

Age of friends and norms about sexual behaviour are associated with HIV and HSV-2 status amongst young South African women in the HPTN 068 study



E Fearon¹, RD Wiggins², AE Pettifor³, C MacPhail^{4 10}, K Kahn^{5 8 9}, A Selin³, FX Gómez-Olivé^{5 9}, E Piwowar-Manning⁶, O Laeyendecker⁷, JR Hargreaves¹

¹ Social and Environmental Health Research, London School of Hygiene and Tropical Medicine; ² Department of Quantitative Social Science, Institute of Education, University College London; ³ Department of Epidemiology, Gillings School of Global Public Health, University of North Carolina Chapel Hill; ⁴ Wits Reproductive Health and HIV Institute, University of the Witwatersrand; ⁵ Medical Research Council/Wits University Rural Public Health and Health Transitions Research Unit; ⁶ Department of Pathology, Johns Hopkins School of Medicine; ⁷ Division of Infectious Diseases, Johns Hopkins School of Medicine; National Institute of Allergy and Infectious Diseases, National Institutes of Health; ⁸ Centre for Global Health research, University of Umeå; ⁹ INDEPTH Network; ¹⁰ School of Health, University of New England.

Introduction

South Africa has a severe HIV epidemic with young women highly at risk. While sexual behaviours are important in determining risk, these are conditioned by the social environment in which young women live.

Friendships are a key part of young people's social environment and might serve as conduits for dominant norms about gender and sexuality, as well as for information and resources and as network connections to sexual partners.

Our research aimed to examine how young women's friendships might affect their risk of acquiring HIV and Herpes Simplex Virus Type 2 (HSV-2) infections.

Methods

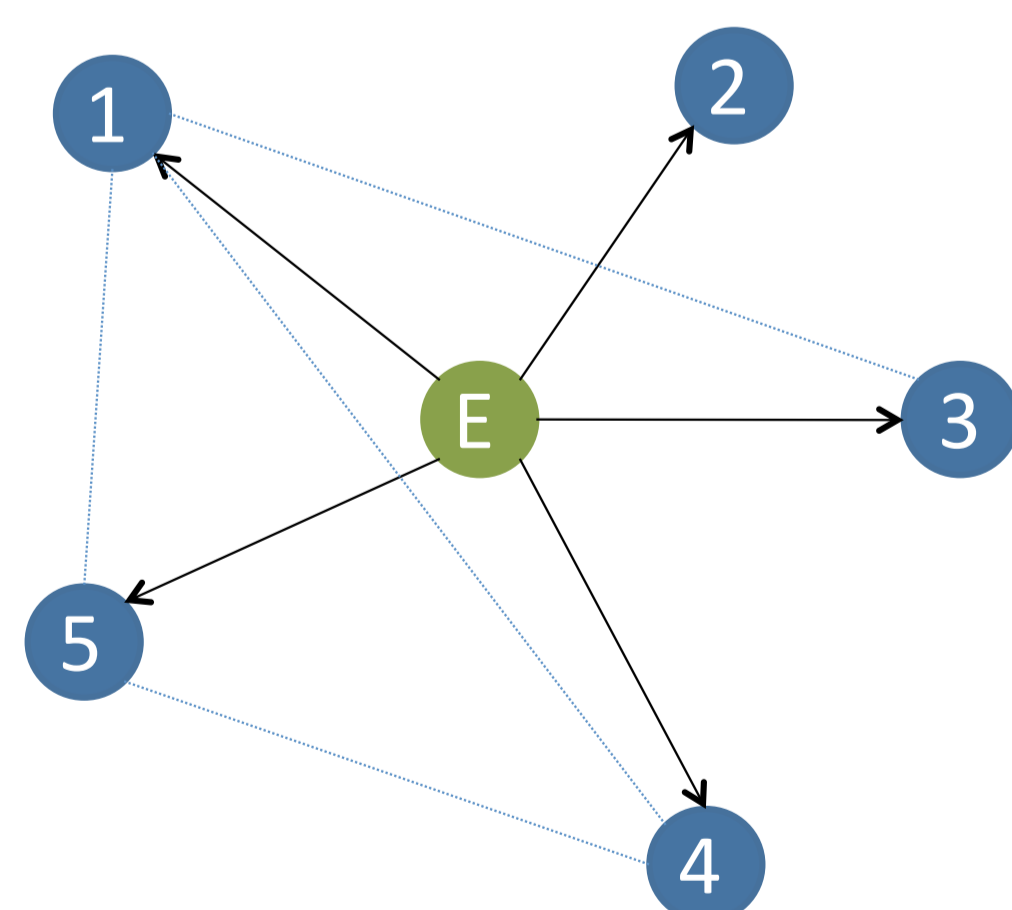
2325 13-20 year-old young women resident in the Agincourt demographic surveillance site, northeast South Africa (Fig 1).

Cross-sectional study using the baseline of HPTN 068 Swa Koteka Conditional Cash Transfer trial, 2011-2012.



Fig. 1 Location of Agincourt study site

Questionnaire modules on demographics, family, education, and sexual behaviour. Each young woman described 5 friendships without identifying friends.



Outcomes: Blood tests for HIV, HSV-2
Friendship net exposures: Age, gender, whether relative, student status, perceived sexual behaviour
Possible confounders: participant's age, grade, household socio-economic status, attributes of mother/father

Fig. 2 Illustration of participants' friendship nets, with 'E' for the participant and 5 friends

Summary measures of 5 friends to describe the 'friendship net'.

Logistic regression to analyse associations with HIV and HSV-2 status, adjusted for characteristics of participants. Entered first friendship net socio-demographic characteristics (Model 1), and secondly perceived friend sexual behaviour (Model 2).

Excluded those HIV positive and reporting never had sex as possible perinatal infections (n=37, and investigated the plausibility of this assumption (not shown here).

Note: There are small updates being made to baseline data at present. There are now 77 confirmed HIV+ participants and 99 HSV-2 positive participants included in the friendship analysis. Re-analysing the data with these updates has made very little difference to findings and has not changed conclusions.

Results

Majority of friends were female, of a similar age, attending school and 22% were also relatives.

73 young women were HIV positive and 108 HSV-2 positive.*

Each additional friend ≥ 1 year older than the participant was associated with 1.45 times the odds of HIV (95% CI 1.09-1.93), and 1.45 times the odds of HSV-2 (95% CI 1.22-1.73).

Perceiving each additional friend to have had sex was associated with 1.32 times the odds of HIV (95% CI 1.04-1.68), and 1.21 times the odds of HSV-2 (95% CI 1.06-1.38).

Little evidence that more friends in school, male friends or relative friends were associated with HIV or HSV-2 once adjusted for other friendship net characteristics.

Table 1 Adjusted associations between HIV status and friendship characteristics, n=2289

Friendship Net Characteristics	n (%) HIV+	Model 1			Model 2		
		OR	95% CI	p value	OR	95% CI	p value
Each additional friend perceived to have had sex	1.8 mean HIV- 3.7 mean HIV+				1.32	1.04 1.68	0.020
Each additional friend ≥ 1 year older than participant	1.0 mean HIV- 1.5 mean HIV+	1.45	1.09 1.93	0.014	1.33	0.99 1.79	0.063
No male friends	28/2000 (1.4)	1		0.121	1		0.087
≥ 1 male friend	9/289 (3.1)	2.00	0.87 4.63		2.17	0.93 5.03	
All friends in school	20/1814 (1.1)	1		0.631	1		0.690
≥ 1 friend out of school	17/475 (3.6)	1.22	0.54 2.73		1.18	0.53 2.62	
Each additional friend who is a relative	2.2 mean HIV- 2.9 mean HIV+	1.03	0.90 1.18	0.692	1.04	0.90 1.19	0.629

Table 2 Adjusted associations between HSV-2 status and friendship characteristics, n=2325

Friendship Net Characteristics	n (%) HSV-2+	Model 1			Model 2		
		OR	95% CI	p value	OR	95% CI	p value
Each additional friend perceived to have had sex	1.7 mean HSV-2- 3.2 mean HSV-2+				1.21	1.06 1.38	0.005
Each additional friend ≥ 1 year older than participant	1.0 mean HSV-2- 1.3 mean HSV-2+	1.45	1.22 1.73	<0.001	1.36	1.14 1.63	0.001
No male friends	90/2028 (4.4)	1		0.309	1		0.307
≥ 1 male friend	18/297 (6.1)	1.35	0.76 2.40		1.36	0.77 2.40	
All friends in school	71/1837 (3.7)	1		0.923	1		0.989
≥ 1 friend out of school	37/488 (7.6)	1.02	0.63 1.67		1.00	0.62 1.63	
Each additional friend who is a relative	2.2 mean HSV-2- 2.2 mean HSV-2+	0.93	0.85 1.02	0.110	0.93	0.85 1.02	0.124

Adjusted for participant age, school grade, orphanhood, socio-economic position, parents' education.

Conclusions

- Having a higher proportion of older friends and friends perceived to have had sex was associated with HIV and HSV-2 infection among young women in South Africa.
- Influence from friends on HIV and HSV-2 risk could occur via norms, or via the social network connections of older friends.
- Investigating friendships and HIV and HSV-2 in the study longitudinally would strengthen the evidence for causality.
- Findings could be applicable both to peer education interventions and to interventions that influence young women's social environments and characteristics of the friendships that they might form.