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**Anonymous Partnerships among MSM and Transgender Women (TW) Recently Diagnosed with HIV and other STIs in Lima, Peru: An individual and dyad-level analysis**

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**KEYWORDS:** Partner notification, anonymous sex, MSM, Latin America

## KEY MESSAGES:

- There is a need to identify the defining factors associated with anonymous partnerships, and disentangle them from traceable partners, to enhance partner notification efforts.
- MSM and TW recently diagnosed with HIV/STI who report recent anonymous partners are critical for understanding the burden of anonymous partnerships and improving notification interventions.
- Reporting a female or transgender woman partner, as one of the three most recent partnerships, was associated with greater likelihood of engaging in anonymous sex.
- Expanding understanding of sexual practices and partnerships beyond a stable versus casual dichotomy is needed to maximize notification efforts among MSM and transgender women Peru.

## ABSTRACT:

**Objectives:** Partner notification (PN) following STI diagnosis is a key strategy for controlling HIV/STI transmission. Anonymous partnerships are an important barrier to PN and often associated with high-risk sexual behaviour. Limited research has examined the profile of MSM and TW who engage in anonymous sex. To better understand anonymous partnership practices in Lima, Peru, we assessed participant- and partnership-level characteristics associated with anonymous sex among a sample of MSM and TW recently diagnosed with HIV/STI.

**Methods:** MSM and TW diagnosed with HIV/STI within the past month completed a cross-sectional survey regarding anticipated PN practices. Participants reported sexual partnership types and characteristics of up to 3 of their most recent partners. Using a Poisson generalised estimating equation (GEE) model we assessed participant- and partnership-level characteristics associated with anonymous partnerships.

**Results:** Among 395 MSM and TW with HIV/STI, 36.0% reported at least one anonymous sexual partner in the past three months (mean of 8.6 anonymous partners per participant; SD 17.0). Of the 971 partnerships reported, 118 (12.2%) were anonymous and the majority (84.8%) were with male partners, followed by 11.0% with female partners, and 4.2% with transgender/*travesti* partners. Partner-level characteristics associated with increased likelihood of having an anonymous partner included female (aPR 2.28, 95% CI 1.05 to 4.95,  $P=0.04$ ) or transgender/*travesti* (aPR 4.03, 95% CI 1.51 to 10.78,  $P=0.006$ ) partner gender.

**Conclusions:** By assessing both individual- and dyadic-level factors, these results represent an important step in understanding the complexity of partnership interactions and developing alternative partner notification strategies for Latin America.

## INTRODUCTION

Notification of sexual partners following HIV and/or STI diagnosis is a key component of public health efforts for STI control.[1] However, non-contactable partnerships pose a critical challenge to existing partner notification (PN) strategies, given the inherent inability to trace such partners following a sexual

encounter. Anonymous sexual partners can be considered a sub-set of non-contactable partnerships, described in the available epidemiologic literature as a key barrier to existing partner notification efforts for STI control among gay, bisexual and other men who have sex with men (MSM) and transgender women (TW).[2] The few studies that have addressed partner notification (PN) practices among MSM in Latin America have typically addressed anonymous as an undifferentiated part of the larger population of casual or secondary partners, and found that notification more frequently occurs within stable rather than casual partnerships.[3,4] However, the unique characteristics of anonymous partnerships, including their inherent non-notifiability, point to the importance of additional research to better understand who constitutes this specific PN risk group and what factors structure their partnership interactions. Further information on anonymous partnerships among MSM in Latin America is needed to inform improved partner notification and prevention efforts.

Given the disproportionate burden of HIV and STI among MSM and TW in Latin America,[5,6] as well as the rapid growth of technologies to support anonymous or pseudonymous sexual contacts among MSM,[2,7] there is an urgent need to disentangle the defining factors and behavioural risks associated with anonymous partnerships from the larger group of casual, but traceable, partners. To better understand anonymous sexual partnerships in Lima, Peru, we assessed participant- and partnership-level characteristics associated with anonymous sexual partnerships in a sample of MSM and TW recently diagnosed with HIV and/or another STI.

## **METHODS**

### ***Study Sample and Procedures***

Data for this analysis were drawn from a 2012 cross-sectional study of MSM and TW recently diagnosed with HIV and/or another STI in Lima, Peru. Eligibility was limited to MSM or TW who reported anal or oral intercourse with a male or TW partner during the previous year, and had been newly diagnosed with HIV, syphilis, genital herpes and/or gonorrhoea/chlamydia (GC/CT) within the previous 30 days. Detailed methods have previously been reported.[4] Written informed consent was obtained from all study participants prior to enrolment, and the behavioural survey was self-administered at the clinic site. The study

protocol was approved by the Institutional Review Boards of the University of California, Los Angeles (G10-03-036-01) and Asociación Civil Impacta Salud y Educación (0104-2010-CE).

### **Measures**

Anonymous partnership frequency and characteristics: Aggregate data on participants' sexual partnerships during the previous three months, including partnership type, was collected. "Anonymous" partners were defined as, "Someone with whom you had sexual intercourse but do not know their full name or how to locate them." Participants were asked to separately describe the characteristics of their three most recent partners, including partner gender and partnership type (stable, casual, anonymous, transactional sex client, or transactional sex worker).

Participant Characteristics: Sociodemographic factors assessed included participants' age, education, sexual orientation/gender identity (heterosexual, bisexual, homosexual and transgender (*travesti*)), sexual role during intercourse (*activo* (insertive), *pasivo* (receptive), or *moderno* (versatile)). Condomless anal intercourse (CAI) on the participant-level was defined by self-report of CAI with any sexual partner in the previous three months.

Partner Characteristics: For each of their three most recent partnerships, participants were asked the number of times they had sex with the partner, the likelihood of having sex with the partner in the future, the perceived likelihood of having transmitted their recently diagnosed HIV/STI to the partner, the perceived likelihood that the partner was the source of their recent HIV/STI diagnosis, the likelihood of notifying the partner of their diagnosis, and their perceptions of the partner's gender and sexual orientation. CAI on the partnership-level was defined according to participant self-report of condomless sex during each of their three most recent sexual partnerships individually.

### **Statistical Analysis**

Fisher's exact tests for dichotomous and t-tests for continuous variables were used to compare characteristics between participants who described one or more of their last 3 partners as an anonymous partner. Robust Poisson generalised estimating equations (GEE) were used to estimate prevalence ratios assessing participant and partner-level characteristics associated with an anonymous partnership, accounting

for clustering by participant since participants could report up to three partnerships.[8] The GEE model consisted of a Poisson distribution and a log link, with a sandwich estimator of the variance. All analyses were conducted in Stata 12.0 (StataCorp, College Station, TX).

## RESULTS

Among 395 participants, 142 (36%) reported sex with at least one anonymous partner in the past 3 months. Eighty-four (21.3%) participants reported an anonymous partner as one or more of their three most recent partnerships. Within the entire study population, 192 (50.5%) participants reported they were diagnosed with an STI (non-HIV) only within the previous 30 days, 72 (19.0%) were newly diagnosed with HIV infection only, and 116 (30.5%) with HIV/STI co-infection. Among participants who reported a recent anonymous partner, 47 (58.8%) were diagnosed with STI only, 12 (15.0%) with HIV only, and 21 (26.3%) with HIV/STI co-infection.

Table 1 lists results of bivariate and multivariable models assessing participant and partner characteristics associated with recent anonymous partnerships among the 971 partners reported. Of the 971 partnerships reported, 118 (12.2%) were anonymous. Participant-level characteristics significantly associated with increased likelihood of reporting an anonymous partner included *moderno* sexual role (aPR 5.40, 95% CI 2.78 to 10.46,  $P<0.001$ ). Partnership-level characteristics associated with increased likelihood of having an anonymous partner included female (aPR 2.28, 95% CI 1.05 to 4.94,  $P=0.04$ ) or transgender/*travesti* (aPR 4.03, 95% CI 1.51 to 10.78,  $P=0.006$ ) partner gender.

## CONCLUSION

This is the first study, to our knowledge, to report individual and partnership-level factors associated with anonymous sex among MSM and TW recently diagnosed with HIV and/or a STI in Lima, Peru. These individuals represent a likely index population for future PN efforts and are a critical study population for developing notification interventions. Anonymous sex is a frequent practice among our sample, highlighting an immediate challenge to existing partner notification strategies that depend on the ability to trace partners following a sexual encounter. By characterizing the epidemiologic profile of MSM and TW recently diagnosed with HIV and/or a STI who have engaged in anonymous sex, both at the individual-level and dyadic-level, our results represent an important step towards developing alternative notification strategies.

The strengths of this study centre on our multilevel results showing that close to one-third of MSM and TW recently diagnosed with HIV and/or a STI reported at least one recent anonymous partner, and over 20% of their three most recent sexual partnerships were with someone they could not contact or notify. Nonetheless, several limitations should be considered when interpreting these results. Though the study survey provided descriptions of each of the main partnership categories, participants may have independently constructed their own definitions of these categories. Also, partner characteristics including gender identity and sexual orientation were reported by participants, and may not reflect the true identities of their anonymous sex partners. Furthermore, anonymous partners are only one subset of non-traceable partners and further research needs to attend to the frequent use of technological platforms with partial or pseudonymous contact information in order to distinguish between anonymous *and* potentially traceable sexual contacts.

Contributing to knowledge of the partnership contexts for HIV and STI transmission among MSM and TW in Peru, these results further underscore the need to expand analysis of sexual practices beyond a simple “stable versus casual” partnership dichotomy. Paralleling existing literature, our findings report that participant characteristics associated with anonymous sexual contacts include *moderno* (versatile) sexual role. [3,9] Furthermore, at the dyadic-level, reporting a female or a transgender woman partner, as one of the three most recent sexual partnerships was also associated with likelihood of engaging in anonymous sex. These data did not assess reasons for engagement in anonymous partnerships, however, stigma has been reported among Peruvian MSM as a reason for hiding casual sexual encounters with men and transgender women from their primary female partners in the context of partner notification.[3] Sexual stigma may be a possible mechanism for anonymous sexual contacts and warrants further exploration.

These data suggest several potential approaches to addressing anonymous partnerships as a critical component of PN efforts. First, the use of mixed methodologies are needed better inform evolving partner notification approaches to HIV and STI control and address the wide diversity of unique challenges of different sexual partner types among MSM and TW in Latin America. To improve intervention development, scholars should assess the social and cultural meanings of anonymous versus untraceable partners, especially



with regard to online platforms that use pseudonymous partner identities but may facilitate contact tracing.[10] Beyond characterizing prevalence and factors associated with anonymous sex, alternative public health strategies are needed to address untraceable partners (e.g., education and testing outreach directed to venues or websites where index cases report meeting large numbers of anonymous partners) and provide supportive approaches to PN among Peruvian sexual and gender minorities recently diagnosed with HIV and/or STIs.

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Table 1: Prevalence ratios assessing factors associated with anonymous partnerships (N=971 partnerships)

	<i>Any anonymous partner in last 3 partnerships (N=84)</i>	<i>No anonymous partners in last 3 partnerships (N=311)</i>	<i>Overall</i>	<i>Participant Characteristics</i>			
				PR <sup>1</sup> (95% CI)	P-value	aPR <sup>2</sup> (95% CI)	P-value
<b>Age</b> (years)	31.8 (8.1)	30.1 (9.6)	30.5 (9.3)	1.02 (0.99 to 1.04)	0.14	1.02 (1.00 to 1.04)	0.11
<b>Education</b> (University or above vs. secondary or less)	47 (55.6%)	113 (36.5%)	160 (40.6%)	1.57 (0.99 to 2.48)	0.054	1.58 (0.99 to 2.52)	0.054
<b>Sexual orientation/ gender identity</b>							
Heterosexual	6 (7.5%)	17 (5.7%)	23 (6.1%)	Ref		Ref	
Bisexual	19 (23.8%)	47 (15.8%)	66 (17.5%)	1.21 (0.49 to 2.98)	0.68	0.51 (0.19 to 1.40)	0.20
Homosexual	47 (58.8%)	188 (63.1%)	235 (62.2%)	0.77 (0.33 to 1.77)	0.53	0.41 (0.14 to 1.25)	0.12
Transgender/travesti	8 (10.0%)	46 (15.4%)	46 (15.4%)	0.51 (0.17 to 1.52)	0.23	0.39 (0.11 to 1.43)	0.16
<b>Sexual Role</b>							
Activo	10 (12.1%)	57 (18.6%)	67 (17.2%)	Ref		Ref	
Pasivo	18 (21.7%)	123 (40.1%)	141 (36.2%)	0.55 (0.23 to 1.33)	0.19	1.53 (0.61 to 3.83)	0.37
Moderno	55 (66.3%)	127 (41.4%)	182 (46.7%)	1.95 (0.97 to 3.93)	0.06	<b>5.40 (2.78 to 10.46)</b>	<b>&lt;0.001</b>
<b>HIV/STI Status</b>							
STI only	47 (58.8%)	145 (48.3%)	192 (50.5%)	Ref		Ref	
HIV only	12 (15.0%)	60 (20.0%)	72 (19.0%)	0.60 (0.31 to 1.14)	0.12	0.55 (0.27 to 1.11)	0.10
HIV and STI co-infection	21 (26.3%)	95 (31.7%)	116 (30.5%)	0.97 (0.57 to 1.64)	0.90	1.08 (0.66 to 1.78)	0.75
	<b>Anonymous Partnership (N=118)</b>	<b>Non-anonymous Partnership (N=853)</b>	<b>Overall</b>	<i>Partnership Characteristics</i>			
				PR (95% CI)	P-value	aPR (95% CI)	P-value
<b>Unprotected sex with partner</b>	49 (41.5%)	414 (48.5%)	463 (47.7%)	0.78 (0.50 to 1.21)	0.27	0.71 (0.44 to 1.13)	0.15
<b>Perceived likelihood of transmitting infection</b>							
Not likely or impossible	50 (42.4%)	336 (39.4%)	386 (39.8%)	Ref		Ref	
Somewhat likely	31 (34.8%)	327 (38.3%)	368 (37.9%)	0.86 (0.54 to 1.38)	0.53	0.80 (0.49 to 1.28)	0.35
Very likely or certain	7 (5.9%)	63 (7.4%)	70 (7.2%)	0.77 (0.33 to 1.82)	0.56	0.56 (0.25 to 1.25)	0.16
I don't know	20 (17.0%)	127 (14.9%)	147 (15.1%)	1.05 (0.58 to 1.91)	0.87	0.78 (0.41 to 1.50)	0.46
<b>Perceived likelihood that partner is source of infection</b>							
Not likely or impossible	38 (32.2%)	278 (32.6%)	316 (32.5%)	Ref		Ref	
Somewhat likely	39 (33.1%)	313 (36.7%)	352 (36.3%)	0.92 (0.59 to 1.45)	0.72	0.97 (0.59 to 1.57)	0.89
Very likely or certain	18 (15.3%)	107 (12.5%)	125 (12.9%)	1.20 (0.64 to 2.26)	0.58	1.64 (0.88 to 3.06)	0.12
I don't know	23 (19.5%)	155 (18.2%)	178 (18.3%)	1.07 (0.59 to 1.97)	0.82	1.30 (0.63 to 2.68)	0.48
<b>Partner's Gender</b>							
Male	100 (84.8%)	777 (91.1%)	877 (90.3%)	Ref		Ref	
Female	13 (11.0%)	60 (7.0%)	73 (7.5%)	1.56 (0.84 to 2.92)	0.16	<b>2.28 (1.05 to 4.94)</b>	<b>0.04</b>
Transgender/Travesti	5 (4.2%)	16 (1.9%)	21 (2.2%)	2.09 (0.86 to 5.06)	0.10	<b>4.03 (1.51 to 10.78)</b>	<b>0.006</b>

Abbreviations: PR: prevalence ratio; APR: adjusted prevalence ratio; CI: confidence interval

<sup>1</sup>Estimated with a bivariate robust Poisson generalised estimating equation model

<sup>2</sup>Estimated with a multivariable robust Poisson generalised estimating equation model