

Friendships and HIV among young women in sub-Saharan Africa

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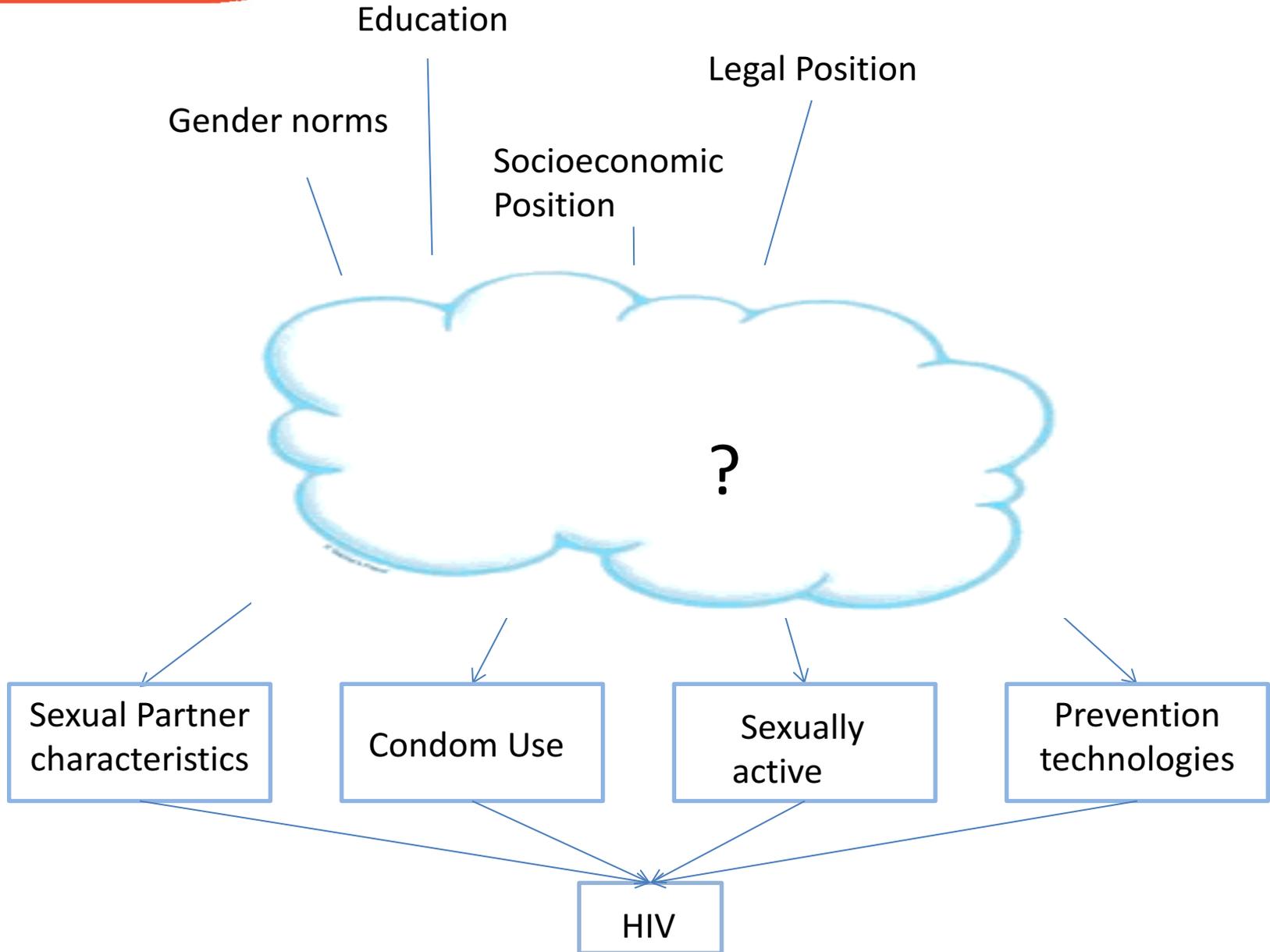
Richard Wiggins, Audrey Pettifor, James Hargreaves

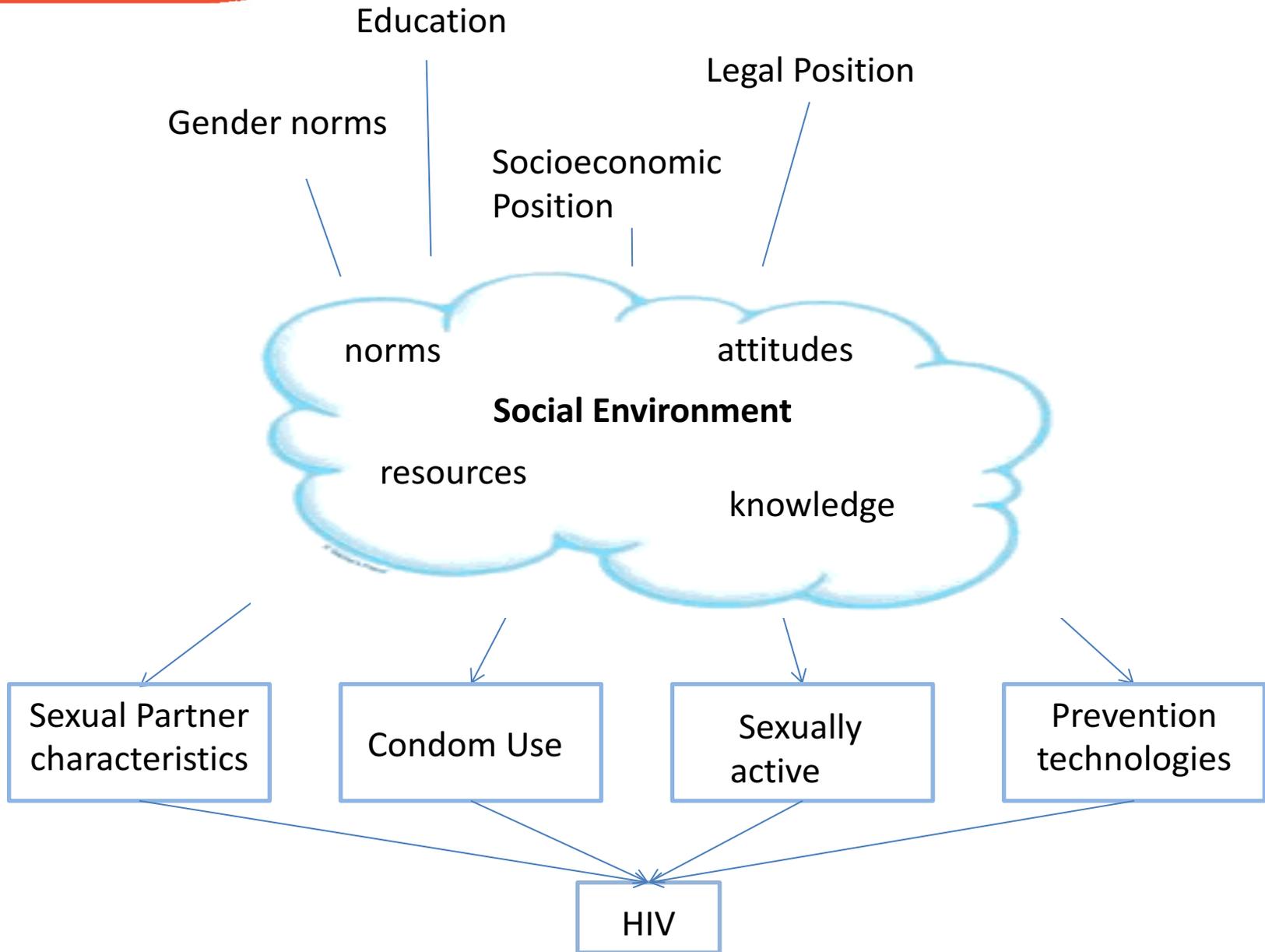
Outline

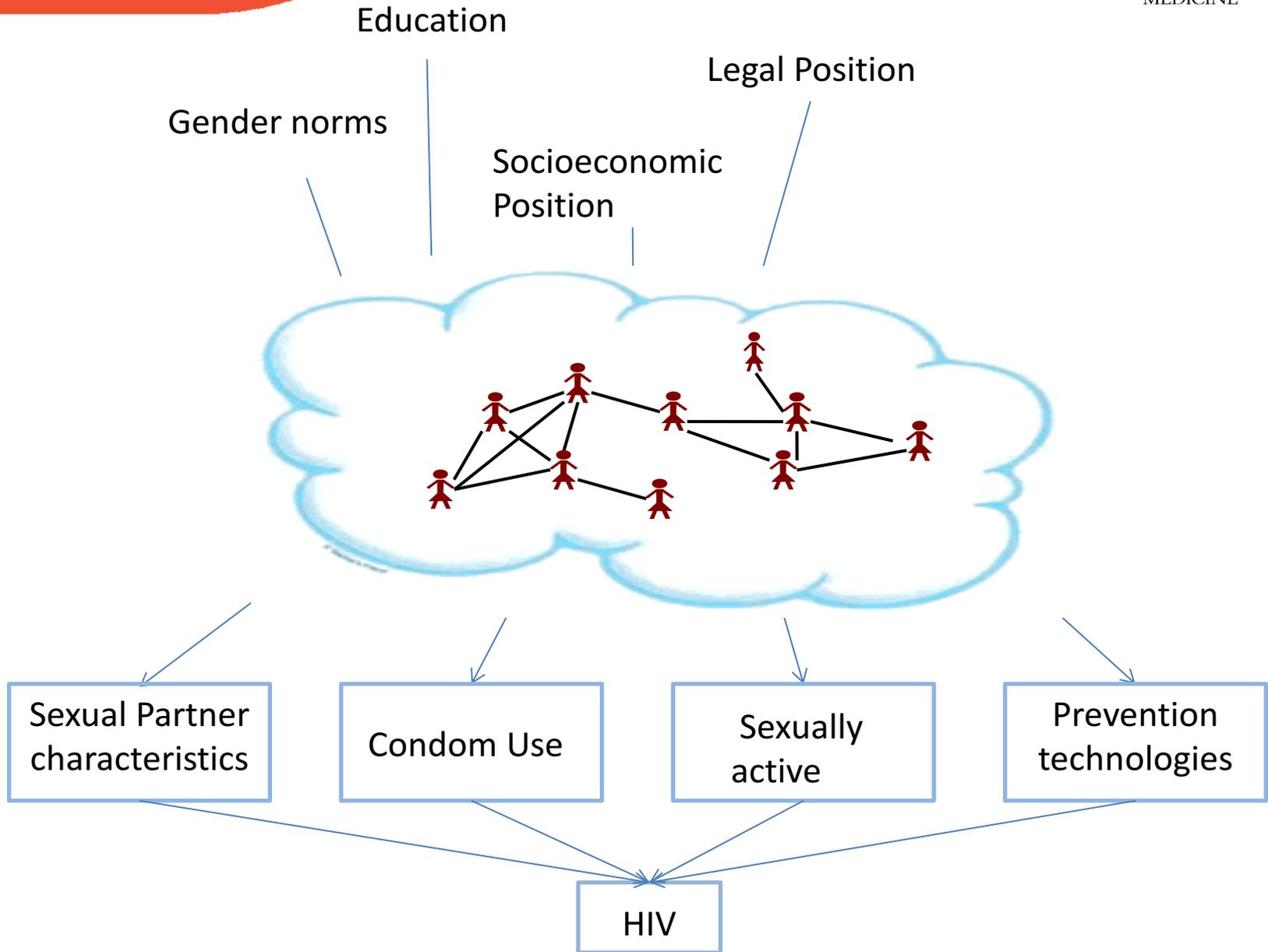
- Young South African women and HIV
- Systematic review of peer influences on young people's sexual behaviour
- Friendships study
 - Hypotheses and research questions
 - Methods
 - Findings
- Discussion: friendships and risk of HIV

Young South African Women and HIV

- Highly at risk, continued high incidence
- Prevalence rises with age as young women become sexually active
- HIV associated with sexual behaviours (condom use, number of partners) but also characteristics of sexual partners themselves
- Structural factors important: norms about gender and sexuality, social and economic position of young women, education status and attainment







Adolescents and the influence of their peers

- People in general subject to influence of their peers, peaking in adolescence
- Long tradition of study of 'peer influence' in social psychology, sociology, criminology and health sciences
- Evidence of peer influence on health related behaviours: obesity, sexual behaviour, contraceptive use, depression, alcohol and substance use.....
- Qualitative evidence suggests that friends play a role in young people's romantic and sexual life but relatively little quantitative research from sub-Saharan Africa

Systematic Literature Review

Is there quantitative evidence that young people in sub-Saharan Africa are influenced by their peers in their sexual behaviour?

- Guided by PRISMA methodology, searched 4 databases
- 30 studies; 11 retained following quality assessment
- 3 cohort studies, 1 time-to-event and 7 cross-sectional
- 37 different peer exposure-outcome associations
- No biologically assessed outcomes of sexual behaviour
- None of 11 studies investigating status or peer communications

Types of peer exposure and hypothesised influence

1. **Peer socio-demographic attributes** (age, gender, etc): influence whom an adolescent comes into contact with via social connections
2. **Perceived peer behaviours** (descriptive norms): provide models of behaviour to be emulated
3. **Peer approval** (injunctive norms): cause adaptations to behaviour; might or might not differ from the behaviours that adolescents perceive their friends to actually be engaged in
4. **Peer communication**: diffusion of information, perceived peer behaviours or norms; or provide a context to question or re-negotiate dominant norms.
5. **Peer connectedness**: social and emotional support; indicate the strength of the normative environment
6. **Status and position within the network of peer relationships**: determine an exposure to information, resources and behaviours; reflect popularity and status amongst peers.

Summary of evidence for effect by outcome types, exposure types and gender

Peer exposure type	Studies	Outcome types			
		Sexual debut	Condom use	Combined 'risky' sexual behaviour	Age of first sexual partner
Peer socio-demographic attributes	Lam et. al.	♦f, 0m			♦f, 0m
Perceived peer behaviours	Kabiru et. al.*	♦f, 0f*			
	Kawai et. al.	♦b			
	Harrison et. al.	0f, ♦m	♦m, 0f		
	Balabola et. al.	♦f, ♦m			
	Cherie et. al.	♦b			
	Brook et. al.			♦f, ♦m, ♦b	
Peer approval norms	Kawai et. al.	0b			
	Balabola et. al.		0b		
	Kakoko	♦b			
	McQuestion et. al.	♦f, ♦m			
Peer connectedness	Wild et. al.			♦f, 0m	
	Mkandawire et. al.	0f, 0m			

Key

- ♦ Good statistical evidence for effect ($p < 0.05$, 95% CI's do not cross the null)
- 0 Lack of statistical evidence for an effect ($p > 0.05$, 95% CI's cross the null)
- f Among females
- m Among males
- b Among both males and females in a pooled analysis

Conclusions Systematic Review

- Quantitative evidence for effect of peers on sexual behaviour among young people in sub-Saharan Africa is inconclusive: no clear patterns by gender, type of peer exposure or type of sexual behaviour outcome
- Lack of studies with biological, non-self-reported sexual behaviour outcomes
- Varied theoretical frameworks, theories of peer influence
- Inconsistent approaches to definition of 'peer', adjustment strategies, causal hierarchies
- Collect data on specific relationships rather than asking about peers in general

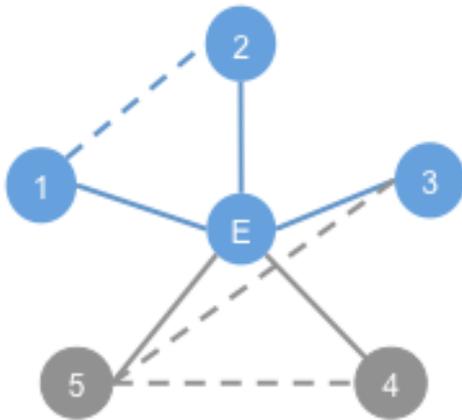


Social Network Analysis

Actors are not independent from each other but are interdependent.
Focus on the pattern of relational ties between individuals or groups.
Resources, ideas, messages travel along relational ties.
The structure that the network takes can create opportunities or constraints to the movement of norms, ideas, and resources along ties.

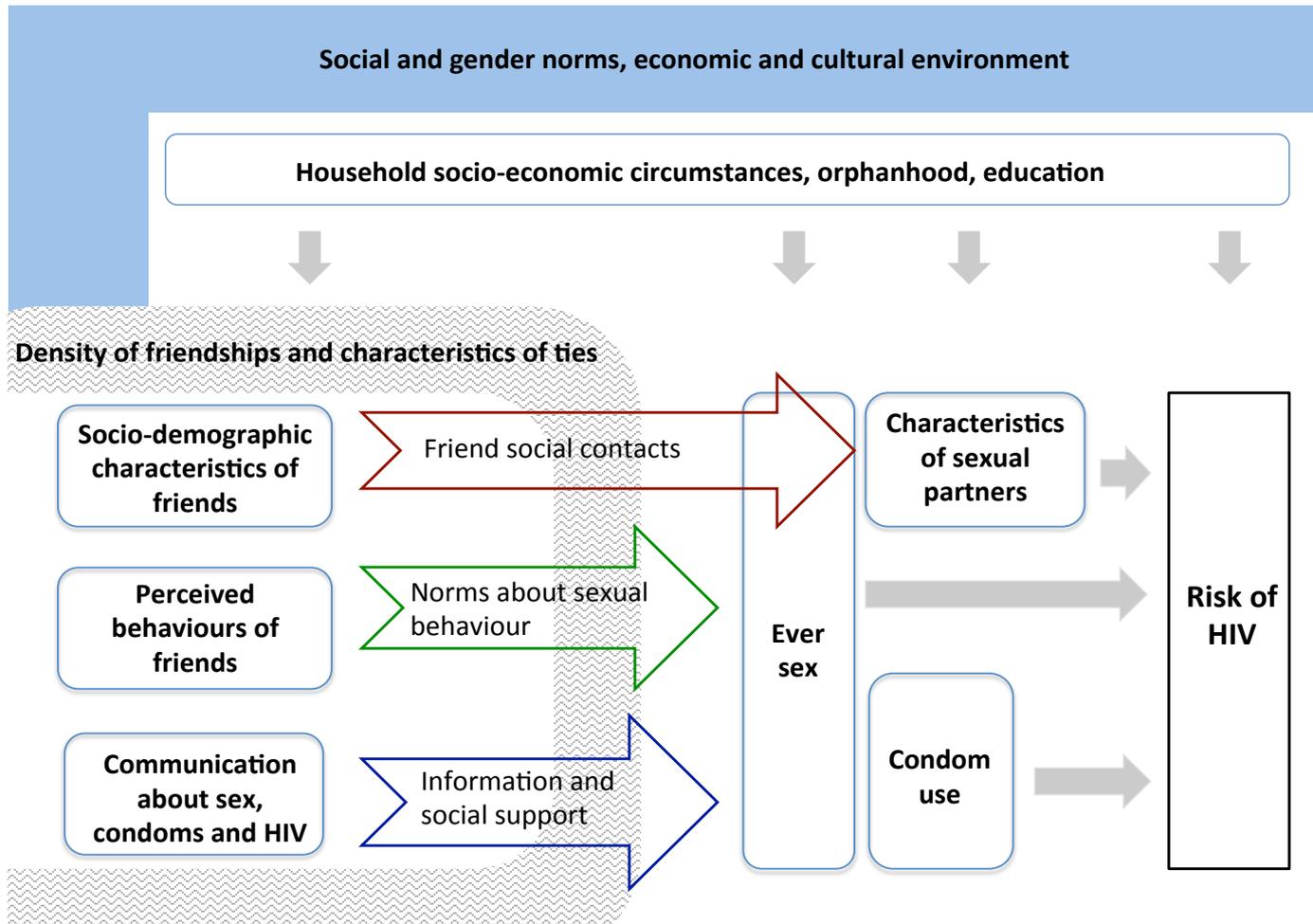
Adapted from Wasserman and Faust, Social Network Analysis, methods and applications, 1994

'Egocentric' Network



- Basis for constructing whole networks
- 'Egos' and the 'alters' to whom they are directly tied
- Can examine how the summarised attributes of alters are associated with outcomes on ego, '*personal network exposure*'

Role for Friendships in HIV risk



Research Questions

Are the characteristics of a young woman's friendship group important in determining her HIV risk?

1. Describe young women's friendship networks

2. Explore friendship net characteristics associations with HIV, HSV-2 status and self-reported sexual behaviour, characteristics of sexual partners

3. Explore different potential mechanisms of peer influence

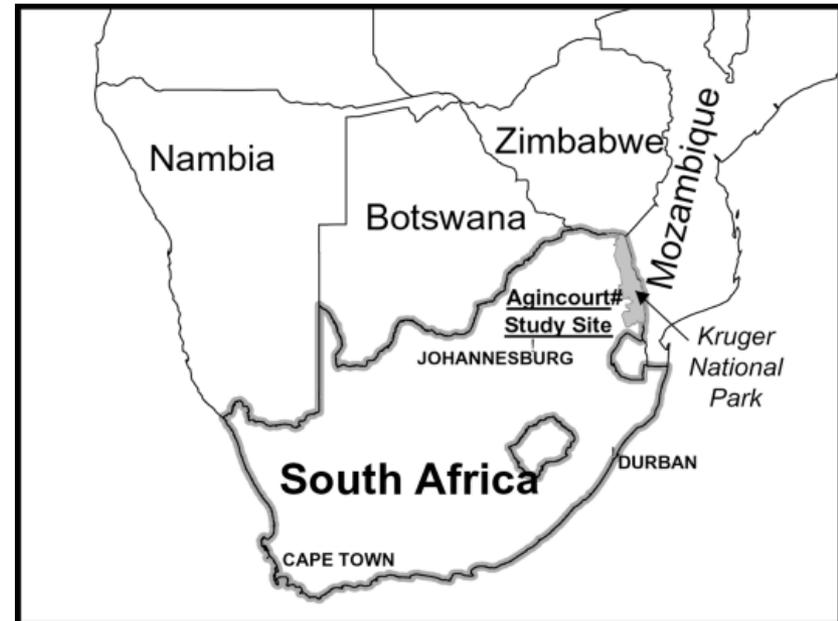
- Friend sociodemographic attributes
- Perceived friendship group norms about having sex
- Communication about sex, condom use and HIV
- Interconnection amongst friends

Potential effect modification:

- density – interconnectedness of friendship group
- duration of friendships and frequency of contact with friends

Methods: Study Site

- In Mpumalanga province
- Shangaan ethnic group
- Densely populated rural area
- Population approx 80,000, 28 villages
- High levels of poverty, fairly poor infrastructure, differs between villages
- High HIV prevalence



Yearly demographic census

Study Design

Cross-sectional, 'egocentric' friendship nets

Study Population: Young women enrolled in HPTN 068 Swa Koteka at baseline (2011-2012)

- Aged 13-20
- Eligible for grades 8-11 at school
- Not pregnant nor married at baseline



HPTN 068 Swa Koteka randomised control trial examining the effects of conditional cash transfers for young women to stay in school on HIV incidence.

- Young women individually randomised at baseline in 2011 to CCT on school attendance. Followed up yearly for 3 years
- Primary outcome: HIV incidence

Data Collection

Interviewer script: Now we want to ask you about five of your friends. We will ask you for initials for each friend. The initials you choose are only to help you remember which friend you are talking about as you answer questions, not to identify your friends. Over the following few minutes we are going to ask you some questions about each of these friends in turn. We will ask for information such as how long you have known each other, where your friend lives, and then something about what you talk about and what you do together. Please remember, we keep all information completely confidential.

1	What are the initials of your friend?	[]
<i>Coding instruction: Identify relationships between all friends before proceeding</i>		
2	What is the relationship between Friend [#] and Friend[#, #, etc.]	Never Met Friend Close friends Know each other but not friends Related by blood Related by marriage In a romantic / sexual relationship Other (specify)
<i>Coding instructions: Record friend grid details for 5 friends total.</i>		
3	What is this friend's gender?	Male Female
4	What is this friend's home village?	[]
5	What is this friend's age?	[]

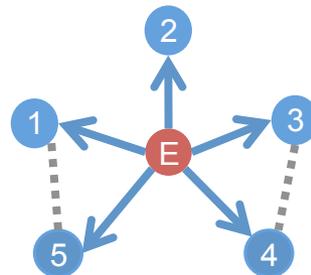
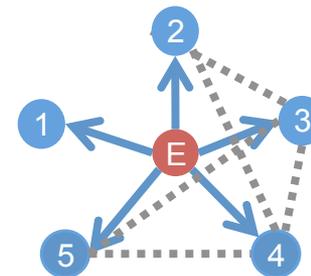
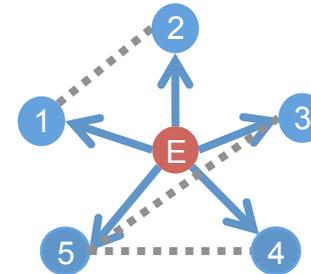
Measures

Participant: Outcomes including HIV, HSV2, reported sexual behaviour, sexual partners and partnership characteristics. Demographics, household characteristics.

Friend attributes: Age, gender, village, blood relative, student status, perceived sexual behaviour, discuss about sex, condom use and HIV

Participant-to-friend tie: Duration of tie, frequency of contact

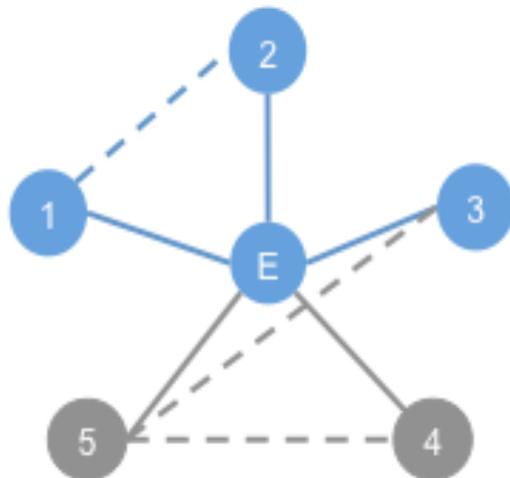
Friend-to-friend tie : Type of relationship between friends (also friends, don't know each other, relatives)



Friendship exposures

Main analysis: Personal Network Exposure

- Number of friends (proportional measures, rounded to nearest 'whole friend')
- Density of friendship net



Proportion of friends discussing
sexual experiences, condom use
and/or HIV

0.6

Density

0.3

Number of discussion triads

1

Statistical Analysis

- Description of friendship nets
- Logistic regression for HIV, HSV-2 and ever had sex outcomes
 - First adjusted participant age only
 - Then adjusted participant sociodemographic characteristics, friendship characteristics entering blocks of peer exposure types sequentially
 - Check for interaction by participant age
 - Effect modification by density of friendship group, duration of friendships, frequency of contact
- Linear regression with random effects for participant for age differences with sexual partners

Potential Perinatal HIV

- Friends not on a causal pathway for perinatal HIV acquisition
- Girls aged 13-20 in 2011-2012 born during period of very HIV incidence in South Africa and not access to PMTCT or ART
- Evidence that young women who were HIV positive and reported never having had sex were different than those reporting ever sex in a way suggestive of perinatally acquired HIV
- For investigating HIV outcome, excluded these young women from regression analyses

Young women participants

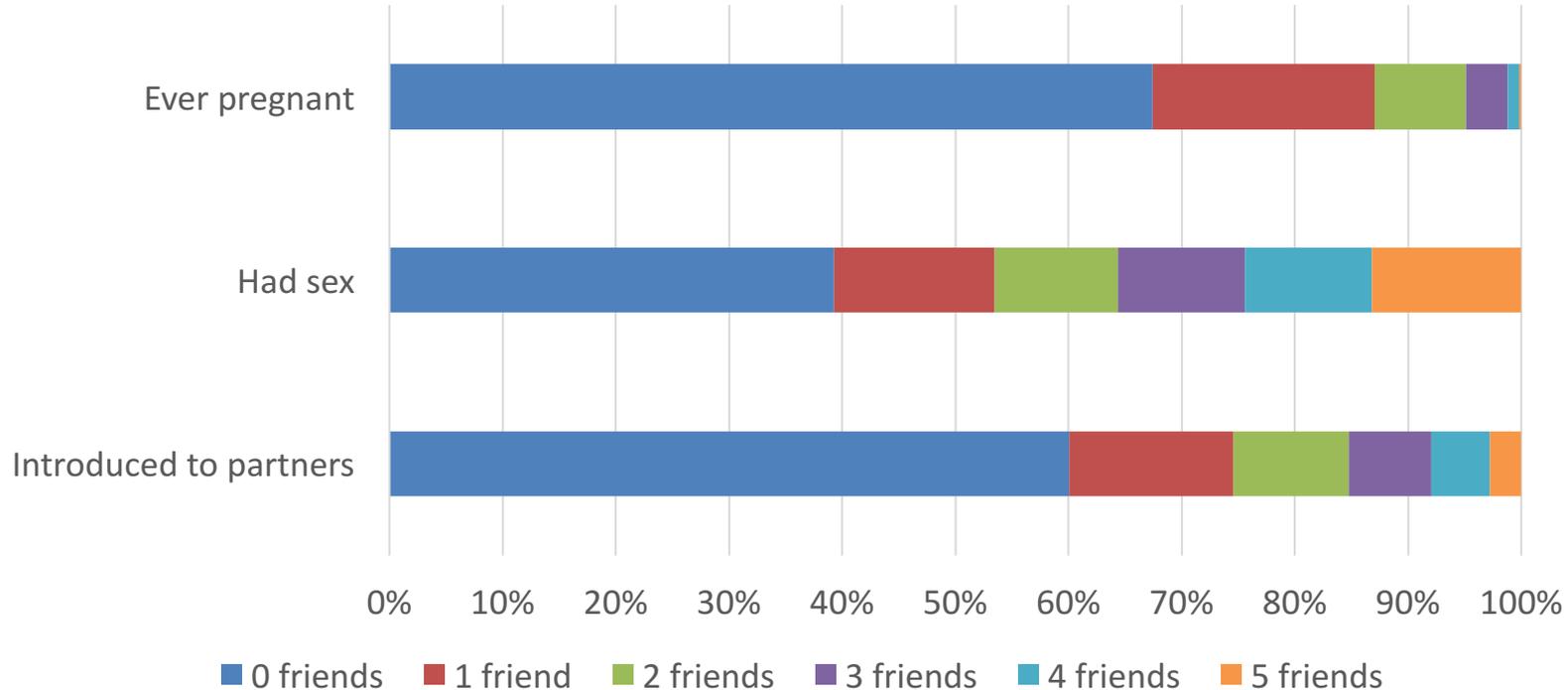
- 2326 young women
- Mean age was 15.5 years old, evenly spread across school grades
- 73/2326 HIV+ (3.3%)
- 106/2326 HSV-2+ (4.6%)
- 644/2326 young women reported ever having had sex (27.7%)
- 1051 sexual partners reported from 633 sexually active participants with data on age, median 2 years older than participants (mean 2.8 years).
- Little evidence that HIV status clustered by village or school

Attributes of young women's friendship nets

- High levels of homophily: majority female (96%), in-school (93%) and similar age (mean 15.9 versus 15.5 years), 19% at least one year older
- 74% in same school and 60% living in same village
- Many friends were also relatives (22%)
- Young women had known most of their friends for a long time (66% >3 years) and saw them frequently (86% most or every day)
- Dense friendship nets: mean of 7 friendship ties out of a possible 10

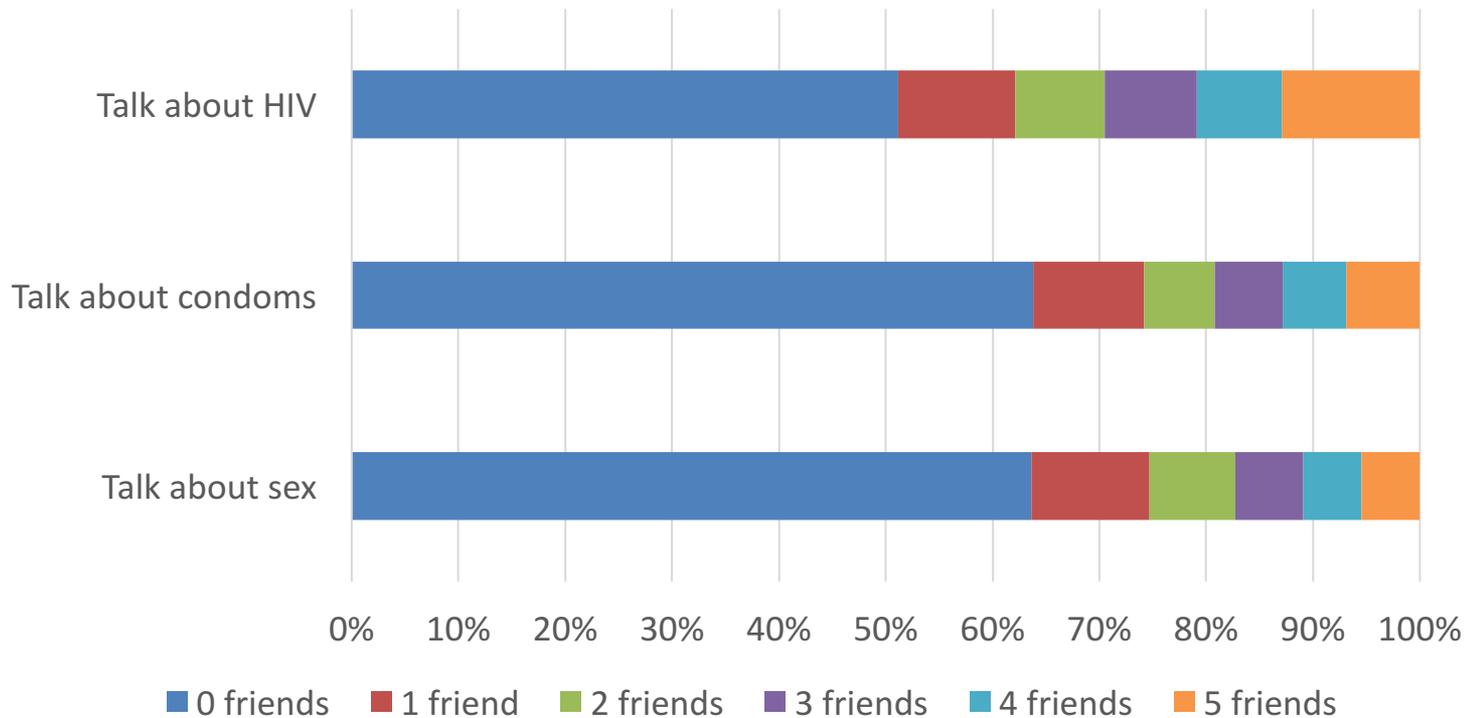
Sex and young women's friendship nets

Friendship nets and connections to partners, ever sex and pregnancy



Discussion of sex in young women's friendship nets

Friendship nets and discussion of sex, condom use and HIV



Mean of 1.3 discussion triads (sexually active) and 2.8 (never sex)

HIV

HIV, n=2290

	Model 1			Model 2		
	OR	95% CI	p value	OR	95% CI	p value
Each additional friend perceived to have had sex				1.29	1.03 1.63	0.025
Each additional friend ≥ 1 year older	1.37	1.03 1.82	0.036	1.26	0.94 1.69	0.123
No male friends	1.00			1.00		
≥ 1 male friend	1.75	0.77 3.98	0.202	1.85	0.81 4.22	0.163
All friends in school	1.00			1.00		
≥ 1 friend out of school	1.13	0.52 2.49	0.755	1.08	0.49 2.36	0.851
Each additional friend who is a relative	1.04	0.91 1.19	0.521	1.06	0.92 1.21	0.439

Adjusted for participant age in years, school grade, whether each parent was alive, household SEP, and mother's and father's education

HSV-2

HSV-2, n=2326

	Model 1			Model 2				
	OR	95% CI		p value	OR	95% CI		p value
Each additional friend perceived to have had sex					1.18	1.03	1.35	0.014
Each additional friend ≥ 1 year older	1.41	1.18	1.69	<0.001	1.34	1.11	1.61	0.002
No male friends	1.00			0.295	1.00			0.292
≥ 1 male friend	1.37	0.77	2.43		1.37	0.77	2.43	
All friends in school	1.00			0.734	1.00			0.808
≥ 1 friend out of school	1.09	0.67	1.78		1.06	0.65	1.74	
Each additional friend who is a relative	0.94	0.86	1.04	0.216	0.95	0.86	1.04	0.239

Adjusted for participant age in years, school grade, whether each parent was alive, household SEP, and mother's and father's education



- Older friends also associated with having older sexual partners
- Older friends, perceiving more friends to have had sex and discussion triads associated with participant ever having had sex.
- Little evidence for:
 - association between discussion triads and HIV or HSV-2
 - interaction between participant age and friendship characteristics and outcomes
 - departure from linear effect
 - interaction by friendship net density
 - frequency of contact or duration of friendship modified associations seen

Summary of findings

- Friends tended to be young women of similar ages, also in school, many also blood relatives. Very dense friendship groups. Slightly more likely to be perceived to have had sex than young women themselves report. Communication about sex, condom use and HIV quite low unless young woman reports having had sex herself.
- Young women with more older friends and more friends perceived to have had sex were more likely to be HIV positive, HSV-2 positive and to report ever having had sex.
- Young women had greater age gaps with older sexual partners when they had older friends.
- Discussion of sex, condom use and HIV not associated with being HIV positive or HSV-2 positive, but this was associated with increased likelihood of reporting having had sex (but possible reverse causality).
- Little evidence for effect modification by density of friendship group or friendship duration and frequency of contact.

Strengths of the study

- 
- HIV and HSV-2 status as outcomes
 - Investigation of different types of peer exposures
 - Described specific friendship relationships: improved control for confounding
 - High quality data (part of an RCT)

Limitations of the study

Measurement biases

- Self-reported sexual behaviour and sexual partners data
- Inaccuracies about friends
- Reporting of perception of friends' behaviour

Missing friendship data

Limited ability to examine structural friendship properties

Cross-sectional, possibility of reverse causality

- Although most friends had been friends for a long time (longer than outcomes)

Conclusions

- Normative environment of friendships important
 - Support for importance of perceived peer norms of behaviour
 - Unclear conclusions about communication, causal directions
- Importance of friend socio-demographic characteristics
 - Older friends -> older sexual partners
 - Potential explanation for grade-for-age and sexual initiation findings (Lam et al 2013)
- Implications:
 - Consideration for adolescent social/group programmes
 - School policies on grade repetition and age-mixing in friendships
 - Selection of peer educators

Thank you

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