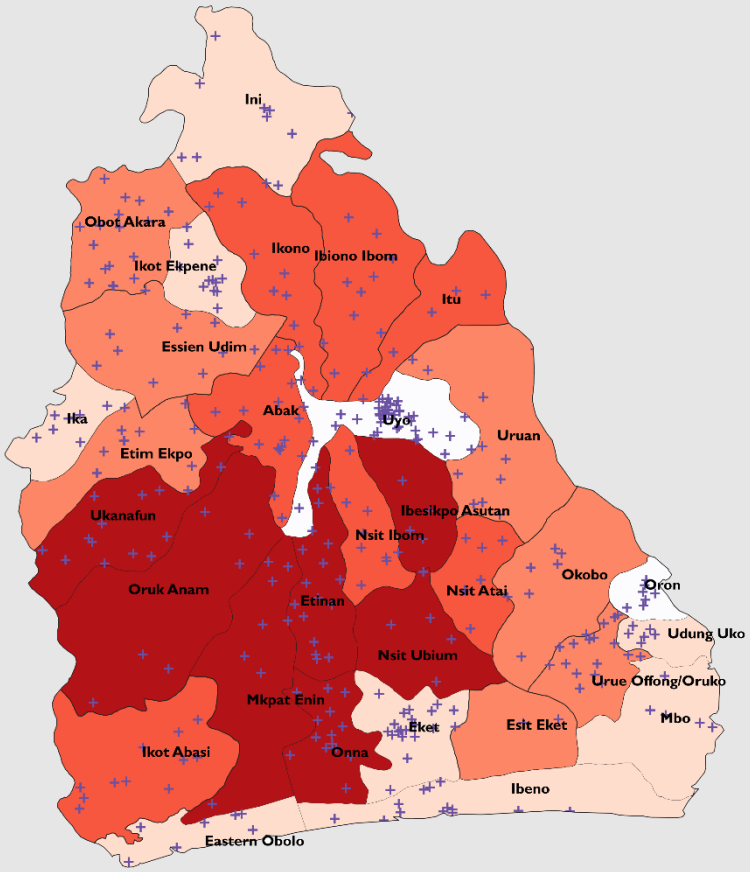

NIGERIA INFORMATION PRODUCT

Improving Patient Retention on Antiretroviral Treatment through High-Frequency Reporting in Akwa Ibom State

NOVEMBER 2020

PEPFAR

USAID FROM THE AMERICAN PEOPLE

Data.FI Data for Implementation

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Background

Retention of patients in HIV care is essential to controlling the HIV epidemic. Patients retained in care with undetectable viral loads are no longer infectious, breaking the HIV transmission cycle. Understanding who is lost to follow-up (LTFU) is essential for targeting tailored HIV programming to bring those patients back into care with differentiated models of service that meet their needs.

The challenge to retaining patients in care is multi-faceted, with treatment fatigue, quality of care, and stigma contributing to LTFU, in addition to data quality and record keeping. A better understanding of the data can help to describe the problem with the appropriate demographic and geographic stratifications to assist implementing partners (IPs) in improving patient retention while also focusing on new treatment initiations.

High-frequency reporting (HFR) data provides an opportunity to conduct retention analysis across USAID-supported facilities in Nigeria. Program data from various IPs' facilities are uploaded to the Automated Partner Performance Reporting (APPR) platform via partners' District Health Information System 2 (DHIS2) instances weekly. The indicators reported in the HFR are either weekly or monthly indicators. Weekly indicators collected in the HFR include HTS_TST, HTS_TST_POS, TX_NEW, TX_CURR, TX_PVLS_D, and TX_PVLS_N.

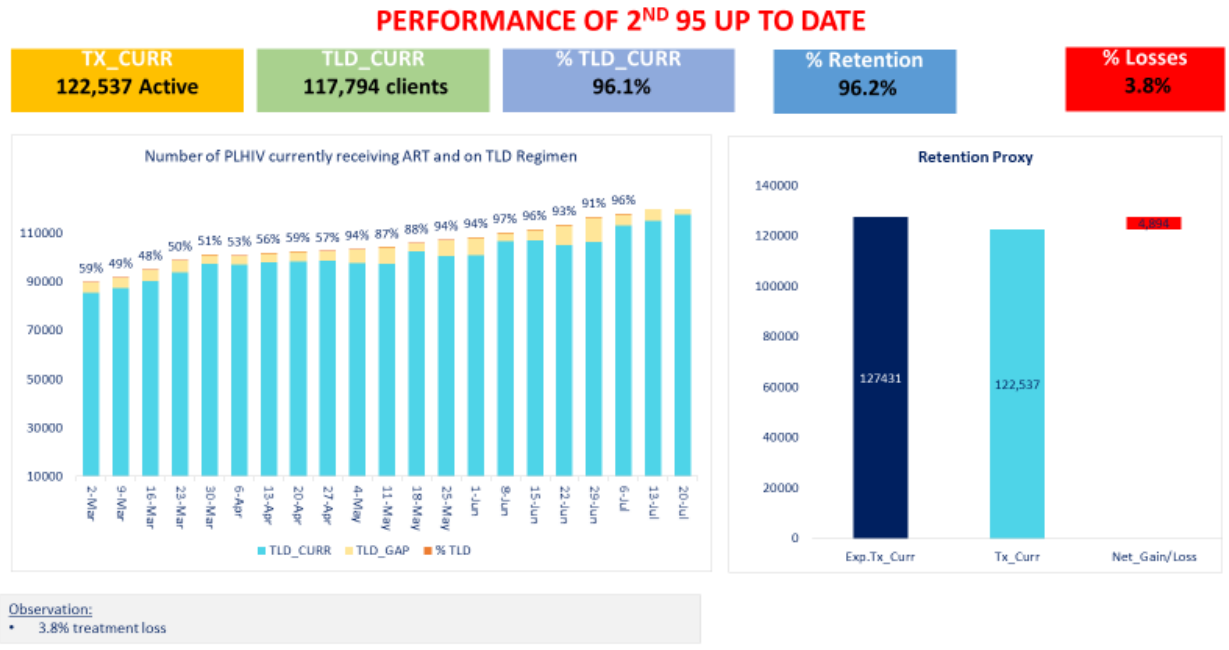
Key PEPFAR indicators of interest

TX_CURR: Number of adults and children currently receiving ART.

TX_NEW: Number of adults and children newly enrolled on antiretroviral treatment (ART).

TX_NET_NEW: The (quarterly) net increase or decrease in ART patients.

Figure 1. Current HFR dashboard snapshot for USAID-supported states



To track program achievements and gaps that may hinder the achievement of quarterly and annual targets, USAID conducts weekly data reviews of HFR reports with IPs. USAID and its IPs also conduct further state specific HFR data analyses to better understand sub-national trends in the HIV epidemic in states like Akwa Ibom.

The 2018 National AIDS Indicator Impact Survey (NAIIS) revealed that while the national prevalence of HIV is 1.4%, with an estimated 3.2 million people living with HIV (PLHIV) in the country as at quarter 1, 2018 (National Agency for the of Aids (NACA)), more than 50% of PLHIV are in seven of the 36 states. Akwa Ibom, located in the southern part of Nigeria, is the state with the highest prevalence rate at 5.5%, with an estimated burden of 225,242 PLHIV. As a result, USAID classified Akwa Ibom as one of the surge states, which places it in the "red" category. Akwa Ibom attracts many migrants because it is an economic hub, with an airport, two major seaports, and a thriving oil and gas production industry. The migration patterns make patient tracking and retention in the state more difficult.

Objectives

This brief will provide USAID and its IPs detailed information using HFR data at the facility and local government area (LGA) level to target effective retention interventions by:

- Comparing trends in retention at the facility, LGA, and state levels over time, identifying improving facilities/programs. Retention indicators include:
  - TX_NET_NEW by age and gender disaggregation
  - TX_NET_NEW ratio as a retention proxy
  - Unexplained gain/loss
- Differentiating high- and poor-performing facilities to identify possible sources of best practices and emphasize areas for targeted retention support
- Identifying any spatial relationships for retention through GIS analysis

Methodology

Data source

All USAID IPs report their program data quarterly into the agency's platform, Data for Accountability, Transparency and Impact (DATIM). USAID required IPs to submit HFR reports following the commencement of surge activities in April 2019 and began formalizing weekly data reporting for effective program management following the success of frequent program measurement from the surge activities. Following the setup of APPR on the DHIS platform in July 2019, all backlogs of the HFR reports submitted by IPs were uploaded into the APPR, and subsequent submissions were made through the same platform.

Data cleaning and restructuring

Data.FI restructured the HFR data into a format most useful for analysis, removing facilities with no/very few populated records or facilities with low average TX_CURR values (average values in the lowest 10% quintile) to prevent these facilities from skewing the final analyses. The dataset was then checked for missing values, with missing TX_CURR values being substituted with the most prior TX_CURR value and missing TX_NEW values being assumed to have a value of zero. The HFR data

contains two age groups — less than 15 years old and greater than 15 years old. This disaggregation was used where applicable.

Data grouping

The cleaned dataset was adapted to report over four-week periods as compared to weekly periods. This was done to increase the change in variable values over time, to reduce the number of potential undefined or infinite indicator results that would result from zero weekly change. The adaption process required TX_NEW values at the end of the period to be the summation of all weekly TX_NEW values within the period.

Indicator analysis

Following the grouping process, two further variables were included for each considered period before indicators could be calculated — TX_CURR_PREV (the TX_CURR at the end of the last period) and TX_NET_NEW (defined for this analysis as the difference in TX_CURR between two consecutive periods). Given the new variable set, two new indicators were calculated — a TX_NET_NEW ratio as a proxy for retention, as well as a value representing the unexplained gain/loss for the period (see box for formulas used). The retention proxy was used to ensure that the result was positive and could be compared across all sites; retention proxy values can range between 0 and infinity, although most are around the value of 1.

Key PEPFAR indicators of interest

TX_CURR: Number of adults and children currently receiving ART.

TX_NEW: Number of adults and children newly enrolled on antiretroviral therapy (ART) within the quarter.

TX_NET_NEW: The differences in TX_CURR between two consecutive periods.

Formulas used

TX_NET_NEW = $TX\_CURR_{present} - TX\_CURR_{previous}$

Retention proxy = $TX\_CURR_{present} / (TX\_CURR_{previous} + TX\_NEW)$

Unexplained loss or gain = TX_NET_NEW – TX_NEW

The described indicators were then considered over time to potentially highlight trends in performance, and the retention proxy was mapped to determine if there is any correlation between retention and location.

Mapping

Using results from the retention proxy analysis, the Inverse Distance Weighted (IDW) tool was used to create an interpolation surface of retention proxy for the state using the mean “retention proxy" variable. The IDW tool determines cell values by using a linearly weighted combination of health facility locations (ESRI). It assumes that facilities that are close to one another are more alike than those that are far apart, inferring that patients tend to attend a clinic closest to their residence to receive treatment (Mcintosh, A.I et al, 2018). The result of the interpolated map was presented using a green-to-red color scheme to highlight the variation between good and poorly performing facilities.

Potential limitations of the analysis

HFR data does not provide detailed age breakdown information, limiting the analysis to results described only in terms of state, LGA or facility by broad age groups and sex.

Also, missing data for some facilities could lead to inaccurate findings.

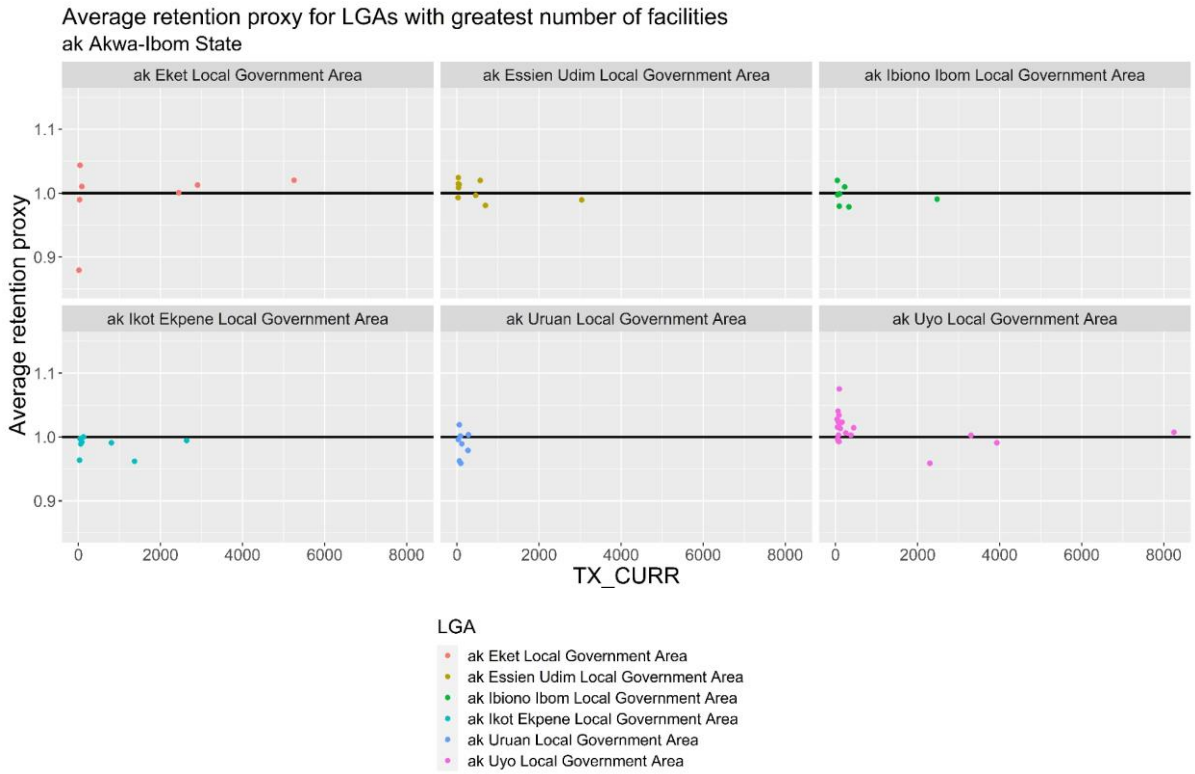
Findings

1. LGAs with retention issues identified by comparing facility-level retention in care using proxy

Figure 2 below presents the average retention proxy for each four-week interval over the time period (FY19 Week 40 – FY20 Week 23) for the top six LGAs with the most facilities (40.8% of included facilities for Akwa Ibom). Retention proxy is plotted against TX_CURR, allowing for a comparison in performance between relatively large and small facilities. The static black line represents a retention proxy equal to 1. The plots also compare the LGA performance.

Through this analysis, Ikot Ekpene LGA was identified as tending to have facilities with proxies less than or equal to 1, suggesting that this LGA lost patients. Uyo LGA had the most facilities with a retention proxy greater than one, implying that the LGA did well in retaining patients.

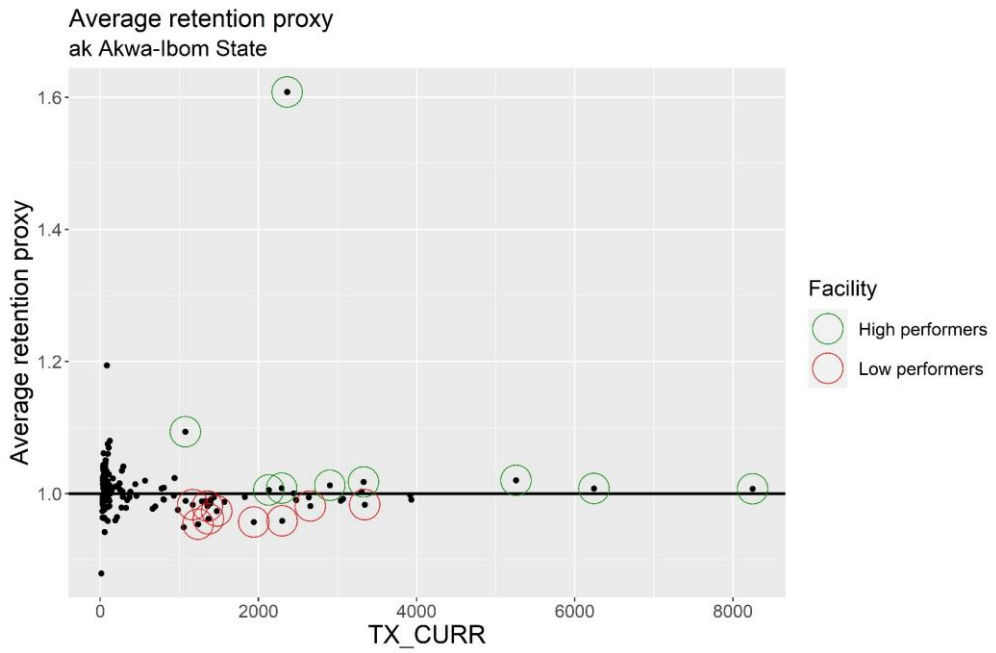
Figure 2. LGA-level TX_NET_NEW ratio as retention proxy



2. Facilities with good and poor retention pinpointed, with further examination needed

Figure 3 above plotted the retention proxy against TX_CURR for all facilities in the state over the whole data time period (FY19 Week 40 – FY20 Week 23). In Figure 3 below, the top and bottom nine facilities with the highest TX_CURR with an overall retention below 0.985 or above 1.005, respectively, are circled in the plot.

Figure 3. Facility-level TX_NET_NEW ratio as retention proxy



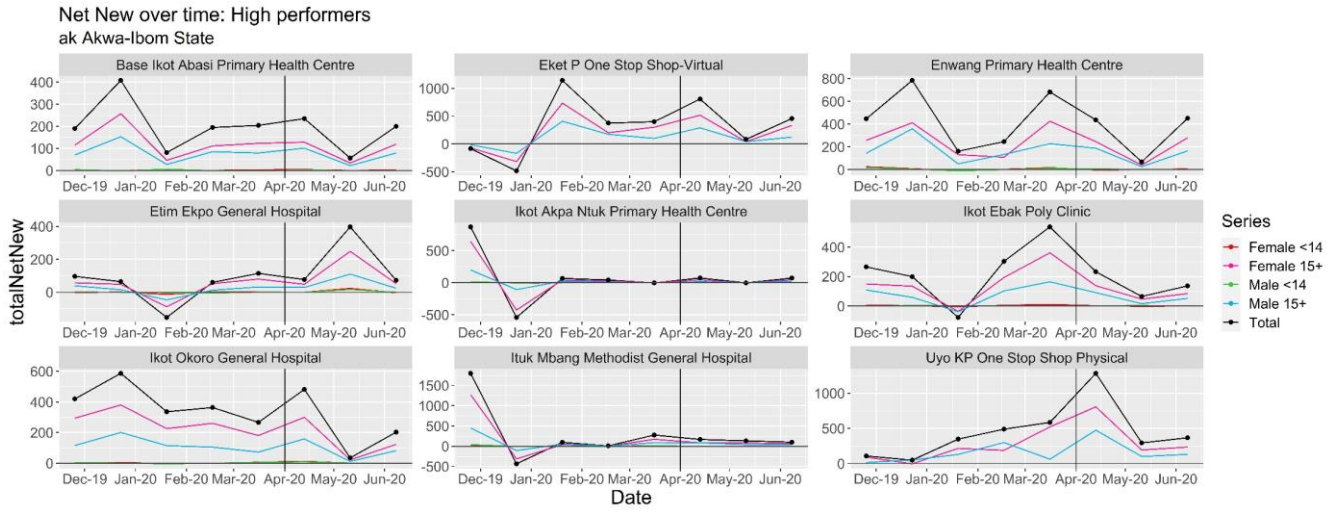
Further analysis is required for the top- and low-performing facilities to determine potential reasons for change. This is particularly important for low-performing facilities because, given their TX_CURR values, a retention proxy below 1 suggests these facilities have potentially lost a relatively large number of patients.

The top and bottom nine facilities' TX_NET_NEW are analyzed in more detail below.

3. TX_NET_NEW examined over time for the high-volume facilities with the highest and lowest retention performance

Figure 4 below showcases the change in TX_NET_NEW over time for high-volume facilities that performed well on retention. The graph presents total TX_NET_NEW over time, as well as TX_NET_NEW disaggregated by age and gender categories available in the HFR.

Figure 4. Change in TX_NET_NEW over time for high-traffic facilities with good retention



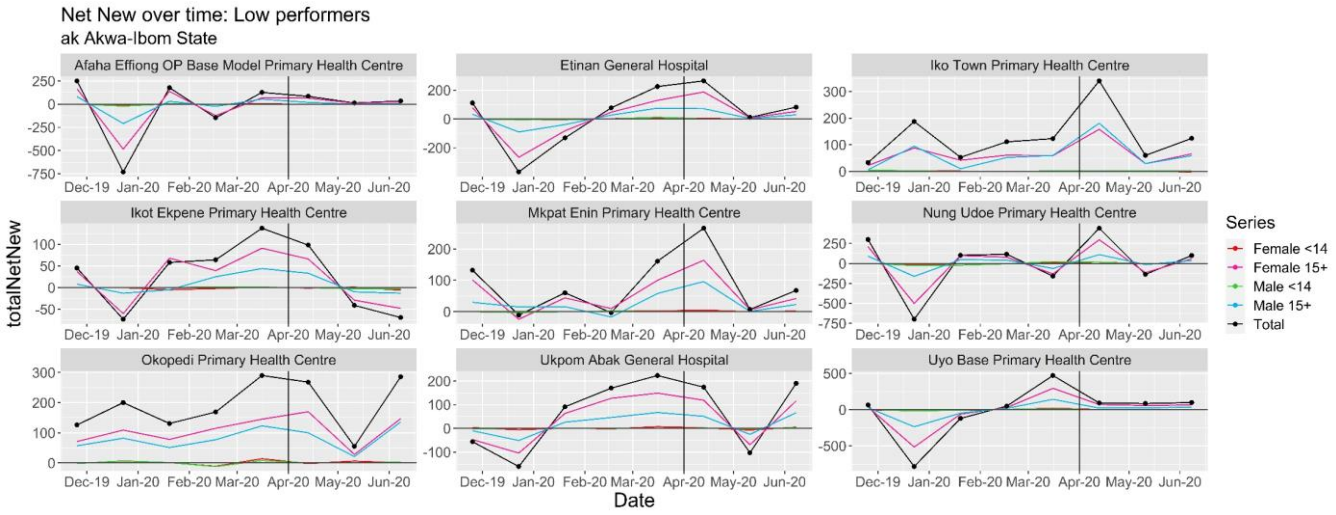
All these facilities performed well in terms of retention over the time period, even with the introduction of COVID-19-related lockdowns in April. Among these top-performing facilities, Uyo KP One Stop Shop Physical was identified as a possible model facility for other facilities to learn from, with its steady increase in patients.

It is interesting to note that there were some facilities whose TX_NET_NEW dropped below zero for 1-2 weeks in late December 2019 and early January 2020 (e.g., Eket P One Stop Shop, Ituk Mbang Methodist General Hospital, and Etim Ekpo General Hospital). The staff attrition of the implementing partner at Eket P One Stop Shop was largely responsible for the drop there, while the dropped noticed at Ituk Mbang Methodist General Hospital and Etim Ekpo General Hospital could largely be due to the end-of-year holiday/festive season, as the clients are largely mobile during the period.

When looking at the breakdown of the cohort by age and gender for these top-performing facilities, it was found that while for most facilities, females over age 15 were responsible for most increases and decreases across the period (see Figure 3), this was a result of more female patients in care at the facilities (as shown in Figure 9).

A similar deep-dive analysis of changes in TX_NET_NEW over time was conducted for the subset of facilities that performed poorly on retention, as shown in Figure 5. The key features to look for in this graph are where, and how often, a facility has a negative TX_NET_NEW, as this indicates it has lost patients over the time period.

Figure 5. Change in TX_NET_NEW over time for high-traffic facilities with poor retention



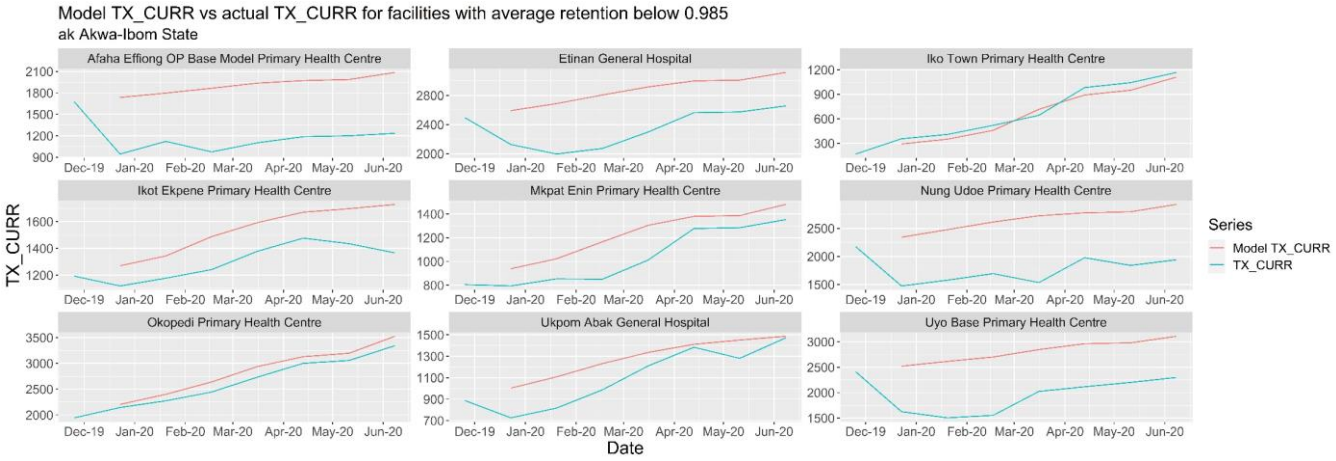
Some facilities that showed poor retention in December and January also saw a secondary drop-off in April 2020, when COVID-19 lockdowns were implemented.

Iko Town PHC is an outlier, as it has consistent positive TX_NET_NEW but is considered a poor performer given three periods of negative, unexplained change on the average retention value. While the TX_NET_NEW indicator is positive at all time points, the unexplained change shows that TX_NET_NEW is not equivalent to the TX_NEW gained. This indicates that even though TX_CURR is always increasing, there are time periods during which the facility is losing more patients than are being initiated. This finding may require further investigation from the IP, since if a facility is losing more patients than initiated, TX_CURR is expected to drop, unless there is significant transfer in or return to care from previous periods. Absence of these explanations may indicate poor data quality.

4. Data from facilities with poor retention further analyzed to establish actionable targets for patients returned to care

To get an accurate understanding of lower performing facilities' retention issues over time, Figure 6 plots where a facility should be if it had 100% retention over the period (red line, modeling TX_CURR_PREV + TX_NEW) against its actual TX_CURR (blue line).

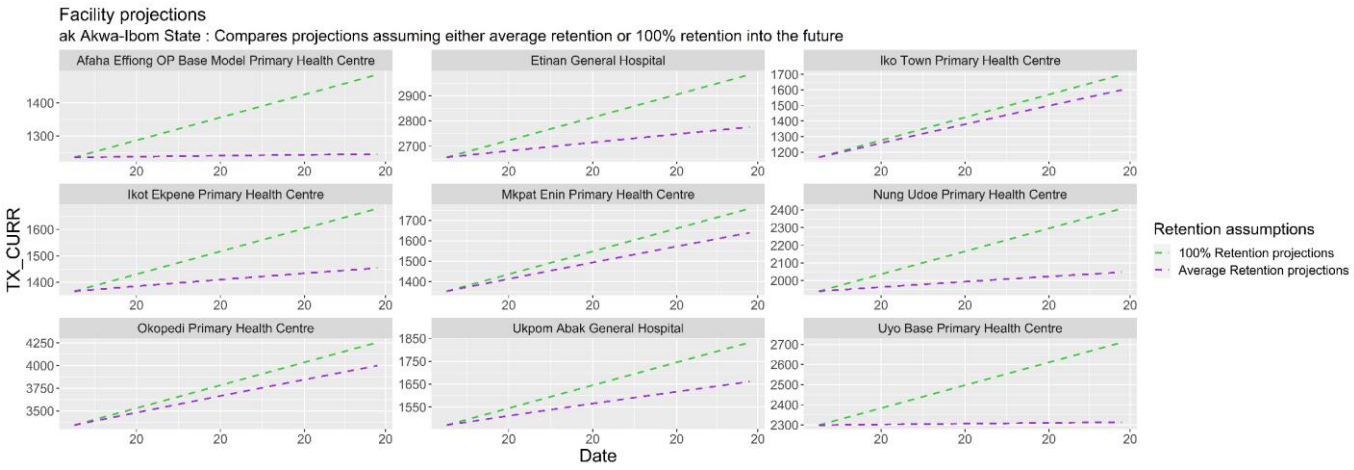
Figure 6. Week-by-week retention proxy for lower-performing facilities



As highlighted in Figure 6, Afaha Effiong OP Base Model PHC and Uyo Base PHC have struggled to regain their previous TX_CURR numbers after significant drops in cohort counts in December, indicating a possible need for additional support.

To identify the facilities most in need of technical assistance from IPs to bring patients back into care, projected TX_CURR for FY20 was plotted based on 100% retention (green dotted line) versus current average retention rates (purple dotted line). See Figure 7 below.

Figure 7. Projections of TX_CURR assuming 100% retention



Effiong OP Base Model PHC and Uyo Base PHC —will need careful support from IPs to rapidly return patients to care.

To inform planning by facilities and IPs, the number of PLHIV who would need to be returned to care by the end of FY20 was calculated, assuming the average TX_NEW and retention rate are maintained going forward (see Table 1 below).

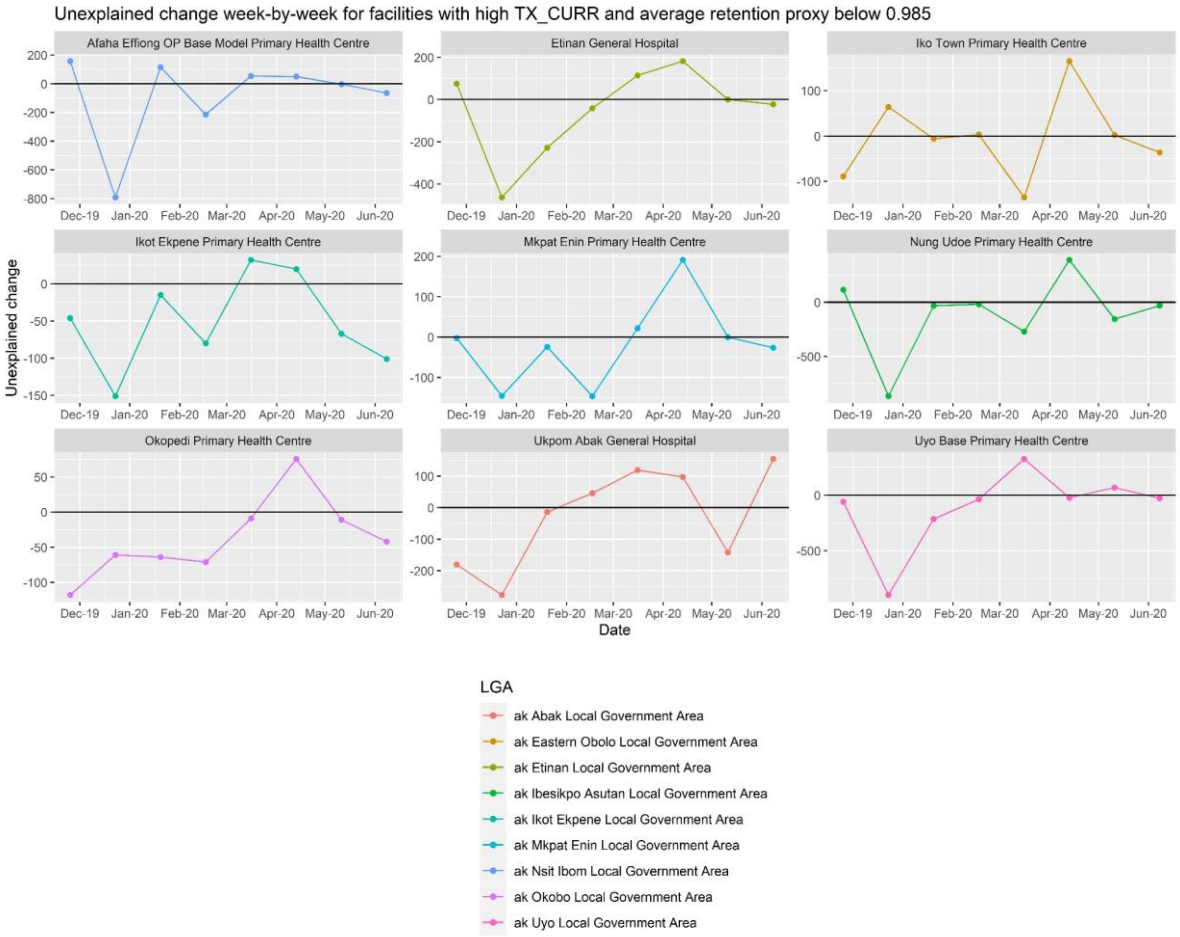
Table 1. Summary of FY20 back-to-care targets for poor-performing facilities

#	Facility name	FY20 back-to-care targets
1	Uyo Base Primary Health Centre	396
2	Nung Udoe Primary Health Centre	361
3	Okopedi Primary Health Centre	256
4	Afaha Effiong OP Base Model Primary Health Centre	241
5	Ikot Ekpene Primary Health Centre	226
6	Etinan General Hospital	208
7	Ukpom Abak General Hospital	171
8	Mkpat Enin Primary Health Centre	118
9	Iko Town Primary Health Centre	98

5. Unexplained gains and losses over time for low-performing facilities highlighted, with further discussion required

Figure 8 below highlights trends for unexplained changes in TX_CURR over time for the facilities with poor retention levels.

Figure 8. Unexplained change over time for lower-performing facilities

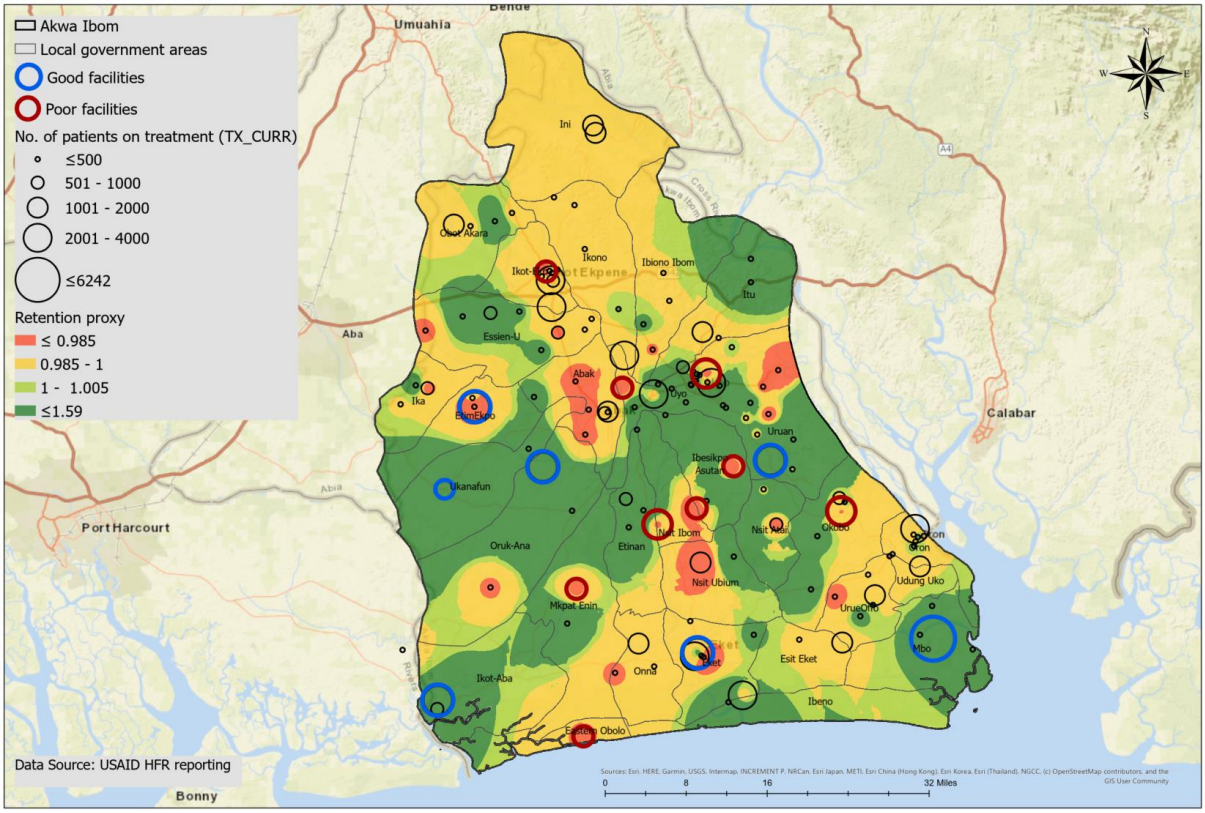


These plots again highlight that the December period posed a significant challenge for these facilities, as they lost many patients. Figure 8 also shows that it takes time for facilities to recover from this drop, as patients take time to come back into care. It does not appear that any specific LGA is showing higher rates of unexplained loss, as all facilities are from different LGAs. Further discussion with the facilities and IPs is required to understand what happened and how to prevent further drops like this.

6. Retention proxy indicators mapped to visualize spatial variations

The map in Figure 9 below highlights the spatial variation of the average retention proxy in facilities across rural and urban areas in Akwa-Ibom State. Values ranged between 0.86 and 1.69, with areas in red inferring low retention proxy and areas in green inferring high retention proxy. The map shows that the main center of Uyo has generally good retention of ART clients, while more rural areas tended to have a retention proxy of lower than 1. The number of patients on treatment across the facilities range between 12 and 6,242.

Figure 9. Map of retention proxy for Akwa Ibom State



Potential takeaways and recommendations based on the analysis

The weekly HFR dashboards provide a snapshot of retention and brief categorization of facilities based on that week's data. Examining trends in retention using the weekly data can provide additional insight into program interventions. Generally, **facilities are improving their retention over FY20** even if still below a proxy retention rate of 1.

In Akwa Ibom State, **several top-performing facilities consistently have a positive TX_NET_NEW**. These should be model facilities for retention, and a deep dive should be done to determine what is working for them. These best practices could then be disseminated through participatory workshops or a peer-to-peer mentoring program.

Another notable pattern in the data was seen for the **December and April periods.** The December period is clearly leading to large decreases in patients that facilities are not recovering from in terms of TX_CURR. The December drop could be due to a high number of clients traveling back to their village or community for Christmas, while the COVID-19-related lockdown is likely be responsible for the drop in April. The same facilities that lost patients in December were also losing patients in April from COVID-19 lockdowns. If the December losses were related only to temporary transitions during the holidays, then there should be a corresponding increase back to baseline after the holidays, but this does not occur, indicating that other factors are also affecting return to care. However, as mentioned above, some facilities saw increases over this time, showing an opportunity to share best practices among similar facility types with poor results to boost performance.

From the visual analysis conducted, there was **no clear correlation between TX_CURR and retention proxy**. The analysis showed that there were small and large facilities that were losing patients regardless of their TX_CURR numbers. In terms of the **age-gender split**, the data showed no real marked difference because the age breakdowns are too coarse, and females appear to be majority of the cohort. Trends appeared to be the same for both genders.

As part of this analysis, facilities that performed poorly were provided **back-to-care targets for FY20**, which can be broken up into weekly targets and checked within the HFR weekly reporting. IPs should leverage this analysis to provide more targeted support and assist facilities to use these targets as a tool to track performance.

Additionally, some facilities may demonstrate **steady cohort growth and still have negative proxy retention**, as was the case with Iko Town PHC. This suggests a strong focus on new initiations that are driving the cohort growth. Further analysis of patient records should be conducted to understand if these new patients are maintained past the initial six months of care.

Mapping of facilities based on their retention performance shows **spatial variation** and depicts what appears to be small pockets of poor-performing areas, while the northern parts of Akwa Ibom were generally losing patients, as the retention proxy was less than 1.

When considering findings from **all three states** that were analyzed (Akwa Ibom, Cross River, and Lagos), some interesting overall patterns emerged. Lagos did not have a clear pattern of retention over time, while Akwa Ibom experienced a drop in numbers around the Christmas period, and Cross River saw a drop in February.

Data protection and data use agreements

All data used for this analysis was provided by USAID. HFR data is stored on the secure APPR database platform, which has user-authentication access. The data used was aggregated facility-level HFR data, which did not include any personal identification information. Data use agreements are already in place between USAID, Palladium, and Right to Care for the use of HFR data.

References

McIntosh, A. I., Jenkins, H. E., White, L. F., Barnard, M., Thomson, D. R., Dolby, T., ... & Van Helden, P. D. (2018). Using routinely collected laboratory data to identify high rifampicin-resistant tuberculosis burden communities in the Western Cape Province, South Africa: A retrospective spatiotemporal analysis. *PLoS medicine*, *15*(8).

Appendix 1. Visual analysis of patients on ART by age and sex

Figure 10 below presents the age and sex distribution over time for facilities deemed to have good retention while Figure 11 presents facilities with poor retention. This plot shows that females over age 15 make up the biggest proportion of TX_CURR for each of these facilities, indicating why the TX_NET_NEW values are most impacted by the TX_NET_NEW for this group.

Figure 10. Age and sex distribution of TX_CURR for facilities with good retention

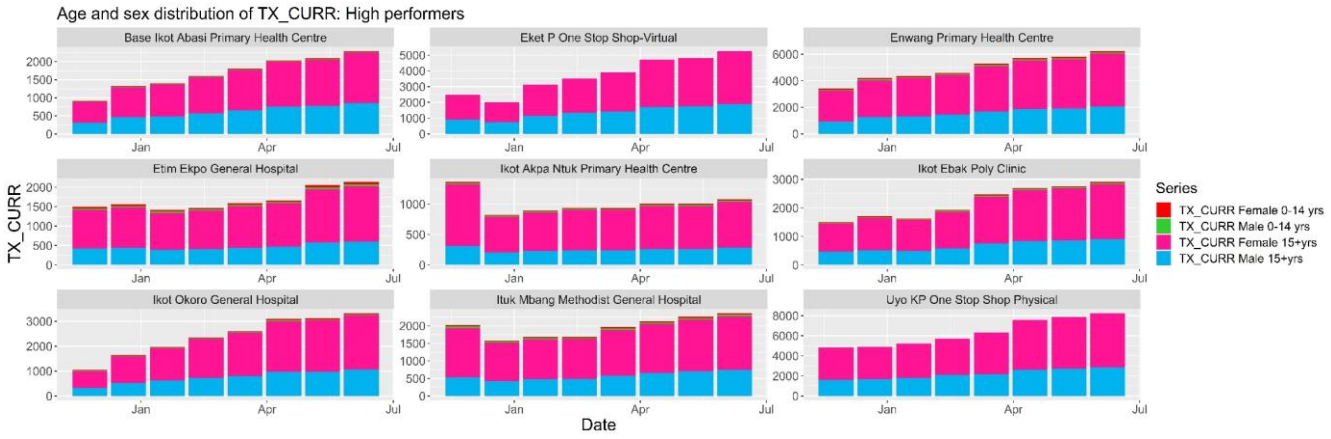
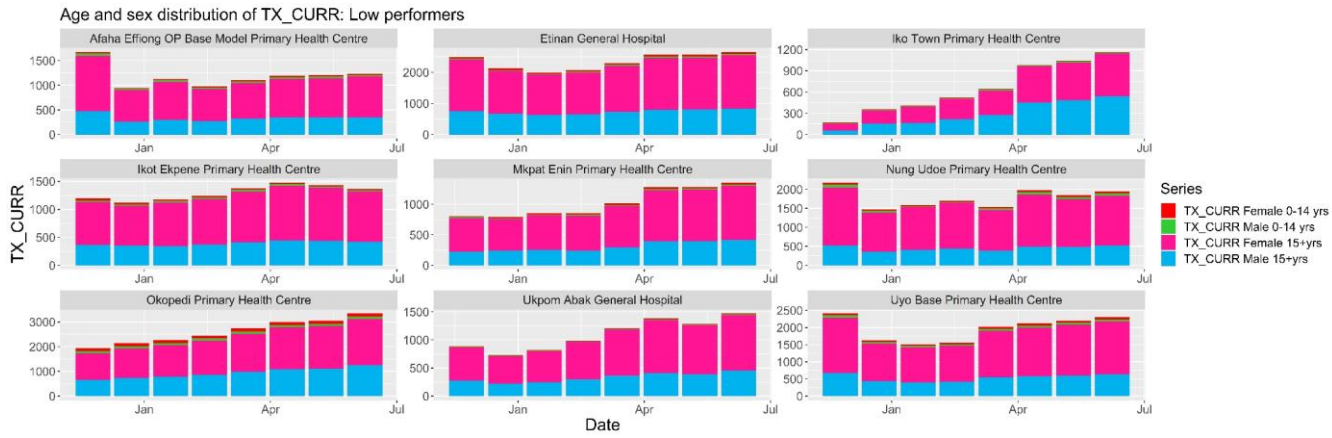


Figure 11. Age and sex distribution of TX_CURR for facilities with poor retention



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