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Short Communication

HIV treatment scale-up: a critical step to controlling HIV epidemic in a resource-limited country

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ABSTRACT

Objectives: The study was conducted to determine the trend in HIV treatment coverage among people living with HIV and to evaluate effectiveness of the national antiretroviral treatment (ART) programme in reducing new infections in a mixed HIV epidemic nation, Nigeria.

Study design: Ecological cross-sectional study.

Methods: The study utilized national HIV programme service data and National HIV/AIDS and Reproductive Health Survey (NARHS) data for 36 states and Federal Capital Territory from 2012 to 2015 in Nigeria. Chi-squared test for trend was conducted to determine differences in ART coverage across the years. We correlated 2015 ART coverage with HIV prevalence Annual Rate of Reduction (ARR) between 2012 and 2015. A linear regression model was fitted to predict the HIV prevalence ARR in relation to ART coverage and adjusted for the effect of socio-behavioral interventions (coverage of condom-use among male).

Results: Nigeria has recorded steady progress with HIV treatment coverage with an annual rate of progress of 18.25%, $P < 0.001$; however, huge gaps still exist. Females and adults had higher odds of receiving ART. HIV prevalence annual reduction rate was higher for states that had higher ART coverage ($r = 0.4$; $P = 0.02$). Our analysis indicated that a 10% increase in ART coverage was associated with a 4% increase in the annual rate of reduction for HIV prevalence (adjusted $\beta = 0.4$; 95% confidence interval: 0.1–0.8; $P = 0.01$).

Conclusions: Regardless of the low ART coverage, our analysis supports the evidence base to inform accelerated access to HIV treatment for population Nigeria and other similar resource-limited settings to make ending HIV by 2030 a reality.

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Introduction

Despite the accelerated global HIV response, millions of people in Sub-Saharan Africa, especially Nigeria, are being left behind.[1,2] Of note, Nigeria, a mixed HIV epidemic nation, has become a priority country for fast-tracking HIV response due to the significant gap in its national response. The gap is huge with an estimated 190,000 annual new HIV infections, and 2.2 million (out of the 3.2 million people living with HIV) are currently not receiving treatment.[3] As a result, an estimated 148,133 AIDS-related deaths were documented in 2015.[3] With the current pace of antiretroviral treatment (ART) coverage, there have been strong debates whether Nigeria can meet the aspirations of ending HIV epidemic by 2030. The aim of this study is to determine the trend in HIV treatment coverage among people living with HIV and to evaluate effectiveness of the national ART programme in reducing new infections among its populace.

Methods

This is an ecological cross-sectional analysis of national HIV/AIDS health sector performance data and National HIV/AIDS and Reproductive Health Survey (NARHS) data for 36 states and Federal Capital Territory from 2012 to 2015 in Nigeria. In order to determine the pace of progress of ART coverage, annual rate of change (ARC) was calculated. We correlated 2015 ART coverage with HIV prevalence Annual Rate of Reduction (ARR) between 2012 and 2015. In the absence of a true (or reliable) HIV incidence data in Nigeria, HIV prevalence ARR was used as a proxy to HIV incidence.

The ARC of ART coverage and ARR of HIV prevalence were calculated as follows:

$$ARC = (ln[ART_{2015}/ART_{2012}])/3^{*}\ (100),$$

where ART_{2015} and ART_{2012} are the ART coverage for 2015 and 2012, respectively and,

$$ARR = (ln[HIV\ Prev_{2015}/HIV\ Prev_{2012}])/3^{*}\ (-100),$$

where HIV $Prev_{2015}$ and HIV $Prev_{2012}$ are the HIV prevalence for 2015 and 2012, respectively.

A linear regression model was fitted to predict the HIV prevalence ARR in relation to ART coverage. The model accounted for the effect of socio-behavioral interventions i.e. coverage of condom-use among male. Furthermore, Pearson Chi-squared test was used to determine age and gender differences, and Chi-squared test for trend were conducted to determine differences across the years by using STATA, version 13, with a $P < 0.05$ considered to be significant. Odds ratio (OR) was used to measure the strength of association between gender/age and HIV treatment.

Ethical consideration

Ethical clearance is not required because the data sets were aggregated state-level data with de-identified respondents' personal information.

Results

The annual ART coverage increased from 491,021 (16.3%) in 2012 to 853,992 (28.1%) in 2015, with an annual rate of change (ARC) of 18.2% (χ^2 test for trend, 131,248.6; $P < 0.001$; Table 1). However, the 2015 coverage was not uniform across the geopolitical zones, lowest (11.6%) in South West and highest (36.5%) in North Central (Fig. 1).

Despite the increasing trend of ART coverage, the ARC for adults was slightly higher than children, 18.5% vs 12.3%, respectively. In 2015, the ART coverage was significantly higher for adults (28.9%) than children (18.7%), $\chi^2(1) = 11{,}266$; ($P < 0.001$). Children were 43% less likely to be placed on HIV treatment (OR: 0.57, 95% confidence interval [CI]: 0.56–0.57), compared to adults. Also, ARC of ART coverage for males and females were similar, 18.5% and 17.4%, respectively. In 2015, females had significantly higher ART coverage than males (33.2% and 19.3% respectively), $\chi^2(1) = 74{,}716$; $P < 0.001$. The odds of females being commenced on HIV treatment were twice higher than males (OR: 2.07, 95% CI: 2.06–2.08).

The proportion of condom-use among men was 10.5%, and the HIV programmatic prevalence has been decreasing with a mean annual rate of reduction of 21.9%. HIV prevalence annual reduction rate was higher for states that had higher ART coverage ($r = 0.4$; $P = 0.02$). After adjusting for the effect of coverage of condom-use among male, our analysis indicated that a 10% increase in ART coverage was associated with a 4% increase in the annual rate of reduction for HIV prevalence (adjusted $\beta = 0.4$; 95% CI: 0.1–0.8; $P = 0.01$).

Table 1 – HIV treatment coverage in Nigeria.

	2012	2013	2014	2015	X^2 *for trend*	*P*-value
Population living with HIV	3,012,125	3,021,670	3,029,358	3,037,364		
Number (%) of people living with HIV receiving ART	491,021 (16.3)	639,397 (21.2)	747,382 (24.7)	853,992 (28.1)	131,248.6	<0.001
Number (%) of males receiving ART	150,605 (11.1)	213,287 (15.7)	226,240 (16.7)	262,689 (19.3)	33,808.4	<0.001
Number (%) of females receiving ART	340,416 (19.7)	426,110 (24.5)	521,142 (29.6)	591,303 (33.2)	93,204	<0.001
Number (%) of adults receiving ART	459,465 (16.6)	592,084 (21.3)	703,358 (25.2)	809,304 (28.9)	131,094.3	<0.001
Number (%) of children receiving ART	31,556 (13.0)	47,313 (19.6)	44,024 (18.4)	44,688 (18.7)	2232.3	<0.001

ART, antiretroviral treatment.