Q-07

Prevalence and Incidence of Advanced HIV Disease in AFRICOS Participants With Viral Nonsuppression

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BACKGROUND

Research Question:

- Among treatment-experienced people presenting with viral non-suppression (VNS), which factors are linked to having Advanced HIV Disease (AHD) at that visit, and which predict progression to AHD over time?

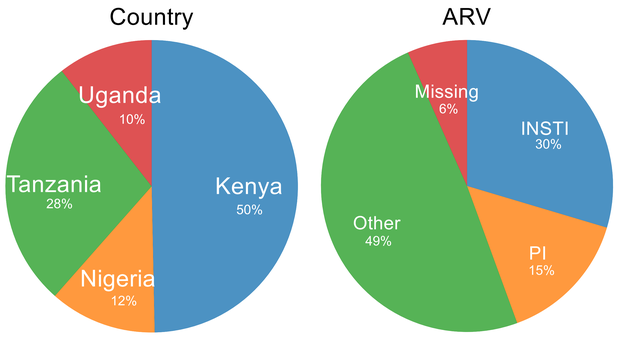
Why This Study Was Conducted:

- Viral non-suppression is common in HIV care and may indicate increased risk for AHD. This study aimed to identify clinical and treatment factors associated with prevalent and incident AHD among those with new VNS to guide more targeted clinical and programmatic responses.

METHODS

- We conducted a retrospective analysis of semiannual patient visits (2013 – 2025) that included CD4 and viral load (VL) records. VNS was defined as VL >1000 copies/mL. We estimated prevalence of AHD (defined as CD4 <200 cells/mm³) at visits with VNS and across discrete VNS episodes.
- Poisson regression with generalized estimating equations identified factors associated with prevalent AHD. Cox proportional hazards models, stratified by country and clustered by patient, assessed factors associated with incident AHD after VNS.

Figure 1: Patient Characteristics



Nearly half of AFRICOS participants experienced viral nonsuppression (VNS), and advanced HIV disease (AHD) was present in 21% of new VNS episodes. Of those without prevalent AHD at VNS, the incidence rate of AHD was 3.6 cases per 100 person-years. High viral load, PI-based regimens, and male sex were associated with prevalent AHD, while lower CD4 counts and PI-based regimen were associated with incident AHD after VNS.

RESULTS

- **Sample characteristics:** Among 3,438 patients (36,248 visits), 47.8% had ≥1 VNS event; median age was 36.2 years and 57.9% were female. Prevalent AHD occurred in 29.5% of VNS-positive visits and 21.4% of discrete VNS episodes. (Figure 1)
- **Prevalent AHD:** Higher log VL (aRR 1.52, 95% CI 1.32–1.76), male sex (aRR 1.55, 95% CI 1.16–2.06), and PI vs INSTI therapy (aRR 1.76, 95% CI 1.24–2.49) were associated with AHD at VNS. (Figure 2)
- **Incident AHD:** Across 769 VNS episodes among 605 patients without AHD at VNS, PI vs INSTI therapy was associated with increased hazard of AHD (aHR 2.40, 95% CI 1.13–5.08). In models adjusted for baseline immune status, each 50-cell/mm³ increase in CD4 was linked to reduced hazard of AHD (aHR 0.29, 95% CI 0.17–0.50), with protection diminishing over time. (Figure 3)

Figure 2: Factors Associated With Prevalent AHD at VNS

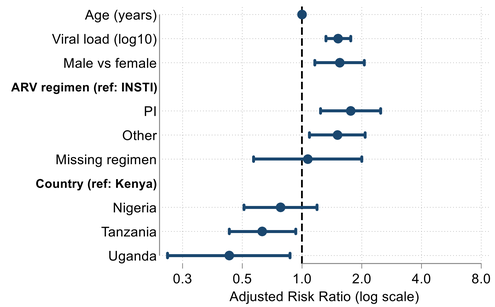


Figure 3: Factors Associated With Incident AHD Following VNS

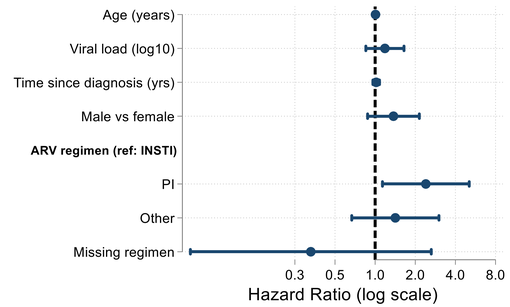
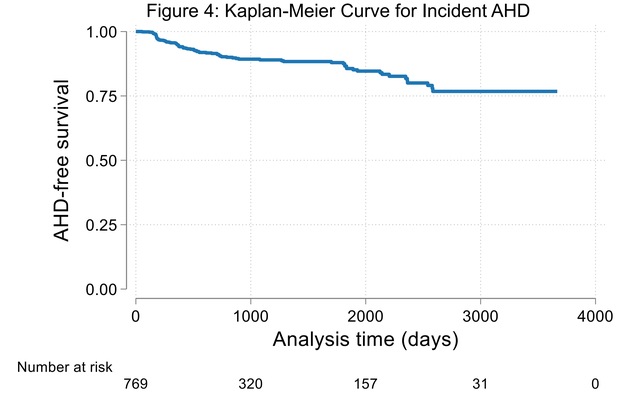


Figure 4: Kaplan-Meier Curve for Incident AHD



CONCLUSIONS

- A fifth of PLHIV presenting with new VNS had AHD, highlighting a substantial clinical burden in routine care.
- Higher viral load and male sex were associated with prevalent AHD, highlighting the importance of CD4 testing in these VNS groups.
- Progression from non-AHD to AHD after VNS was uncommon, occurring at 3.6 cases per 100 person-years.
- ART regimen differences, particularly PI use, were associated with increased risk and hazard of incident AHD, though these could reflect underlying treatment history and adherence challenges rather than causal effects.
- In models including CD4 count, higher CD4 was strongly protective against incident AHD, though this protection diminished over time.
- These findings underscore the need for person-centered risk stratification to help prioritize CD4 testing in individuals presenting with VNS.

ADDITIONAL KEY INFORMATION

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