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Let's Talk About Sex: The Impact of Partnership Contexts on Communication About HIV Serostatus and Condom Use Among Men Who Have Sex with Men (MSM) and Transgender Women (TW) in Lima, Peru

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Code Availability: The code used in analysis of these findings is available upon reasonable request to the authors.

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Abstract

Sexual communication with partners informs risk assessment and sexual practices. We evaluated participant, partner, and network factors associated with communication about condom use and HIV serostatus and explored their relationships with condomless anal intercourse (CAI) among 446 men who have sex with men (MSM) and 122 transgender women (TW) in Lima, Peru. Generalized estimating equations assessed contextual influences on communication and practices with recent sexual partners. More frequent HIV communication was reported by MSM who: identified as heterosexual, compared to bisexual or gay; characterized partnerships as stable, compared to casual, anonymous, or commercial; or discussed HIV/STIs with close social contacts ($p<0.05$). TW in concurrent partnerships discussed condom use more frequently than those in monogamous relationships ($p<0.05$). Condom use discussions and alcohol use among MSM were associated with CAI ($p<0.05$). Findings highlight complexity in sexual decision-making and call for further study of conversation content and practices to inform HIV prevention messaging.

Resumen:

La comunicación sexual entre parejas informa sobre la valoración de riesgos y las prácticas sexuales. Evaluamos los factores de participantes, sus parejas y sus redes en relación con la comunicación sobre el uso de condones y el serostatus del VIH, y exploramos sus asociaciones con el sexo anal sin condón (CAI) entre 446 hombres que tienen sexo con hombres (HSH) y 122 mujeres transgéneros (MT) en Lima, Perú. Usamos ecuaciones de estimación generalizadas para evaluar las influencias contextuales en la comunicación y las prácticas con parejas sexuales recientes. La comunicación sobre el VIH fue más frecuente entre los HSH: que se identificaron como heterosexuales, en comparación con bisexuales o gay; quienes reportaron sus relaciones de pareja como estables, en comparación a casuales, anónimas o comerciales; o quienes discutieron el VIH/ITS con contactos sociales cercanos ($p<0.05$). Las MT con relaciones concurrentes discutieron el uso de condones con más frecuencia que las que reportaron relaciones monógamas ($p<0.05$). Las discusiones sobre el uso de condones y el consumo de alcohol se asociaron con CAI entre los HSH ($p<0.05$). Estos resultados resaltan la complejidad de las decisiones sexuales y ameritan un mayor estudio del contenido y las prácticas de conversación para informar los mensajes de prevención del VIH.

Keywords

HIV serostatus communication; Condom negotiation; Men who have sex with men; Transgender Women; Peru

INTRODUCTION:

Peruvian men who have sex with men (MSM) and transgender women (TW) are disproportionately affected by HIV and sexually transmitted infections (STIs). HIV prevalence among MSM has been reported between 12 and 22.3% and estimated at 30% among TW (1–4). Outside of Peru, partner communication about HIV serostatus and condom use has been shown to be a valuable, but context-dependent, tool in the prevention of HIV and STIs. Discussions of HIV status with intimate partners may promote informed

risk assessment and decision-making, while condom negotiation can help individuals implement condom use intentions (5–7). Prior analyses examining safer sex communication and sexual behaviors among MSM have repeatedly found associations between discussions about condom use and use of condoms (5, 8, 9). At the same time, research has suggested that dyadic characteristics, community or cultural norms, and situational factors influence conversation patterns and frequency (5, 8, 9).

Data on the relationship between HIV serostatus discussions and sexual health outcomes are mixed. HIV serostatus disclosure has the potential to decrease HIV transmission risk from condomless anal intercourse (CAI) (5, 7, 10–12), yet literature points to variations in the frequency and accuracy of HIV serostatus discussions and their impact on sexual practices (10, 13–15). Factors such as partnership trust and intimacy, length of time from diagnosis (among persons living with HIV), and knowledge of partners' HIV status may promote discussion and subsequent safer sex behaviors (10, 13, 16). In contrast, stigma, fear of rejection or loss of privacy, substance use, and lack of regular HIV testing may represent barriers to engagement in these conversations (13, 16, 17).

In Peru, prior studies have noted the importance of dyadic characteristics in individuals' perceptions of partner risk, sexual behaviors, and partner notification of STIs or HIV (18–21). Among MSM, the sexual orientation, role, and practices of individuals and their partners may influence control, risk perception, and likelihood of HIV/STI disclosure in sexual encounters. For example, studies have described power differentials between *activo* (insertive) and *pasivo* (receptive) partners and have found that behaviorally bisexual men are less likely to disclose a recent HIV or STI diagnosis to female partners (18, 19).

Transgender women (TW) may face additional barriers to sexual health communication (22). Research findings underscore the relationship between gender identity, sexual role, structural economic factors, and condom use decisions among Peruvian TW. Due to social marginalization, TW may less like to exert control over condom use or types of intercourse practiced in partnerships with predominantly heterosexual- or bisexual-identifying cisgender men (23–25), may frequently adopt a *pasivo* (receptive) sexual role (19, 24), may be exposed to greater partner violence or coercion (25, 26), and may engage in precarious employment through informal labor economies such as commercial sex work (24, 25, 27). Greater partner concurrency and increased alcohol use prior to sex, compared to MSM, may also contribute to increased HIV vulnerability among TW (28, 29).

Despite these studies, more information on sexual communication among MSM and TW in Peru is needed. In a study evaluating HIV serostatus communication among MSM and TW, disclosure was associated with knowledge of partner serostatus and was more common in stable partnerships (30). However, as overall knowledge of individual *or* partner HIV serostatus was low (30–34), the impact of HIV status communication on strategies to promote safer sex was less clear. There is also a need to explore which discussion strategies, if any, MSM and TW are using with short-term casual or anonymous partners (35).

In qualitative findings from a Peruvian HIV prevention intervention, some MSM and TW reported nonverbal condom negotiation as normative behavior in public sex venues (36).

Other participants described that relationship intimacy and financial motivations influenced condom use decisions (36), suggesting that these decisions are multifactorial and context-dependent. Yet, to our knowledge, there have been no studies specifically exploring condom use communication in Peru.

To address this gap and improve understanding of how discussions about condom use and HIV serostatus may be associated with condomless sex among MSM and TW in Peru, we sought to identify participant, partner, and network contexts associated with communication about condom use or HIV serostatus; explore the association between these conversation types; and determine how the two types of discussions differentially relate to actual CAI practices.

METHODS

Study Population:

We conducted a secondary analysis of data from the screening visits of a study investigating rectal STI testing and treatment as part of an integrated bio-behavioral HIV prevention intervention (37). Between June and December 2017, MSM and TW with negative or unknown HIV serostatus were recruited from community venues by peer educators at the non-governmental organization, *Asociación Civil Vía Libre*. Via Libre is Peru's oldest HIV/AIDS non-governmental organization (NGO), and is dedicated to providing HIV and STI prevention, treatment, and education services to at-risk populations in Lima, Peru. Participants were eligible for the primary study if they: 1) Were ≥18 years of age; 2) Were assigned male sex at birth; 3) Were HIV-negative by self-report; and 4) Reported condomless receptive anal intercourse (CRAI) with a partner of HIV-positive or unknown HIV serostatus in the past 6 months. In this analysis, we excluded participants who described their sexual role during intercourse as "*activo"* (insertive only) (n= 11), due to small participant numbers and given that the parent study was designed to recruit MSM and TW who reported recent receptive anal intercourse. We additionally excluded participants who did not report data on any sexual partners (n= 10).

Study Measures and Procedures:

Participants completed a socio-behavioral survey via a computer-assisted self-interview (CASI). Survey questions assessed participant demographics, including gender identity, sexual orientation, and sexual role, and sexual practices, both generally over the past 30 days, and specifically with their last 3 sexual contacts. Sexual orientation included the following options: "Heterosexual," "Bisexual," "Gay," and "Transgender," in accordance with findings from previous Peruvian studies, which suggest overlap between gender identity and sexual orientation (25, 38). All participants were tested for HIV, gonorrhea, chlamydia, and syphilis, and underwent a physical exam and medical history to detect signs and symptoms of STIs. Participants presenting with symptoms of urethritis or proctitis, or who had a laboratory-based STI diagnosis, were provided with appropriate antibiotic treatment according to 2016 guidelines from the Centers for Disease Control (CDC) (39). Individuals with previously undiagnosed HIV were referred to local HIV treatment sites organized by the Peruvian Ministry of Health. All participants received 15 *Nuevos soles*

(approximately $5.00) as reimbursement for transportation costs as well as five condoms and packets of lubricant.

Study Variables:

Partner-specific survey questions explored participants' perception of their partners' gender identity and sexual orientation, partnership type (stable, casual, anonymous, commercial), partnership concurrency (non-exclusivity by participant or partner; analyzed initially among all partnerships and then excluding partnerships of 0–1 days duration), knowledge of partner HIV serostatus, and alcohol and/or drug use before sex by participants or their last 3 sexual partners.

The three primary outcomes for this analysis were: 1) Discussions of condom use prior to or during sex; 2) Communication about HIV serostatus; and 3) Event-specific CAI (CAI in one or more of the last three sexual encounters). To construct the condom use discussion outcome, we assessed whether participants discussed condoms prior to, during, or after their last sexual encounter with a given partner versus not at all. Responses were dichotomized to differentiate conversations before or during sex from not discussing the topic or having conversations after sex. HIV serostatus communication was defined as disclosing HIV status to a partner *or* having knowledge of that partner's HIV serostatus, in order to capture communication from both participants and their partners. Responses to a question about participant HIV status disclosure to each partner in their last sexual encounter were dichotomized as above (disclosure of HIV status before/during sex versus after sex or not at all). These responses were then combined with knowledge of partner HIV status, which, for the purposes of the HIV serostatus communication outcome, was limited to knowledge obtained from a partner sharing their status or receiving HIV testing with the participant. CAI frequency was determined based on participant responses to questions about partner-specific sexual practices, including condom use.

Statistical Analysis:

Given previously characterized differences in sociodemographic characteristics, social and sexual contexts, and STI/HIV prevalence between MSM and TW, we stratified all analyses according to participants' self-reported gender identity (cisgender man or transgender woman) (2, 25). We conducted descriptive analyses to characterize participants and their 3 most recent sexual partners. We then constructed bivariate tables comparing participant and partner characteristics across each outcome but did not perform significance testing, given the correlated nature of partner-level data reported by the same participant.

To estimate associations between partnership contexts, participant characteristics, and the three primary outcomes, we calculated prevalence ratios using Generalized Estimating Equations (GEE) with Poisson regression (40, 41). We used GEE with an exchangeable working correlation structure to account for clustering of partner-level data. For partner communication outcomes, we initially explored the relationship of participant characteristics, discussions of HIV and STI prevention questions or concerns with close social contacts, sexual network size, and partnership characteristics with conversations about

HIV status and condom use. For CAI, we tested associations of condom use discussions, HIV status communication, and knowledge of partner serostatus against partner-level CAI.

We then constructed multivariate models to test all relationships associated with outcomes at a significance level of $p < 0.05$ in crude analyses. All multivariate models were adjusted for participant age, education, sexual orientation/gender identity, and sexual role; partner type; and alcohol and drug use prior to sex. We selected covariates based on conceptual reasoning prior to running any multivariate analyses and regardless of significance level in crude analysis, given previous work suggesting their influence on sexual practices (19, 27, 30, 42, 43). For our multivariate model testing condom use discussions as an exposure for CAI, we confirmed that covariates were not significantly associated with condom negotiations prior to running the model. Given that discussions of HIV serostatus and condom use may be interrelated parts of broader communication about sexual health, we did not include HIV status communication in the multivariate analysis for condom discussions and vice versa. All analyses were performed using Stata 14.2 (Stata Corp, College Town, TX).

Consent/Permissions:

The University of California, Los Angeles Institutional Review Board and the Ethics Committee at *Asociación Civil Vía Libre* approved all study procedures before their implementation. All participants provided written informed consent prior to any study activities or data collection.

RESULTS:

Sample Characteristics:

Of the 614 people who screened for the primary study of rectal STIs, 446 MSM (median age 27 years, IQR 22–34) and 122 TW (median age 29, IQR 24–38) were eligible for inclusion in this analysis. Table 1 provides a description of demographic and behavioral characteristics of participants. Most participants identified their sexual orientation as gay (82.7% or 363/439 of MSM and 76.5% or 91/119 of TW). Among MSM, 52.4% (230/439) reported their sexual role as *moderno* (versatile) and among TW, 86.1% (105/122) reported their role as *pasivo* (receptive). The majority of MSM (77.6% or 346/446) and TW (63.1% or 77/122) reported CAI with at least one of their previous three sexual partners.

Characteristics of Last 3 Sexual Partners:

Table 2 describes partnership characteristics of participants' last three sexual contacts. MSM perceived 98.2% (1255/1278) of partners to be cisgender men and 47.7% (602/1263) to identify as gay. MSM classified the majority of recent partnerships as casual (57.4% or 735/1280). They reported concurrency in 40.2% (514/1280) of their previous 3 partnerships. MSM participants reported overall knowledge of 10.8% (139/1285) of their partners' HIV serostatus and described changing sexual behaviors due to this knowledge in 69.5% (86/124) of encounters, consistently using condoms with 11/18 (61.1%) of partners of HIV-positive serostatus. They had conversations about condom use before or during sex with 12.7% (163/1281) of partners and communicated about HIV serostatus with 15.3% (196/1285) of partners. MSM described CAI with 53.3% (681/1278) of these same partners.

TW similarly described most partners as cisgender men (95.7%, 332/347) and perceived 58.4% (202/346) of their partners as bisexual. The majority of TW's partnerships were characterized as casual (35.2%, 122/347) or commercial (30.0%, 104/347) and 28.0% (97/347) of partnerships were reported as concurrent. When relationships of 0–1 days were removed from analysis, 17.4% (34/196) of partnerships were concurrent. TW reported knowledge of 8.6% (30/349) of partners' HIV serostatuses and changed their sexual practices based on this knowledge with 70.4% (19/27) of their past three sexual contacts. Regarding discussion and behavioral outcomes, TW had conversations about condom use with 13.0% (45/347) of partners, communicated about HIV status with 16.9% (59/349), and reported CAI with 42.1% (146/347) of their previous three sexual partners.

Associations between participant factors, partner contexts, and outcomes:

In crude analysis for MSM, partner-level conversations about condom use and conversations about HIV status were associated with each other (PR 3.00, [95% CI 2.19, 4.12], *p*-value <0.001 and PR 2.67, [95% CI 2.01, 3.55], *p*-value <0.001). Among MSM, knowledge of partner status was not associated with conversations about condom use (PR 1.34 [95% CI 0.86, 2.07], *p*-value 0.19) or CAI (PR 0.84 [95% CI 0.67, 1.05], *p*-value 0.13). Crude analysis for TW showed that partner concurrency, compared to monogamy, was associated with increased discussions of condom use (PR 2.41 [95% CI 1.23, 4.73], *p*-value 0.01); however, when partnerships of 0–1 days were excluded from analysis, this association was no longer significant (PR 2.52 [95% CI 0.97, 6.60], *p*-value 0.06). Among TW, conversations about condom use and conversations about HIV were associated with each other (PR 5.95 [95% CI 3.29, 10.74], *p*-value <0.001and PR 3.73 [95% CI 2.29, 6.06], *p*-value<0.001). (See Tables 3 & 4.)

In adjusted analysis, among MSM, participant identification as bisexual (aPR 0.35 [95% CI 0.15, 0.81], *p*-value 0.01) or gay (aPR 0.28 [95% CI 0.14, 0.59], *p*-value 0.001; reference: heterosexual) was negatively associated with communication about HIV serostatus, while stable partnerships (casual aPR 0.37 [95% CI 0.25, 0.54], *p*-value <0.001, anonymous aPR 0.28 [95% CI 0.17, 0.46], *p*-value <0.001, and commercial aPR 0.47 [95% CI 0.23, 0.98], *p*-value 0.04) and discussions of HIV or STIs with close social contacts (aPR 2.18 [95% CI 1.19, 4.02], *p*-value 0.01) were associated with more frequent communication. Factors associated with more prevalent CAI among MSM were alcohol use by partner or participant prior to sex (aPR 1.15 [95% CI 1.03, 1.29], *p*-value 0.01) and discussions of condom use (aPR 1.20 [95% CI 1.04, 1.37], *p*-value 0.01). Among TW, partnership concurrency (aPR 2.27 [95% CI 1.08, 4.77], *p*-value 0.03) was associated with increased discussions of condom use in multivariate analysis.

DISCUSSION:

Among Peruvian MSM and TW participants reporting recent receptive condomless anal intercourse, we demonstrated that sexual health conversations with partners both rarely occurred and did not result in a greater likelihood of condom use. Partner-level conversations about condom use and HIV status also varied in frequency with participant and partnership characteristics. Among MSM, discussions of HIV or STIs with social contacts were

associated with more frequent HIV communication with sexual contacts. Taken together, these data reflect the importance of individual and partnership contexts in sexual health discussions but suggest a disconnect between discussions and behavior.

Participants discussed condom use with 12.8% and HIV status with 15.6% of their past 3 partners in their last sexual encounter, with results suggesting overlap in participants who discussed each topic. Consistent with findings from prior studies, MSM discussed HIV more frequently with stable partners (30). The infrequency of discussions overall may be explained in part by the large number of short-term, casual, and anonymous partnerships reported in this study. Previous work has described high levels of stigma around HIV and infrequent HIV and STI testing in Peru, which may further disincentivize discussions (18, 30, 44, 45). HIV voluntary counseling and testing (VCT) and partner notification of STIs represent two methods to assist individuals in obtaining, and sharing, information about their sexual health. However, attempts to support MSM and TW in disclosure must also address barriers to testing and stigma or fear around diagnosis (16, 30, 44). Community-level changes to promote awareness and discussion of sexual health may therefore serve to bolster HIV and STI prevention efforts (46). Broader messaging that “Undetectable Equals Untransmittable” may additionally reduce stigma toward and facilitate conversations about HIV (47, 48). Awareness of “U = U” has been associated with increased disclosure of HIV serostatus in diverse global settings, but there is a need for greater discussion of the subject by healthcare providers in Latin America (48).

We noted that discussions of HIV status were more common among MSM who identified as heterosexual. A prior Peruvian study found that heterosexual-identifying MSM were more likely than gay, bisexual, or transgender peers to consider their partners a source of STIs, despite perceiving their own risk for HIV/STIs to be lower than these same peers’ (20). Heterosexual MSM may engage in more discussions about HIV serostatus than gay or bisexual-identifying peers due to higher perceived risk of encounters with men or TW. In our study, heterosexual-identifying MSM participants exclusively reported partnerships with men. The conversation patterns we observed may therefore have resulted from the same-sex partnership context, influenced by both participants’ and partners’ gender and sexual identities.

Partner-level HIV serostatus communication was also more common among MSM who discussed HIV or STI prevention with close social contacts. A study in the Dominican Republic found that men who discussed condoms with peers reported more consistent condom use with female sex workers (49). Peer communication may reflect and disseminate social norms and information about sexual health (49), thereby influencing private behaviors. Our study did not find an association between partner-level HIV communication and CAI, so we cannot draw a conclusion about the behavioral impact of peer conversations on Peruvian MSM. However, our findings do suggest a link between social and sexual interactions in this population.

Among TW, our results show that partnership concurrency was associated with more frequent condom use discussions compared to monogamy; however, when we controlled for partnerships of ≤1 day’s duration, there was no longer an association. TW may discuss

condom use with short-term, concurrent partners as a risk reduction method in casual, anonymous, or transactional partnerships. Previous Peruvian studies have found that both MSM and TW preferentially engage in CAI with stable partners (28, 50). In concurrent partnerships involving stable and non-stable contacts, TW may practice negotiated safety to facilitate intimacy with primary partners (28). However, as sex with primary partners contributes substantially to HIV transmission in Peru (51), it is critical to rethink health promotion strategies and partner-level risk reduction methods in tandem, such as the role of sexual communication in promoting testing or condom use within primary partnerships themselves. Furthermore, short-term encounters have important public health implications: Concurrency with single-contact partners may not pose a risk of transmitting HIV or an STI acquired from a later partnership within that specific dyad (52), but condomless intercourse with multiple sexual contacts within a short or overlapping timeframe can hasten the spread of STIs or HIV in the population (53, 54). Our data suggest that TW may often discuss condom use in these partnerships, but future work should further delineate the behavioral impact of these discussions.

Lastly, among MSM, we found that condom use discussions were paradoxically associated with increased CAI, highlighting a crucial gap between condom conversations and behavior. When asked directly about partner serostatus knowledge and sexual behaviors, MSM described changing their practices in 69.5% of encounters with a partner whose serostatus they knew, reporting consistent condom use in the majority (61.1%) of encounters with partners with HIV-positive serostatus. Thus, in the few encounters where MSM knew their partners' HIV status, the information affected sexual decision-making and favored condom use. However, despite the strong association between discussions of condom use and HIV serostatus, there was no relationship between HIV communication and CAI, underscoring a need for more detailed examination of sexual decision-making processes and content.

There are several limitations to our findings: First, this population consisted of a convenience sample of MSM and TW who had recently engaged in receptive CAI and mainly identified as gay or bisexual, limiting generalizability. Second, our data was collected via participant self-report and is therefore subject to recall bias and inaccuracies regarding partnership characteristics, as partner-level questions assessed participant perceptions of their partnerships. Third, there may be overlap in social and sexual relationships, which may have influenced frequency of discussions about HIV and STIs with social contacts. Fourth, while this secondary analysis evaluated partner-level communication patterns and knowledge of partner HIV status through a variety of questions from the primary study, the parent study was not designed to address these questions and we were not able to study in detail how the content and structure of specific partner conversations may have influenced condom use decisions.

CONCLUSION:

Findings offer important insights into associations between partner-specific communication patterns and sexual practices among Peruvian MSM and TW. Given that pre-exposure prophylaxis is still not widely available in Peru and that Peruvian MSM and TW report infrequent HIV or STI testing behaviors, behavioral prevention strategies such as condom

use, and HIV VCT are crucial to HIV and STI prevention efforts. Infrequent conversations about HIV serostatus and condom use may increase likelihood of serodiscordant CAI and, even among seroconcordant partners, transmission of STIs. Our analysis focused primarily on individual and partner-level factors influencing discussion frequency, but builds off of previous work that supports a broader norm of silence about HIV and sexual practices among Peruvian MSM and TW (30, 36, 55). Collectively, these studies suggest a need for multi-level interventions (including community health education efforts and wider dissemination of the message that "U = U") that promote partner-level discussions about sexual health, risk, and safer practices and structural-level changes to shift societal perceptions of condom use and sexual communication. Results additionally direct future research to investigate the interactive processes of conversation content and sexual decision-making, to better understand and address discordances between conversations and practices.

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Table I:

Sociodemographic and behavioral characteristics of MSM and TW reporting receptive CAI in the past 6 months in Lima, Peru, 2017, N= 568.

	MSM (N = 446)[a]	TW (N = 122)[a]
	N (%) or Median (IQR)[b]	N (%) or Median (IQR)
Age	27 (22,34)	29 (24,38)
Education		
<Secondary	27 (6.1)	24 (19.7)
Secondary	152 (34.1)	70 (57.4)
>Secondary	267 (59.9)	28 (23.0)
Participant Sexual Orientation/Gender Identity		
Heterosexual	6 (1.4)	8 (6.7)
Bisexual	70 (16.0)	6 (5.0)
Gay	363 (82.7)	91 (76.5)
Transgender		14 (11.8)
Participant Sexual Role		
Pasivo	209 (47.6)	105 (86.1)
Moderno	230 (52.4)	17 (13.9)
Discussed questions/concerns about HIV/STI prevention with close social contacts	372 (83.4)	101 (82.8)
Median Sexual Network Size	5 (2,10)	10 (4,11)
CAI with any of last 3 partners	346 (77.6)	77 (63.1)

[a]Ns for some variables do not total to MSM N= 446 or TW N= 122 due to missing data. Definitions: *CAI:* condomless anal intercourse; *IQR*: interquartile range.

Table II:

Partnership characteristics of Peruvian MSM and TW's past 3 sexual contacts, 2017, N=1634.

	MSM (N= 1285)[a]	TW (N= 349)[a]
	N (%) or Median (IQR)	N (%) or Median (IQR)
Partner Gender Identity		
Cisgender man	1255 (98.2)	332 (95.7)
Cisgender woman	11 (0.9)	3 (0.9)
Transgender woman	12 (0.9)	12 (3.5)
Perceived Partner Sexual Orientation		
Heterosexual	178 (14.1)	119 (34.4)
Bisexual	483 (38.2)	202 (58.4)
Gay	602 (47.7)	25 (7.2)
Partner Type		
Stable	114(8.9)	52 (15.0)
Casual	735 (57.4)	122 (35.2)
Anonymous	334 (26.1)	69 (19.9)
Commercial	97 (7.6)	104 (30.0)
Median Partnership Length (days)	3 (0, 148)	10 (0, 248)
Partnership Concurrency	514 (40.2)	97 (28.0)
Alcohol Use by participant or partner prior to sex	377 (29.5)	142 (40.9)
Drug Use by participant or partner prior to sex	144 (11.3)	91 (26.2)
Knowledge of Partner HIV serostatus	139 (10.8)	30 (8.6)
Condom use discussions before or during sex	163 (12.7)	45 (13.0)
HIV serostatus communication	196 (15.3)	59 (16.9)
CAI	681 (53.3)	146 (42.1)

[a]Ns for some variables do not total to MSM partner N = 1285 or TW partner N = 349, due to missing data.

Definitions: *CAI*: condomless anal intercourse; *IQR*: interquartile range.

Table III.

Partnership characteristics of Peruvian MSM and TW by conversation patterns and sexual practices, 2017, partner N= 1634

	MSM (partner N = 1285)[a]						TW (partner N = 349)[a]					
	Condom Use Discussions (n/N= 163/1281)[b]		HIV serostatus Communication (n/N= 196/1281)[b]		CAI (n/N= 681/1278)[b]		Condom Use Discussions (n/N= 45/347)[b]		HIV serostatus Communication (n/N= 59/347)[b]		CAI (n/N= 146/347)[b]	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
	N (%) or Median (IQR)		N (%) or Median (IQR)		N (%) or Median (IQR)		N (%) or Median (IQR)		N (%) or Median (IQR)		N (%) or Median (IQR)	
Partner Gender Identity												
Cisgender man	1094 (98.1)	161 (98.8)	1064 (98.3)	191 (97.5)	562 (98.6)	647 (97.9)	294 (97.4)	38 (84.4)	280 (97.2)	52 (88.1)	184 (95.8)	137 (95.1)
Cisgender woman	11 (1.0)	0 (0)	9 (0.8)	2 (1.0)	6 (1.1)	4 (0.6)	2 (0.7)	1 (2.2)	2 (0.7)	1 (1.7)	2 (1.0)	1 (0.7)
Transgender woman	10 (0.9)	2 (1.2)	9 (0.8)	3 (1.5)	2 (0.4)	10 (1.5)	6 (2.0)	6 (13.3)	6 (2.1)	6 (10.2)	6 (3.1)	6 (4.2)
Perceived Partner Sexual Orientation												
Heterosexual	152 (13.8)	26 (16.2)	147 (13.8)	31 (15.8)	94 (16.7)	78 (11.9)	104 (34.6)	15 (33.3)	101 (35.1)	18 (31.0)	65 (34.0)	48 (33.3)
Bisexual	429 (38.9)	54 (33.5)	423 (39.6)	60 (30.6)	221 (39.3)	247 (37.8)	175 (58.1)	27 (60.0)	166 (57.6)	36 (62.1)	115 (60.2)	83 (57.6)
Gay	521 (47.3)	81 (50.3)	497 (46.6)	105 (53.6)	248 (44.1)	329 (50.3)	22 (7.3)	3 (6.7)	21 (7.3)	4 (6.9)	11 (5.8)	13 (9.0)
Partner Type												
Stable	96 (8.6)	18 (11.0)	70 (6.5)	44 (22.5)	52 (9.1)	52 (7.9)	48 (15.9)	4 (8.9)	36 (12.5)	16 (27.1)	29 (15.1)	16 (11.1)
Casual	649 (58.1)	86 (52.8)	632 (58.3)	103 (52.6)	301 (52.7)	402 (60.7)	104 (34.4)	18 (40.0)	106 (36.8)	16 (27.1)	68 (35.4)	53 (36.8)
Anonymous	292 (26.1)	42 (25.8)	301 (27.8)	33 (16.8)	166 (29.1)	164 (24.8)	57 (18.9)	12 (26.7)	58 (20.1)	11 (18.6)	39 (20.3)	30 (20.8)
Commercial	80 (7.2)	17 (10.4)	81 (7.5)	16 (8.2)	52 (9.1)	44 (6.7)	93 (30.8)	11 (24.4)	88 (30.6)	16 (27.1)	56 (29.2)	45 (31.3)
Median Partnership Length (days)	3 (0,141)	20 (0,253)	2 (0,138)	21 (0,241)	0 (0,83)	8 (0,193)	10 (0,248)	3 (0,213)	8 (0,207)	118 (0,764)	10 (0,146)	8 (0, 385)
Partnership Concurrency												
No	671 (60.0)	95 (58.6)	663 (61.2)	103 (52.6)	311 (54.4)	434 (65.7)	228 (75.5)	22 (48.9)	210 (72.9)	40 (67.8)	140 (72.9)	102 (70.8)
Yes	447 (40.0)	67 (41.4)	421 (38.8)	93 (47.5)	261 (45.6)	227 (34.3)	74 (24.5)	23 (51.1)	78 (27.1)	19 (32.2)	52 (27.1)	42 (29.2)
Alcohol use by participant or partner												
No	764 (70.5)	107 (70.4)	762 (70.1)	112 (73.7)	452 (75.7)	450 (66.1)	173 (59.3)	24 (54.6)	164 (56.6)	33 (68.8)	127 (63.2)	78 (53.4)

	MSM (partner N = 1285)[a]						TW (partner N = 349)[a]					
	Condom Use Discussions (n/N= 163/1281)[b]		HIV serostatus Communication (n/N= 196/1281)[b]		CAI (n/N= 681/1278)[b]		Condom Use Discussions (n/N= 45/347)[b]		HIV serostatus Communication (n/N= 59/347)[b]		CAI (n/N= 146/347)[b]	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
	N (%) or Median (IQR)		N (%) or Median (IQR)		N (%) or Median (IQR)		N (%) or Median (IQR)		N (%) or Median (IQR)		N (%) or Median (IQR)	
Yes	319 (29.5)	45 (29.6)	325 (29.9)	40 (26.3)	145 (24.3)	231 (33.9)	119 (40.8)	20 (45.5)	126 (43.5)	15 (31.3)	74 (36.8)	68 (46.6)
Drug use by participant or partner												
No	965 (89.1)	131 (86.2)	974 (89.6)	125 (82.2)	538 (90.1)	596 (87.5)	217 (74.3)	32 (72.7)	220 (75.9)	31 (64.6)	144 (71.6)	112 (76.7)
Yes	118 (10.9)	21 (13.8)	113 (10.4)	27 (17.8)	59 (9.9)	85 (12.5)	75 (25.7)	12 (27.3)	70 (24.1)	17 (35.4)	57 (28.4)	34 (23.3)
Knowledge of partner HIV status												
No	1004 (89.8)	138 (84.7)	--	--	524 (91.1)	620 (93.5)	274 (90.7)	43 (95.6)	--	--	182 (93.8)	137 (95.1)
Yes	114 (10.2)	25 (15.3)	--	--	51 (8.9)	43 (6.5)	28 (9.3)	2 (4.4)	--	--	12 (6.2)	7 (4.9)
Condom use discussions before or during sex												
No	--	--	983 (90.6)	135 (68.9)	512 (89.5)	570 (86.1)	--	--	268 (93.1)	34 (57.6)	166 (86.5)	126 (87.5)
Yes	--	--	102 (9.4)	61 (31.1)	60 (10.5)	92 (13.9)	--	--	20 (6.9)	25 (42.4)	26 (13.5)	18 (12.5)
HIV serostatus communication												
No	983 (87.9)	102 (62.6)	--	--	499 (86.8)	587 (88.5)	268 (88.7)	20 (44.4)	--	--	163 (84.0)	127 (88.2)
Yes	135 (12.1)	61 (37.4)	--	--	76 (13.2)	76 (11.5)	34 (11.3)	25 (55.6)	--	--	31 (16.0)	17 (11.8)

[a] All Ns are at partner-level; Ns for some variables do not total to MSM partner N = 1285 or TW partner N = 349, due to missing data.

[b] n represents the population size reporting each outcome, written over the total population size, N. Definitions: *CAI:* condomless anal intercourse; *IQR:* interquartile range.

Table IV.

Crude and adjusted prevalence ratios modeling associations between partner and partnership contexts with sexual communication behaviors and CAI among Peruvian MSM and TW, 2017, participant N = 568, partner N = 1518

	MSM (participant N = 446, partner N = 1191)[a]														
	Condom Use Discussions (n/N= 163/1281)[b]				HIV serostatus Communication (n/N= 196/1281)[b]				CAI (n/N= 681/1278)[b]				Condom Use Discussi		
	PR (95 % CI)	*p*-value	aPR (95 % CI)	*p*-value	PR (95 % CI)	*p*-value	aPR (95 % CI)	*p*-value	PR (95 % CI)	*p*-value	aPR (95 % CI)	*p*-value	PR (95 % CI)	*p*-value	
Age	0.98 (0.96, 1.00)	0.08			1.00 (0.99, 1.02)	0.79	1.00 (0.98, 1.02)	0.86			1.00 (0.99, 1.00)	0.96	1.00 (0.97, 1.03)	0.98	
Education (<Secondary is reference)															
Secondary	0.78 (0.39, 1.58)	0.49			0.55 (0.32, 0.94)	0.03	0.45 (0.24, 0.82)	0.009			0.93 (0.68, 1.28)	0.67	1.74 (0.68, 4.46)	0.25	
>Secondary	1.07 (0.55, 2.08)	0.83			0.73 (0.45, 1.19)	0.21	0.67 (0.38, 1.20)	0.18			1.03 (0.76, 1.39)	0.87	1.50 (0.51, 4.42)	0.46	
Participant Sexual Orientation/Gender Identity (Heterosexual is reference)															
Bisexual	0.49 (0.17, 1.44)	0.20			0.32 (0.18, 0.55)	<0.001	0.35 (0.15, 0.81)	0.01			1.14 (0.65, 2.01)	0.65	2.73 (0.58, 12.87)	0.21	
Gay	0.40 (0.15, 1.08)	0.07			**0.28 (0.18, 0.42)**	**<0.001**	**0.28 (0.14, 0.59)**	**0.001**			1.48 (0.87, 2.51)	0.15	0.72 (0.20, 2.68)	0.63	
Transgender													1.26 (0.27, 5.83)	0.77	
Participant Role (*Pasivo* is reference)															
Moderno	0.88 (0.63, 1.23)	0.46			0.95 (0.70, 1.30)	0.76	0.85 (0.59, 1.22)	0.38			0.97 (0.85, 1.11)	0.69	0.94 (0.40, 2.25)	0.89	
Discussed questions or concerns about HIV/STI prevention with close social contacts	1.47 (0.91, 2.37)	0.11			**1.87 (1.04, 3.35)**	**0.04**	**2.18 (1.19, 4.02)**	**0.01**					1.00 (0.34, 2.90)	1.00	
Sexual Network Size > Median (<Media n is reference)	0.84 (0.59, 1.19)	0.32			**0.71 (0.51, 0.98)**	**0.04**	0.76 (0.52, 1.12)	0.16					0.83 (0.42, 1.66)	0.60	
Partner Gender Identity (Cisgender man is reference)															
Cisgender woman					0.77 (0.13, 4.74)	0.78							3.60 (0.92, 14.11)	0.07	

	MSM (participant N = 446, partner N = 1191)[a]														
	Condom Use Discussions (n/N= 163/1281)[b]				**HIV serostatus Communication (n/N= 196/1281)[b]**				**CAI (n/N= 681/1278)[b]**				**Condom Use Discussi**		
	PR (95 % CI)	***p*-value**	**aPR (95 % CI)**	***p*-value**	**PR (95 % CI)**	***p*-value**	**aPR (95 % CI)**	***p*-value**	**PR (95 % CI)**	***p*-value**	**aPR (95 % CI)**	***p*-value**	**PR (95 % CI)**	***p*-value**	
Transgender woman					1.33 (0.38, 4.64)	0.66							**4.05 (1.58, 10.40)**	**0.004**	
Perceived Partner Sexual Orientation (Heterosexual is reference)															
Bisexual	0.79 (0.48, 1.28)	0.34			0.82 (0.51, 1.33)	0.42							1.10 (0.52, 2.34)	0.81	
Gay	0.94 (0.59, 1.49)	0.79			1.14 (0.72, 1.81)	0.58							1.29 (0.47, 3.54)	0.62	
Partner Type (Stable is reference)															
Casual	0.76 (0.47, 1.22)	0.26			**0.42 (0.30, 0.58)**	**<0.001**	**0.37 (0.25, 0.54)**	**<0.001**			1.06 (0.87, 1.29)	0.55	2.59 (0.66, 10.22)	0.17	
Anonymous	0.74 (0.44, 1.26)	0.27			**0.29 (0.19, 0.45)**	**<0.001**	**0.28 (0.17, 0.46)**	**<0.001**			0.94 (0.76, 1.16)	0.55	2.71 (0.63, 11.64)	0.18	
Commercial	1.02 (0.50, 2.08)	0.96			**0.48 (0.28, 0.83)**	**0.008**	**0.47 (0.23, 0.98)**	**0.04**			0.89 (0.66, 1.20)	0.45	1.56 (0.34, 7.14)	0.57	
Partnership Length	1.00 (1.00, 1.00)	0.08			1.00 (1.00, 1.00)	0.08							1.00 (1.00, 1.00)	0.24	
Partnership Concurrency	0.96 (0.70, 1.30)	0.78			1.27 (0.97, 1.66)	0.08							**2.41 (1.23, 4.73)**	**0.01**	
Alcohol use by participant or partner	0.99 (0.70, 1.41)	0.96			0.82 (0.58, 1.15)	0.26	0.81 (0.57, 1.16)	0.25			**1.15 (1.03, 1.29)**	**0.01**	1.17 (0.60, 2.30)	0.65	
Drug use by participant or partner	1.12 (0.64, 1.95)	0.70			**1.64 (1.11, 2.43)**	**0.01**	**1.87 (1.20, 2.91)**	**0.006**			1.09 (0.92, 1.28)	0.32	0.92 (0.42, 1.99)	0.82	
Knowledge of partner HIV status	1.34 (0.86, 2.07)	0.19							0.84 (0.67,1.05)	0.13			0.36 (0.06,2.19)	0.27	
Condom use discussions before or during sex					**2.67 (2.01,3.55)**	**<0.001**			**1.19 (1.04,1.36)**	**0.01**	**1.20 (1.04,1.37)**	**0.01**			
HIV serostatus communication	3.00 (2.19,4.12)	**<0.001**							0.94 (0.80, 1.10)	0.44			**5.95 (3.29, 10.74)**	**<0.001**	

[a] N for multivariate analyses based on complete case data; Ns for individual variables may vary, depending on completeness of participant responses.

[b] n represents the population size reporting each outcome, written over the total population size, N.

Definitions: *CAI:* condomless anal intercourse, *aPR:* adjusted prevalence ratio, *95% CI:* 95% confidence interval.

Bold text indicates $p < 0.05$. Multivariate analyses were adjusted for participant age, education, sexual orientation/gender identity, and sexual role; partner type; and alcohol and drug use prior to sex.

Unless otherwise specified, “No” is reference.