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Scale-up of antiretroviral treatment access among people living with HIV in Rivers State, Nigeria, 2019–2020

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Abstract

Objective: The aim of this study was to describe and evaluate the impact of the programme intervention of the Rivers State Antiretroviral Treatment (ART) Surge, a collaboration between the US President's Emergency Plan for AIDS Relief (PEPFAR) and the State Ministry of Health, to increase HIV case-finding and ART access in Rivers State, the state with the largest ART gap among people living with HIV (PWH) in Nigeria.

Design: During April 2019—September 2020, the intervention included six specific strategies: using local government area-level ART gap analysis to guide case-finding; expanding targeted community testing; tailoring comprehensive key population HIV services; engaging HIV treatment programme stakeholders; synchronizing team efforts; and using near real-time data for programme action.

Methods: Weekly reported facility and community data on tests conducted, PWH diagnosed, and PWH initiated on ART were aggregated. The total number of PWH maintained on ART was reported quarterly.

Results: During May 2019—September 2020, the weekly number of newly diagnosed PWH initiated on ART supported by PEPFAR in Rivers State increased from 82 to 1723. During October 2019—September 2020, the monthly number of people screened for HIV testing eligibility in the community increased from 44 000 to 360 000. During April 2019—September

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Conflicts of interest

The authors declare that they have no conflicts of interest.

2020, the total number of PWH on ART supported by PEPFAR statewide increased by 3.8 times, from 26 041 to 99 733.

Conclusion: The strategies applied by HIV program stakeholders contributed to scale-up of PWH identification and ART linkage within the Rivers State ART Surge. Continued gains through time indicate the importance of the application of a quality improvement approach to maintain programme flexibility and effectiveness.

Keywords

AIDS; antiretroviral agents; US Centers for Disease Control and Prevention; Nigeria; quality improvement

Introduction

Nigeria has the second highest number of people living with HIV (PWH) in the world, estimated at 1.8 million [1]. Progress towards controlling the HIV epidemic in Nigeria is measured through comparing proportions of PWH who are diagnosed, on antiretroviral treatment (ART), and virally suppressed to the UNAIDS 90–90-90 HIV targets. The Nigeria HIV/AIDS Indicator and Impact Survey (NAIIS), a 2018 nationally representative household survey, provided national and state-level data on these indicators. The survey demonstrated a national HIV prevalence of 1.4% [95% confidence interval (95% CI) 1.3–1.4] among people aged 15–64 years, but prevalence, as well as the estimated total numbers of PWH and of PWH on ART, varied widely by state. This variability indicated that to control the HIV epidemic in Nigeria, policymakers needed to implement HIV programme strategies tailored to state needs.

Rivers State has a statewide HIV prevalence of 3.6% (95% CI 2.9–4.3) [2]. The UNAIDS Spectrum 2019 model projected the total number of PWH in the state in 2020 to be 184 551, but as of 2018, only 45 879 were on ART, with 29 273 (64%) of those receiving ART through support of the US President's Emergency Plan for AIDS Relief (PEPFAR) as of September 2018 [3]. This difference between estimated PWH and number on ART, termed the ART gap, was the largest of any state in the country. In Rivers State, reaching the UNAIDS 90–90-90 goal for treatment, that 81% of all PWH are on ART, required increasing the total number of PWH on ART from 45 879 to 149 486.

PEPFAR has supported the Government of Nigeria in providing HIV services, including ART, through technical assistance and direct funding of implementing partners, since 2004. As the largest provider of ART in Rivers State, in March 2019, PEPFAR leadership set a goal to help close the state ART gap by finding, initiating and retaining on treatment 100 000 additional PWH.

The magnitude of this proposed scale-up was considerably larger than historic PEPFAR programme achievement in Rivers State. Staff from the Centers for Disease Control and Prevention (CDC) Nigeria and its implementing partner, the Institute for Human Virology Nigeria (IHVN), partnered with the state Ministry of Health to implement this scale-up, termed the Rivers State ART Surge. We describe the strategic components used to

implement the Surge, as well as demonstrate progress in expanding ART access for PWH in Rivers State during the first 18 months of Surge implementation, from April 2019 to September 2020.

Materials and methods

Strategic components of the Rivers State ART Surge

1. Analysis and use of local government area-level ART gaps to geographically guide case-finding. In Nigeria, the local government area (LGA) is the administrative level below the state. Using small area estimates of LGA-level HIV prevalence derived from NAIIS state-level data, LGA-level ART gaps could be estimated. Analyses of these gaps indicated that the Rivers state ART gap was not evenly distributed; rather, 50% of the state gap could be attributed to large gaps in just seven of the 23 LGAs in the state. This analysis facilitated geographic prioritization and resource allocation for case-finding, including among affected populations outside of Port Harcourt city, the focus of previous PEPFAR programming.

2. Expansion of targeted community outreach testing. The scale-up of case-finding required could not be met solely by testing and diagnosis of PWH seeking care in health facilities, so dedicated HIV testing teams entered communities to conduct HIV education, screening, counselling and testing. Testing positivity rate was maintained through application of a standardized HIV risk stratification tool (RST) and through focus on higher-prevalence communities as suggested by epidemiologic and programme data, as well as implementation of offer of community-based testing to sexual contacts and biological children of index PWH. The RST included questions on previous HIV testing and result and HIV risk behaviours (Supplemental file 1, http://links.lww.com/QAD/C46). The RST was administered to people at least 15 years of age, and answering positively to any HIV risk factor question led to offer of HIV testing. The participation of community-based organizations and local healthcare workers in this effort helped overcome security and logistics challenges in certain areas of the state and among underserved populations.

3. Tailoring comprehensive key population outreach, testing and treatment through ‘one-stop shops’. The key population strategy focused on increased support for key population ‘one-stop shops’, three physical locations with statewide mobile outreach, offering HIV testing and treatment, linkage to other health and social services, and a supportive community environment. Individual one-stop shops served specific key population subgroups, including two serving MSM and one serving female sex workers and people who inject drugs. They also offered ancillary health services, including medical treatment for sexually transmitted infections and cryotherapy for genital warts, to facilitate the offer of HIV services. Key population peers conducted social network outreach to improve case-finding and acceptability of services in the key population community.

4. Engagement of other HIV treatment programme stakeholders in the state. Although PEPFAR is the largest programme engaged in HIV treatment services in Rivers State, there are several others, including private practitioners, corporations and other international funders. Statewide scale-up of ART required the participation, coordination and resource mobilization of these stakeholders, and thus, a state HIV consortium was formed with written commitment from participating organizations. In addition, political engagement from state leadership, including the governor and deputy governor, was crucial in eliminating state-level healthcare user fees, or fees paid by PWH to the clinic for services ancillary to HIV treatment. User fees had been identified by care recipients and providers as a key barrier to PWH seeking healthcare in facilities.

5. Synchronization of efforts with clear lines of accountability. To guide and coordinate state-level activities, CDC Nigeria and IHVN established a dedicated Rivers State Surge leadership team. IHVN staff were embedded in treatment sites and reported directly to the leadership team, and staff were accountable for achievements of their assigned sites. In addition, IHVN hired clinical mentors to coordinate LGA- and site-level activities within one or more of the 23 LGAs. The Director of Public Health and Disease Control Services in the Rivers State Ministry of Health served as chief clinical mentor, enabling alignment of Ministry of Health and PEPFAR/CDC efforts.

6. Using near real-time weekly data for programme action through a quality improvement approach. Staff working in facilities and communities, including clinical mentors, collected data on Surge variables on a weekly basis and reported them to the Rivers State Surge leadership team. Reported data were validated and activities were reviewed weekly on Internet-based conference calls among staff and the leadership team. The leadership team provided in-person and virtual visits to selected treatment sites every two to three months. During these regular calls and visits, staff used a quality improvement approach [4] to generate and test site-level change ideas to efficiently test and identify PWH and link them to care.

Data sources and analysis

Data collection and reporting from health facilities were done using a weekly Excel-based dashboard, with reporting in place by May 2019. Facilities reported numbers of tests done, HIV-positive individuals found and treatment initiations into this dashboard on a weekly basis. Data were aggregated at the LGA and state levels. Facility-level data were combined with community testing data to provide total treatment initiations within PEPFAR services across the entire state. Rivers State Surge leadership team data leads reviewed submitted weekly facility and community data to apply logic checks and identify outliers, and made requisite corrections in consultation with site staff. Serial 10-week medians were used to monitor weekly progress in treatment initiations from May 2019 to September 2020.

Community testing efforts, in place by October 2019, were tracked in a separate Excel-based tool. Community testing staff reported numbers of individuals screened for HIV risk using

the RST, tests done, positive individuals found and treatment initiations on a weekly basis. The linkage rate to ART initiation was calculated using a proxy measure of number of ART initiations divided by number of HIV-positive individuals diagnosed. The Excel tool provided a monthly display of aggregate data to show progress from October 2019 to September 2020.

The proportion of total new ART initiations in the state contributed by community efforts was calculated by month from October 2019 to September 2020. To demonstrate the contribution of key population focused outreach efforts in total new ART initiations in the state, the proportion of ART initiations associated with the three key population one-stop shops was calculated by month for the same time period.

Sites also reported the total number of PWH on treatment monthly, and the Rivers State Surge leadership team aggregated the number of current PWH receiving ART, including both newly diagnosed and established PWH, at the end of each quarter. As quarterly reporting was required by PEPFAR and aligned with previous state-level reporting, these quarterly data allowed tracking of scale-up of PWH on ART during the examined period and comparison with quarters in fiscal years 2017 and 2018.

Because this evaluation of a public health programme used de-identified data with no perceived ethical risk to care recipients, no informed consent was obtained. This public health programme activity review was covered under a nonresearch determination from the CDC Center for Global Health.

Results

During May 2019—September 2020, the weekly number of newly diagnosed PWH initiated on ART supported by PEPFAR in Rivers State increased from 82 the week of 4 May 2019, to a peak of 1723 the week ending 12 September 2020 (Fig. 1). Community testing efforts began contributing to this total by October 2019. A decrease in the number of PWH initiated on ART during the weeks of 28 December and 4 January coincided with holidays, when facility HIV services were limited. The decrease at the end of March coincided with state notification of cases of coronavirus disease 2019 (COVID-19), leading to restricted movement of testing teams. Serial 10-week median values for ART initiations indicate an increase during the examined period, from 132 during the first 10 weeks to 1515 during the seventh 10 weeks.

Data on targeted community testing were available during October 2019—September 2020 (Fig. 2). The number of persons screened for HIV risk in the community using the RST increased from 43 917 in October 2019 to 361 075 in August 2020. The number tested for HIV also increased commensurately during October 2019—April 2020, giving a consistent value for the proportion of those ‘screening in’ who were tested between 81 and 88%. During May—September 2020, this proportion dropped to a range of 52–58%. The test positivity rate declined slightly during the time period, as more people were screened, but remained at least 2.6% each month, near the state HIV prevalence of 3.6%. The proxy linkage rate of PWH to ART initiation was consistently at least 95%.

The proportion of monthly total new ART initiations in the state that were contributed by community efforts increased from 30% in October 2019 to 81% in April 2020, and it remained at least 68% during November 2019—September 2020 (Table 1). The number of monthly total new ART initiations during October 2019—January 2020 was flat but increased thereafter. During November 2019—September 2020, the mean proportion of monthly total new ART initiations in the state attributed to the three key population one-stop shops, inclusive of facility-based and community-based efforts, was 29%, with monthly proportions ranging from 21% in June 2020 to 37% in February 2020 (Table 1).

Quarterly summaries of the number of PWH on ART in the PEPFAR programme in Rivers State during fiscal year 2017 to 2020 showed growth from 21 862 at fiscal year 2017 Quarter 1 to 29 273 at fiscal year 2018 Quarter 4, a net gain of 7411 PWH over two fiscal years (Fig. 3). During the Surge, corresponding to fiscal year 2019 Quarter 3 (April—June 2019) through fiscal year 2020 Quarter 4 (July—September 2020), there was an initial decline in the total number of PWH on ART to 21 914 at fiscal year 2019 Quarter 3, followed by a quarter-on-quarter climb to a peak of 99 733 PWH on ART at fiscal year 2020 Quarter 4. The net increase in PWH on ART, indicated by the difference between the total at fiscal year 2019 Quarter 2 prior to Surge (26 041) and the total at fiscal year 2020 Quarter 4 (99 733), was 73 692. The number of PWH on ART in the PEPFAR programme in the state increased by a factor of 3.8 between April 2019 and September 2020.

Discussion

The Rivers State ART Surge was successful in rapidly scaling up HIV case-finding and ART linkage in the state during April 2019—September 2020. Reflecting on the strategies used to advance the Surge, and how they were adapted through experiential learning over time, may provide programmatic lessons for ART scale-up in settings with demonstrated gaps in the first and second 90s of the UNAIDS 90–90-90 HIV goals.

The pattern of weekly growth of new PWH initiating ART demonstrates programme flexibility in overcoming barriers, especially in adapting to the arrival of COVID-19 in Rivers State in March 2020. Although state authorities limited population movement in some parts of the state through mid-May, the Surge team was permitted to provide essential HIV services. Community outreach was modified to reduce close contact among both clients and staff. Services were adapted to decrease frequency of contact, most significantly through the introduction of 90-day ART ‘starter packs’, or 90-day ART supplies for those initiating treatment. These adaptations allowed HIV services to continue and accelerate after movement restrictions were relaxed in mid-May 2020.

Growth in the overall number of PWH initiated on treatment by week coincided with an increase in targeted community outreach testing. Health facility target numbers for new PWH diagnoses and ART initiations were commensurate with planned testing and treatment linkage scale-up, higher than the total number of people seeking care in health facilities. Moreover, rural populations and populations at risk for HIV acquisition may not seek care in health facilities in Nigeria, whether because of distance, cost, or dissatisfaction with services [5–7]. In other sub-Saharan African settings, community-based testing increases

testing coverage among youth [8], and when coupled with immediate ART for those testing positive, is associated with retention in care among men [9]. Thus, targeted community outreach testing quickly became and remains a principal driver of testing, diagnosis and treatment initiation, contributing at least 68% of monthly total treatment initiations during November 2019 through September 2020. Although the focus on targeted community testing did not immediately lead to an increase in the number of monthly total new ART initiations, this number increased as outreach and training improved. This success led to further emphasis on community outreach after April 2020, with more testing teams hired and trained, leading to higher numbers of people screened for HIV in those months.

Testing positivity rate in the community was maintained through several factors. First, NAIIS-derived small area estimates of HIV prevalence indicated high-burden communities in which community outreach teams could focus testing efforts. Second, these data were complemented by programmatic data, as community outreach teams mapped and focused on areas in which they were finding high testing positivity rates. Mapping of and focus on hotspots have been identified as effective ways to target community testing in other sub-Saharan Africa settings [10]. Third, community outreach testing teams screened potential testers using an RST, facilitating testing only among those with identified risk for HIV acquisition. In this setting, that proportion was over 80% during October 2019—April 2020, although the proportion fell below 60% thereafter, perhaps because of effective application of the stratification tool in low-risk or low-prevalence areas of the state. Use of such a screening tool has been found to improve efficiency of testing among adolescents in Zimbabwe [11]. Finally, upon diagnosis of an HIV-positive individual, community outreach teams traced and offered testing to that individual's sexual contacts. Community-based index testing services were useful in case-finding in Zambia, especially among men [12].

With a preserved testing positivity rate, numbers of new diagnoses made by community testing outreach teams increased along with monthly increases in the number of at-risk people tested for HIV. This growth was driven by reaching at-risk populations and by the willingness of those populations to test. Both of these factors may have been facilitated by the fact that community outreach teams were staffed by community-based organizations and local healthcare workers. Rivers State, situated in the Niger River Delta, contains remote and poorly accessible areas, and suffers from political unrest. This environment presented challenges in accessing and building trust in communities to provide HIV services, and overcoming these challenges required the knowledge of local staff. Use of local staff in HIV service outreach has been found to be a useful strategy in Nigeria [13].

The high proxy linkage of over 95% among PWH diagnosed in the community indicates that newly diagnosed PWH were efficiently initiated on ART. This high community linkage was facilitated by a programmatic emphasis on rapid ART initiation, including the offer and initiation of ART directly in the community, now expanded in the context of the COVID-19 epidemic. Community-based ART initiation has been shown to be effective in Rivers State [14], and same-day initiation has been associated with higher rates of linkage to care and viral suppression [15]. Of note, community outreach teams have continued providing ART to interested PWH living in areas far from HIV treatment facilities and in areas of high security risk, and these efforts may contribute to retention of these PWH in care.

A major driver of ART initiations during October 2019—September 2020 was outreach, diagnosis, and linkage to care among key population PWH: 29% of total ART initiations were contributed by the state's three key population focused one-stop shops, both in the facilities and the community. Key population peers played a central outreach role in testing, linkage to care and retention in care among diagnosed key population PWH; this role has been important in other key population treatment settings in Nigeria [13,16,17]. Recognition of the importance of key population community involvement and support in sustaining key populations in HIV care has led to plans for further decentralization of key population services to 'drop-in centers', community satellite sites for ART distribution for key populations.

Increases in the number of weekly ART initiations led to accelerated growth of total PWH on treatment by quarter during April 2019—September 2020, compared with the number of PWH on treatment during the preceding 2 years. The initial decrease in the total PWH on treatment during key population 2019 Quarter 3 was the result of a statewide, comprehensive data quality assessment conducted at the outset of the Surge. The overall increase through time may be partially a result of accommodating increased human resources within an HIV programme organizational structure introduced as a component of the ART Surge. Dedicated IP staff at sites, clinical mentors working within LGAs, and a locally based Surge leadership team facilitated synchronization with other organizations' staff in advancing a statewide Surge. Other contributors to this increase in comparison with previous years were programme reliance on targeted testing in communities and on availability of NAIIS-derived data of hotspots to more efficiently guide case-finding.

The increase in quarterly total PWH on treatment may also have been because of the connection between weekly data availability enabled by a dashboard and ongoing programme action, using a quality improvement approach. Quality improvement collaborative (QIC) efforts have been effective in scaling best practices and achieving targets in HIV service outcomes in similar settings [18,19]. Although the Surge was not formally conceived as a QIC, its use of data for rapid programme action across multiple sites to achieve a shared aim aligns with the QIC model. In fact, some elements of the Surge, including weekly data reviews to monitor impact of change ideas, and engagement of the Rivers State Surge leadership team in making strategic programme shifts affecting the entire state, may have accelerated or broadened the gains than those typically seen in QIC projects. In this way, the Surge demonstrates how QIC models can be scaled and fit within ongoing public health programming.

Limitations of this report include the inability to directly attribute interventions to the observed outcomes given the lack of experimental design. In addition, it relies on aggregate programme data, which may differ from cohort or individual-level data. Treatment initiations were based on client report of being newly diagnosed, so duplication in counts of initiations is possible. Finally, a proxy indicator derived from programme data was used to evaluate completeness of treatment initiation.

Conclusion

Notwithstanding these limitations, the Rivers State ART Surge demonstrates rapid scale-up of HIV case-finding and linkage to ART for PWH in the state. The six strategies underpinning the scale-up functioned together to advance the Surge, and regular data reviews and application of a quality improvement approach helped tailor the approach and accelerate gains. Future efforts to close the ART gap in Rivers State will build on these efforts, with an intensified focus on retaining PWH, including key populations, recently brought to HIV care, and with a continued emphasis on flexibility and innovation in approach in the context of the ongoing COVID-19 outbreak in Nigeria. Retaining PWH in care may require integration of community-based outreach and services in routine HIV care and ongoing government engagement to maintain sustainability. Implementation of the Rivers State ART Surge offers lessons for ART scale-up elsewhere in Nigeria and similar low-resource settings.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgements

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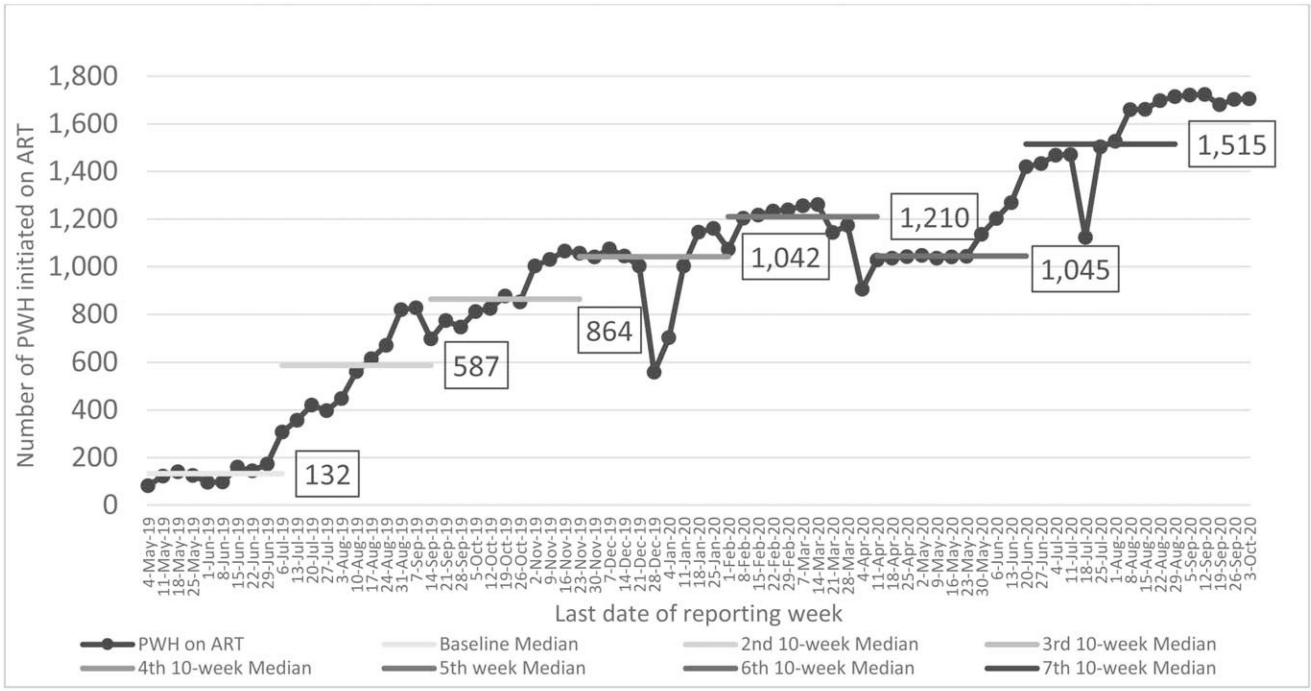

Fig. 1. Newly diagnosed people living with HIV initiated on antiretroviral treatment in the PEPFAR program by week, Rivers State, Nigeria, May 2019—September 2020[a].

[a]To capture data through the end of September 2020, data for the week ending in 3 October 2020 are included.

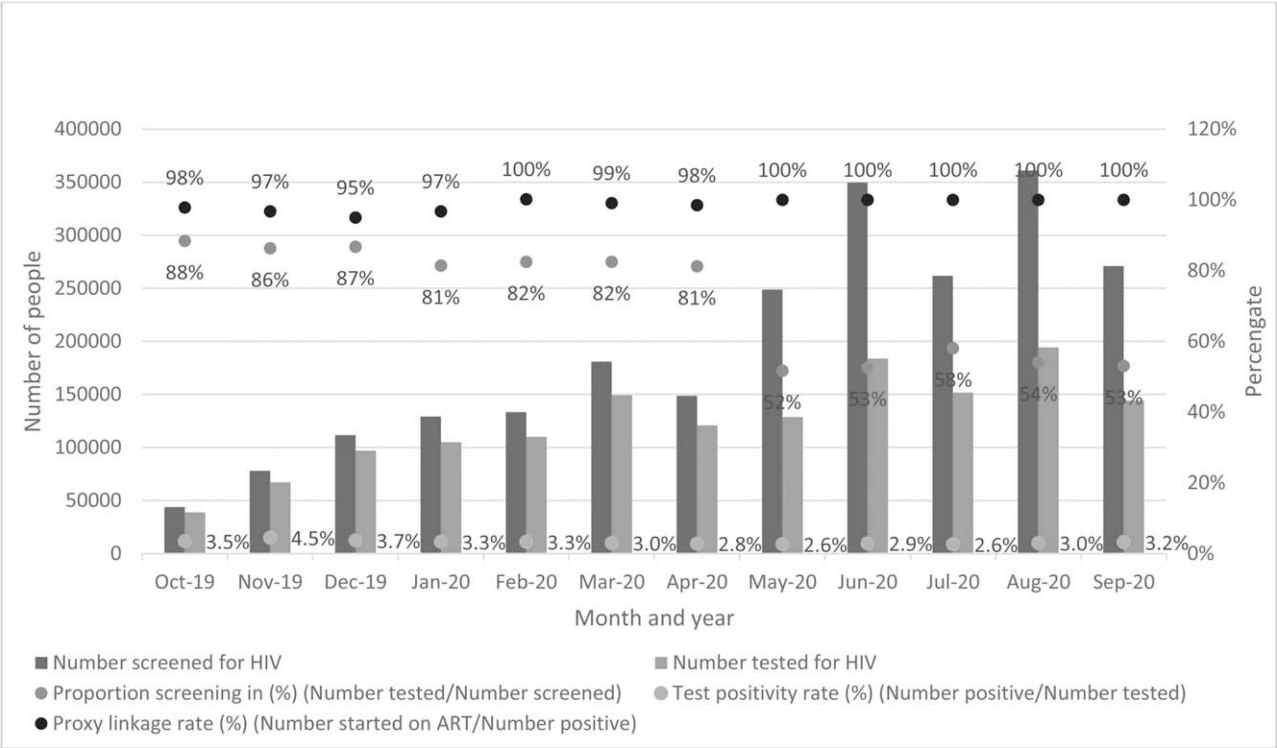

Fig. 2.

Summary of targeted community HIV screening, testing, diagnosis and antiretroviral treatment initiation by month, Rivers State, Nigeria, October 2019—September 2020.

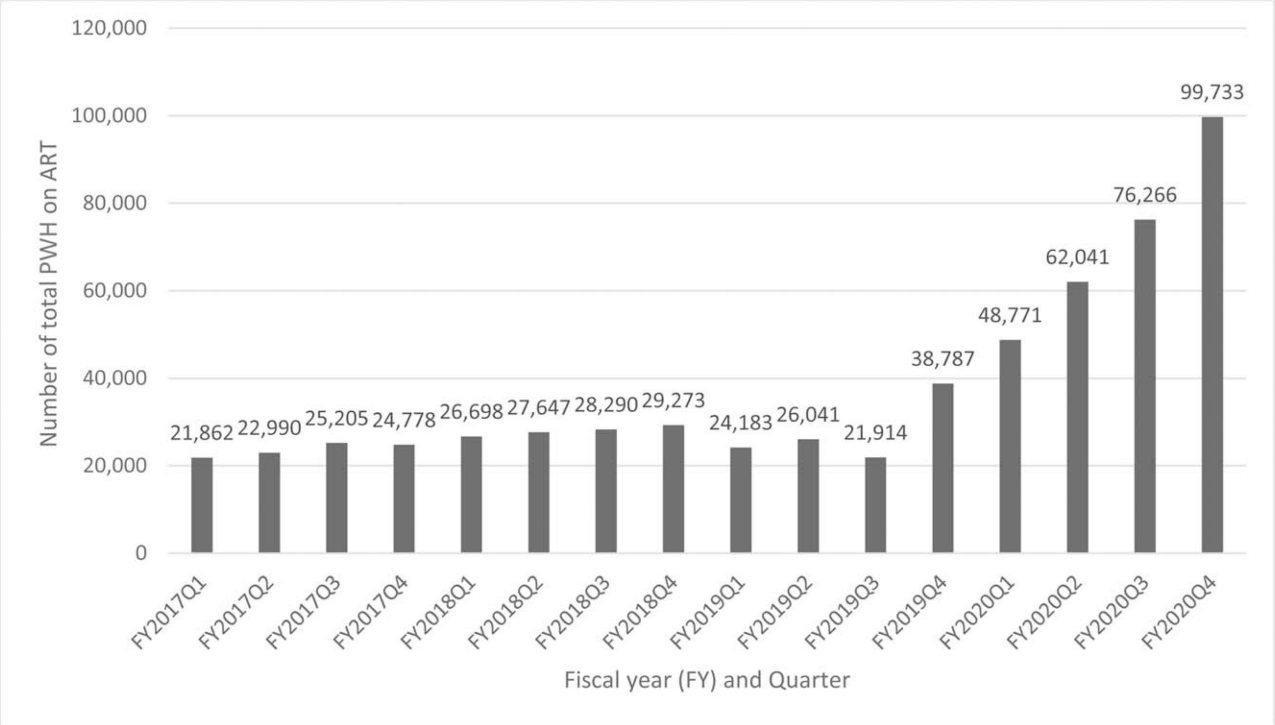

Fig. 3.

Number of people living with HIV on antiretroviral treatment in the PEPFAR programme at the end of each quarter of the fiscal year, Rivers State, Nigeria, fiscal years 2017–2020.

Table 1.

Antiretroviral treatment initiations through community efforts and through key population one-stop shops' efforts by month, Rivers State, Nigeria, October 2019–September 2020[a].

Month	Total ART initiations	ART initiations through community efforts	Percentage contribution to total ART initiations through community efforts	ART initiations through KP one-stop shops' efforts	Percentage contribution to total ART initiations through KP one-stop shop's efforts
Oct-19	4365	1323	30%	1411	32%
Nov-19	4191	2930	70%	1374	33%
Dec-19	4382	3416	78%	1204	27%
Jan-20	4382	3316	76%	1360	31%
Feb-20	4893	3626	74%	1831	37%
Mar-20	5738	4433	77%	1510	26%
Apr-20	4152	3378	81%	1122	27%
May-20	4254	3359	79%	1450	34%
Jun-20	6972	5339	77%	1495	21%
Jul-20	5624	3894	69%	1461	26%
Aug-20	8452	5821	69%	2044	24%
Sep-20	6811	4601	68%	1880	28%

ART, antiretroviral treatment; KP, key population.

[a]Categories of community efforts and KP one-stop shop efforts for ART initiations are not mutually exclusive, because some targeted community testing was carried out among KPs.