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Age-stratified sexual partner profiles to characterize HIV risk across lifespan – Botswana and Zambia

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BACKGROUND

- Accurately predicting the age and sex distribution of HIV over time is critical for precision interventions and resource planning.
- Progress towards epidemic control and changes in sexual partnership patterns over time impact this distribution.
- Characterizing age- and sex-specific sexual partner matrices may improve prediction accuracy and better inform programming for epidemic control.

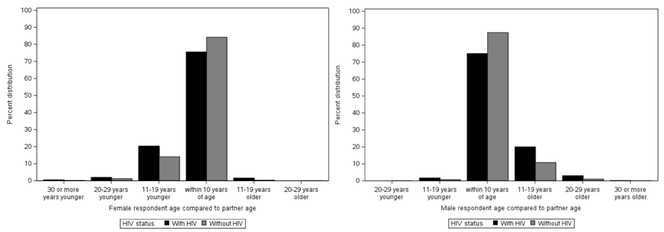
METHODS

- We used data from repeated PHIA surveys in Zambia and Botswana to create partner matrices.
- For respondents with viral nonsuppression (NVLS= >1000 copies/mL) we extracted the mean number of partners in the last 12 months, stratified by age, sex, and partner HIV status.
- Partner matrices in Zambia from 2021 against those from 2016 were compared (prior NVLS data was unavailable for Botswana).
- Intergenerational partnerships (IP), defined as sexual partner +/- 10 years of age, by HIV status, age, and sex, and condomless sex (CS) among people with HIV (PWH) with NVLS were estimated.
- Estimates and 95% confidence intervals (95% CI) are weighted.
- Jackknife methods were used to estimate variance.

RESULTS

In Zambia mean number of serodifferent female partners increased among NVLS males in younger age groups and decreased in older males where seroconcordant female partners increased. Mean serodifferent same sex partners decreased among males aged 40-44 and seroconcordant increased among NVLS males 45-49. In Zambia, prevalence of IP increased 23% among males and 28% among females. Prevalence of CS with last partner among NVLS males decreased in Zambia from 48% (43-54) to 14% (11-18) and from 44% (40-47) to 15% (6-25) among NVLS females. CS among males and females with NVLS who were aware of their HIV status was similar over time, 70% (57-81) in 2016 vs 79% (62-96) in 2021 and 73% (66-80) in 2016 vs 67% (19-100) in 2021. In Botswana in 2021, prevalence of IP was 17% among males and 20% among females, similar age pattern as Zambia. Prevalence of CS within NVLS males and females was 10%. Among males and females aware of their status with NVLS CS was 9% (0-19) and 30% (12-49). Prevalence of IP among PWH was higher than among HIV-negative people in both countries regardless of sex.

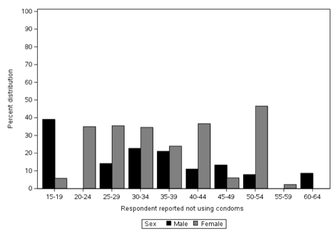
This research was supported by the National Institute Of Allergy And Infectious Diseases of the National Institutes of Health under Award Number R21AI179493. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.



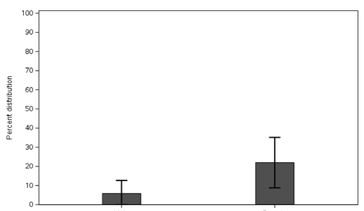
Pattern of intergenerational partnerships by sex and HIV status, Botswana 2021

Mean age difference in sexual partner age by sex and HIV status, BAIS 2021

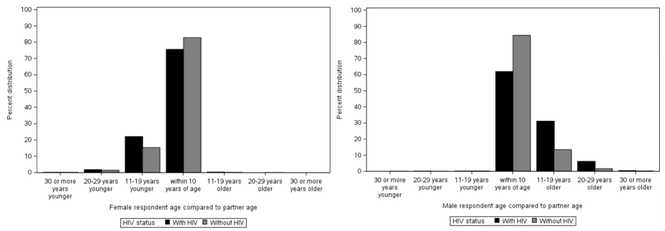
	Partner 1 of up to 3 most recent	
	Male respondents	Female respondents
Final HIV status determination in BAIS V 2021	Age difference in years (weighted mean & 95% CI)	Age difference in years (weighted mean & 95% CI)
Positive	5.2 (4.6, 5.8)	-5.0 (-5.4, -4.7)
Negative	3.7 (3.5, 3.9)	-4.9 (-5.1, -4.6)
	Partner 2 of up to 3 most recent	
Positive	6.8 (4.4, 9.1)	-3.1 (-4.2, -2.0)
Negative	3.4 (2.9, 3.9)	-4.6 (-5.2, -4.1)
	Partner 3 of up to 3 most recent	
Positive	8.3 (3.6, 13.0)	-2.9 (-4.6, -1.2)
Negative	2.8 (2.2, 3.5)	-4.4 (-5.3, -3.5)



Proportion of people with a viral load >1,000 copies/mL who had condomless sex with last partner by age and sex, Botswana 2021



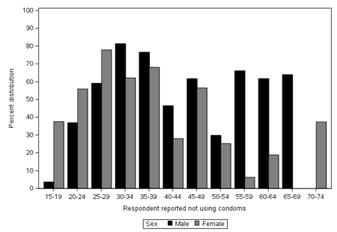
Proportion of people aware of their HIV status with a viral load >1,000 copies/mL who had condomless sex with last partner by age and sex, Botswana 2021



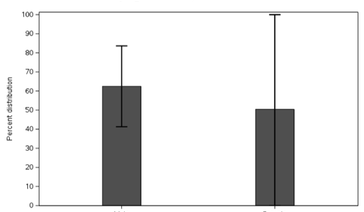
Pattern of intergenerational partnerships by sex and HIV status, Zambia 2021

Mean difference in sexual partner age by sex and HIV status, ZAMPHIA 2021

	Partner 1 of up to 3 most recent	
	Male respondents	Female respondents
Final HIV status determination in ZAMPHIA 2021	Age difference in years (weighted mean & 95% CI)	Age difference in years (weighted mean & 95% CI)
Positive	8.0 (5.9 – 10.1)	-6.4 (-6.8 – -6.0)
Negative	5.4 (5.2 – 5.3)	-5.9 (-6.1 – -5.7)
	Partner 2 of up to 3 most recent	
Positive	10.6 (9.0 – 12.3)	-7.6 (-9.5 – -5.6)
Negative	5.5 (5.1 – 5.9)	-5.8 (-6.6 – -4.9)
	Partner 3 of up to 3 most recent	
Positive	11.4 (9.1 – 13.7)	-7.2 (-9.4 – -5.0)
Negative	5.2 (4.7 – 5.8)	-6.0 (-8.6 – -3.4)

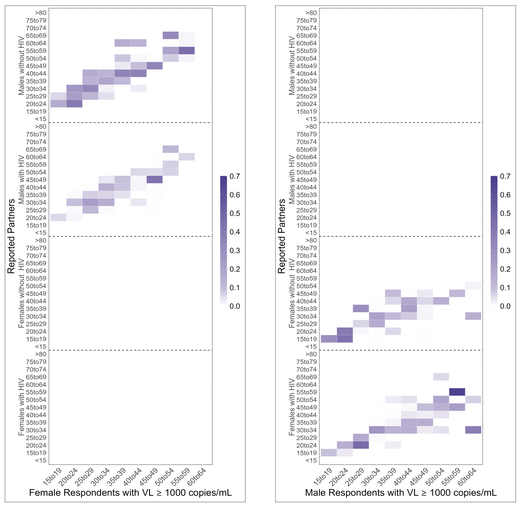


Proportion of people with a viral load >1,000 copies/mL who had condomless sex with last partner by age and sex, Zambia 2021

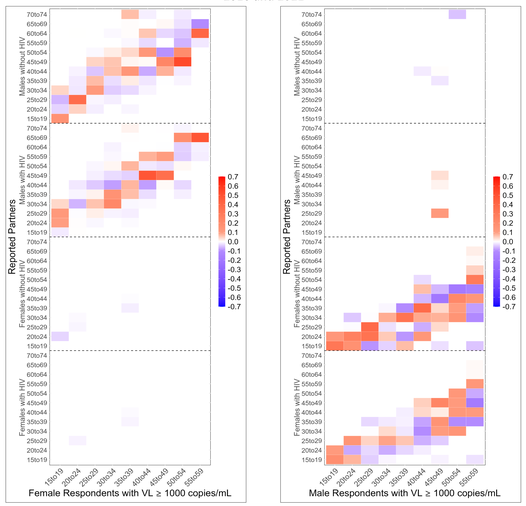


Proportion of people aware of their HIV status with a viral load >1,000 copies/mL who had condomless sex with last partner by age and sex, Zambia 2021

Mean number of sexual partners in the last 12 months among HIV-positive BAIS V survey respondents with a viral load > 1,000 copies/mL, by age and sex—Botswana 2021



Difference in mean number of sexual partners in the last 12 months among HIV-positive ZAMPHIA survey respondents with a viral load > 1,000 copies/mL, by age and sex—Zambia 2016 and 2021



CONCLUSIONS

Sexual partner profiles change within and across age/sex specific groups over time which can influence patterns of HIV acquisition risk. Differences in progress towards epidemic control in Zambia and Botswana appear to be reflected in the prevalence of IP and CS among people with a viral load high enough to transmit to their partners. Reaching status aware NVLS PWH is important for epidemic control.