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Individual and partnership factors associated with anticipated versus actual partner notification following STI diagnosis among men who have sex with men and/or with transgender women in Lima, Peru

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Abstract

Objectives—A detailed understanding of intentions and practices related to partner notification (PN) following STI diagnosis can improve control strategies. We assessed participant-level and partner-level factors guiding notification behaviour among men who have sex with men and/or

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Contributors JLC, ERS and HMB: conceptualised the analysis. JLC, ERS, JR, MVV, JS and JRL: assisted with study design and implemented the study procedures including data collection. HMB and ERS: conducted the statistical analysis. HMB, JLC, ERS, JEL and MG: interpreted the results. HMB: drafted the manuscript. All authors: edited and approved the final version of the manuscript.

Competing interests None declared.

Patient consent Obtained.

Ethics approval The study procedures were approved by the UCLA Office for Human Research Participant Protection (for ClinicalTrials.gov NCT01720654: IRB11-003095; for ClinicalTrials.gov NCT01720641: IRB 11-003105), the Asociación Civil Impacta Comité de Bioética (for ClinicalTrials.gov NCT01720654: Certificate 0053-2012-CE; for ClinicalTrials.gov NCT01720641: 0052-2012-CE), and the US Naval Medical Research Unit-6 (for ClinicalTrials.gov NCT01720654: Protocol HRPP NAMRU6.2012.0033), and registered with the Peruvian Instituto Nacional de Salud. Written informed consent was obtained from all study participants.

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with transgender women (MSM-TW) in Lima, Peru, including discordances between anticipated and actual notification.

Methods—Men newly diagnosed with gonorrhoea, chlamydia and/or syphilis between 2012 and 2014 reported recent partners' characteristics, anticipated PN practices, and actual PN outcomes following diagnosis. Generalised estimating equation Poisson regression analyses assessed factors guiding PN outcomes.

Results—Participants (n=150) predominantly identified as homosexual (70%) and moderno (versatile sexual role, 55%); 55% of partners (n=402) were casual. Among all sexual partners, 35% were notified of the STI diagnosis, though only 51% of predicted PN occurred and 26% of actual notifications were unanticipated. 47% of participants notified no partners, while 24% notified all partners. PN was more common with stable versus casual (adjusted prevalence ratio (aPR), 95% CI: 0.53, 0.39 to 0.73) or commercial (aPR, 95% CI: 0.38, 0.12 to 1.21) partners, and among participants who perceived PN as normative among their peers (aPR, 95% CI: 1.96, 1.37 to 2.82). A trend towards greater notification following condom-protected intercourse was observed (aPR, 95% CI: 1.33, 0.98 to 1.81). PN frequency did not differ by type of STI diagnosed. Anticipated notification predicted actual notification (aPR, 95% CI: 1.67, 1.19 to 2.33) only imperfectly: 81 (54%) participants' PN practices did not match their anticipated behaviour. Successful notification despite anticipated silence (40 participants, 63 partners) was associated with stable partnerships and a normative perception of PN. Non-notification despite intention (43 participants, 73 partners) frequently occurred among participants reporting exclusively oral sex with the partner or with partners identified as activo (insertive role).

Conclusions—Anticipated notification imperfectly reflects actual PN behaviour. Future interventions to improve PN among MSM-TW in Peru need to acknowledge partnership contexts.

OBJECTIVES

Partner notification (PN) is a critical component of sexually transmitted infection (STI) control that targets public health efforts to high-risk sexual networks.¹ Given the burden of STIs among men who have sex with men (MSM) and/or with transgender women (TW) in Latin America,² there is a need to understand how PN operates, and can be addressed, in specific partnership contexts.

Our group has studied different aspects of PN among MSM and TW in Peru, including the effectiveness of expedited partner therapy.³ Formative research, conducted largely in 2011–2012, detailed the acceptability of new PN tools,⁴ and explored perceived source of STIs among STI-diagnosed MSM.⁵ Our recent mixed-methods analysis found anticipated PN more likely for main partners and for non-HIV STIs.⁶ However, anticipated behaviour is influenced by social desirability bias, and practices may change post diagnosis. Most PN outcomes studies report retrospective data on the proportion of partners notified or reporting to a study clinic.⁷ However, this metric misses information on partner-specific factors and often fails to compare notification outcomes with anticipated behaviour.

We evaluated participant-level and partner-level factors guiding notification following STI diagnosis among MSM in Lima, Peru, including discordances between anticipated and actual partner-specific notification.

METHODS

Participants and recruitment

From August 2012 to June 2014, MSM and TW newly diagnosed with gonorrhoea (NG), chlamydia (CT), and/or syphilis were screened for eligibility in two trials of PN and treatment (ClinicalTrials.gov NCT01720654, NCT01720641). (Since formative research found significant differences in social contexts of notification for HIV versus curable STIs, these trials focused only on NG/CT and syphilis infection.) Eligibility for screening included: (1) age ≥ 18 years; (2) male sex assigned at birth and (3) sexual contact with a man or TW in the previous year.

We restricted our analysis to participants in the control arms to limit the effects of any experimental interventions. As few participants self-identified as TW and the number of cisgender female partners reported was low, only men reporting sexual encounters with men or TW (MSM-TW) were included in this analysis.

Study procedures

All participants completed a computer-assisted self-administered (CASI) behavioural survey, underwent a physical examination, completed HIV/STI testing and received pretest and post-test counselling (including standard PN recommendations). Participants received STI treatment and 10 *Nuevos soles* (US\$3.50) for transportation.

Data collection

At screening, we collected information on sociodemographics, sexual orientation/gender identity, and sexual role (*activo* (insertive role during anal intercourse), *pasivo* (receptive) and *moderno* (versatile)).⁸ Participants identified each of their three most recent sexual partners with a pseudonym or label to assist with future recall and reported characteristics of each partner, including relationship type (stable, casual, anonymous, commercial sex (provider or client)),⁶ partner-specific sexual practices, and partner gender identity/sexual orientation and sexual role.

Four-point Likert scales assessed attitudes about PN importance, perceived norms surrounding PN and anticipated likelihood of notifying each named partner. At the 14-day follow-up visit, participants were reminded of the pseudonyms and asked to report partner-specific notification outcomes.

Sample size and power calculations

Sample size calculations for the clinical trials were based on notification outcomes from previous observational studies of Peruvian men and women diagnosed with an STI, as detailed in their respective manuscripts.⁶⁹

Data analysis

The main outcome was self-reported notification for each recent partner at 14-day follow-up. A secondary outcome explored 'PN discordance', or notification events that did not align

with anticipated behaviour (ie, notification of a partner who was not expected to be notified, or failure to notify a partner despite anticipating notification).

We calculated descriptive summaries of participant and partner characteristics. Prevalence ratios were calculated using generalised estimating equation models to adjust for clustering to estimate factors associated with notification. Variables were selected for the model using conceptual reasoning, as selection based solely on significance testing was limited by collinearity and small sample size. We repeated this approach to assess factors associated with PN discordance. All analyses were performed with Stata V.14.0 (StataCorp, College Station, Texas, USA).

RESULTS

We analysed data from 150 MSM-TW recently diagnosed with syphilis, NG, and/or CT (table 1). Participants generally agreed it was important to notify sexual partners after being diagnosed with NG/CT (83%), syphilis (77%) or HIV (78%). However, most believed that few of their friends would notify a stable partner if diagnosed with the same STIs (NG/CT: 12%, syphilis: 15%, and HIV: 19%). The median number of sexual partners in the prior month was 2 (IQR 1 to 4).

Participants in our analysis listed 402 non-anonymous partners and anticipated notifying 38% of these partners (table 1). Multi-partner participants predominantly listed partners of the same type: all casual (41.4%), all stable (24.8%) or all commercial clients (6.0%); 27.8% reported mixed partnership types. At follow-up, 35% of all partners had been notified (per participant self-report), including 53% of stable, 25% of casual, and 11% of commercial partners. (Though excluded from our analysis, cisgender female partners (n=16) were notified at a similar rate (31%).) Forty-seven per cent of participants did not notify any recent partner, 24% notified all partners, and 29% notified only certain partners.

Notification was more frequent for stable compared with casual (adjusted prevalence ratio (aPR), 95% CI: 0.53, 0.39 to 0.73) or commercial (aPR, 95% CI: 0.38, 0.12 to 1.21) partners. A trend emerged towards notifying partners with whom participants had used condoms (aPR, 95% CI: 1.33, 0.98 to 1.81). Notification frequency did not differ according to age or type of STI, but was associated with perceived community norms supporting notification (aPR, 95% CI: 1.96, 1.37 to 2.82).

In looking at discrepancies between anticipated and actual notification, 51% of predicted notifications occurred, while 26% of successful notifications were unanticipated. Anticipated notification predicted actual notification (aPR, 95% CI: 1.67, 1.19 to 2.33), though only imperfectly as 54% of all participants did not follow through with their expected notification behaviour. Forty-three participants did not notify 73 partners despite notification intention, and 40 participants notified 63 partners despite anticipated silence. Unanticipated notification was more frequent with stable as opposed to casual (crude PR (cPR), 95% CI: 0.38, 0.24 to 0.58) or commercial (cPR, 95% CI: 0.09, 0.18 to 0.51) partners, and by participants describing community norms supporting notification (cPR, 95% CI: 2.58, 1.45 to 4.59). Failure to notify (despite intent) was more frequently reported

with casual partners (cPR, 95% CI: 1.52, 1.02 to 2.27), exclusively oral sex partners (cPR, 95% CI: 1.67, 1.14 to 2.45) and *activo* as opposed to *pasivo* (cPR, 95% CI: 0.68, 0.43 to 1.06) or *moderno* (cPR, 95% CI: 0.67, 0.44 to 1.00) partners.

DISCUSSION

Our analysis details the association of individual-level and dyad-level factors with notification practices (and their discordance with anticipated behaviour) following STI diagnosis among MSM-TW in Lima, Peru. These findings affirm the centrality of partnership type in guiding PN, and identify discrepancies between anticipated PN behaviour and actual outcomes. Taken together, our findings reveal how differences in individual and partnership characteristics, risk perceptions, and social norms result in distinct patterns of PN among MSM-TW. Knowledge of these factors can help tailor new PN modalities to high-risk populations in Latin America.

We observed several unexpected findings. Notification may be more likely following condom-protected sex, despite the reduced risk of STI transmission. However, participants may be employing both condom use and PN as dual strategies to protect the health of their partners. That PN frequency did not differ by STI diagnosis in this study of only NG/CT and syphilis affirms our formative research differentiating HIV from other STIs, which were generally considered interchangeable.

Our findings are among the first to address discordance between anticipated and actual notification behaviour. Both discordant and concordant notification results followed similar patterns, highlighting the primacy of partnership type. The disproportionate failure to notify *activo* (insertive) partners may reflect power dynamics within Peruvian sexual partnerships where the insertive partner is considered masculine, virile, and potentially abusive.⁶⁸ These findings suggest that patterns of communication and trust are more powerful determinants of notification than behavioural intention. Psychosocial and behavioural studies on PN emphasise that self-efficacy, social influence, and relationship quality all determine dyadic behaviour.⁷¹⁰ To our knowledge, however, there have not been behavioural studies addressing intent versus actual PN for MSM, and a need remains to identify the psychosocial factors that result in PN discordance following STI diagnosis.

Several limitations to our study exist. All partner characteristics, as well as PN outcomes, were reported by participants rather than by partners, generating uncertainty regarding partner data. In classifying participants, the baseline survey included self-identified sexual orientation and gender identity options within the same multiple-choice question, collapsing the two variables into a uniform category, possibly misclassifying TW. Finally, the original study was not powered to detect associations for our secondary outcome (PN discordance), so we chose to focus on descriptive and bivariate analyses for this outcome. Despite these limitations, our data provide important information to tailor future PN interventions.

CONCLUSION

Our results highlight how individual attitudes, partnership characteristics, biological factors, and social structures all inform PN processes among MSM-TW in Peru following an STI

diagnosis. Given that anticipated notification is only an imperfect predictor of actual PN outcomes, future mixed-methods research may better elucidate which factors impact the gap between intention and action to improve future PN interventions for vulnerable populations.

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Table 1

Participant and partner characteristics and their association with partner notification behaviour among MSM and/or with transgender women diagnosed with STI, Lima, Peru, 2012 to 2014

		Factors associated with actual partner notification (n=139/402)	PN discordance	
			Unanticipated notification (n=63/249)	Non-notification despite intent (n=73/153)
Variable	Category labels (%)	Adjusted PR (95% CI)	Crude PR (95% CI)	Crude PR (95% CI)
Participant characteristics				
Age (n=150)	In years (mean: 29 years)	0.99 (0.97 to 1.02)	0.98 (0.94 to 1.01)	0.98 (0.94 to 1.01)
Education (n=150)	Less than full high school (13.3)	Ref	Ref	Ref
	High school degree or higher (86.7)	1.12 (0.63 to 1.98)	2.18 (0.56 to 8.44)	1.51 (0.68 to 3.36)
Sex role (n=149)	Activo (17.5)	Ref	–	–
	Pasivo (27.5)	0.75 (0.44 to 1.27)	–	–
	Moderno (55.0)	1.07 (0.70 to 1.65)	–	–
STI(s) diagnosed (n=150)	NG/CT (42.0)	Ref	–	–
	Syphilis (46.0)	0.85 (0.56 to 1.27)	–	–
	NG/CT and syphilis coinfection (12.0)	0.95 (0.56 to 1.62)	–	–
Notification perceived as community norm (stable partners) (12.7)		1.96 (1.37 to 2.82)	2.58 (1.45 to 4.59)	0.62 (0.34 to 1.14)
Partnership characteristics				
Type of partnership * (n=398)	Stable (37.9)	Ref	Ref	Ref
	Casual (55.3)	0.53 (0.39 to 0.73)	0.38 (0.24 to 0.58)	1.52 (1.02 to 2.27)
	Commercial sex client (6.8)	0.38 (0.12 to 1.21)	0.09 (0.18 –0.51)	1.42 (0.53 to 3.83)
Partner sexual orientation/ gender identity (n=379)	Homosexual (66.2)	Ref	–	–
	Bisexual (24.0)	0.91 (0.61 to 1.35)	–	–
	Heterosexual (8.7)	0.94 (0.58 to 1.52)	–	–
	Transgender (1.1)	0.69 (0.19 to 2.51)	–	–
Sexual role (n=388)	Activo (34.0)	–	Ref	Ref

			PN discordance	
			Unanticipated notification (n=63/249)	Non-notification despite intent (n=73/153)
Variable	Category labels (%)	Adjusted PR (95% CI)	Crude PR (95% CI)	Crude PR (95% CI)
	Pasivo (22.9)	–	1.13 (0.70 to 1.82)	0.68 (0.43 to 1.06)
	Moderno (43.0)	–	1.04 (0.65 to 1.68)	0.67 (0.44 to 1.00)
Oral sex only (n=402)	No (91.3)	–	Ref	Ref
	Yes (8.7)	–	0.88 (0.47 to 1.66)	1.67 (1.14 to 2.45)
Condomless anal sex (n=402)	Yes (51.0)	Ref	–	–
	No (49.0)	1.33 (0.98 to 1.81)	–	–
Anticipated PN outcome (n=402)	Non-notification (61.9%)	Ref	N/A	N/A
	Notification (38.1)	1.67 (1.19 to 2.33)	N/A	N/A

* Anonymous partners were excluded from analysis.

CT, chlamydia; MSM, men who have sex with men; NG, gonorrhoea; PN, partner notification; PR, prevalence ratio.