Poster Number: 1129

HIGH VIREMIA AMONG 'STABLE' PATIENTS RECEIVING ANTIRETROVIRAL THERAPY IN ZAMBIA

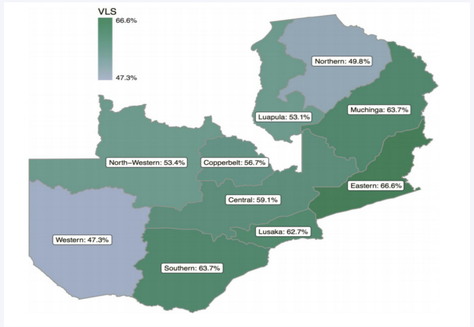
Mpande Mukumbwa-Mwenechanya[1] Jillian Kadota[1] Emilie Efronson[1] Paul Somwe[1] Monika Roy[2] Kelvin Kaputula[1] Sam Bosomprah[1] Jake Pry[1,3] Nancy Padian[4] Elvin Geng[2] Charles Holmes[5] Izukanji Sikazwe[1] Anjali Sharma[1] Carolyn Bolton Moore[1, 6]

[1] Centre for Infectious Diseases Research In Zambia [2]University of California, San Francisco, US [3] University of California , Davis, US [4]University of California, Berkeley, US [5]Georgetown University, Washington D.C., US [6]University of Alabama at Birmingham, US

BACKGROUND

- Despite widespread availability of ART in Zambia, only 59.8% HIV-positive adults 15-59 years old were found to have Viral Load (VL) suppression (<1000 copies of viral RNA/ml) according to the 2015-2016 Zambia Population Based HIV Impact Assessment (ZAMPHIA) community based study (1).
- This high level of silent non-suppression threatens to undermine the country's ability to attain the UNAIDS 2020 treatment target of 90-90-90.
- HIV VL associated with various factors, females have a 35-50% lower HIV VL relative to males (2).
- VL suppression among HIV+ people in Zambia is (1):
  - highest among 45 to 59 years old adults: 73.5% among females, 73.0% among males
  - distinctly lower among 15 to 24 years old: 34.0% among females, 35.7% among males

Figure 1. Viral Suppression Rates Among HIV positive Adults, By Province (1)



OBJECTIVES

1. To determine the prevalence of viremia among stable patients being enrolled into differentiated service delivery in two urban ART clinincs purposively selected for heavy clinic patient load (>4500)
2. To identify factors associated with HIV VL among stable patients

Stable patients were defined as; HIV+, age≥14, on ART > 6 months, not acutely ill by clinical judgement, CD4 ≥200/µl in last 6 months(if available), not pregnant

METHODS

- **Enrolled:** A systematic sample of 405 stable patients to receive accelerated 3-monthly ART pick-ups from a dedicated treatment room (FastTrack Model).
- **Data Collection:**
  - Dry blood spots (DBS) collected by Pharmacy Technologists and lay healthcare workers through finger prick to test for VL at enrolment into FastTrack model.
  - Socio-demographic, clinical and pharmacy data
- **Data Analyses**:

Bivariate and backward stepwise logistic regression analyses to assess:

- Crude viral suppression rates
- Factors associated with odds of unsuppressed HIV VL at FastTrack enrollment.

Quantitative bias analysis using known limitations in the specificity (87.3%) and sensitivity (80.8%) of DBS results for true plasma viral load from external studies to correct for estimates on prevalence of viremia(3).

RESULTS

- Of the 405 enrolled, 308 patients had complete clinical data and were included in the analysis.
- 43.5% (n=134) without a CD4 test result in last 6 months, were enrolled based on clinical judgement of 'stability.'

Figure 2. Prevalence of suppression corrected for DBS measurement bias (Sensitivity = 80.8%, Specificity = 87.3%)

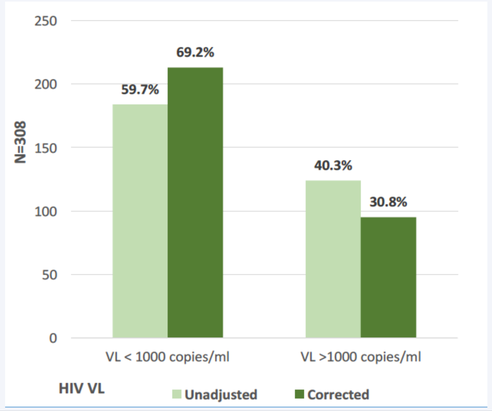


TABLE 1. Characteristics associated with unsuppressed viral load (defined as ≥1000 copies viral RNA/ml)

Patient Characteristics	Proportions (%)	N	OR (95% CI)	p-value
Sex				
Male	83 (26.6)		Reference	
Female	225 (73.4)		0.79 (0.47, 1.33)	0.37
Age Category at ART Start				
≤25 years	39 (12.9)		Reference	
26-35	116 (38.3)		0.83 (0.40, 1.72)	0.73
>35 years	148 (48.8)		0.76 (0.37, 1.53)	
WHO Stage at ART Start[1]				
1	109 (38.0)		Reference	
2	56 (19.5)		1.25 (0.65, 2.42)	0.36
3 or 4	122 (42.5)		1.47 (0.87, 2.50)	
Time on ART at Enrolment				
≥1 year	284 (92.2)		Reference	
<1 year	24 (7.79)		1.13 (0.48, 2.68)	0.77
# late/missed pharmacy pick-ups in last 12 months				
0-3	127 (41.2)		Reference	
4-7	124 (40.3)		1.36 (0.82, 2.25)	0.48
8-11	57 (18.5)		1.07 (0.56, 2.04)	

[1]-6.8% missing data for WHO Stage

- The analysis sample was 73% female (n=225) with a median age of 34.7 years (IQR: 29.7-39.9) and median days on ART of 2144 (IQR: 1087-2947).
- Median age (40) and sex (73.6% female) of the full sample were not statistically different from the analysis sample.

KEY FINDINGS

- At enrollment, 40.3% (n=124) had >1000 copies of viral RNA/ml
- VL non-suppression corrected to 30.8% when analyzed for DBS measurement bias,
- No significant association between unsuppressed HIV VL and gender, age, WHO staging at ART start, time on ART and late/ missed pharmacy appointments was found.
- Odds of unsuppressed VL was greater for those who started ART at WHO clinical stage 2 (OR: 1.25; 95% CI: 0.65, 2.42) and stage ≥3 (OR: 1.47; 95% CI: 0.87, 2.50) compared to those who started at WHO clinical stage 1, although effect sizes were statistically insignificant.

CONCLUSIONS

- When corrected for specificity and sensitivity, rates of VL non-suppression among patients identified as stable during FastTrack enrolment were significantly higher than that reported by ZAMPHIA(1) (11%) and for a larger cohort of patients in government-run ART clinics supported by CIDRZ (4%).
- Community obtained DBS does not appear to be a suitable method of monitoring VL in Zambia when compared to plasma VL assessment.
- More research is underway to understand the discrepancy in results between community obtained DBS and that reported by the other studies in order to optimize community obtained DBS for VL monitoring.

REFERENCES

1. Zambia Population Based HIV Impact Assessment,2015-2016
2. Suresh R, Donn JC, et al. Factors associated with HIV RNA viral loads in ART naïve patients: implications for treatment as prevention in concentrated epidemics Journal of Virus Eradication 2016; **2**:36-42
3. PannusDataset: Sensitivity and specificity of dried blood spots for HIV-1 viral load quantification: a laboratory assessment of three commercial assays.

ACKNOWLEDGEMENTS

- We would like to thank Government of Republic of Zambia, the Zambian Ministry of Health, and the study participants.
- This study was funded through a grant from Bill& Melinda Gates Foundation
- Ethical approval was obtained from the University of Zambia Biomedical Research Ethics Committee, and the University of California, San Francis

REPUBLIC OF ZAMBIA

CONTACT INFORMATION

Mpande Mukumbwa-Mwenechanya
Centre of Infectious Diseases Research in Zambia (CIDRZ)
P.O. Box 34681
Lusaka, ZAMBIA
Mpande.Mwenechanya@cidrz.org