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“Do you think your main partner has other sex partners?” A simple question provides insight into sexual risk in Jamaica

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Abstract

To estimate the association between a simple measure of sexual partner concurrency and sexually transmitted infection (STI) we conducted a cross-sectional population-based household survey (n=1795) and targeted surveys of people at venues where people meet sexual partners (n=1580) to ask about sexual behavior. Persons interviewed at venues were tested for HIV, gonorrhoea, chlamydia, gonorrhea, and trichomoniasis. We compared the association between STI and reporting a partner had other partners. More women than men reported their main partner had other partners. Thirteen percent of all women in the population-based survey and 14.4% in the targeted survey reported having one partner in the past 12 months and that partner had additional partners. STI prevalence was significantly associated with reporting a partner had other partners (36.8% vs 30.2%; prevalence ratio [PR]1.2; 95% CI 1.1,1.4). Construction of complete sexual networks is costly and not routinely feasible. We recommend adding a question to cross-sectional surveys used to monitor sexual behavior about whether the respondent believes his or her partner has other sexual partners. Although subject to bias, the question was useful in Jamaica to identify a group of women with only one sexual partner at increased risk of infection.

Keywords

Sexually transmitted infection; risk assessment; partner concurrency; North America; epidemiology; sexual behavior

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Introduction

The rate and pattern of new sexual partner acquisition is a determinant of HIV and sexually transmitted infection (STI) transmission in a population[1]. Other determinants being equal, people with more sexual partners have a greater probability of being exposed to an infectious agent and a higher probability of infecting someone else. Mathematical models of HIV transmission show that persons with overlapping or concurrent sexual partnerships, however, are more likely to transmit infection than those with the same number of partners whose partnerships are sequential and non-overlapping [2, 3]. The other side of the “concurrency coin” is also true— people who have only one sexual partner are at higher risk of acquiring infection if their main sexual partner has other partners compared to similar persons whose main partner does not have additional partners. The debate over the relative importance of concurrent partnerships in fueling the HIV epidemic has received a great deal of attention and is ongoing [4, 5].

Measures of the proportion of the population involved in concurrent sexual partnerships frequently rely on sexual behavior surveys that use calendar recall methods to obtain the dates each respondent’s reported sexual relationships began and ended and subsequent review of these dates to determine the proportion of respondents with an overlapping partnership [6, 7]. This approach misses persons exposed to the risk of concurrency due to the concurrent partnerships of their main sexual partner. Studies using measures of concurrency that only include people personally engaged in two or more overlapping partnerships consequently underestimate the proportion of the population exposed to the risk of concurrency.

One approach for estimating the total proportion of the population exposed to the risks arising from concurrency [2] is to identify full sexual networks in a population. Although there are [8]examples of empiric construction of complete sexual networks, notably in Likoma Island, Malawi, the associated cost and difficulty of constructing networks have precluded routine identification of these networks in other settings.

We sought to determine whether we could identify the sub-group of survey respondents at risk due to the concurrency of their main partner without seeking out confirmatory interviews with these partners or linking records in any way as well as compare the prevalence of STI among those who report their partner has other partners and those who do not.

Methods

We added one question asking whether the respondent believes her partner has other sexual partners to the Jamaica national sexual behavior household survey in 2008 and two surveys of patrons of venues in Jamaica identified by community informants as places where people meet new sexual partners.

2008 Household Survey

In 2008, the Ministry of Health in Jamaica conducted a nationally representative cross-sectional sexual behavior survey of 1800 men and women aged 15-49. Methods for the probability-based household survey are fully described elsewhere[9]. The survey did not include HIV or STI testing. Respondents who were married, had a live-in or a main sexual partner were asked about their spouse/main partner (dubbed “Person A”): “Do you think that Person A has sex with anyone else?”

PLACE Patron and Worker Surveys

Jamaica routinely provides outreach services to sites identified as places where people meet new sexual partners. A cross-sectional survey of men and women at 147 sites was conducted in 2007 as part of an evaluation of the Kingston PLACE intervention[10, 11]. Respondents were interviewed about their sexual behavior and a subset of 542 workers and patrons -- specifically, male and female patrons of bars and clubs, female workers at bars and clubs, and female street workers-- were also tested for HIV using rapid tests and gonorrhoea (GC), chlamydia (CT) and trichomonas (TV) using nucleic acid amplification tests (Aptima, Hologic|Gen-Probe, Inc.) .

In 2012, similar cross-sectional surveys with workers and patrons at public places and events identified as places where people meet new sexual partners were conducted throughout Jamaica [12]. In 2012, 1389 venues were identified by approximately 1800 community informants. At a stratified random sample of these sites (oversampling for sites with sex work), we interviewed 1038 male and female staff and patrons and tested them for HIV, gonorrhea, chlamydia and trichomonas. Respondents were asked if they had a main partner and if their main partner had other sexual partners. Data from both PLACE surveys are combined for this analysis and weighted to reflect the probability of selection into the sample.

Concurrency Analysis

First we categorized each respondent in the surveys to one of the following levels of sexual partnerships in the past 12 months:

- Level 0: Never had sex;
- Level 1: No sex in the past 12 months;
- Level 2: One partner in the past 12 months and partner does not have other partners;
- Level 3: One sex partner in the past 12 months but partner has other partners;
- Level 4: Multiple partners but main partner does not have other partners; and
- Level 5: Multiple partners and main partner also has other partners.

Then, we estimated the prevalence of infection by level for the men and women who were tested. We used prevalence ratios to compare the prevalence of infection between respondents reporting that their partners had other partners and those reporting that their partners did not have other partners. Prevalence ratios were stratified by the respondent's

number of partners (one vs. multiple partners) so that one prevalence ratio compared exposure level 2 to level 3, and another prevalence ratio compared level 4 to level 5. We used generalized estimating equations to account for clustering by venue and year of survey. All analyses were conducted using SAS V9.3 (SAS Institute, Inc., Cary, NC).

Results

Few men reported their main partner had other partners (Table 1).

Among women reporting one sexual partner, almost twice as many in the PLACE survey (14.4% / 29.1% =41%) reported that their partner had other partners as in the household survey (13.0% / 59%=22%). Among women, 13% in the national population-based survey and 14.4% in the PLACE survey were exposed to the risks of a concurrent partnership solely because of the additional partners of their main partner (level 3).

Men were more likely than women to report multiple partnerships. Half of the men in the national survey and 66% of men in PLACE sites reported having more than one partner in the past year. Over 20% of the men and women surveyed at PLACE sites reported both having more than one sexual partner in the past 12 months and having a main partner who had other partners.

Reporting that one's main partner had additional partners was significantly associated with a higher prevalence of STI (36.8% vs 30.2%; prevalence ratio [PR]1.2; 95% CI 1.1,1.4). Among respondents who reported only one sexual partner, STI prevalence was higher among those who reported that their partner had other partners (PR: 1.3; 95% CI: 1.1, 1.9). This was evident for both men and women [Insert Figure 1a and 1b]. STI prevalence was also higher among men and women with multiple partners who reported that their main partner had other partners (PR:1.2; 95%CI: 1.0, 1.4).

Figure 1 indicates that participants who reported that their partners had other partners were more likely to be infected with an STI in 16 of 19 comparisons covering four different infections (the probability of this occurring by chance is 5%).

There were other differences between respondents who reported their partner had additional partners and those who did not. These differences were consistent across survey groups and respondent gender. Respondents who reported that their partner had additional partners were younger, had lived fewer years in the community, had fewer years of education, were more likely to be unemployed, less likely to practice religion actively, less likely to be married or living with a partner, more likely to be away from home a month or more, and more likely to have used a condom at last sex with their main partner (data not shown).

Discussion

A simple question asking respondents whether or not their main partner has other sexual partners identified a sub-group of people at increased risk of STI infection. Among men and women interviewed at social sites in Jamaica identified as places where people meet new sexual partners, having a partner who had other partners was associated with infection, even

among those with multiple partners themselves. Other studies have asked a series of questions to assess whether an overlap in sexual partnerships occurred during a specific time period. The timing of the overlap is clearly important[13]. Our study was limited to the respondent's assessment of her partner's other partnerships at the time of the survey. Assessing the association between concurrency and infection is not new. Other studies have assessed the association between STI and reports of partner concurrency[14, 15] but did not investigate the association for respondents who reported their partners (and not themselves) had additional partners.

These results may be biased. Respondents often under-report their own partnerships, and may be likely to under-report the known partners of their partners. It is likely that couples hide outside partnerships from each other and this may be more true for women. The nationally representative survey reveals inconsistencies in partner reporting. For example, among sexually active persons, 66% of men reported multiple partners while only 26% of women reported their male partner had other partners. It is difficult to reconcile these differences without assuming that men over-reported outside partnerships, women did not know about their partners' outside partnerships, or women knew about but did not want to disclose the outside partnership. The statements could also be reconciled if the multiple partnerships reported by the men were sequential and non-overlapping.

Other studies have found a strong association between partner and respondent concurrency. One explanation is that respondents project their concurrency onto their partners [16-19]. If this occurred in our study, the association we found between STI prevalence and partner concurrency would be biased.

We expected that STI would be higher in men and women exposed to additional risk through their partners' partners. However, even among women who reported one partner in the past year and no outside partnerships by this partner, 29% were infected with at least one infection. This could reflect under-reporting of sexual partnerships by women.

In summary, categorising respondents by level of partnership using the question about whether one's main partner has other partners appears to be useful in identifying respondents at greater risk of STI infection. Further research among couples could provide more insight into the validity of respondent reports of partner behavior.

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Figure 1A.

Among Men and Women Reporting One Sexual Partner, Prevalence of STI/HIV

Consistently Higher (9 of 10 Comparisons) Among Those Reporting Their Partner Has other Partners

Among Respondents with 1 Partner

Reports Partner Has Other Partners: (Ns)

Men: Yes: 25; No: 108; Women: Yes: 120 ;No:119

Figure 1B.

Among Men and Women Reporting More than One Sexual Partner, Prevalence of STI/HIV Usually Higher (7 of 10 Comparisons) Among Those Reporting Their Partner Has other Partners

Among Respondents with > 1 Partner

Reports Partner Has Other Partners:(Ns)

Men: Yes: 145; No: 306; Women:Yes:345;No:371

Table 1

Percentage of men and women in a 2008 national survey and the 2007/2011 PLACE surveys reporting 6 levels of concurrent partnerships in Jamaica.

Level	Concurrency	National Survey		PLACE Surveys	
		Men	Women	Men	Women
		N=892	N=903	N=602	N=978
0	Never had sex	11.6	12.5	0.2	0.1
1	No sex in the past 12 months	13.3	14.0	3.4	2.7
2	One sexual partner and partner does not have other partners	23.8	46.0	18.0	14.7
3	One sexual partner who has other sexual partners	1.8	13.0	4.4	14.4
4	Multiple partners for respondent	40.7	8.3	50.0	34.4
5	Multiple sexual partners for both respondent and main partner	8.7	6.3	24.3	33.7
	Total	100.0	100.0	100.0	100.0