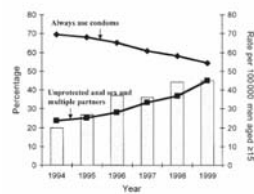


Risky Business: Social Context and Relationship Outcomes in the Shadow of HIV

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Background



- HIV incidence among men who have sex with men (MSM) remained stable in the 1990s despite an increase in multiple unprotected anal intercourse (UAI) partners and rectal gonorrhea.
- This phenomenon could be partly explained by serosorting – HIV+ MSM choosing to have UAI with other HIV+ MSM to reduce the risk of epidemic spread.

The Positive Partners Study

- Positive Partners is a prospective study among HIV-positive sex partners in San Francisco. Our objective is to determine if HIV-1 superinfection occurs and, if so, under what conditions.
- Individuals are enrolled if they had frequent (>10 episodes) unprotected intercourse with an HIV+ partner in the past year.
- This analysis included the 176 MSM enrolled in the study to date.
- NOTE:** All participants discussed here are HIV+, while their partners may be HIV+, HIV-, or of unknown HIV status.

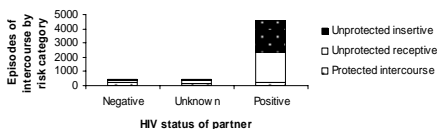
Data and Methods

- We have used sexual network methods with which we collect data on participant, partner, and relationship characteristics on a partner-by-partner basis. These techniques allow us to effectively conduct analysis with the individual, the partnership, or the sexual event as unit of analysis depending on the hypothesis being tested. This provides a more rigorous examination of the social and relational dynamics related to risk behavior than traditional approaches that are limited to the individual as the unit of analysis.
- Here we use these methods to test current hypotheses regarding specific social and relational contexts that have been difficult to analyze effectively using traditional methods.

Serosorting

- We define serosorting as the selection of sexual practices based on partner's perceived HIV status. HIV+ MSM reduce the risk of infecting partners by choosing to have unprotected intercourse (UAI) – and especially unprotected insertive intercourse (UIAI) – with other HIV+ individuals.

5,431 Episodes of Anal Intercourse by HIV Status of Partner and Risk Category (Past 3 Months)

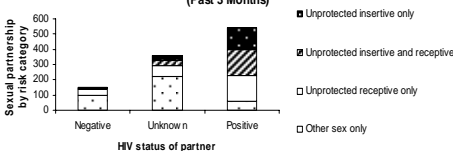


- 83.5% of anal intercourse episodes were with HIV+ partners, thereby allowing no risk of new HIV infections.

Strategic Positioning

- Strategic positioning is a risk-reduction strategy in which the HIV+ partner assumes the receptive position during UAI.

Sexual Position of HIV+ Participant in 1,049 Sexual Partnerships (Past 3 Months)

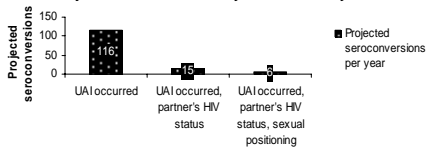


- The highest risk for HIV transmission occurred in a small minority of these partnerships; in only 7.4% was the HIV+ participant insertive with HIV- or unknown-status partners.

How much do these strategies reduce the risk of epidemic spread?

- We estimated how many seroconversions would occur as a result of this cohort's sexual behavior in the past 3 months using published per-contact incidence rates for UAI (Vittinghoff *Am J Epi* 1999). The risk of sex with unknown-status partners was reduced by 28% to reflect the proportion of HIV+ MSM in San Francisco.
- We used three methods of analysis to estimate projected seroconversions per year. As we factored in partner's HIV status and then strategic positioning, we were able to more accurately estimate the risk of epidemic spread.

Projected Seroconversions by Method of Analysis



Information available to the researcher

Research Questions

Risk outcomes in social context

- Did the Internet facilitate high-risk sexual partnerships?
- Was non-disclosure of HIV status associated with high-risk sex?

Relationship outcomes in the risk context

- Was sexual pleasure related to seroconcordance and/or UAI?
- What were the emotional outcomes of serosorting and strategic positioning?

Time trends

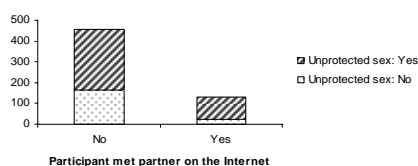
- Were older men who experienced the pretreatment AIDS epidemic more risk-averse than younger men?
- Did serosorting increase or decrease over time?

Results

Did the Internet facilitate high-risk sexual partnerships?

- Participants met 1 out of 5 partners on the Internet, totaling 132 Internet-initiated partnerships.
- 81.2% of those partnerships included UAI, while only 60.7% of partnerships formed in traditional cruising environments (i.e. bars, sex clubs, etc.) included UAI.

Participant Met Partner on the Internet by Unprotected Sex



- 24% of Internet partnerships included UAI with HIV- or unknown-status partners, compared to 16% of partnerships initiated in traditional cruising environments.
- However, when strategic positioning was considered, the incidence of highest-risk sex (HIV+ partner was insertive during UAI) in Internet partnerships was comparable to partnerships initiated in other venues.

Risk Behavior by Venue

Partnership	Internet partnerships (133)	Cruising environment partnerships (330)	Other partnerships (131)
Included UAI	81% (108)	61% (198)	80% (93)
Included UAI with HIV- or unknown-status partners	24% (32)	16% (53)	11% (14)
Included UAI with HIV- or unknown-status partners, and the HIV+ participant was insertive	8% (11)	8% (26)	6% (8)

- The Internet was associated with high-risk sex (unprotected and discordant), but not with highest-risk sex (unprotected, discordant, and HIV+ participant was insertive).

Was non-disclosure of HIV status associated with high-risk sex?

- Non-disclosure of HIV status has been linked to high-risk sex (Kalichman *Health Psychol* 1999). In this sample, the HIV+ participant did not know his partner's HIV status in one-third (34.5%) of partnerships.
- 3 out of 4 (74.9%) of the partnerships in which the partner's HIV status was undisclosed occurred in the social context of "tricking," or casual partnerships in which all sex occurred on one day.
- Having linked non-disclosure to tricking, we investigated a) whether non-disclosure was associated with high-risk sex in general among our participants, and b) whether non-disclosure was associated with high-risk sex specifically in the context of tricking.

Risk Behavior and Disclosure in Social Context

Partnership	Partner's HIV status (1,053)		Social context (586)	
	Negative (151)	Undisclosed (362)	Trick (266)	Treat (320)
Included UAI	33% (50)	40% (141)	55% (145)	78% (250)
Included UAI with HIV- or unknown-status partners	33% (50)	40% (141)	23% (60)	12% (39)
Included UAI with HIV- or unknown-status partners, and the HIV+ participant was insertive	7% (11)	18% (66)	9% (24)	7% (21)

- Non-disclosure was associated with high-risk sex in general. However, highest-risk sex (HIV+ partner was insertive during UAI) occurred as frequently in tricks as longer-term partnerships (treats).
- Sexual negotiations including disclosure and harm reduction may lead to different outcomes in different social or relational contexts.

Was sexual pleasure related to seroconcordance and/or UAI?

- Sex was reportedly more pleasurable when the participant's partner was also HIV+ ($r=0.28, p<0.001, n=588$).
- Participants also reported that sex was more pleasurable when it included UAI, regardless of the partner's HIV status ($r=0.28, p<0.001$).

What were the emotional outcomes of serosorting and strategic positioning?

- We created a least squares linear regression model to identify factors determining how close participants felt to their partners.
- Participants felt closer to partners when the partners were HIV-positive, when the sex was more pleasurable, and when the participant knew the partner longer before having sex.
- Participants felt less close to partners when all sex occurred on one day.

Factors Determining How Close Participant Felt to Partner

	B Coefficient	SE	Beta	Significance
All sex occurred on one day	-1.448	0.105	-0.457	<0.001
Sex rating (scale of 1 to 10)	0.145	0.021	0.223	<0.001
How long participant knew partner before sex	0.171	0.029	0.175	<0.001
Partner's HIV status (0=negative or unknown, 1=positive)	0.452	0.099	0.142	<0.001
R ²		0.526		
Adjusted R ²		0.523		
n=584				

- According to this model, factors related to "active" serosorting – including optimizing sexual pleasure (seroconcordant UAI), disclosure, and simply spending the time prior to initiating sex to make these things possible – account for over half of the variation in emotional bonds between participants and their partners.

Were older men who experienced the pretreatment AIDS epidemic more risk-averse than younger men?

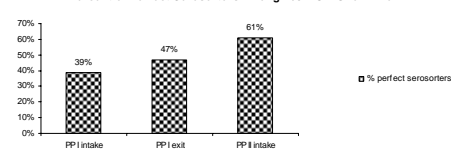
- Age was not associated with serosorting. However, participants serosorted more the longer they were HIV+ ($r=-0.15, p=.05, n=167$).
- In a regression model that independently controlled for the effect of age and time since testing positive, the association between serosorting and time since testing positive was even stronger (Adj. R²=0.025, Beta=-0.21, $p=0.02$).

Did serosorting increase or decrease over time?

- Due to changes in funding, Positive Partners (PP) was divided chronologically into PP I and PP II. The PP I cohort was examined at both intake and exit.

- We measured the number of "perfect serosorters" – HIV+ participants whose sexual behavior in the past 3 months did not allow any risk of HIV transmission to partners – at 3 timepoints between 2001 and 2005.

Percent of Perfect Serosorters Among 168 MSM Over Time



- The percent of perfect serosorters in Positive Partners increased over time, both within the PP I cohort and from PP I to PP II intake.

Conclusions

- Sexual network methods that account for partner's HIV status and sexual positioning are necessary to accurately assess risk of HIV transmission and epidemic spread. These methods are also useful when testing hypotheses linked to the social context and emotional outcomes of serosorting and strategic positioning.
- Serosorting and strategic positioning are successful harm-reduction strategies among HIV+ MSM. Serosorting is increasing over time; we believe this trend is due to the effort of MSM to reduce the spread of the HIV epidemic, as well as the positive associations between seroconcordance, sexual pleasure, unprotected intercourse, and emotionally close partnerships.

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