# Viral Load Before Switching to Dolutegravir & Association With HIV Treatment Outcomes

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## BACKGROUND

- Globally, HIV treatment programs are transitioning from NNRTIs to dolutegravir (DTG)
- For patients on ART, the WHO encourages assessing viral load (VL) before switching to DTG:
  - If VL <1000 copies/mL: switch to DTG + TDF + 3TC/FTC
- Limited availability and/or accessibility of VL testing in some settings

**Study objectives:**

- **Describe VL testing status among ART-experienced patients who switched to DTG**
- **Examine associations between pre-switch VL and subsequent HIV treatment outcomes**

## METHODS

- Routine clinical care data from the Central Africa and East Africa regions of the International epidemiology Databases to evaluate AIDS (IeDEA)
- Inclusion criteria:
  - ≥16 years at HIV care enrollment
  - Documented switch to DTG from NVP/EFV between July 2017-February 2020
  - Started ART ≥6 months before switching
  - ≥6 months of possible follow-up after switching
- Follow-up began on date of switching to DTG until an outcome of interest, competing event, database closure, or administrative censoring at 18 months
- Cause-specific hazards regression models were used to examine associations between **VL measured within 12 months prior to DTG switch** and:
  - Incident VL ≥1000 copies/mL without resuppression
  - New or recurrent pulmonary TB or WHO Clinical Stage 4 event
  - Switch to a PI regimen
  - Switch back to an NNRTI regimen
  - Death or loss to program
- Competing events included death/loss to program and switching to a non-DTG regimen

Patients who switched to DTG with an *unknown* or *unsuppressed viral load* had **worse subsequent HIV treatment outcomes** compared with patients who switched with a viral load <200 copies/mL

## RESULTS

- 36,393 patients from 5 countries: Kenya (82%), Uganda (9%), Rwanda (5%), Tanzania (3%), and Democratic Republic of the Congo (0.5%)
  - Median follow-up time: 11 months (IQR 9-13)
- **Most recent VL in 12 months before switching: <200 copies/mL (88%), 200-399 copies/mL (5%), 400-999 copies/mL (3%), ≥1000 copies/mL (1%), no VL test (4%)**
  - Median VL 342 copies/mL (IQR 255-491) among those with a VL 200-999 copies/mL (N=2713)
  - Median VL 7195 copies/mL (IQR 2173-32,501) among those with a VL ≥1000 copies/mL (N=400)

**Incidence rate of outcomes and associations with pre-switch VL status**

| | Incident VL ≥1000 copies/mL* | Pulmonary TB or WHO Clinical Stage 4 event* | Switch to a PI regimen | Switch back to an NNRTI regimen | Death or loss to program |
|---|---|---|---|---|---|
| **Incidence rate per 100 person-years (95% CI)** | 1.5 (1.4-1.6) | 0.3 (0.3-0.4) | 0.3 (0.3-0.4) | 8.3 (8.0-8.6) | 4.1 (3.9-4.3) |
| **VL status before switching to DTG, adjusted† hazard ratio (95% CI)** | | | | | |
| <200 copies/mL | Reference | Reference | Reference | Reference | Reference |
| 200-399 copies/mL | **1.61 (1.13-2.30)** | 1.46 (0.53-4.04) | 1.35 (0.54-3.36) | 0.99 (0.82-1.20) | 1.14 (0.90-1.46) |
| 400-999 copies/mL | **1.75 (1.18-2.59)** | 1.00 (0.25-4.11) | **2.72 (1.17-6.35)** | 1.20 (0.97-1.49) | 1.12 (0.82-1.52) |
| ≥1000 copies/mL | **6.60 (4.36-9.99)** | **13.97 (6.62-29.50)** | **30.53 (17.87-52.18)** | **2.83 (2.22-3.61)** | **2.56 (1.81-3.63)** |
| No VL test | **2.89 (1.99-4.19)** | **4.78 (2.77-8.24)** | 2.13 (0.90-5.04) | **1.55 (1.31-1.83)** | **3.77 (3.19-4.46)** |

*Analysis limited to patients who had the outcome assessed.
†Models included a random effect for clinic/site and were adjusted for age group, sex, prior AIDS diagnosis, and history of disengagement from care.

## CONCLUSIONS

- Patients without a recent VL test or with a VL ≥1000 copies/mL had worse HIV treatment outcomes on DTG compared with patients who switched with a suppressed VL (<200 copies/mL)
- Limitations include possible underrepresentation of patients with an unknown or unsuppressed VL
- **A pre-switch VL may be useful to identify patients at elevated risk of adverse HIV treatment outcomes after switching to DTG**
- **Patients with an unsuppressed VL before a planned switch to DTG may benefit from additional clinical monitoring and/or adherence support**
- **Surveillance of patients who switched to DTG without a recent VL or with an unsuppressed VL may help identify ways to preserve DTG as a long-term treatment option**

## NOTES

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Research ethics committees at sites and regional data management centers provided ethical oversight and approved the use of deidentified data for this analysis.

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