Durability of viral suppression among 2.4M people on HIV treatment: a national cohort study in South Africa

CROI Conference on Retroviruses and Opportunistic Infections

1200

Evelyn Lauren[1,2,+], **Jacob Bor**[1,3,4,5,+,*], Dickman Gareta[3,6,7], Khumbo Shumba[1], Mazvita Muchengeti[8], William MacLeod[1,4], Matthew P. Fox[1,4,5], Wendy Stevens[9,10], Tshepo Molapo[11], Thato Chidarikire[11], Dorina Onoya[1,+], Koleka Mlisana[9,12,+]

[1]Health Economics and Epidemiology Research Office, University of the Witwatersrand, Johannesburg, South Africa, [2]Department of Biostatistics, Boston University School of Public Health, Boston, MA, USA, [3]Africa Health Research Institute, Somkhele, South Africa, [4]Department of Global Health, Boston University School of Public Health, Boston, MA, USA, [5]Department of Epidemiology, Boston University School of Public Health, Boston, MA, USA, [6]Institute of Social and Preventive Medicine, University of Bern, Switzerland, [7]Graduate School for Health Sciences, University of Bern, Switzerland, [8]National Institute of Communicable Diseases, National Health Laboratory Service, South Africa, [9]National Health Laboratory Service, South Africa, [10]Diagnostic Innovations Hub, University of Witwatersrand, Johannesburg, South Africa, [11]HIV/AIDS and STIs Cluster, National Department of Health, Pretoria, South Africa , [12]School of Laboratory Medicine and Medical Sciences, University of KwaZulu Natal, Durban, South Africa; [+]equal contributions

BACKGROUND

- **Undetectable = Untransmissible (U=U):** People living with HIV (PLHIV) who take antiretroviral therapy (ART) and maintain a viral load (VL) <200 copies/ml) cannot transmit HIV sexually[1]
- Efficacy and acceptability of U=U as clinical guidance hinges on the extent to which PLHIV can maintain viral suppression
- South Africa has the largest HIV treatment program in the world; however, durability of viral suppression is not known

DATA SOURCE

South Africa's NHLS National HIV Cohort

- National Health Laboratory Service (NHLS) conducts all VL testing for South Africa's public-sector HIV program
- A novel unique patient identifier was created via record linkage, enabling longitudinal analysis of the NHLS database
- Linkage had 94% Sensitivity, 99% Positive Predictive Value[2,3]

STUDY POPULATION

All PLHIV aged 15-59 years in South Africa's public sector HIV treatment program who had a VL <200 copies/ml from March 2015-September 2016 (**N = 2,383,871**)

OUTCOME MEASURES

1. VL monitoring at 12 months

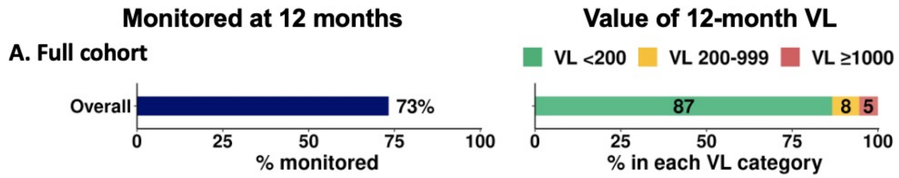
- Any VL test 6-18 months after baseline

2. Value of 12-month VL (and associated transmission risk[4])

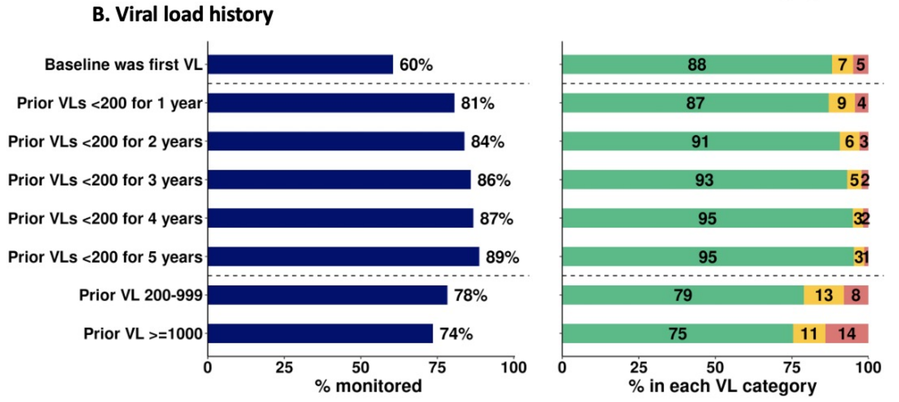
- 12-month VL <200 copies/ml (**ZERO RISK**)
- 12-month VL 200-999 copies/ml (**NEGLIGIBLE RISK**)
- 12-month VL ≥1000 copies/ml (**ELEVATED RISK**)

RESULTS

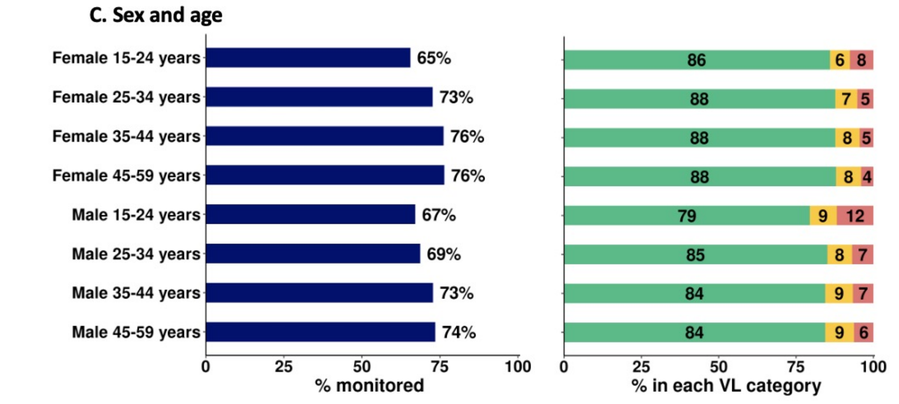
- Among PLHIV with VL <200 copies/ml at baseline, 73% had a 12-mo VL
- Of these, 87% had a 12-mo VL <200 copies; 95% had a VL <1000 copies/ml



- Patients with a history of VL suppression before baseline were more likely to be monitored and have sustained VL suppression at 12 months
- Low rates of 12-month VL monitoring in patients newly in care



- Younger PLHIV were less likely to be virally monitored
- Viral suppression was highly durable in nearly all age/sex strata



CONCLUSION

Viral suppression is highly durable in South Africa's public sector HIV program. Among PLHIV who were virally suppressed and monitored at 12-months, 95% still had zero or negligible risk of HIV transmission.

REFERENCES

1. Eisinger RW, Dieffenbach CW, Fauci AS. HIV viral load and transmissibility of HIV infection: undetectable equals untransmittable. *JAMA*. 2019;321(5): 451-452.
2. Bor J, MacLeod W, Oleinik K, Potter J, Brennan AT, Candy S, et al. Building a national HIV cohort from routine laboratory data: probabilistic record-linkage with graphs. bioRxiv. 2018; doi:10.1101/450304
3. MacLeod WB, Bor J, Candy S, Maskew M, Fox MP, Bulekova K, et al. Cohort profile: the South African National Health Laboratory Service (NHLS) National HIV Cohort. *BMJ Open*. 2022; 12(10):e066671.
4. Broyles LN, Luo R, Boeras D, Vojnov L. The risk of sexual transmission of HIV in individuals with low-level HIV viraemia: a systematic review. *The Lancet*. 2023; 402(10400): 464-471.

ACKNOWLEDGMENTS

We are grateful to South Africa's National Department of Health, NHLS, and the patients and providers who generated the data.

We acknowledge financial support from U.S. National Institutes of Health 1R01AI152149 "Evaluating UTT with a National HIV Cohort to Optimize South Africa's HIV Response" (JB, DO, EL, DG, KS, WM, MPF). MPF was additionally supported by the National Institute of Mental Health under Award Number R01MH121998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the US National Institutes of Health nor of the South African Department of Health.

QUESTIONS / FEEDBACK?

Jacob Bor (jbor@bu.edu), HE²RO & Boston University