

# Cost-Effectiveness of Dolutegravir Vs Efavirenz-based Combined Antiretroviral Regimens in HIV-Infected Treatment-naïve Patients at Nigeria’s University College Hospital

Abdulumuminu Isah, PhD<sup>1</sup>, Emeka E. Duru, BPharm<sup>2</sup>, Favour C. Nwabineli, BPharm<sup>1</sup>, Ezinwanne J. Ugochukwu BPharm<sup>3</sup>, Maryam B. Muhammad BPharm<sup>3</sup>, Jamila Sani, BPharm<sup>3</sup>

<sup>1</sup>University of Nigeria, Nsukka, Nigeria. <sup>2</sup>University of Utah, Salt Lake City, USA.

<sup>3</sup>Kaduna State University, Kaduna Nigeria.



## BACKGROUND

- ❖ Nigeria has the fourth-largest HIV epidemic in the world (after South Africa, India and Mozambique), with about two million people living with the infection in 2021<sup>1,2</sup>
- ❖ The highly active antiretroviral therapy (HAART) is the cornerstone of current treatment for people living with HIV<sup>13</sup>
- ❖ World Health Organization (WHO) recommended the use of Dolutegravir (DTG) based treatment as the preferred first-line regimen for people living with HIV initiating antiretroviral therapy<sup>4</sup>
- ❖ The Nigerian Federal Ministry of Health (FMOH) adopted the switching of eligible adults and adolescent patients from EFV - based regimen (TDF+3TC+EFV), and Zidovudine/Lamivudine/ Nevirapine (AZT+3TC+NVP) to DTG-based regimen (TDF+3TC+DTG) from November 2018<sup>3</sup>

## OBJECTIVE

- ❖ This objective of the study was to evaluate the comparative cost-effectiveness of Dolutegravir and Efavirenz based antiretroviral therapies in HIV-infected treatment-naïve patients in a treatment center in Nigeria.

## METHODS

- ❖ **Study Design:**
  - This was a case-control study involving the use of the APIN databases of HIV positive, treatment-naïve patients, who received care from University College Hospital, (UCH) Ibadan, Nigeria, from January 2019 to December 2020.
- ❖ **Patient Population:**
  - HIV positive patients ≥ 18 years who were initiated on either DTG or EFV-based regimen during the study period.
- ❖ **Data Collection Tool:**
  - The data collection tool consisted of three main domains: sociodemographic characteristics, clinical parameters, and cost of treatment via a pro-forma.
- ❖ **Interventions/Comparator:**
  - DTG-based regimen
  - EFV-based regimen.

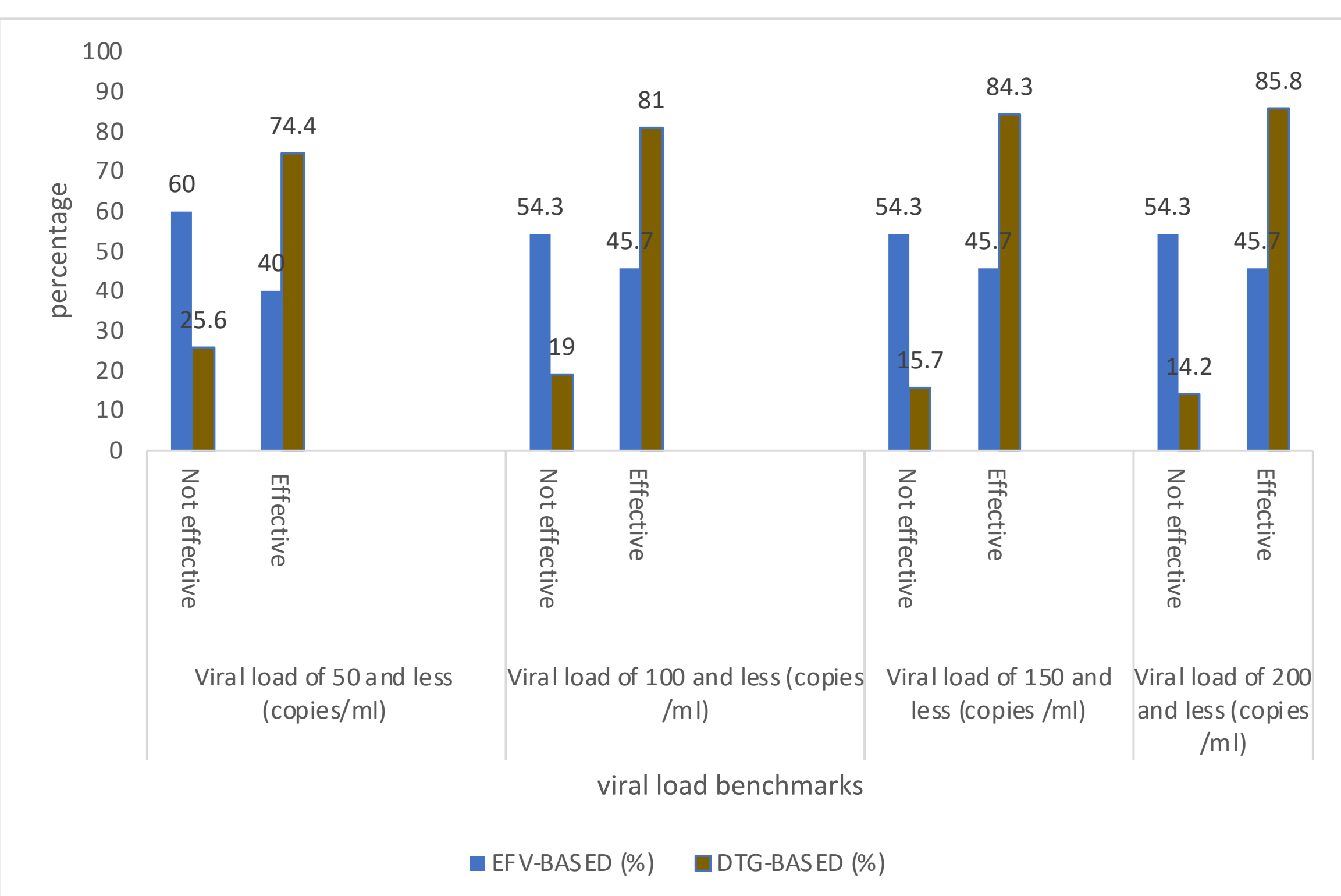
## RESULTS

**Table 1. Socio-demographic Characteristics of Patients**

Characteristics	EFV-based n=35 (%)	DTG-based n=394 (%)	P-value
Female	23 (65.7)	238 (60.4)	0.944
Age			
< 20 years	6 (17.1)	20 (5.1)	0.491
20-50 years	22 (62.9)	278 (71.3)	
>50 years	7 (20.0)	93 (23.6)	
Occupation status			
Employed	21 (56.1)	340 (86.3)	<0.001*
Unemployed	6 (17.1)	42 (10.7)	
Marital Status			
Married	13 (37.1)	194 (49.2)	0.096
Not Married	22 (62.9)	200 (50.8)	

- ❖ **Cost and Treatment Effectiveness:**
  - The costs were calculated from the payer's point of view.
  - The Global Fund's Pooled Procurement Mechanism Reference Pricing for ARVs was used to determine the monthly cost of antiretroviral medications.
  - Viral load test result after the initiation of antiretroviral therapy was used as the measure of effectiveness in both DTG and EFV regimen group.
- ❖ **Data Analyses:**
  - Microsoft Excel (16.72) and Statistical Product and Services Solutions (SPSS) version 25 was used for data analysis
  - The incremental cost-effectiveness ratio (ICER) was reported as cost per effectiveness.
  - A treatment was considered to be cost-effective if its incremental cost per effectiveness was not more than 51% of 2019 Nigerian per capita Gross Domestic Product (GDP) of \$2229.859
  - The robustness of the ICER finding was tested using a sensitivity analysis.

**Figure 1. Effectiveness of ARV Regimen using different Viral Load benchmarks**



**Table 2: Cost-Effectiveness Analysis between EFV and EFV based Regimens**

Parameters	EFV-based	DTG-based
Frequency	35	394
Total Cost (\$)	2,773,586.20	31,220,528.48
Ave Cost (\$)/patient	79,245.32	79,239.92
Effectiveness at 50copies/ml (%)	40	74.4
Effectiveness at 100copies/ml (%)	45.7	81
Effectiveness at 150copies/ml (%)	45.7	84.3
Effectiveness at 200copies/ml (%)	45.7	85.8
ACE at 50 copies/ml	6,933,965.50	41,963,075.91
ACE at 100 copies/ml	6,069,116.41	38,543,862.32
ACE at 150 copies/ml	6,069,116.41	37,035,027.85
ACE at 200 copies/ml	6,069,116.41	36,387,562.33
ICER at 50 copies/ml		15.70
ICER at 100 copies/ml		15.29
ICER at 150 copies/ml		13.99
ICER at 200 copies/ml		13.46

ACE= Average Cost Effectiveness, ICER= Incremental cost effectiveness ratio, EFV=Efavirenz, DTG=Dolutegravir

- ❖ A total of 429 patients’ data were retrieved for this study. Mean age was 41 years.
- ❖ Most of the patients were on DTG-based regimen, n=394 (91.8%)).
- ❖ DTG-based regimens had better efficacy than EFV-based regimen at all viral load benchmarks (50, ≤100, ≤150 and ≤200 copies/ml).
- ❖ The total cost of managing all the patients on DTG-based regimen was \$31,220,528.48, which translated to \$79,239.92 per patient while that of EFV-based regimen was \$2,773,586.20, and \$79,245.32.
- ❖ The incremental cost-effective ratio (ICER) of patients on DTG at VL of 50copies/mL over those on EFV was \$15.70 per effectiveness in a patient.

## DISCUSSION

- ❖ The young population found in this study is an indicator that new cases of HIV are prevalent in young adults at their productive age.
- ❖ At all viral load benchmarks, DTG-based regimen demonstrated significant higher effectiveness than EFV-based regimen. This was consistent with several published studies<sup>18-22</sup>.
- ❖ DTG -based regimen also showed a higher cost per effectiveness than EFV at all viral load threshold.
- ❖ The use of viral load as a sole measure of effectiveness was a limitation because other clinical characteristics such as adverse effects can also be a measure of effectiveness

## CONCLUSION

- ❖ DTG- based regimen is associated with a higher cost of treatment compared to EFV-based regimen and was more effective in treating HIV naïve patients. Thus, switching from EFV to DTG-based regimens will lead to both increased cost and increased effectiveness.



Emeka Elvis Duru, BPharm  
[elvis.duru@utah.edu](mailto:elvis.duru@utah.edu)

## REFERENCES



Presented at ISPOR 2023, Boston, May 7-10, 2023