

# **Positive Effects of Intensified Preventive Calls/Home Visits on Early Retention Among Adults Newly Initiated on Antiretroviral Therapy in Zambézia Province, Mozambique**

## **Final Report**

***Date of release of report:*** Abstract first submitted to CDC-MZ on December 12, 2019; final report submitted September 2020

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## Executive Summary

### Background

In Mozambique, early retention rates among antiretroviral therapy (ART)-treated adults remained low in 2018, ranging from 65% to 69% at one and three months, respectively. To bolster retention, patients newly initiated on ART received services during the first three months on ART including phone calls and/or monthly supportive home visits performed (for non-pregnant/lactating adults) by Counselors and Peer Educators and (for pregnant/lactating women [PLW]) by Mentor Mothers. In February 2019, activities were intensified in 20 health facilities in Zambézia Province, focusing on technical support to counselors and volunteers, data triangulation, and weekly process measures monitoring. The effect on early retention was evaluated.

### Purpose and Question

The purpose of this evaluation was to assess if the package of intensified interventions had a favorable impact on early retention of adults recently initiated on ART in selected health facilities. The primary objective was to assess the effect of the strengthening of support phone calls and preventive home visits on the early retention. A secondary objective of evaluating the association strictly between preventive home visits and early retention was also planned, however, this was not achieved due to lack of data that could be collected within the evaluation period.

### Methods

An internal outcome evaluation was conducted using routine process measures. Routinely collected aggregated program data extracted from electronic patient database of HIV-positive adults initiating ART between September 2018 and August 2019 were evaluated. Retention was defined as returning for  $\geq 1$  ART pick-up within 33 days (i.e., one-month retention) and 61-120 days (i.e., three-month retention) post ART initiation. Trend analysis was done using generalized linear mixed effects models to account for site-level clustering, adjusting for covariates (urban vs. rural, clinic size, and district).

Limitations included having a small sample size at select health facilities which may have led to estimates that are not widely generalizable; unavailability of data regarding patients returning to the health facility after a successful contact which prevented the planned evaluation of association strictly between preventive home visits and early retention; and use of routine program data which were subject to the quality and completeness of data registry and database entry.

### Results

Analysis included 19,750 patients. Overall, one- and three-month retention rates increased with the intervention from 61% to 93%, and 76% to 91%, respectively. In the observation period, the odds of being retained at one month increased by 1.92 (95% CI: 1.67-2.20) and we predicted a

continuous retention rate increase of 1.23 (95% CI: 1.18-1.29) in the post-observation period. The change was less substantial (OR 1.01, 95% CI: 0.87-1.16) for three-month retention, but the retention rate increase was still significantly higher (OR 1.25, 95% CI: 1.19-1.31).

### **Conclusions**

Improved psychosocial support implementation appeared to have a significant effect on early retention. Counselors and volunteers ensured procedural fidelity through clear identification of roles and responsibilities and creating a feedback loop regarding performance. However, potential positive bias from intensified monitoring of process measures could have led to an artifactual increase in early retention rates during the intervention period, which could limit results interpretation. Support for high quality community-clinic linkage should commence as early as possible to prevent lost to follow-up in this critical post-ART initiation window.

## Project Background

According to data from the national survey IMASIDA 2015, the HIV prevalence among adults (15-49 years of age) in Zambézia province was 15.1%.<sup>[1]</sup>

Retention of combination antiretroviral therapy (ART)-treated patients in HIV care has been a challenge in Mozambique, with national data showing that in 2018, 68% of patients were retained in care at 12 months.<sup>[2]</sup> Unpublished programmatic data from electronic patient tracking systems (EPTS) in 85 priority health facilities showed that in Mozambique, early retention rates among ART-treated adults remained low in 2018, ranging from 65% to 69% at one and three months, respectively.

Since August 2016, the country has been implementing the “Test and Start“ strategy (commonly referred to as the “Treat All” approach, namely initiating ART in all HIV-positive persons regardless of immune status/CD4 cell count) in order to accelerate progress towards attaining the lofty UNAIDS 95-95-95 goals. With the implementation of “Test and Start” strategy, retention in care has become even more challenging considering that many patients will be initiated on ART while asymptomatic and not necessarily knowing their CD4 cell count which makes them not fully aware of their individual immune status and overall benefits of ART. The added burden of a significant rise in the total number of ART-eligible patients presenting to initiate ART in an already over-burdened and fragile health system is a threat to quality of service as it relates to the provision of quality counseling, adherence support, and care.

Strengthening the quality and intensity of psychosocial support has become very important and Ministry of Health (MOH) guidelines have recently been updated so that patients at-risk, such as those newly initiating ART, those being lost to follow-up, and patients suspected to be on a failing ART regimen, all receive an intensified package of interventions. All newly enrolled patients should receive increased support in the first months after ART initiation, particularly pregnant and lactating women (PLW), whose poor retention has been found to be driven by early loss-to-follow up (LTFU) following ART initiation.<sup>[3]</sup>

Vanderbilt University Medical Center (VUMC), through its wholly owned subsidiary Friends in Global Health (FGH), has been providing CDC/PEPFAR-funded technical assistance in Zambézia Province, Mozambique since 2006. Over the past years, VUMC/FGH programs have expanded, currently supporting the provision of comprehensive HIV/AIDS services in 144 health facilities of Zambézia province.

To improve retention in care, in the health facilities supported by FGH, all patients newly initiated on ART are contacted by phone call or visited monthly during the first three months following ART initiation. For PLW and children, these support activities are performed within the Mentor Mothers Program (MMP), established by the MOH and implemented in Zambézia Province since

2017. For non-pregnant/non-lactating adults, these phone call and supportive home visit activities are performed by Peer Educators.

To further bolster retention in care rates, at the end of January 2019, FGH collaborated with the Provincial Health Directorate of Zambézia (DPS-Z) to implement intensified psychosocial support (PSS) activities (i.e., phone calls and preventive home visits) as well as data triangulation activities in 20 supported large-volume health facilities (HFs). This intensified implementation included the following:

- Allocation of a Focal Point to district and provincial teams at each of the 20 supported HFs;
- Clinical mentoring to health care providers, focusing on correct scheduling of follow-up clinical appointments/visits, as well as reinforcement of roles/responsibilities within the intensified PSS activities;
- Strengthening of the management of the weekly HF-based Adherence Committee (*Comité de Adesão*, or CAD) meetings with volunteers (Peer Educators and Mentor Mothers) through more intensive monitoring of the volunteers' home visit activities, results, and evaluation of volunteers' individual performance, with the provision of feedback for improving performance as needed; additionally at these meetings:
  - It was also reinforced to volunteers the importance of consistently motivating patients to return to the HF according to the scheduled appointment or immediately thereafter, but no later than 33 days following their previous ART pick-up;
  - Volunteers were encouraged to visit patients requiring additional support twice (versus once) in the same month, to encourage they return to the HF in a timely manner;
- Weekly monitoring (using a shared secure online platform) of process measures used to ascertain fidelity to the standard operation procedures (SOP) of the psychosocial support activities. These included the following:
  - Number of patients who were eligible (i.e., in their first three months on ART) to receive monthly supportive phone calls and preventive home visits as indicated from the weekly electronically generated lists (disaggregated by non-pregnant adults and PLW);
  - Number of patients who were eligible (i.e., in their first three months on ART) to receive the first supportive phone calls and preventive home visits as indicated from the weekly electronically generated lists (disaggregated by non-pregnant adults and PLW);
  - Number of patients who were eligible (i.e., in their first three months on ART) to receive the first supportive phone calls and preventive home visits as indicated from

those manually added from the ART register (disaggregated by non-pregnant adults and PLW);

- Number of phone calls made (first call and all calls);
- Number of “visit cards” given in the CAD (first visit and all visits);
- Number of patients who returned to the HF up to two weeks after the visit card had been given in the CAD;
- Verification (data triangulation) of the auto-generated list produced weekly from the electronic database of the complete group of patients eligible for supportive and preventive activities (i.e., phone calls and/or home visits).

In addition to the above activities, further quality improvement (QI) activities were strengthened in parallel, including the: i) standardization and increased monitoring of the weekly meetings of the clinical committees at the HFs (including process measures of the joint revision of clinical files), and ii) the intensification of mentoring activities with the new development of specific clinical mentoring plans for each of the 20 supported HF.

Costs related to the intensified implementation include time spent by FGH staff for daily provision of PSS by health counselors, mentoring performed by district and provincial PSS officers for PSS activities, and time spent on data triangulation by health counselors.

## Evaluation Purpose and Questions

Evidence on various successful strategies for re-engagement with HIV services including ART has been documented, such as use of phone calls[4], SMS reminders[5], and active tracing visits.[6, 7] There is a dearth of literature, however, on the results of similar preventive visits activities on early retention outcomes in Mozambique. In this context, we aimed to evaluate the effect of the intervention of intensified package of PSS and QI activities on early retention.

The primary objective was to evaluate the effect of the strengthening of the support phone calls and preventive home visits on the early retention of adults recently initiated on ART in select health facilities within Zambézia Province. A secondary objective was to evaluate if there is a positive association between strictly preventive home visits and early retention. However, this secondary objective was not achieved due to lack of data that could be collected within the evaluation period.

This evaluation addressed the main question: does the package of interventions have a favorable impact on early retention?

## Evaluation Design, Methods, and Limitations

### *Type of evaluation*

To meet the above objectives and assess the effect of this intervention, our team conducted an internal outcome evaluation, in which routine process measures were used to evaluate the outcomes. We performed a trend analysis over time (from September 2018 to August 2019) evaluating the effect of the intensified program for support and mentoring activities on patients' early retention in ART care, with the intervention commencing on January 21, 2019 (pre-post analysis).

We included in the evaluation aggregated data on one- and three-month retention for all HIV-positive adults enrolled in HIV services and initiating ART in 20 supported health facilities between September 2018 and August 2019.

Early retention outcomes were measured weekly and were defined as follows:

- One-month retention = return for ART pick-up within 33 days post-ART initiation
- Three-month retention = return for ART pick-up between 61-120 days following ART initiation)

### *Sampling strategy*

All health facility sites where the intervention was implemented during the established evaluation period were included in the evaluation. The sample included all adult patients (i.e.,  $\geq 15$  years of age), including non-pregnant and pregnant/lactating women initiating ART in the 20 priority, large volume ( $> 2,000$  patients currently receiving ART), low retention sites where 50% of persons living with HIV are receiving care in Zambézia province.

The list of health facilities included in the evaluation are noted below in **Table 1**.

**Table 1.** List of health facilities where the intervention was implemented (Data COP18 October - December 2018).

Health Facility	TX_NEW	TX_CURR
Quelimane / CS 17 de Setembro	294	6,092
Nicoadala / CS Nicoadala	607	5,894
Namacurra / CS Namacurra	588	5,844
Quelimane / CS Coalane	259	5,598

Maganja da Costa / CS Maganja da Costa	380	5,560
Milange / CS Milange	362	5,102
Gurue / CS Gurue	199	4,703
Quelimane / CS 24 de Julho	226	4,127
Pebane / CS Pebane	268	3,833
Mocuba / CS Mocuba	245	3,691
Quelimane / CS Chabeco	183	3,174
Alto Molocué / HR Alto Molocué	202	2,912
Quelimane / CS 4 de Dezembro	161	2,729
Quelimane / CS Namuinho	189	2,702
Inhassunge / CS Inhassunge	158	2,385
Quelimane / CS Maquival Sede	150	2,322
Quelimane / CS Icidua	175	2,224
Nicoadala / CS Licuare	287	2,206
Pebane / CS 7 Abril	137	2,021
Quelimane / CS Micajune	177	2,017

*Methods for data collection and analytics, with rationale*

This evaluation required the analysis of aggregated secondary data from patient medical records, extracted from password-protected secure electronic patient files in OpenMRS database.

The analysis period covered the period from September 21, 2018 up to August 21, 2019. As the intervention began in January 2019, the post-intervention period was from January 21, 2019 to August 21, 2019.

Monthly data were collected on the following indicators:

1. Monthly number of patients newly initiating ART 1 month prior to month of results submission deadline, total and by health facility and target group.
2. Monthly number of patients newly initiating ART 1 month prior to month of results submission deadline that returned for 2<sup>nd</sup> clinical consultation or 2<sup>nd</sup> ART pick-up within 33 days of ART initiation, total and by health facility and target group.
3. Monthly number of patients newly initiating ART 4 months prior to month of results submission deadline, total and by health facility and target group.
4. Monthly number of patients newly initiating ART 4 months prior to month of results submission deadline that returned for a clinical consultation or ART pick-up between 61-120 days of treatment initiation, total and by health facility and target group.

Data from patients who transferred out of care (i.e., transferred to another HF not included in this analysis) and/or had medically-advised ART interruptions during the evaluation period were restricted from the analysis to avoid potential confounding effect on early retention outcomes. For one-month retention analysis, this meant exclusion of 983 patients who transferred out, and one patient who had a treatment interruption. For three-month retention analysis, this meant exclusion of 2,008 patients who transferred out, and eight patients who had treatment interruptions.

### *Data analysis plan*

Frequency tables and trend plots were used to explore the data. A trend analysis (including change in trends) was performed, comparing results pre- and post-intervention. This was done using generalized linear mixed effects models (GLM), adjusting for covariates including urban vs. rural, clinic size, and district (variables which could be related to attrition), while accounting for similarities between HFs and districts.

A GLMM was used to estimate the effect of the intervention on the probability (Pr) of returning for an appointment (i.e., not being lost-to-follow-up [LTFU]). We fitted the following model:

$$\begin{aligned} g\{Pr(y_j = 1)\} & \quad (1) \\ & = \beta_{0(i,j)} + \beta_1 t_i + \beta_2 interv_i + \beta_3 t_i \times interv_i + \beta_4 urban_i \\ & + \beta_5 flux_i \end{aligned}$$

where  $y_j$  is an indicator variable corresponding to the whether the  $j$ th patient returned for care,  $t_i$  corresponds to time (months),  $interv_i$  is an indicator variable taking the value 1 if the intervention was implemented and 0 otherwise, and  $\beta_{0(i,j)}$  is the intercept, which is allowed to vary among HFs, with  $\beta_{0(i,j)} = N(\mu, \sigma^2)$ , where  $\mu$  and  $\sigma^2$  are the mean and variance across all HFs. The link function  $g\{\cdot\}$  is the logit. The marginal distribution of the data is obtained by integrating over the distribution of the random effects (HFs). We are interested in estimating the following parameters:  $\beta_1$ , the slope before intervention;  $\beta_2$ , the level change due to the intervention;  $\beta_3$ , the change in the slope after the intervention was introduced.

Using equation 1 we can also create a counterfactual, estimating the response, i.e., probability of retention, if no intervention had taken place. This is done by predicting the outcome, but setting  $interv_i = 0$ .

The link function  $g(\cdot)$  is the logit function that guarantees that the estimated values lies in the (0,1) interval. This was required as the outcome, retention (i.e., the number that returned divided by the total), is a proportion. Otherwise, fitting a simple linear model (i.e., setting  $g(\cdot)$  as an identity function) may have led to estimates that were smaller than 0 or greater than 1. The point estimates will, therefore, be given as odds ratios and will be reported with 95% Wald confidence intervals. To help with interpretation, we also generated figures for each scenario (all patients,

pregnant/lactating patients only, and not-pregnant, for both 1- and 3-month retentions), by taking the inverse of the logit function  $g^{(-1)}(\cdot)$ , called the *expit* function, i.e., inverting equation (1). These figures will describe the probability of being retained over time, before and after intervention, for HFs that are either urban or rural and with a specified flux. We will also plot together the counterfactual described above, showing how retention would vary over time had no intervention taken place.

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/>]. The mixed effect logistic model was run using R package “lme4” (Douglas Bates, Martin Maechler, Ben Bolker, Steve Walker (2015). Fitting Linear Mixed-Effects. Models Using lme4. *Journal of Statistical Software*, 67(1), 1-48. doi:10.18637/jss.v067.i01.).

### *Limitations of design*

Our objective was to estimate the effect of intervention. For the purposes of this evaluation, the post-intervention period consists of seven months, February – August 2019. While there seems to be a positive trend in early retention outcomes, we acknowledge the small sample size may have led to estimates that are statistically significant, however, not generalizable to the entire province or region.

We were not able to perform the analysis evaluating association of the contacts made during the first month following ART initiation with weekly early retention rates because data were not available on the number of patients returning to the health facility after a successful contact (only the total number of visits and total number of patients returning were available). As such, we were not able to evaluate positive association strictly between preventive home visits and early retention. However, as the package of interventions showed a positive result, and successful visits are linked to the fact that the other activities of the package are in place, we can surmise that the preventive visits could result in a higher return (i.e., early retention) rate.

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

### *Summary of stakeholder engagement*

FGH technical teams have ongoing collaborations with key stakeholders working in the health facilities we support and communities in which we are engaged. The implementation of these intensified support activities was piloted in direct coordination with our partners at the DPS-Z as well as with district-level partners in health and administrative agencies.

The concept proposal and plan for secondary data analysis evaluation was reviewed and approved by the sponsoring institution, the Centers for Disease Control and Prevention based in Mozambique (CDC-MZ).

### Ethical Considerations and Assurances

The FGH/VUMC evaluation team members (each trained in research/evaluation ethics and with current Good Clinical Practice [GCP] certification) had the responsibilities of: i) managing the data collection process (from OpenMRS and Google drive sources), ii) overseeing the signing and execution of an FGH-VUMC data-use agreement, and iii) managing and confirming the storage and transfer (from FGH to VUMC) of all data for the purposes of this analysis.

All FGH and VUMC personnel who accessed program data for the purposes of this analysis have completed an up-to-date Data Confidentiality Agreement and have received training in data management and confidentiality.

All data included in this analysis were aggregated, de-identified programmatic data. The electronic and web-based databases outlined in the *Methods* section 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 VUMC statistician).

#### *Deviations from SOW/protocol (if any)*

There were none related to this evaluation.

#### *Data quality assurance*

FGH technical support teams were on-site and overseeing the fidelity of the implementation of these support activities. 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. All indicator data were collected and internally reported monthly by the Health Information Systems (HIS) team, following the regular reporting period for program data. These data were stored securely on password-protected databases at district- and provincial-level offices.

The performance of the program indicators was monitored by HF staff where these activities were implemented, as well as by FGH program leads at district-, provincial-, and national-level of organization operation.

For the purposes of analysis within this evaluation, data collection and review were completed by trained and experienced members of the FGH and VUMC evaluation team. Only de-identified, aggregated data were included in this analysis.

## Findings and Conclusions

### Results: Retention

Data adult patients who initiated ART between September 2018 and August 2019 were included in the analysis. For one-month retention, data from 19,750 adults were included, among them, 3,103 were PLW and 16,645 were men and non-pregnant/non-lactating women. For three-month retention, data from 21,490 adults were included, among them 3,323 PLW and 18,162 men and non-pregnant/non-lactating women. Overall, one- and three-month retention rates increased with the intervention from 61% to 93%, and 76% to 91%, respectively (**Table 2**).

**Table 2.** Retention outcomes

Retention (mean)	September 2018			August 2019		
	All Adults	Pregnant/lactating adults	Non-pregnant/lactating adults	All Adults	Pregnant/lactating adults	Non-pregnant/lactating adults
<b>1-month</b>	<b>61%</b>	70%	59%	<b>93%</b>	95%	92%
<b>3-month</b>	<b>76%</b>	85%	73%	<b>91%</b>	94%	90%

### Results: Trend Analysis

Overall, during the observation period, odds of being retained at one month increased by 1.92 (95% CI: 1.67-2.20;  $P < 0.001$ ) (**Table 3**).

Using a fitted model (**Figure 1**), we predicted a continuous increase in one-month retention rate of 1.23 (95% CI: 1.18-1.29;  $P < 0.001$ ) in the post-observation period, for HFs located in a urban setting with average flux.

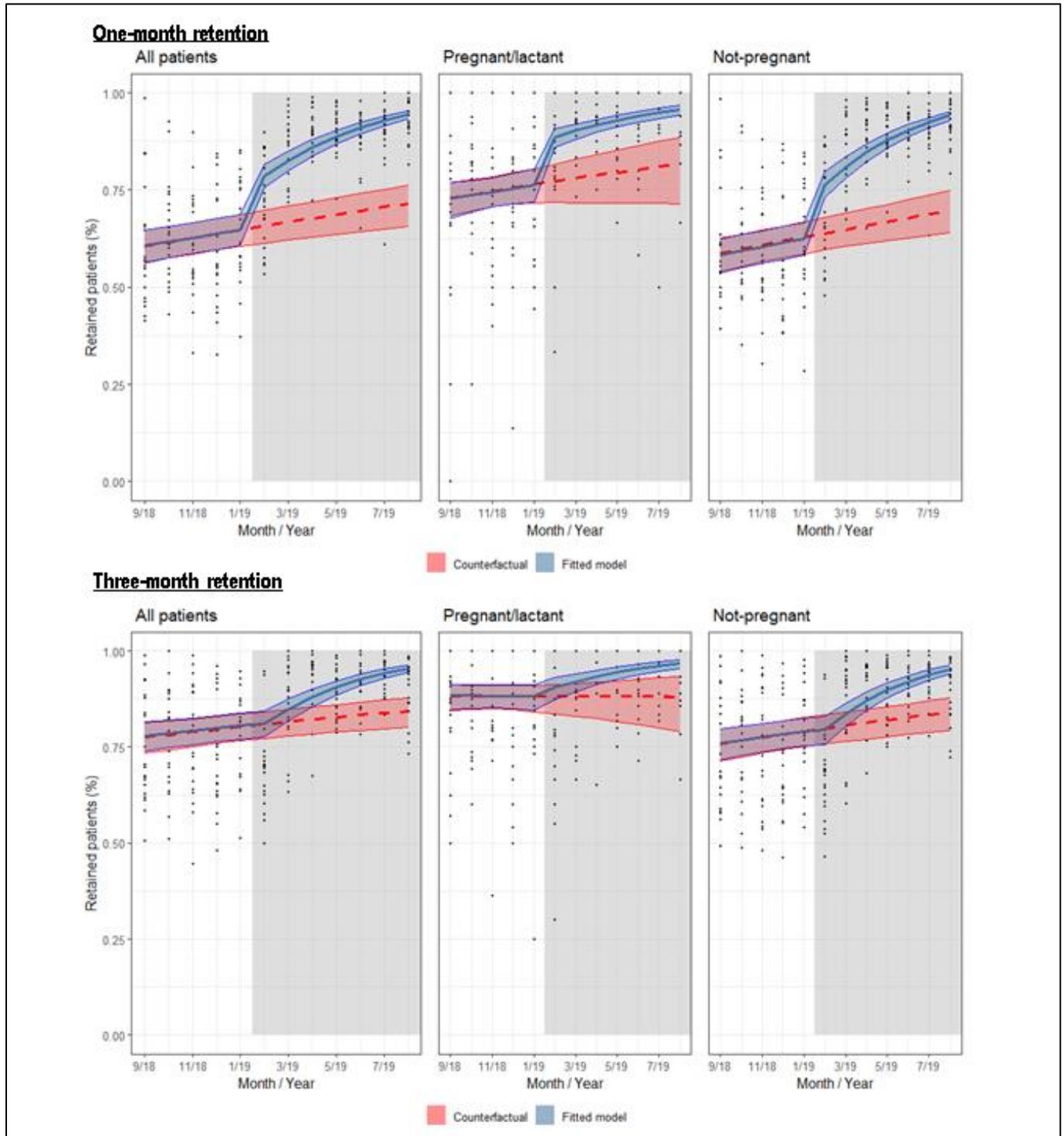
The change was less substantial (odds ratio [OR] 1.01, 95% CI: 0.87-1.16;  $P = 0.950$ ) for three-month retention, but the predicted continuous increase rate was still significantly higher (OR 1.25, 95% CI: 1.19-1.31;  $P < 0.001$ ).

Among only adult PLW, the effect was prominent for one-month retention (OR 2.30, 95% CI: 1.55-3.41;  $P < 0.001$ ), though less so for three-month retention (OR 1.26, 95% CI: 0.83-1.93;  $P = 0.283$ ).

The odds for change in slope remained considerable for one-month retention (OR 1.14, 95% CI: 1.01-1.29;  $p = 0.040$ ) and three-month retention (OR 1.22, 95% CI: 1.07-1.39;  $P < 0.001$ ).

**Table 3.** Outcomes of models

<b>Variable</b>	<b>Intercept</b>	<b>All adults</b> Odds Ratio (95% CI)	<b>p-value</b>	<b>Only pregnant/ lactating adults</b> Odds Ratio (95% CI)	<b>p-value</b>
<b>One-month retention</b>					
Retained	Intervention	1.92 (1.67-2.20)	<0.001	2.30 (1.55-3.41)	<0.001
Change in slope after intervention	Intervention: time (interaction)	1.23 (1.18-1.29)	<0.001	1.14 (1.01-1.29)	0.040
<b>Three-month retention</b>					
Retained	Intervention	1.01 (0.87-1.16)	0.950	1.26 (0.83-1.93)	0.283
Change in slope after intervention	Intervention: time (interaction)	1.25 (1.19-1.31)	<0.001	1.22 (1.07-1.39)	<0.001



**Figure 1.** Fitted model of effect of the intervention on one-month and three-month retention (September 2018 - August 2019).

### *Discussion and conclusions*

This evaluation assessed the effect of a package of activities implemented in order to improve early retention. The package consisted of a combination of strengthened management, mentorship and supervision of staff, consistent data triangulation regarding clinical consultations and ART pick-ups at the HF of patients who recently initiated ART, and weekly monitoring of process measures in an online platform. Data triangulation was repeated on a weekly basis after the patients received preventive visits to inform volunteers (Peer Educators and Mentor Mothers) on the results of their visits. The ownership and fidelity to the established procedures were thus ensured through this feedback loop regarding performance and complemented by clear identification of roles and responsibilities as described in the detailed SOPs for these activities. These activities aimed at the strengthening of psychosocial support delivered through preventive calls and visits post-ART initiation appeared to have a significant positive effect on early retention. Notably, the intensified monitoring of routine process measures could have led to an artifactual increase in early retention rates during the intervention period, pointing to a potential positive bias that limits the interpretation of these results.

FGH began supporting the Mentor Mothers program in August 2017 with a subsequent gradual program expansion across FGH-supported health facilities in Zambézia Province since that time. The Mentor Mothers program is an intensive peer support service through which experienced HIV-affected women receive training and provide at least monthly support visits (preventive and problem-focused) to HIV-positive PLW, starting from their enrollment in antenatal care (ANC) and continuing through the cascade of prevention of mother-to-child HIV transmission (PMTCT) and early infant diagnosis (EID) standard services. Additionally, in November 2018, a cadre of Mentor Mothers' "supervisors" were trained to support and enhance the Mentor Mothers program.

The effective implementation of the earlier established Mentor Mothers program possibly explains the pre-existing higher early retention rates among PLW, as similar programs have been found to reduce early attrition.[8] High quality community support should commence and reinforce continual linkage to care as early as possible to prevent loss to follow-up in this critical post-ART initiation window.

### Recommendations

Further evaluation throughout continued program expansion will be necessary to understand if effects seen are generalizable to the larger province and the country of Mozambique as a whole. Sustained evaluation of these program activities is also planned to determine the effect on patients' longer-term retention in care and viral suppression.

Clinical mentoring and the existence of a performance feedback loop may be important factors in healthcare providers' and volunteers' compliance to the defined SOP for supportive and preventive

activities, whereby positively affecting the performance of intensified psychosocial support activities, including data verification as well as the accuracy of retention data.

Given this, we plan to continue efforts to inform clinical administrators and advisors, public health officials, and policymakers in the region of these contextual findings of this evaluation for consideration in expansion of a similar and/or expanded weekly monitoring strategy in attempt to improve process measures related to PSS activities, as well as early retention outcomes at additional health facilities. To date, this novel approach has been expanded in Zambézia Province to a total of 51 HFs, having a persistent desired positive effect on ART early retention rates.

### Dissemination

FGH has shared the results of this program evaluation with national- and provincial-level MOH authorities to reinforce the importance of these support activities on early retention outcomes. These findings will help to inform implementation strategies at the provincial and national level and strengthen the advocacy for continued early support activities.

In an effort to share best practices and lessons learned from this program evaluation, a CDC-MZ-approved abstract detailing these findings was submitted to the AIDS 2020 Virtual Conference (July 2020) and the INTEREST 2020 Virtual Conference (December 2020). The abstract was accepted for and recently presented as a poster discussion session at AIDS 2020 and was accepted for and will be presented as a mini-oral presentation at INTEREST 2020.

Additionally, a peer-reviewed publication detailing these important finding is being developed, with plans for submission to a high impact public health journal for broader dissemination of results and recommendations.

## Appendices

### *Approved evaluation SOW/protocol*

The approved concept note is submitted along with this final report for reference (approved 09July2019). This evaluation is covered by and was 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*

The following tables are example shells for source documents for programmatic data collection:

**Table 4.** Indicators for 1-month retention (Objective 1; source: secure Google Drive [GD] file)

	<b>Initiated ART 2m before reporting period</b>	<b>Alive &amp; Not Transferred Out and Did not have consultation or pick-up drugs 2x</b>	<b>Alive &amp; Not Transferred Out and Had Consultation or Picked-up Drugs 2x</b>	<b>Deceased</b>	<b>Transferred Out</b>	<b>Discontinued Treatment</b>
Hospital Rural de Alto Molocue						
CS Gurue						
Inhassunge CS						
Maganja da Costa CS						
Milange CSURB						
Mocuba CSURB						
Namacurra CS						
Licuaire CS						
Nicoadala CS						
7 de Abril CS						
Pebane CS						
CS Micajune						
Maquival Sede CS						
17 de Setembro CSURB						
24 de Julho CSURB						
4 de Dezembro CSURB						
Centro de Saude de Icidua						
Chabeco CSURB						

Coalane CSURB						
Namuinho CS III						

**Table 5:** Indicators for 3-month retention (Objective 1; source: secure GD file)

	<b>Initiated ART 4m before reporting period</b>	<b>Alive &amp; Not transferred out and Defaulter</b>	<b>Alive &amp; Not transferred out and In Treatment</b>	<b>Deceased</b>	<b>Lost to Follow-Up</b>	<b>Transferred Out</b>	<b>Stopped Treatment</b>
Hospital Rural de Alto Molocue							
CS Gurue							
Inhassunge CS							
Maganja da Costa CS							
Milange CSURB							
Mocuba CSURB							
Namacurra CS							
Licuire CS							
Nicoadala CS							
7 de Abril CS							
Pebane CS							
CS Micajune							
Maquival Sede CS							
17 de Setembro CSURB							
24 de Julho CSURB							
4 de Dezembro CSURB							
Centro de Saude de Icidua							
Chabeco CSURB							
Coalane CSURB							
Namuinho CS III							

*Informed consent*

There was no consent form necessary for use of data for this evaluation, as only routinely collected, de-identified, aggregated programmatic data were included in the analysis for this evaluation. As such, 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 was included in the evaluation.

*Biosketches*

Not applicable.

*Conflict of interest statement*

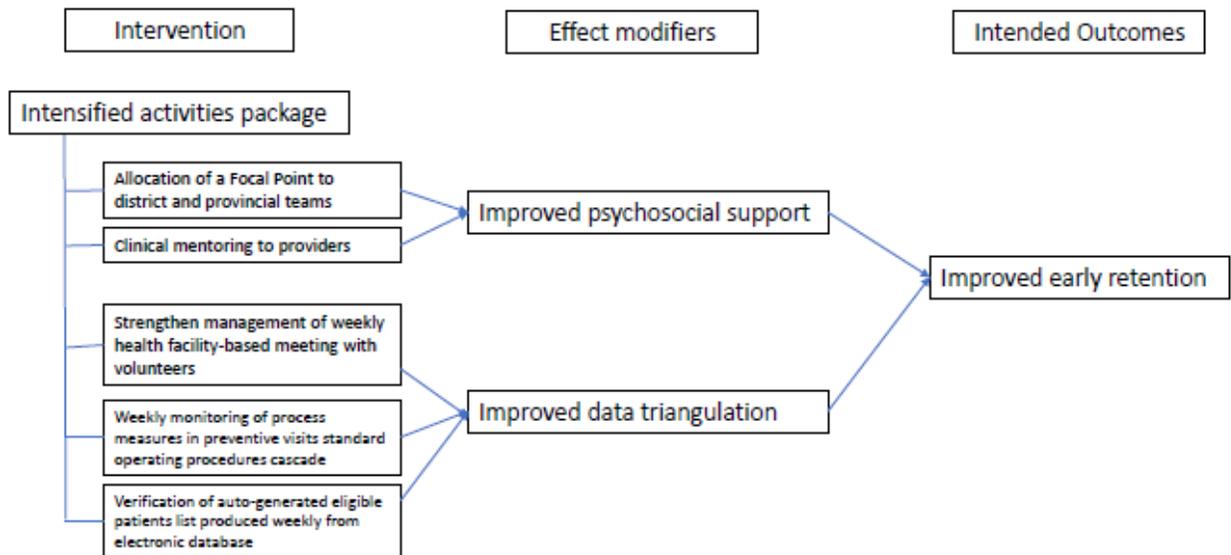
The collaborators in this evaluation have no conflicts of interest to declare.

*Evaluation costs*

Evaluation costs were limited to the personnel time required for extraction and analysis of routine secondary data, results review and discussion, and report preparation.

*Results or Logical Framework*

Please see below in Figure 2 a framework demonstrating the causal pathway for the intended outcome of improved early retention.



**Figure 2.** Logic framework for intended causal pathway for improved early retention outcome.

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