

Early treatment interruptions in ART are associated with sharp reductions in viral suppression

KEY FINDINGS

- More than 30% of ART clients retained in care for 6 months had ≥ 1 treatment interruption >28 days before returning to care.
- Continuous engagement (no interruptions) was associated with **higher viral suppression (VS) at 6 months** than cyclical engagement (interruption >28 days followed by return to care).
- Clients with continuous engagement were 60% more likely to achieve VS after adjusting for demographic and clinical characteristics (aRR 1.60, 95% CI 1.55–1.64).
- Preventing early treatment interruptions and rapidly re-engaging clients who miss visits could substantially improve VS.

Patients who stayed continuously engaged in care were about 60% more likely to achieve viral suppression at 6 months than those who had treatment interruptions.

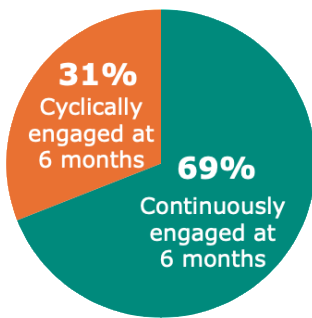
WHY DOES THIS MATTER?

- The first 6 months following ART initiation are when clients establish treatment routines and are expected to achieve viral suppression.
- The impact of interruptions on achieving initial viral suppression remains unclear but is important for targeting interventions and improving treatment outcomes.

WHAT DID WE DO?

- Setting: 24 public-sector primary healthcare clinics in Eastern Cape, Gauteng, KwaZulu-Natal and Mpumalanga provinces.
- Population: Adults starting or restarting ART during 2018–2024 and remained in care for at least 6 months.
- Data source: South Africa's national ART database (Tier.Net).
- Two engagement patterns during first 6 months:
 - Continuous engagement: No visit ≥ 28 days late.
 - Cyclical engagement: ≥ 1 visit at least 28 days late with return to treatment by 6 months.
- Outcomes at 6-month viral load test: suppressed or undetectable (<50 copies/mL); low-level viremia (50–199), intermediate viremia (200–999); unsuppressed (≥ 1000); no result (missing test).
- Estimated adjusted risk ratios (aRRs) for viral suppression, adjusting for age, sex, year of initiation, ART regimen, engagement pattern, baseline CD4 count, and WHO clinical stage.

WHAT DID WE FIND?



- 40,865 clients retained in care at 6 months (66% female, median age 33 years).
- 21% had a baseline CD4 <200 cells/ μ L and 6% were WHO Stage 3 or 4, both indicators of advanced HIV disease.
- 50% of continuous engagers and 49% of cyclical engagers initiated on TDF/3TC/DTG; the rest initiated on TDF/FTC/EFV.

Figure 1.
Continuous engagement

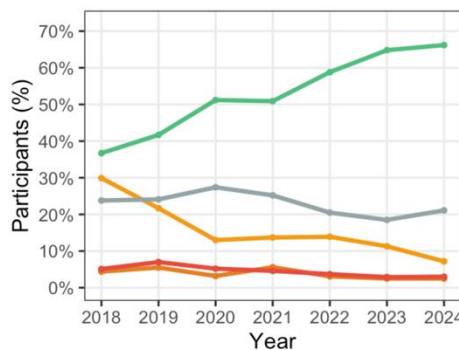
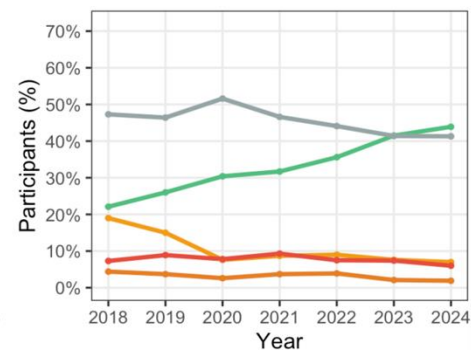
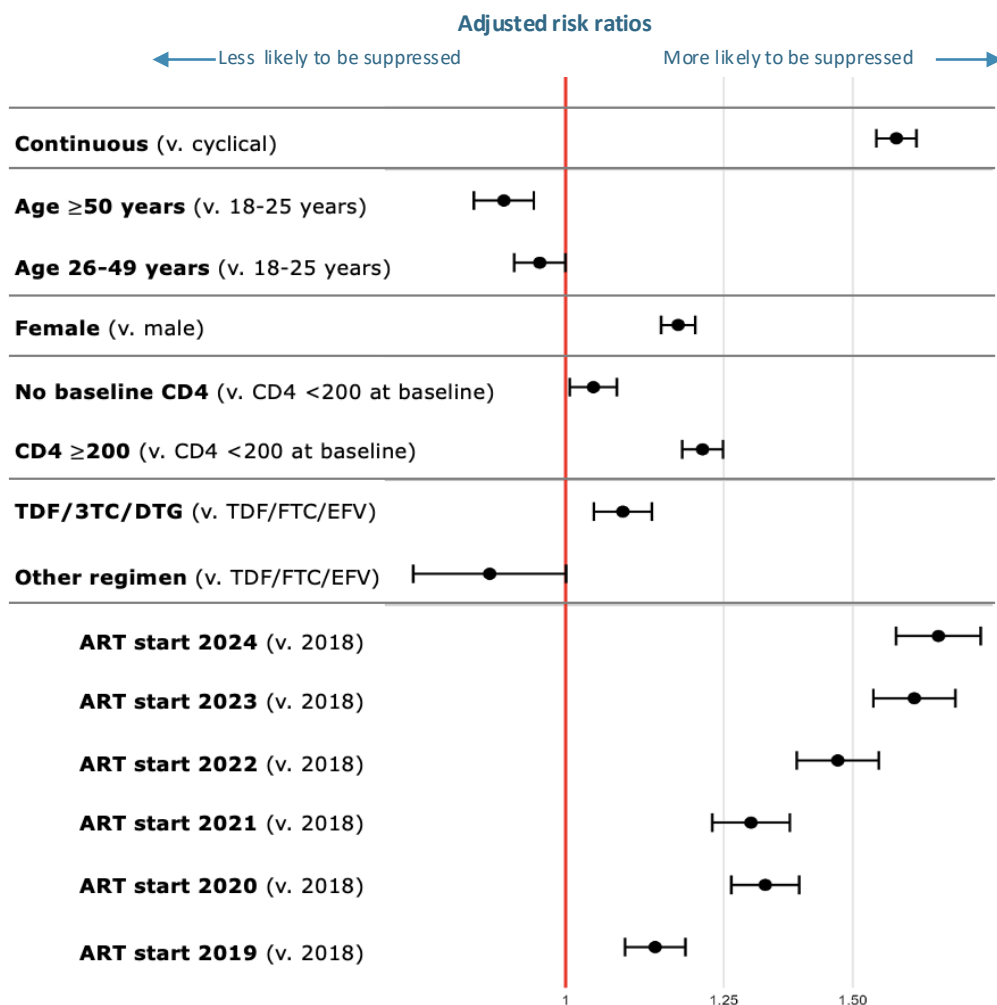


Figure 2.
Cyclical engagement



- Continuous engagers were more likely to have 6-month viral load tests than cyclical engagers (78% vs 58%).
- For continuous engagers (Figure 1), viral suppression at 6 months increased from **37% to 66%** between 2018 and 2024; low-level viremia fell from 30% to 7%.
- For cyclical engagers (Figure 2), viral suppression at 6 months increased from **22% to 44%**; low-level viremia fell from 19% to 7%.

Figure 3. Predictors of viral suppression at 6 months (<50 copies/mL)



- Continuous engagement (compared with cyclical) was strongly associated with viral suppression (aRR 1.60; 95% CI 1.55-1.64) (Figure 3).
- Baseline CD4 count ≥200 cells/μL and TDF/3TC/DTG regimen were also associated with higher rates of viral suppression (aRR 1.21; 95% CI 1.18-1.25) .
- Later years of initiation showed progressive improvement, with initiation in 2024 associated with 1.67 times higher suppression than initiation in 2018 (aRR 1.67; 95% CI 1.57-1.77).

CONCLUSIONS

- **Continuous engagement** in the first 6 months of HIV treatment is associated with **much higher rates of viral suppression** compared to cyclical (interrupted) engagement.
- Viral suppression rates improved steadily between 2018 and 2024; this likely reflects both the **advent of dolutegravir** (replacing efavirenz) and other improvements in service delivery and the quality of care over this time period.
- **Preventing treatment interruptions during the early treatment period is important.** Targeted interventions that support adherence and minimize care gaps may improve long-term viral control and reduce transmission risks.
- Results should be interpreted with caution: visit attendance is used as a proxy for medication possession, but some individuals may have leftover or borrowed medication on hand; TIER.Net does not account for silent transfers, which cause over-estimates of interruptions and disengagement; and the study sample is not nationally representative.