Poster Number: 01078

MOBILITY, NEW HIV INFECTIONS AND PROGRESS TOWARD THE 90-90-90 TARGETS IN NAMIBIA

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Background

The southern African nation of Namibia has both high migration rates and a large burden of HIV, yet little is known about how these intersect. The population of Namibia is highly dispersed, and urbanization, poverty, and climatic events such as flooding or drought requiring frequent adaptation and mobility. The effects of migration are highly contextual, but it has been shown to be a key driver of HIV transmission in sub-Saharan Africa, in part due to social disruption leading to high-risk behaviors such as sexual partner concurrency and transactional sex. Mobility has also been associated with delayed HIV diagnosis and poor linkage and retention in care. We assessed the impact of mobility on HIV transmission and treatment outcomes using data from the nationally representative 2017 Namibia Population-based HIV Impact Assessment (NAMPHIA).

Methods

NAMPHIA included a stratified multistage probability sampling design, to select a sample of adults aged 15–64 years. Recent infection (<130 days) was measured using HIV-1 LAg avidity, excluding samples with a viral load less than 1000 copies/ml or with detectable antiretrovirals (ARVs). Awareness of HIV status and ARV use were based on self-report and/or detectable ARVs in blood. Viremia was defined as no viral load suppression (VLS, <1000 copies/ml) regardless of serostatus; community viremia was a weighted average across the sampled enumeration area, and excluded those diagnosed as recently infected. Ever migrants (EMs) included those who had lived outside their home region, or away from home for longer than a month in the past 3 years. Recent in-migrants (RMs) were those who moved to the community <2 years prior, even if this was an intra-regional move, compared to long-term in-migrants (LIMs). Hazardous alcohol use was defined using the AUDIT-C scale. We assessed associations using logistic regression-EMs were compared to those without any reported significant migration (classified as non-migrants (NM)). To assess the timing of risk of in-migration, RMs were compared to LIMs.

Results

84% (9,671/11,510) of women and 73% (7,268/9,954) of men completed questionnaires and testing for HIV. 6.1% reported living outside Namibia, 52.5% had lived in another region, and 28.8% had lived away from home for >1 month, for a total of 62.5% of adults classified as EM; 15.3% of adults were RM. HIV prevalence was 12.6%, and did not differ by migration status, but was highest closer to the border with Angola and in the Zambezi region where there are many cross-border migrants (Figure 1a). Population VLS was 77.4%, but there were clusters of high viremia, particularly along the B1 highway from South Africa (Figure 1b). RM was associated with recent HIV infection (aOR 4.01; 95% CI: 0.99–16.22) after adjusting for community viremia. Both EM and RM had lower proportions of VLS primarily due to less awareness of being HIV positive (Figure 2)-if aware, there were no significant differences in proportion on ART for EM or RM. There was weak evidence that RM on ARVs had less VLS than long-term in-migrants (93% vs. 88%, p=0.059). On multivariable analysis (Table), adjusted odds of VLS were low for EM (aOR, 0.73; 95% CI 0.55-0.97), for RM (aOR, 0.57; 95% CI: 0.35–0.92) and for those with hazardous alcohol use (aOR, 0.29; 95% CI: 0.45–0.92).

Table

	Outcomes				
	VLS aOR (95% CI) (n=2,433)	**Recent HIV infection aOR (95%CI) (n=9,820)[a]**		**VLS aOR (95% CI) (n=1,461)**	**Recent HIV infection aOR (95%CI) (n=5,845)[a]**
Ever migration	**0.73 (0.55-0.97)***	1.27 (0.30-5.36)	**Recent in-migration**	**0.57 (0.35-0.92)***	**4.01 (0.99-16.22)***
Age (per year increase)	**1.05 (1.04-1.06)*****	0.98 (0.95-1.02)	**Age (per year increase)**	1.06 (1.04-1.08)***	1.01 (0.97-1.05)
Female sex	**1.92 (1.49-2.47)*****	**4.66 (1.51-14.42) ****	**Female sex**	2.23 (1.54-3.22)***	2.23 (0.63-7.88)
Wealth quintile (per 1 increase)	NI	0.81 (0.48-1.38)	**Wealth quintile (per 1 increase)**	NI	**0.48 (0.29-0.82)****
Worked in past 12 months	**0.70 (0.54-0.90)****	NI	**Worked in past 12 months**	0.64 (0.08-0.51)**	NI
Hazardous drinking	**0.33 (0.22-0.49)*****	NI	**Hazardous drinking**	0.29 (0.45-0.92)*	NI
Community viremia	NI	0.96 (0.82-1.13)	**Community viremia**	NI	1.11 (0.99-1.23)

Maps with spatial interpolation to estimate prevalence of each outcome in adults aged 15-64 using inverse density weighting. (A) Weighted prevalence of ever migrants (%) in adults. Black lines indicate national administrative regions. (B) Weighted HIV prevalence (%) in adults. (C) Weighted prevalence of HIV viremia in adults (ie, proportion of population with an HIV viral load >1000 copies/ml, regardless of serostatus). The migration flows were derived from Worldpop micro-census data. The black line indicates the B1 highway from South Africa to Angola.

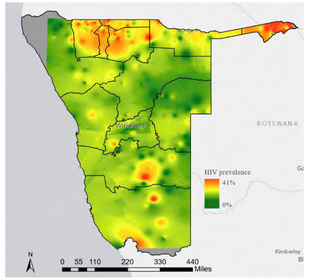


Figure 1a: Prevalence of HIV in Namibia, 2017

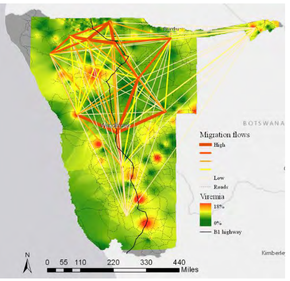
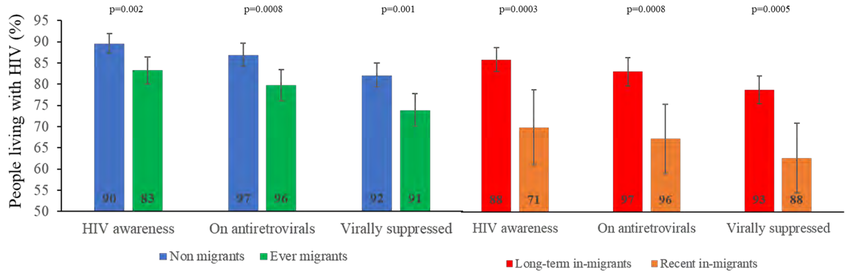


Figure 1a: Prevalence of HIV viremia with migration flows overlaid



Inset numbers are conditional percentages, and bar height indicates the proportion of all people living with HIV (PLHIV). Antiretroviral status was determined by self-report and/or those who tested positive for nevirapine, lopinavir, and efavirenz. P-values indicate significance of difference between overall proportions, using chi-squared analysis on weighted data. There were no significant differences between conditional percentages.

Figure 2. Awareness of HIV diagnosis, antiretroviral status, and viral suppression by migration status in Namibia (2017).

Conclusion

The study demonstrated that despite a high population-level VLS, there are still populations lagging in accessing effective prevention and treatment for HIV in Namibia. The association between migration and HIV acquisition and lack of VLS should be further assessed using targeted surveys of priority populations, such as fishing communities, and transport and domestic workers. Viremia appeared to map along the B1 highway; continued scale-up of testing and treatment at sites along this major route might be an efficient way to interrupt transmission and improve access to care. Understanding how to reach at-risk migrants with prevention and treatment can help optimize the national HIV response.

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This research was supported by the United States President's Emergency Plan for AIDS Relief (PEPFAR) through the U.S. Centers for Disease Control and Prevention (CDC) under the terms of Cooperative Agreement Number #U2GGH001226. The contents are solely the responsibility of ICAP and do not necessarily reflect the views of the United States Government.