategic and policy support and guidance to the four provinces (administrative divisions) of the country. There are four Provincial AIDS Control Programs (PACPs) implementing the HIV Programs in their respective provinces that include HIV prevention service delivery and HIV treatment Programs. Pakistan introduced a live web-based HIV AIDS-management information system (NACP-MIS) in 2015 and maintains case-based data of all patients registered in the 16 of the 38 ART facilities across the country. Aggregate data from the remaining 16 centres is reported in the national data repository.

ART facilities are established based on geographical mapping of PLHIV registered at the ART centres to provide free of cost diagnostics including HIV, CD−4 and viral load tests, and importantly antiretroviral medicines (ARVs). Patients diagnosed with HIV are registered in the ART centres and provided a unique identification code (UIC) for tracking along the treatment cascade. Periodic quality checks are conducted by the Program data unit to ensure data quality and reliable reporting. Furthermore, the NACP-MIS anonymises patient data using unique code identifiers for data management, analysis and reporting to maintain patient confidentiality. As secondary data was used for the study therefore written informed consent from the subjects was not obtained. However, a password protected electronic data base with restricted access was maintained and all personal identifiers were kept confidential.

Data Collection and Measurement

In the current cross-sectional study, secondary case-based data maintained in the national HIV AIDS-MIS was used. The national database functions to provide key information for evidence-based strategy and policy making, evaluation of the treatment Program, monitoring patient outcomes, medicines forecasting and planning for future interventions. Case-based data of all patients registered in the NACP-MIS from 1 January 2017 to 31 December 2018 was extracted from the national database. Data of registered PLHIV who were not initiated on ART (pre-ART), transferred out, and those with missing information on the key study variables i.e. key population typology, province, time of treatment initiation and discontinuation were excluded from the study. The patient UIC was used to extract key socio-demographic data and treatment profiles of patients registered in the national electronic database. The primary outcome variable of the study is LTFU from ART care after initiation of ART. LTFU for all patients registered at the ART centres was calculated from the time of initiation of ART and patients whose last visit to the ART clinic was >180 days (6 months) and has not been reported dead or transferred out to another ART clinic (9).

Data Analysis Data after extraction was collated with the HIV database for completion and accuracy. The extracted data was double entered into epi-data (version 3.1). The data was then exported into SPSS version 20 for further descriptive analysis. Descriptive statistics such as frequency and percentage were applied to study the characteristics. Time of lost to follow up was calculated from the date of initiation of ART and to the date of lost to follow up after treatment initiation in months.

Results

Of the eligible 5,215 patients initiated on ART 3,217 (65.6%) were active PLHIV on ART and 1,686 (34.3%) were lost to follow-up of which 593 (32.2%) were LTFU after only one visit to the ART centre.

Socio-demographic Characteristics of study cohort

Table–1 shows that of the 5,215 patients were initiated on ART during the period between 1st January 2017 to 31st December 2019. Majority of the participants 3,097 (59.4%) were aged between 15–49 years with a mean age of 23.66 years. Males represented 4,069 (78%) of the study population and only 133 (2.6%) transgender persons were registered and initiated on ART during the study period. Among the patients initiated on ART 60.5% belonged to the province of Sindh. In terms of typology people who inject drugs (PWIDs) accounted for 29.6% of the subjects whereas female sex workers had the lowest representation. Alarmingly, 3,247 (62.3%) at the time of registration at the ART centre were PLHIV who did not disclose their identity (typology) to the service provider.

Age between 15–49 years, male gender, people with undisclosed identity and province of residence (Sindh) were found to be the key characteristics of the patients lost to follow up. Although private sector ART centres catered to 628 (12%) of the patients initiated on ART yet the type of ART facility did not significantly influence treatment outcomes in terms of LTFU.

Time of lost to follow-up after initiation of ART

Of the total 1,686 PLHIV loss to follow-up 1,012 (60%) were lost in the first year after treatment initiation. and12 months after initiation of ART. Among the PLHIV-LTFU in the after completion of one of treatment 603 (59.6%) were PLHIV with undisclosed identity followed by 345 (34.1%) PWID-PLHIVs. Study results revealed that the proportion of PLHIV-LTFU decreased in the second year after initiation of ART.

Discussion

This research was conducted to study the extent and characteristics of LTFU in patients initiated on ART in Pakistan. The country's treatment Program is predominantly based in public sector health facilities with only 03 out of the total 38 ART centres functioning in the private sector. Over the last 5 years a gradual increase in patients initiated on ART was seen from a cumulative 45% to 69% among those registered in the ART centres with a concomitant increase in the cumulative LTFU from 45% to 54% during the same period (5). The cumulative LTFU of the studied sample was 34.3% among the total initiated on ART in 16 ART centres located in 03 provinces and federal capital of the country. The high percentage (34.3%) of LTFU in the studied sample correlates with the national data (37.5%) and also with findings of a systemic review of the sub Saharan ART Program that reported a LTFU of 40% among PLHIV on ART (11,12). Rosen et al. also reported a progressive increase in LTFU over time in their studies conducted in sub Saharan countries (13,14).Studies conducted in Ethiopia in 2015 identified 14.8% of PLHIV on ART as LTFU and a systematic review of ART Programs in sub-Saharan African also revealed that the LTFU was very high (59%) among the PLHIV on ART (13,15). National evidence reveals that some of the factors contributing to LTFU include disease associated stigma and discrimination, attitude of healthcare staff, timings of healthcare facilities, catastrophic out of pocket health spending, and weak social support systems(16)

In our study we observed that young age and male gender are strong risk factors for LTFU in patients on ART. This finding has also been observed in other studies conducted in Guinea-Bissau, Ethiopia, Kenya, Nigeria and parts of West Africa (12,17–20). Pakistan has a male dominated society with strong socio-cultural norms. Men value their honour, strengthen and position in society immensely and therefore may intentionally be negligent of their treatment needs for fear of status disclosure and fall from grace. This trait has been echoed by Seifu et al. in their study (15).

Pakistan is in the concentrated phase of the HIV epidemic with a HIV prevalence of >5% in key populations. Findings of this study are suggestive of a significant relationship between PLHIV who belonged to key populations (PWIDs, TGs and sex workers) and LTFU as a treatment outcome. This finding is consistent with studies that have identified key populations as a risk factor to LTFU(21,22). The high proportion of LTFU in key population groups can be ascribed to weak linkages between the community organizations and treatment facilities, lack of family, community, and peer support, and fragile community monitoring systems. Our study has shown that among the key populations people who inject drugs are predominantly LTFU due to their chaotic behaviours, compromised mental state, and absence of family support. This finding has been supported by Mekonnen et al. in his study (17). The PLHIV tracking system in hospital settings is extremely fragile and lacking in treatment adherence support groups. Studies have supported the role of establishing community networks, strengthening community outreach mechanisms, promoting HIV literacy and benefits of

treatment, peer support initiatives, supporting partner or treatment buddies, continuous counselling and introducing patient friendly institutional measures to increase treatment access and retention (23–25).

Our study findings reveal a significant association between LTFU and PLHIV with undisclosed identity. Pakistan is an Islamic country with conservative society and strong religious values. Due to the myths associated with HIV, the disease has been incriminated with socially inacceptable and religiously condemned behaviours. Therefore, a great majority of the key populations do not disclose their identity at the time of enrolment into the ART Program due to fear of hostility, discrimination, denial of health services, and fear of punitive measures. This finding has been substantiated in study conducted by Hunt et al in Zimbabwe and in a systemic review conducted by Shan et.al who reported fear of confidentiality breach and stigma to be the main reasons for concealing their identity from healthcare providers (26,27). The effects of undisclosed identity on treatment outcomes have been adverse in terms of delays in seeking health care, interrupted or and discontinuation of treatment as reported by supported by Duby et al. in their study (28).

Loss to follow-up and poor retention in treatment Programs are broadly influenced by internal, interpersonal and structural barriers. Regional studies have attributed inherent factors as behaviour (drug use, sex work), gender identity/sex orientation (transgenders and men who have sex with men) and disease associated stigma and discrimination, socio-economic factors, lack of legal protection, chaotic and migratory lifestyles, fear of criminalization and exploitation to the high rates of LTFU among the key populations (21). The stigmatized attitude of healthcare providers towards key populations and HIV patients has been one of the hurdles in providing them with HIV prevention, treatment, care and support services that can be attributed to their fear of HIV due to limited knowledge as well as their denouncement of key population behaviours (29–31). Structural barriers such as distance of ART centres, cost of travel, intricacies within the health delivery system such as multiple stations for testing, treatment and follow-up as well as hospital timings also contribute to high rates of LTFU(11,23,25).

The current study has revealed that majority of the PLHIV loss to follow up belonged to the Province of Sindh. As per AEM estimates Sindh constitutes 43% of the country's PLHIV burden, with high HIV prevalence in key populations in major cities of the province (3,32). There were 10 ART centres in the province at the time of the study and constituted 60.5% of the total study case-based dataset (5). A study conducted in Karachi by Samo RN and colleagues is in agreement with our study findings regarding geographical and epidemiological profile of Sindh (33).

Another significant finding of the study was the early LTFU after initiation of ART that is indicative of lack of effective engagement with the PLHIV to promote ART uptake and support treatment adherence. Effective counselling and sustained contact with PLHIV play an important role in the retention of PLHIV in the HIV treatment and prevention cascade. Due to the multiple socio-economic, cultural and health determinants influencing HIV treatment uptake and adherence counselling and psycho-social support are fundamental to combatting LTFU among PLHIV on treatment. Findings of global and regional studies are strongly correlate the link between counselling, psycho-social support and favourable HIV treatment outcomes (24,34). In the past year the country has introduced some interventions such as appointment of case managers at ART centres for patient tracking, providing nutrition support in the form of food packages to PLHIV-LTFU to re-engage them, developing linkages with key population CBOs and community organizations for patient tracking patients lost

to follow up and introducing an alert system in the NACP-MIS to remind the healthcare providers of patients appointments. Studies are needed to evaluate the impact of these interventions.

Strength and Limitations

The strength of this research is that national level data case-based data set was analysed for a period of two years was analysed to know the socio-demographic characteristics and risk factors for LTFU in the Pakistan. The study also had some limitations as case-based data from Punjab (province with the highest PLHIV burden) was not available. The population categorization in terms of typology was another serious limitation as PLHIV who were members of key population groups and those who belonged to the general population, spouse, client or non-key population partner could not be separated and were categorized as PLHIV with undisclosed identity or others. This may have led to overestimation of LTFU in a population group that is in contrast to epidemiological landscape of the country and may have had a confounding effect on the study findings. The time period of the study was limited due to ambiguities in the data in the previous years and element of over or under reporting of PLHIV treatment status may exist. Another limitation missing information with regards to age of the PLHIV that could have again led to over or under estimation of LTFU in the studied population.

Conclusions And Recommendations

The cumulative LTFU among the PLHIV on ART in the study data set was 34.3%. Age, male sex, people who inject drugs among key population typology and people with undisclosed identity were considered to be key characteristics of PLHIV-LTFU. Geographic distribution (Sindh province) of PLHIV also influenced LTFU. The time of LTFU after treatment initiation was also found an important circumstance in the study subjects as a greater proportion of the PLHIV were lost to.

Despite limitations, the study findings provide an important understanding of the country's treatment Program, the extent and socio-demographic characteristics of PLHIV-LTFU. It also provides directions to the data managers for addressing gaps in data collection, and ambiguities in the database that tend to compromise the quality of the NACP management information system. This calls for information system strengthening at both the institutional and community levels supported by the introduction of innovative technologies using electronic medical records and biometric devices to develop a credible database of PLHIV. The findings of the study also highlight the need to develop contextually appropriate patient tracking mechanisms to link PLHIV-LTFU to treatment and curtail the number of PLHIV-LTFU for better treatment outcomes and to reduce the number of new infections in the country. Further studies are needed to elucidate strategies and mechanisms for addressing the information gaps and for addressing the high LTFU among PLHIV in the country.

Abbreviations

AIDS: acquired immune deficiency syndrome; ART: anti-retroviral therapy; ARV: anti-retroviral; CD−4: cluster of differentiation 4; FSW: female sex workers; HIV: human immunodeficiency virus; KP: key population; LMICs: low middle income countries; LTFU: loss to follow-up; MIS: management information system; MSM: men who sex with men; MSW: male sex workers; NACP: National AIDS Control Program; PACPs: Provincial AIDS Control

Programmes; PLHIV: people living with HIV; PWIDs: people who inject drugs; TGSW: transgender sex workers; UIC: unique identification code; WHO world health organization

Declarations

Ethical Approval

Ethical approval for the study and use of Program data was obtained from the IRB of the Common Management Unit for TB, AIDS and Malaria prior to initiation of the study. The NACP-MIS anonymises patient data using unique code identifiers for data management, analysis and reporting to maintain patient confidentiality. As secondary data was used for the study therefore written informed consent from the subjects was not obtained. However, a password protected electronic data base with restricted access was maintained and all personal identifiers were kept confidential.

Consent for publication:

Not applicable.

Availability of data and materials:

The dataset contains confidential patient information/data which should not be shared publicly according to the journal ethical policy. Therefore, the datasets used and/or analysed during the current study are available from the corresponding author and can be shared on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Author's Contribution

SIP conceived and designed the study, performed analysis and interpretation of data and drafted the first manuscript. SIP and FH participated in data collection (extraction), data entry, critical review of data, data

analysis and critical review of the subsequent draft of the manuscript. All authors read and approved the final version of the manuscript for publication.

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Tables

Table 1: Socio-demographic characteristics of patients (PLHIV) initiated on ART in at the 16 HIV treatment Centres (ART) centres in Sindh, Baluchistan, KPK and ICT of Pakistan

| Socio-demographic Characteristics		Number (n=5,215)	Percentage (%)
Age	<15 years	250	4.8
	15-49 years	3097	59.4
	>49 years	372	7.1
	Missing	1496	28.7
Gender	Male	4069	78
	Female	1013	19.4
	Transgender	133	2.6
Population Group	PWIDs	1543	29.6
	MSW/MSM	142	2.7
	TG/TSW	133	2.6
	FSW	3	0.1
	Prisoners	14	0.3
	Migrants	133	2.6
	PLHIV with undisclosed identity	3247	62.3
Province	Baluchistan	483	9.3
	KPK	1214	23.3
	Sindh	3156	60.5
	Islamabad Capital Territory	362	6.9

Table 2: Clinical characteristics of people living with HIV (PLHIV) registered at the HIV treatment (ART) centres in Pakistan from Jan 2017 to Dec 2018

		N (%)
Type of Health facility	Public	4587(88)
	Private	628(12)
Treatment Status		
Alive	On follow-up	3217(65.6)
	Loss to follow-up	1686(34.3)
4903(94)		
Dead		312 (.05%)
	<6 months of initiation of ART	543 (32.2)
Time of LTFU after initiation of ART	6-12 months of initiation of ART	170 (10)
	12-18 months of initiation of ART	58 (3.4)
	18-24 months of initiation of ART	20 (1.2)

Map of Pakistan (HIV Treatment Centres in Sindh, Baluchistan, Khyber Pakhtunkhwaa and Islamabad Capital Territory)
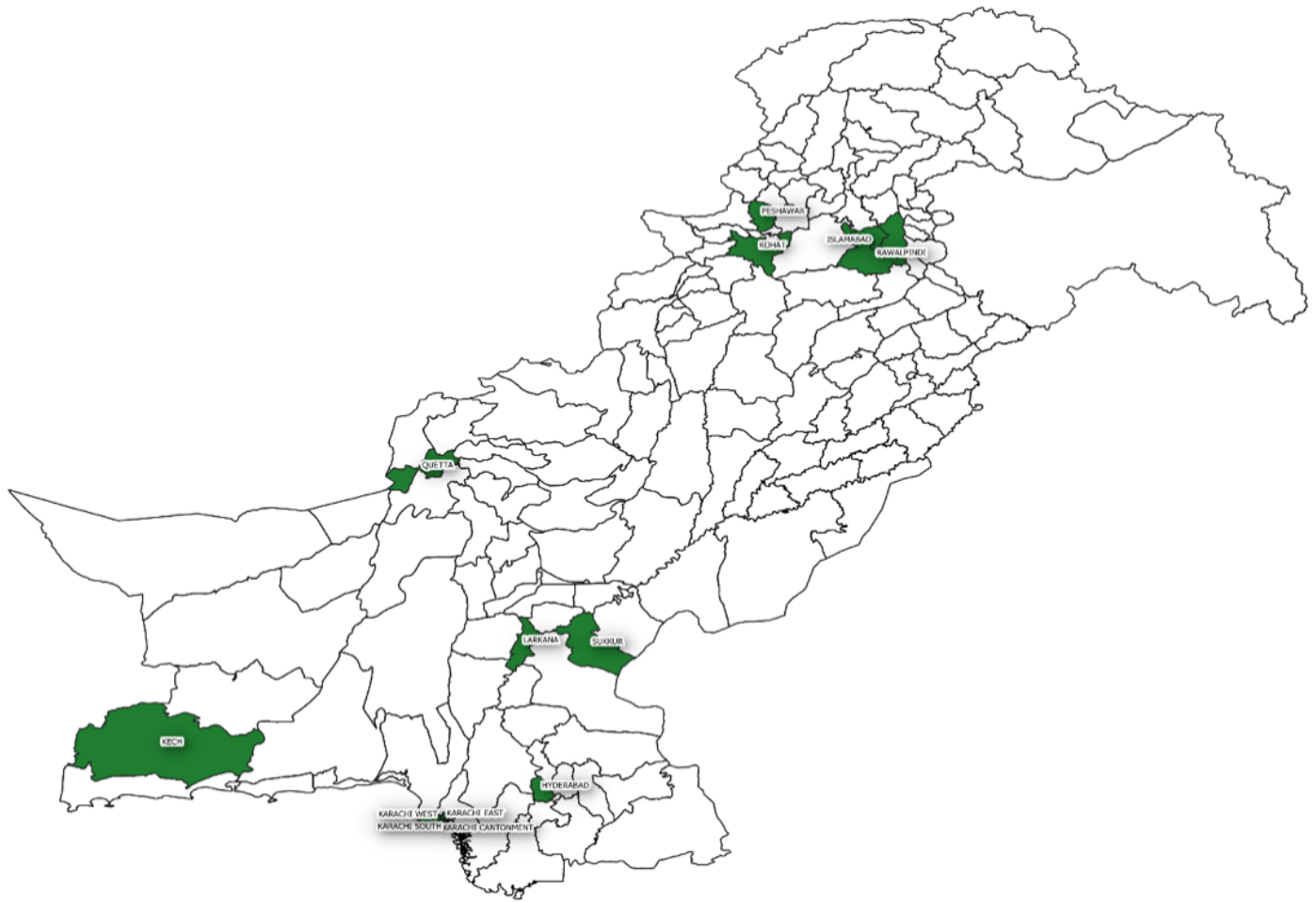
Figures
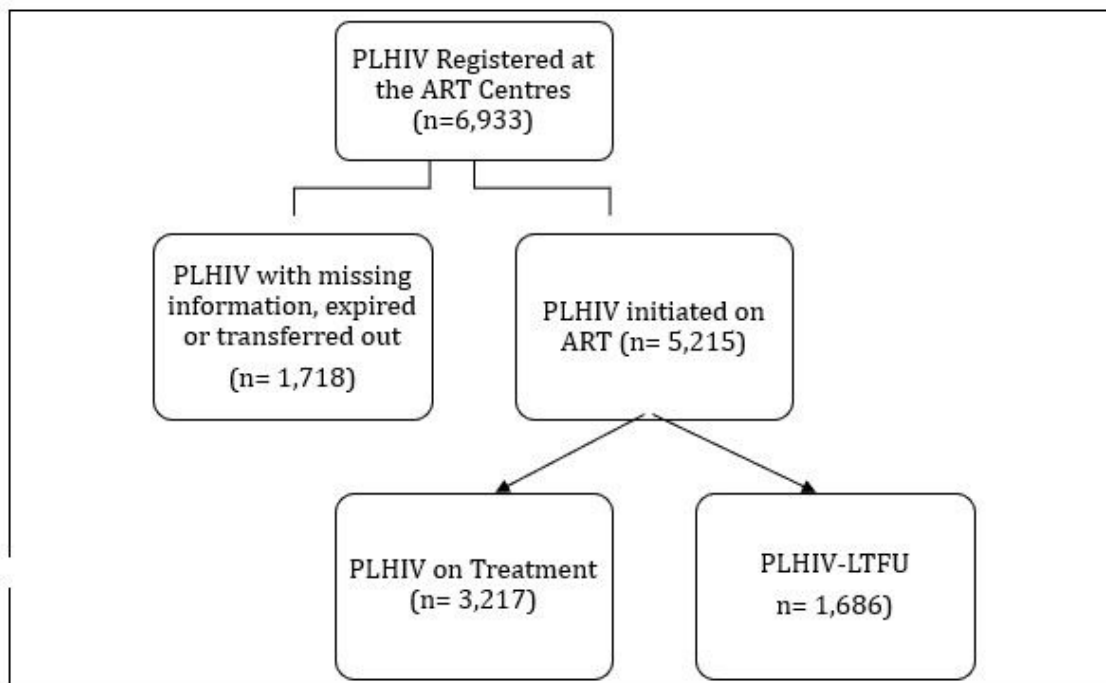
Operational Definitions

Lost to follow up: a patient who has not visited/attended the ART clinic for ≥180 days (6 months) and has not been reported dead or transferred out to another ART clinic.

Dead: a patient who has expired with confirmed documentation.

Transferred-out: a patient who has moved to another health facility that is not a part of the study with confirmed record of transfer out.

Active PLHIV on ART: a patient who regularly attends the ART clinics at least once every 06 months for follow-up and reports his/her own adherence to ART.

Confirmed documentation: patient information recorded in the NACP-MIS after verification by the ART facility staff and recorded in the patient file.

Figure 1

Patients registered at 16 ART Centres in Sindh, Baluchistan, KPK and ICT, Pakistan between 1st January 2017 to 31st December 2018