Improved 12-month ART retention rates through intensive monitoring of key process measures in Zambézia Province, Mozambique

Final Report

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Executive Summary

The 12-month retention rate of patients on combination antiretroviral therapy (ART) in Zambézia Province, Mozambique remains low (68%). An essential first step in characterization of patient attrition rates is ensuring that clinical files (CFs) of defaulting and lost to follow-up (LTFU) patients are retrieved in a timely fashion to initiate tracing activities. To address this, in 2016, Friends in Global Health (FGH) piloted a standardized procedure for CF management, and expanded to 39 health facilities (HFs) in February 2018, with weekly monitoring of process measures. We report results on the effect of this Quality Improvement (QI) intervention on retention.

Data on availability of CF and 12-month retention rate of HIV-positive non-pregnant/non-lactating adults (≥15 years) enrolled in care at 39 HFs were evaluated between September 2017 to 2018. CF availability was based on the number of files found within two hours from weekly lists generated for defaulting and LTFU patients. Retention was defined as the percentage of patients actively receiving ART 12 months following ART initiation. The effect of this intervention on 12-month retention rates was evaluated using a generalized linear mixed model.

A total of 20,729 patients who initiated ART between September 2016 to 2017 were included. The overall CF availability and 12-month retention rate increased from 61% to 82% and from 64% to 79%, respectively. With the intervention, patients are 41% more likely to be retained (OR 1.41; 95% CI, 1.03-1.96; P=0.03). This improvement was sustained post-intervention with variability at HF level.

Intensive monitoring of CF availability for defaulting and LTFU patients is associated with significant improvements in 12-month retention rates where this QI intervention was implemented. The variations between HFs suggest that site-level contextual factors play a role. The feedback loop may be an important factor in compliance by health personnel to the defined standard operational procedures, positively affecting defaulter tracing and quality of retention data.

Project Background

The Mozambique Ministry of Health (MoH) recommends that each patient enrolled in human immunodeficiency virus (HIV) care and treatment services and initiated on combination antiretroviral treatment (ART) have an individual clinical file (CF). However, poor availability of these patient files can affect the quality of care and services provided.

The 12-month ART retention rate of adult patients in Zambézia Province remains low (68%; MoH national report, 2018). An essential first step in identifying and preventing patient attrition is ensuring that the CFs of defaulting and lost to follow-up (LTFU) patients are retrieved in a timely fashion to initiate standardized patient tracing activities.

To address this, the non-governmental organization (NGO), Friends in Global Health (FGH), collaborated with the Provincial Health Directorate of Zambézia (DPS-Z) to identify a strategy for quality improvement (QI) of service delivery at health facilities (HFs) in the rural province of Zambézia, Mozambique. Within the context of the National Directive for Quality Improvement, in 2016, the team piloted a standardized procedure for CF management. This strategy was conceived to improve the quality of care delivered to patients, ensuring their individual clinical history was always available to the provider, and ultimately, to improve the quality of available data on patient retention.

The strategy was initially piloted in three high patient volume rural district HFs: Magiga HF, and Ile and Gilé district capital HFs. The FGH QI team led consecutive Plan-Do-Study-Act (PDSA) cycles to address challenges encountered by clinical teams. Other QI team activities included mapping the flow of CF presence and usage at each sector where the CF entered, adapting the tracking tool to monitor the flow of CFs, and identifying actions specific to the context of each sector or location to improve CF availability.

Weekly monitoring and visualization of CF availability, defined as finding the CF within two hours, contributed to the discussion and analysis of results in each HF included in the pilot. It was identified that weekly monitoring of this key process measure could influence clinical teams to make timely decisions to increase the availability of CFs and improve the quality of services.

Based on results from a systematic data verification in these three pilot HF sites conducted in April 2018, FGH and DPS-Z opted to expand implementation of these QI activities. The novel QI strategy was expanded to an additional 36 FGH-supported HFs in February 2018, for a total of 39 HFs. Based on lessons learned from the pilot activities, FGH developed Standard Operating Procedures (SOPs) to train staff and ensure fidelity during the expansion of the QI strategy:

- Allocate a dedicated lay counselor to the reception area (as receptionist);
- Limit the number of people accessing the CFs or archives, thus increasing ownership, overview and enforcement of defined procedures;
- Routine cleaning of the archives;

- Provide clear definition of staff roles and responsibilities throughout the different sectors, including procedures for data clerks;
- Use of a tracking tool for the flow of CFs at the HFs, managed by the dedicated receptionists.

Aside from CF availability, the team soon identified additional process measures related to ongoing patient tracing activities and began weekly tracking of visits to defaulting patients by health activists in May 2018, as well as triangulation of data from different sources and consented phone calls, both of which began in July 2018. All process measure data collected to track performance were included in FGH's routine weekly monitoring activities, which are stored in a secure web-based system.

Purpose and Questions

The objective was to evaluate the effect of the QI strategy on adult 12-month ART retention.

Design, Methods, and Limitations

Type of evaluation

An observational, cross-sectional study was performed. We conducted a secondary data analysis on aggregated individual- and health facility-level data collected by district and provincial teams for routine programmatic monitoring and reporting purposes.

Stakeholder engagement

FGH technical teams have ongoing collaborations with key stakeholders working in the health facilities and communities in which we support and are engaged. The implementation of this QI strategy was piloted in full collaboration and support by our partners at the DPS-Z as well as district-level health authorities.

Sampling strategy

We included all clinical data available from the OpenMRS electronic medical records database for adult patients enrolled in ART services during evaluation period. We included all programmatic data for process measures related to the QI intervention from FGH secure internet databases.

Methods for data collection

We included all patients who were HIV-positive non-pregnant/non-lactating adults (≥15 years of age) enrolled in care at the 39 selected HFs between September 2017 to September 2018 (five months prior to the introduction of the QI initiative, and seven months after).

No specific exclusion criteria were identified.

The availability of CFs (measured as the proportion of CFs available, see definitions below) was based on the number of files found within two hours from weekly lists generated for defaulting and LTFU patients. The performance of this process measure was registered and tracked weekly for all 39 HFs in an aggregated database in a secure-entry online platform (see Appendices, data collection instrument). For the purpose of this analysis, data for these indicators, including the number of patients on the weekly lists as well as the number of CFs found within two hours, were collected weekly from the online platform from March to September 2018.

Definitions used in the process measure for monitoring adult patient CF availability:

- Denominator = total number of patients identified as defaulting or LFTU on the weekly list generated in OpenMRS to inform patient tracing activities
- Numerator = all files located from the list within a time frame of two hours
- [Numerator] / [Denominator] = % of CF availability

Retention was calculated on a monthly basis and defined as the proportion of patients actively receiving ART 12 months after ART initiation.

Ethical considerations

This secondary data analysis is covered under the protocol "*Quality Improvement for HIV Care and Treatment in Zambézia Province of the Republic of Mozambique under the President´s Emergency Plan for AIDS Relief (PEPFAR)*", approved by Mozambique IRB (CIBS-Z) and US VUMC IRB.

All data included in this analysis were de-identified programmatic data. The electronic databases are stored on password protected and encrypted servers at FGH. De-identified data were extracted from these secure databases and sent via secure file transfer to relevant key personnel (e.g., the statistician).

Deviations from SOW/protocol

There were none related to this evaluation.

Data quality assurance

FGH technical and QI teams provided in-service training, oversaw the fidelity of SOP implementation, and verified the quality of data collected in HF sites where the strategy was implemented. Process measure performance was reported weekly and monitored by FGH staff.

Programmatic data used in this evaluation were subject to routine data verification processes conducted by trained members of FGH's Monitoring and Evaluation (M&E) team and stored securely on password protected databases at district and provincial level offices. Data for programmatic indicators were collected and internally reported monthly by the Health Information Systems (HIS) team, following the regular reporting period for program data.

Datasets used in analysis were checked for consistency and appropriateness with the sampling criteria.

Data analysis plan

We performed a series trend analysis to evaluate the effect of the introduction of the QI strategy on availability of CFs and 12-month retention. We described data from five months prior to implementing the novel QI strategy through seven months after the strategy's introduction. We evaluated the effect of this QI intervention on 12-month retention rates using a generalized linear mixed model. Variables included in the model were district, health facility, year or calendar time, retention status, and intervention period.

The statistical analysis was conducted using R statistical software (R Core Team [2018]. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL http://www.R-project.org/).

Limitations of design

Among the limitations for this analysis is the data collected is nested within HFs. Records from within a HF are likely to be more correlated than data obtained between HFs. To account for this dependence, we fitted a mixed effect model with the intercept and slope treated as random factors, such that each HF model could have their own intercept and slope.

Another technical consideration is the outcome of the data, as the response variable is a ratio restricted to the [0,1] interval. Normality assumptions were therefore violated so we fitted a generalized (mixed effects) linear model, with the logit link function.

Routine program data were used, thus datasets obtained for analysis were subject to the quality and completeness of data registry and database entry.

The evaluation was done in 39 FGH-supported HFs and results may not be representative for the entirety of the province nor the country.

Findings

Trends in clinical file availability and 12-month retention

A total of 20,729 patients who initiated ART between September 2016 to September 2017 were included.

CF availability data were collected from February to September 2018. The overall rate of adult patient CF availability, defined as the percentage of files from the weekly list of adult patients who are defaulting or LTFU located within two hours, increased from 61% to 82% (Figure 1).
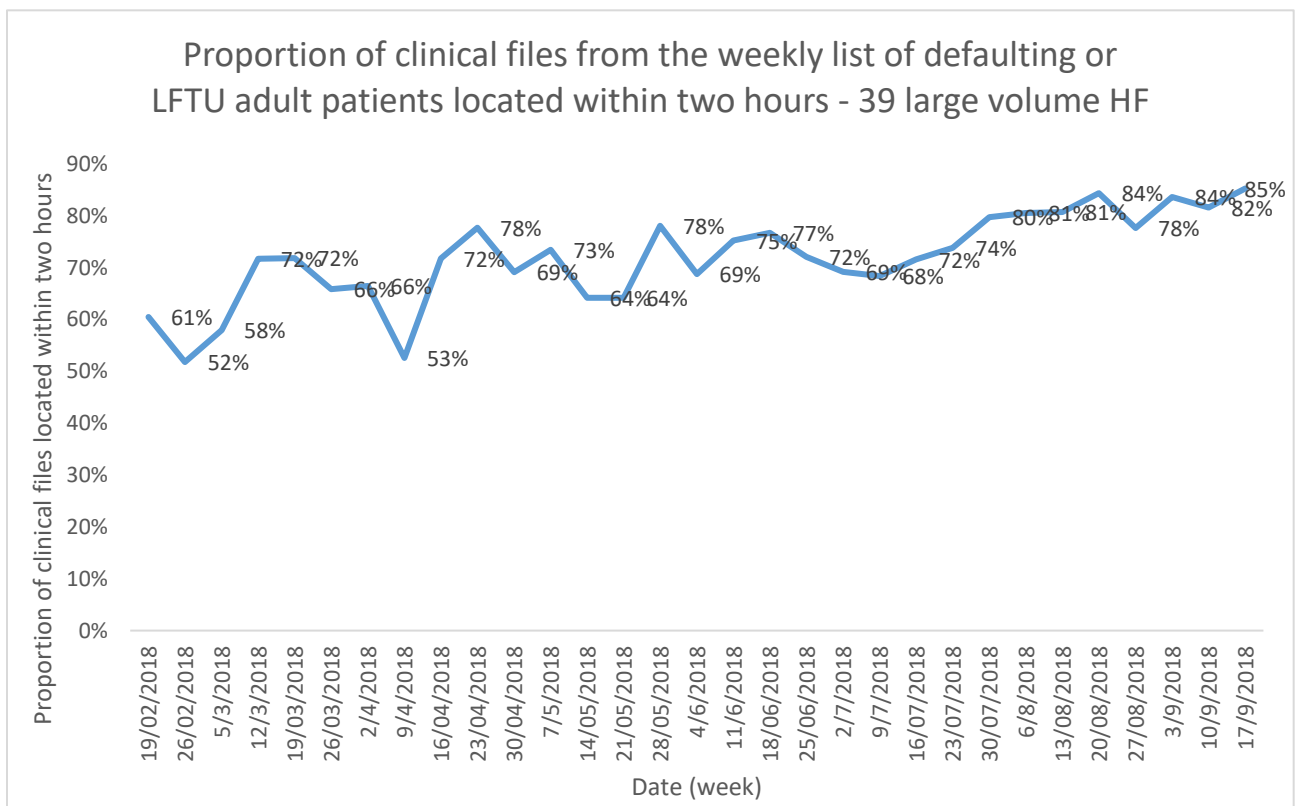

Figure 1. Overall trend in adult patient CF availability during evaluation period (39 HFs).

The adult 12-month **retention in care** rate increased from 64% to 79%, with variability of results at HF level (Figure 2).
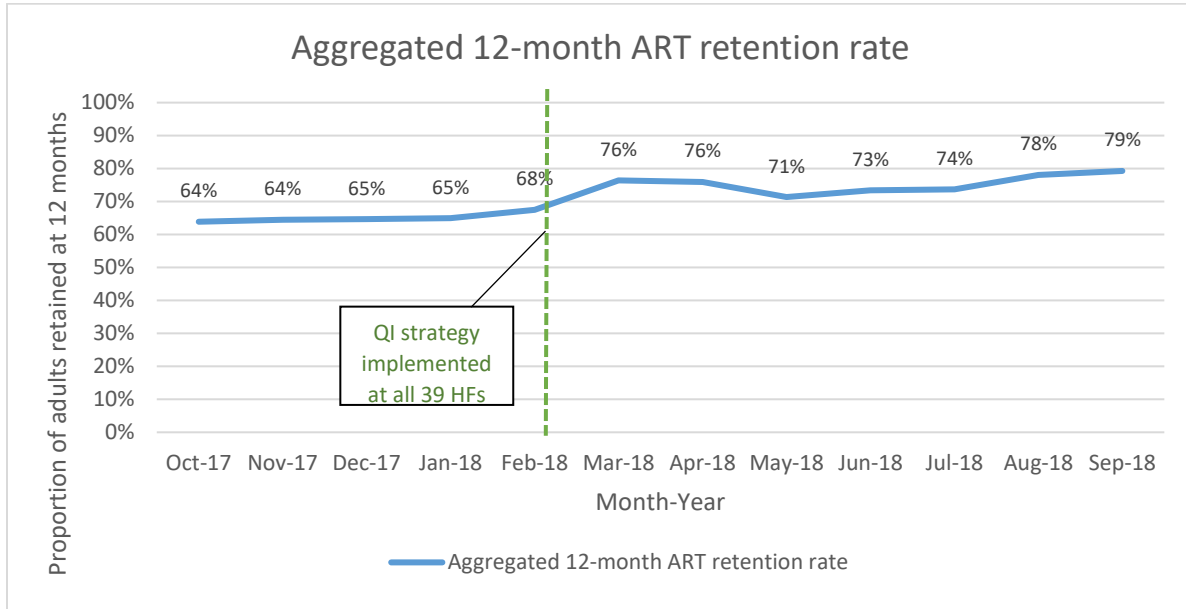
Figure 2. Trend in 12-month retention.

Effect of QI intervention on 12-month retention rate

With the intervention, patients were 41% more likely to be retained in care (odds ratio [OR] 1.41; 95% CI, 1.03-1.96; P=0.03). This improvement in retention was sustained post-intervention during the evaluation period until September 2018, with variability at HF level.

However, according to results from the fitted model, the slope of the proportion of retained patients was not statistically different to that of baseline/pre-intervention (OR 0.996; 95% CI, 0.941-1.05; P=0.89) following the sharp increase at the introduction of the intervention in February 2018.
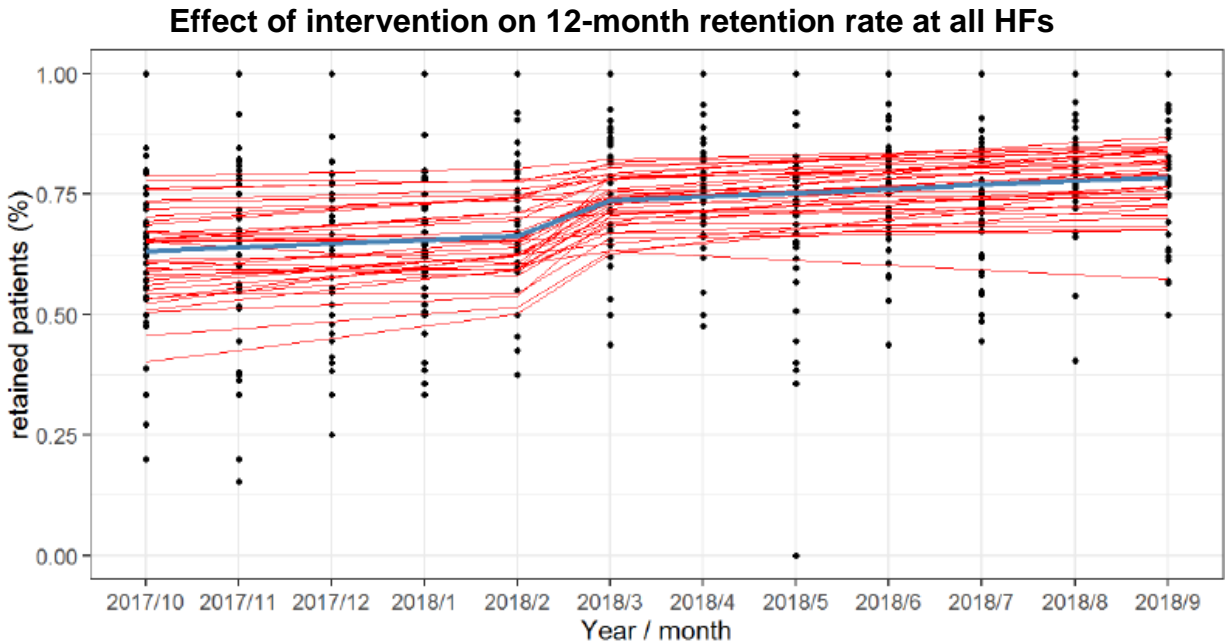
Effect of intervention on 12-month retention rate at all HFs

Figure 3. Fitted model of effect of intervention on 12-month retention in care rates,

In Figure 3, each red line corresponds to a model for an individual HF and the blue line corresponds to the population mean model (of all HFs included). The population curve (blue line) shows a large increase when the QI strategy took place (February 2018), however, the rate of increase soon returned to its previous rate prior to the intervention. Thus, the effect for improved retention was mostly local, despite improvement noted over time.

There was high variability in the individual-level curves. Some of the HFs served only a limited number of individuals, thus wide variation was seen in the proportion of patients retained.

Conclusions and Recommendations

Intensive monitoring of CF availability for defaulting and LTFU patients is associated with improvements in 12-month retention rates where this QI intervention was implemented.

Our results show that in these selected sites in Zambézia Province, improved availability of patient CFs potentially allowed for:

- Clinicians and counselors to access patients records and regularly perform clinical and psychosocial support (PSS) consultations;
- Increased fidelity of SOP implementation for home visits and phone calls to patients;
- Improved update of information within OpenMRS.

The variations between HFs suggest that site-level contextual factors play a role. The feedback loop may be an important factor in healthcare providers' compliance to defined SOPs, positively affecting the quality of care, including defaulter tracing as well as the accuracy of retention data.

Given this, we plan to continue efforts to inform public health officials and policymakers in the region of these contextual findings of this evaluation for consideration in adopting a similar and/or expanded weekly monitoring strategy in attempt to improve CF availability and potentially related patient outcomes in these HFs. To date, the approach has been expanded in Zambézia Province to a total of 55 HFs, with a continuous positive effect on ART retention rates.

Dissemination plan

In an effort to share best practices and lessons learned from this QI strategy, FGH has shared these results with provincial- and national-level MoH collaborators and stakeholders.

Additionally, a CDC-MZ-approved abstract with these findings was presented in a poster format at the International AIDS Society (IAS) 2019 Conference in Mexico City, Mexico (July 2019). Furthermore, a DPS-Z collaborator/co-author presented the findings in an oral presentation at the *Jornadas Provínciais* provincial scientific conference in Zambézia Province, Mozambique (August 2019).

This report will be translated and disseminated at national and local levels, and results will be discussed to identify approaches to improving CF availability, including clinical mentoring and intensive monitoring of key process measures.

Appendices

Approved evaluation SOW/protocol

These QI activities, evaluation, and results dissemination activities are covered by and were approved by CDC-Mozambique Associate Director for Science (ADS) under the VUMC/FGH blanket protocol for secondary data analyses to evaluate and improve program outcomes using routine HIV Care and Treatment data (CGH HSR #: 2016-163a).

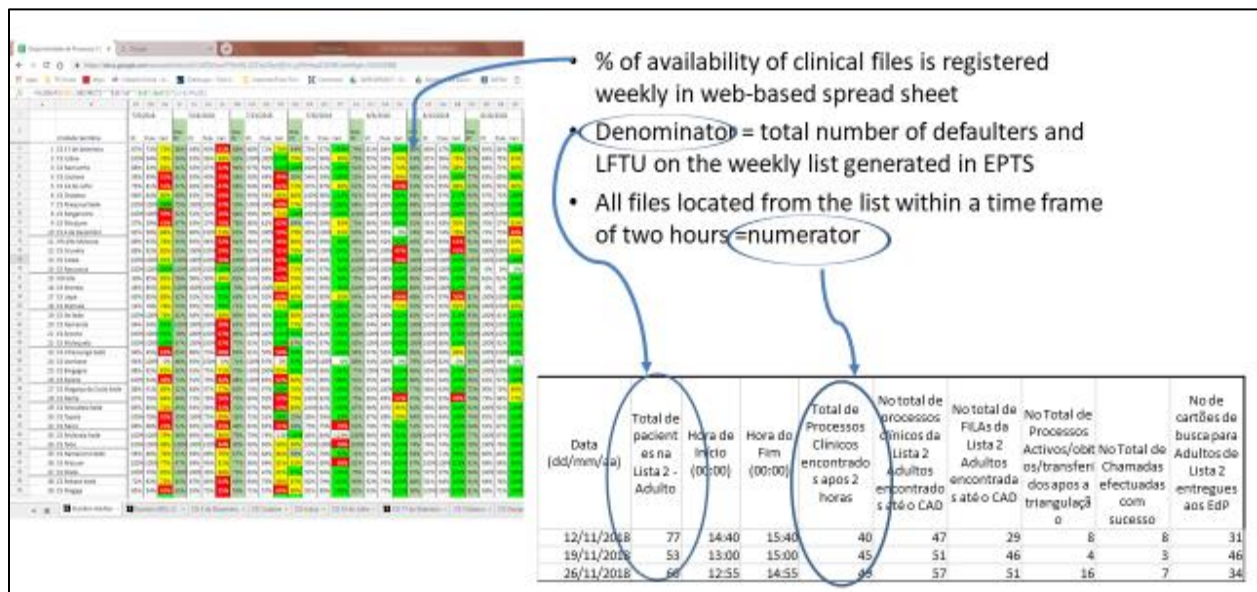*Data collection instruments/tools*

Figure 4: Tool for monitoring availability of adult patients' clinical files and other process measures for improving quality of data collection (source database for CF availability data).

Informed consent

Informed consent was not required for use of data in this evaluation, as it was a secondary analysis of routinely collected, de-identified, programmatic data. A waiver of consent was approved, as the evaluation involved no more than minimal risk, would not have been possible without the waiver, and the waiver did not adversely affect the rights nor welfare of the patients whose data were included in the evaluation.

Biosketches

Not applicable.

Conflict of interest statement

The collaborators in this evaluation have no conflicts of interest to declare.

Evaluation costs

Not applicable.

Results or Logical Framework

Not applicable.

References

1. Republic of Mozambique, Ministry of Health, National Health Service. (2019). 2018 Annual Report: Annual Report on HIV/AIDS Related Activities. Maputo, Mozambique.