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Partner Disclosure of PrEP Use and Undetectable Viral Load on Geosocial Networking Apps: Frequency of Disclosure and Decisions about Condomless Sex

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Abstract

Background—Recent advances in biomedical prevention strategies, including pre-exposure prophylaxis (PrEP) and achieving an undetectable viral load (UVL) among HIV-infected persons, show promise in curbing the rising incidence of HIV among men who have sex with men (MSM) in the United States. This mixed methods study aimed to investigate the frequency with which MSM encounter potential sex partners on geosocial networking apps who disclose biomedical prevention use, and how MSM make decisions about condom use after these disclosures.

Method—Participants were recruited via advertisements placed on a large geosocial networking app for MSM. A total of 668 and 727 participants, respectively, responded to questionnaires assessing partner disclosure of PrEP use and UVL. Each questionnaire included an open-ended item assessing reasons for condomless anal sex (CAS) with partners using biomedical prevention.

Results—Across both surveys, a majority of respondents encountered potential sex partners who disclosed PrEP use or UVL, and the majority of those who met up with these partners engaged in CAS at least once. Qualitative analyses found that most participants who reported CAS did so after making a calculated risk about HIV transmission. We also describe a novel risk reduction strategy, “biomed-matching,” or having CAS only when both individuals use PrEP or have UVL. We report serostatus differences in both quantitative and qualitative findings.

Conclusions—Disclosure of PrEP use and UVL is not uncommon among MSM. Many MSM make accurate appraisals of the risks of CAS with biomedical prevention, and mobile apps may aid with disclosing biomedical prevention use.

Keywords

HIV/AIDS; men who have sex with men; biomedical prevention; pre-exposure prophylaxis; viral suppression

Men who have sex with men (MSM) are substantially impacted by HIV/AIDS in the United States¹. Recent advances in biomedical prevention strategies, including pre-exposure

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prophylaxis (PrEP)² and achieving an undetectable viral load (UVL)³ among HIV-infected persons (i.e., treatment as prevention; TasP), show promise in curbing the rising incidence of HIV among MSM¹. However, some have voiced concerns that increased availability and knowledge of PrEP and TasP may lead to decreased condom use^{4,5} (i.e., “risk compensation”), which could perpetuate new HIV infections if protective effects of imperfect biomedical strategies are overcome by an increase in transmission risk behaviors. More information is needed about how frequently MSM have condomless anal sex (CAS) with HIV-negative partners on PrEP and HIV-positive partners with UVL, as well as details about how MSM make decisions about condom use in these situations.

Findings from the iPrEx study indicated that daily PrEP use reduced HIV infections among MSM by 44%², and MSM who were more than 90% adherent to the daily dosing decreased their risk of becoming HIV infected by 73%². There is also some evidence for the efficacy of intermittent PrEP. In the open-label extension of iPrEx (iPrEx OLÉ), taking 2-3 doses per week was 84% efficacious, while 4 or more doses per week was 100% efficacious⁶. Very little epidemiological data is available on the prevalence of PrEP use in the U.S., but recent data suggests high interest in PrEP amongst MSM⁷. With regard to UVL, TasP relies on viral suppression among HIV-positive individuals, which is most often achieved through optimal ART use^{3,8}. For example, the PARTNER Study, a longitudinal study of serodiscordant couples (34.5% MSM couples), recently reported that 0% of HIV-negative partners acquired HIV from their HIV-positive partner when the positive partner was virally suppressed⁹. Unfortunately, CDC data indicates that only about 30% of HIV-positive individuals in the U.S. achieve UVL¹⁰.

These biomedical advances have led to a paradigm shift in HIV prevention, though much remains unknown about how to optimally implement these relatively new strategies, and CDC recommends condom use even in the presence of PrEP and TasP^{11,12}. We need to know more about how MSM make decisions about sexual behavior and prevention in the context of biomedical prevention. It remains unclear how frequently MSM disclose PrEP use or UVL to their sexual partners and how often MSM engage in CAS as a result. Evidence suggests that MSM believe they would reduce their condom use if they were on PrEP^{13,14}, but studies of MSM and heterosexuals in Africa have not found evidence of this behavior change after PrEP initiation^{2,4,15}. Research also suggests that within serodiscordant partnerships, biomedical information (i.e., HIV-positive partner's viral load, CD4 count¹⁶⁻²⁰) plays a key role in condom use decisions^{16,18}. The current study aimed to investigate the frequency with which MSM encounter potential sex partners on geosocial networking apps who disclose biomedical prevention use (i.e., PrEP use or UVL), as well as how MSM make decisions about condom use after these disclosures. This mixed methods study will help to inform integrated behavioral and biomedical interventions to optimize use of biomedical prevention and curb rising rates of HIV.

Methods

Participants, Recruitment and Procedures

We recruited participants nationally via banner and pop-up advertisements placed on a geospatial smartphone application for MSM. The campaign served the dual purpose of

recruiting participants for a randomized clinical trial (RCT; not reported here) and to collect survey data from MSM. Advertisements ran from November 2014 through February 2015 and described a university survey that provided an opportunity to provide input to better understand and serve the health needs of the LGBTQ community. Advertisements were shown throughout the U.S., with pop-up ads shown 5 times (upon initial login to the app within each 24-hour advertising period). Banner advertisements ran continuously during the period. No incentives for participation were provided for completing the surveys. This study was approved by the Institutional Review Board as an anonymous, exempt study.

Potential participants were taken to an online eligibility screener. A total of 4,783 individuals clicked the ads and 2,932 (61.3%) consented and started the screener. Of those, 801 (27%) were ineligible for survey participation. Potential participants were ineligible due to demographic characteristics (female or under age 18; 3.7%), provisional eligibility for the RCT (age 18-29 years, male sex assigned at birth and male gender identity, not in a serious monogamous relationship > 6 months, had sex with a male, had CAS < 6 months, and HIVnegative/unknown status; 53.4%), or failure to complete the screener (42.3%). Further, we identified duplicate participants by matching on 10 demographic characteristics (e.g., age +/-1 year, zip code, etc), and 33 cases were classified as duplicates and were deleted.

The remaining 2,098 participants were routed to various surveys; participants completed a brief demographic screener, after which they were routed to all surveys for which they were eligible based on their responses. No additional inclusion criteria were used for the current surveys beyond general criteria (i.e., mobile app users, at least 18 years of age), and 680 and 730 were offered the opportunity to complete surveys assessing partner disclosure of PrEP use and UVL, respectively. We removed participants who did not complete all questions associated with the surveys of interest, leaving 668 (M age = 38.09, SD = 11.33) and 727 (M age = 38.17, SD = 11.45) respondents to the PrEP and UVL surveys, respectively (see Table 1 for demographic characteristics of the analytic sample).

Measures

Each survey consisted of six items assessing the frequency of potential sex partner disclosure of biomedical prevention use on mobile dating apps and subsequent sexual behavior with those partners. The entry question to each survey was: “When you’ve been on mobile dating apps looking for sex partners, has anyone ever told you that they were [on PrEP/HIV-positive, but had an undetectable viral load]?” “Yes” responses were then asked: “When someone on an app told you that they [were on PrEP/had an undetectable viral load], how often did they say they were looking to have anal sex without a condom?” Response options included: never, once or twice, 3-5 times, and more than 5 times. Unless “never” was selected, participants were asked two follow-up questions: “When someone on an app told you that they [were on PrEP/had an undetectable viral load], how often did they refuse to have anal sex unless it was without a condom?”; and “When someone on an app told you that they [were on PrEP/had an undetectable viral load] and said they were looking to have anal sex without a condom, how often did you actually meet up with them?” Response options were: never, once or twice, 3-5 times, and more than 5 times. Participants who reported they had ever met up with a partner who disclosed PrEP use or UVL were then

asked: “When you met up with these partners, did you use a condom during anal sex?” Response options were on a 5-point scale that ranged from “we never used condoms” to “we always used condoms.” Unless participants selected “we always used condoms,” they were asked an open-ended question: “Please tell us why you decided not to use condoms with these partners who [were on PrEP/had an undetectable viral load].”

Analyses

We calculated response frequencies for each of the quantitative items using SPSS statistical software. We conducted Chi-square tests to examine response differences between HIV-negative and HIV-positive respondents. Note that we re-coded “don't know/never tested” into HIV-negative for these analyses. The sixth open-ended item in each of the surveys produced 57 and 77 qualitative responses for the PrEP and UVL disclosure surveys, respectively. Eight participants did not provide an answer to the open-ended question on the PrEP disclosure survey, while 12 failed to do so on the UVL survey. We examined differences in demographics (age, race/ethnicity, HIV status) and sexual behavior between completers and non-completers and few differences emerged. Non-completers on the PrEP disclosure survey were more likely to be HIV-positive, and non-completers on the UVL disclosure survey reported more frequent CAS with partners with UVL.

For code development and application, we applied two rounds of constant comparison analysis. During the first phase of open coding, we coded all responses using an initial set of a priori hypothesized categories, as well as identifying emerging themes using constant comparison analysis^{21,22}, resulting in a codebook with 14 broad thematic codes. The codebook included code descriptions and illustrative examples of excerpts in order to facilitate inter-coder agreement²³. Two independent coders then coded all responses and we calculated reliability of each code. The mean Cohen's Kappa across all themes was .86, and we resolved any disagreements through consensus. Finally, for the purpose of presenting findings, we grouped the 14 axial codes into four overarching thematic categories: risk assessments, attitudes toward condom use, partner-related influences, and indifference or uncertainty. Axial codes that were applied to fewer than 5 excerpts (3 codes) were removed from the present analysis. Analyses thus included 11 axial codes related to CAS with partners using biomedical prevention. In order to draw comparisons between HIV-positive and HIV-negative respondents, we merged the quantitative data using mixed methods approaches used successfully in our prior research for qualitative interviews^{24,25}. We conducted Chi-square tests to examine differences in theme endorsement.

Results

Quantitative Findings: Sex Partner Disclosure of Biomedical Prevention

See Table 2 for a summary of results. On the PrEP disclosure survey, 42.8% and 62.4% of HIV-negative and HIV-positive MSM, respectively, reported having ever had a potential sex partner disclose PrEP use on a mobile app, $\chi^2 = 12.38$ (1, $N = 668$), $p < .001$. Of these, the majority of both HIV-negative and HIV-positive MSM reported that a potential sex partner on PrEP had asked to have CAS. Further, when sex partners on PrEP requested CAS, more than half of both HIV-negative and HIV-positive MSM reported at least one such partner

had refused anal sex unless it was condomless. A majority of HIV-positive respondents met up with a potential partner on PrEP who asked for CAS, while about a quarter of HIV-negative participants did so, $\chi^2 = 21.08$ (3, $N = 218$), $p < .001$. Regardless of serostatus, the vast majority of those who met up with a partner on PrEP who requested CAS reported at least one episode of CAS with those partners. Taking into account all respondents to whom a potential sex partner disclosed PrEP use, 15.9% and 44.8% of HIV-negative and HIV-positive MSM, respectively, reported ever having had CAS with a partner on PrEP.

With regard to the UVL disclosure survey, 67.9% and 90% of HIV-negative and HIV-positive MSM, respectively, reported having ever had a potential sex partner disclose they were HIV-positive but had UVL on a mobile app, $\chi^2 = 20.37$ (1, $N = 727$), $p < .001$. Of these, the majority of both HIV-negative and HIV-positive MSM reported that a potential sex partner with UVL had asked to have CAS, though this occurred more frequently among HIV-positive respondents, $\chi^2 = 37.25$ (3, $N = 516$), $p < .001$. Further, when partners with UVL requested CAS, more than half of HIV-negative and HIV-positive MSM reported at least one such partner had refused anal sex unless it was condomless. A large majority of HIV-positive participants reported ever having met up with a partner with UVL who requested CAS compared to only 16.3% of HIV-negative respondents, $\chi^2 = 90.37$ (1, $N = 348$), $p < .001$. The vast majority of both HIV-negative and HIV-positive participants who met up with a partner with UVL who requested CAS reported at least one episode of CAS with these partners, and CAS was marginally more common amongst HIV-positive respondents, $\chi^2 = 9.14$ (1, $N = 99$), $p = .058$. Taking into account all respondents to whom a potential partner disclosed UVL, 8.7% and 60% of HIV-negative and HIV-positive respondents, respectively, reported ever having had CAS with those partners.

Qualitative Findings: Reasons for Condomless Sex with Partners using Biomedical Prevention

Four thematic categories emerged: a) risk assessment, b) attitudes toward condom use, c) partner-related influences, and d) indifference or uncertainty. Table 3 includes descriptions of each of the 11 axial codes along with the percent of participants coded with each axial code in each survey. Below we describe each theme and report statistically significant differences in theme endorsement by participant serostatus.

Within the risk assessment category, five themes emerged: “HIV risk is lower with biomedical prevention”, “I also have an undetectable viral load”, “I am also on PrEP”, seropositioning (i.e., acquisition risk is lower for “tops”), and serosorting (i.e., we had the same HIV status). The most frequently endorsed theme across all categories was “HIV risk is lower with biomedical prevention,” and compared to HIV-positive MSM, this theme was significantly more frequently endorsed by HIV-negative MSM as a reason for CAS with HIV-positive partners with UVL, $\chi^2 = 6.85$ (1, $N = 79$), $p < .01$. This code indicated that participants noted specific knowledge that the risk of transmission is lower with use of these strategies. One HIV-negative participant stated the following: “Based on the recent studies regard[ing] undetectable transmission stats I felt it is an acceptable risk.” Of those who endorsed this theme, many participants acknowledged some transmission risk with a partner on PrEP (39.3%) or with UVL (62.5%), but others reported inaccurate information about the

risks associated with CAS with a partner on PrEP (17.9%) or with UVL (9.4%) (e.g., transmission is impossible).

Participants reported they also used seroadaptive behaviors to minimize transmission risk when they had CAS. Many stated that their partners had their same serostatus (i.e., serosorting), and this was reported by a larger proportion of HIV-positive MSM. A smaller number reported they used seropositioning to reduce risk when having CAS with partners on biomedical prevention (i.e., acquiring risk is lower for the insertive partner). Compared to HIV-positive MSM, HIV-negative respondents were significantly more likely to endorse this theme as a reason for CAS with HIV-positive MSM with UVL, $\chi^2 = 5.41$ (1, $N = 79$), $p < .05$. HIV-negative MSM who reported CAS with HIV-negative partners on PrEP also endorsed seropositioning more frequently than HIV-positive MSM, though this was only marginally significant, $\chi^2 = 2.74$ (1, $N = 57$), $p = .098$. Finally, some MSM reported a novel seroadaptive behavior, which we call “biomed-matching,” and is indicated by endorsement of “I also have an undetectable viral load” or “I am also on PrEP”. These MSM reported they had CAS because both they and their partners were using a biomedical prevention strategy (either PrEP or UVL), thus substantially reducing transmission risk. A larger proportion of HIV-positive participants reported this strategy. One HIV-positive participant with UVL stated: “[I] only sleep [with] guys who are on PrEP or undetectable.”

In the attitudes toward condom use category, two themes emerged: “condoms interfere with sexual functioning” and “condomless sex is more pleasurable”. Approximately 10% of respondents endorsed each code on each survey. Compared to HIV-positive MSM, HIV-negative respondents were significantly more likely to endorse “condomless sex is more pleasurable” as a reason for CAS with partners with UVL, $\chi^2 = 4.04$ (1, $N = 79$), $p < .05$. One HIV-negative participant described CAS with partners with UVL: “I have always found bare sex far more enjoyable and fulfilling...I considered the risk of infection to be insignificant.”

Three themes emerged with regard to partner-related influences on CAS with partners on biomedical prevention: trustworthiness and communication, leaving the decision up to the partner, and being horny or aroused by the partner. Trustworthiness and communication was the most frequently endorsed theme within this category. This code was applied when, before having sex, MSM noted a specific reason for believing the partner was trustworthy (e.g., prior knowledge of or communication with partner) and/or had communicated about their health status. Leaving the decision up to one's partner was rarely endorsed on the UVL disclosure survey, but was endorsed by a larger minority of respondents on the PrEP disclosure survey. HIV-positive respondents were significantly more likely than HIV-negative respondents to endorse this theme as a reason for CAS with partners on PrEP, $\chi^2 = 5.21$ (1, $N = 57$), $p < .05$. Fewer MSM endorsed being horny or aroused as a reason for CAS with partners with UVL. HIV-negative respondents were significantly more likely to endorse this theme than HIV-positive MSM as a reason for CAS with HIV-positive partners with UVL, $\chi^2 = 4.61$ (1, $N = 79$), $p < .05$, though this theme was not endorsed for partners who disclosed PrEP use. The following response from an HIV-negative participant who had CAS with a partner who had UVL illustrates several of these codes: “I felt the risk for HIV transmission was low based upon conversations online and after actually meeting and

talking. But I was very preoccupied with my sex partner's potential for full sexual pleasure. That gives me pleasure too.” The final theme was uncertainty or indifference (approximately 10% on each survey), which indicated that participants did not know why they had CAS or that they were not concerned about the risks. We did not observe serostatus differences in endorsement of this theme.

Discussion

The current findings indicate that it is not uncommon for MSM who seek sex partners on mobile dating apps to encounter potential sex partners who disclose use of biomedical prevention strategies, including HIV-negative MSM who disclose PrEP use and HIV-positive MSM who disclose having UVL (i.e., viral suppression). Furthermore, the majority of MSM who received such disclosures reported that these partners had specifically asked to have CAS and that they often refused to have sex unless it was condomless. A small but sizeable minority of respondents reported ever having met up with partners on biomedical prevention who requested CAS, but the vast majority of these individuals engaged in CAS with at least one of these partners. Participants' qualitative responses describing reasons for CAS with a partner on biomedical prevention highlight the potential impact such strategies may have in curbing rising HIV incidence, as well as the need for clearer guidelines about condom use in the context of biomedical prevention. MSM most commonly reported that they had CAS with a partner on biomedical prevention because they knew that these biomedical strategies greatly reduce the likelihood of HIV transmission, and very few respondents made incorrect statements about the efficacy of PrEP or UVL.

We found important serostatus differences in both quantitative and qualitative data that have implications for prevention strategies. HIV-positive respondents were substantially more likely to have ever had a potential sex partner disclose PrEP use or UVL. They were also much more likely to have ever met up with these partners after such a disclosure and subsequently to have engaged in CAS. This likely reflects that HIV-positive MSM are choosing to have CAS with partners to whom they are less likely to transmit HIV because of partners' use of biomedical strategies. Mobile dating apps may provide a more efficient and less stigmatizing environment in which HIV-positive MSM can disclose their status and seek partners to whom transmission is less likely because of their use of PrEP or because their viral load is suppressed. Our qualitative data support this; HIV-positive MSM were more likely to describe seroadaptive behaviors as reasons for having CAS with partners who used biomedical prevention, such as serosorting (i.e., CAS with individuals who share their serostatus). Our analyses revealed a novel seroadaptive behavior that we are calling “biomed-matching”, which refers to CAS when both partners are using biomedical prevention (i.e., either PrEP or UVL/TasP), and this was more frequently described as a strategy among HIV-positive MSM. Biomed-matching is a promising and likely very effective prevention strategy because it does not solely rely on a partner's self-reported medication status. Research should continue to examine this combination strategy as a component of biomedical and behavioral prevention.

Beyond making risk assessments based on knowledge of biomedical prevention or seroadaptive behaviors, qualitative data revealed several other important influences on

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decisions to have CAS with partners on biomedical prevention. First, attitudes toward condoms were an important influence on CAS, and MSM described issues related to reduced sexual functioning with condoms and enhanced pleasure with condomless sex. Previous quantitative and qualitative findings have also linked condom attitudes to HIV risk behavior^{26,27}. Second, a substantial minority reported that characteristics of their partners or their relationships with those partners influenced decisions, including trustworthiness and communication and leaving the decision up to their partners, and the latter was more frequently endorsed by HIV-positive MSM. While both of these strategies indicate that the participant and their partners may have discussed their statuses and use of biomedical prevention prior to sex (a critical component of sexual decision making), it also means that these MSM trusted that their partners were using these prevention strategies effectively. In the absence of more concrete knowledge about a partner's status and medication regimen, the most effective prevention strategy is a combination approach that includes both biomedical prevention and another prevention approach (e.g., condom use, another biomedical approach)²⁸. MSM, primarily those who were HIV-negative and had partners on PrEP, also noted that being horny or aroused by partners influenced CAS decisions. This finding is consistent with prior work demonstrating that acute sexual arousal is associated with higher rates of sexual risk-taking^{29,30}.

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Finally, about 10% of participants reported that they were unsure why they had CAS or that they were indifferent to the outcome. This theme was endorsed consistently across participant serostatus and across biomedical prevention type (i.e., PrEP use, UVL). This indifference to the risk associated with sexual behavior may indicate that a significant minority of MSM are engaging in CAS with partners regardless of their partners' HIV status or use of biomedical prevention, which may be placing themselves or their partners at risk for HIV infection. We should also note that several hypothesized themes did not emerge from the qualitative data as reasons for CAS, including alcohol and drug use, loneliness, and reduced emotional intimacy with condoms, indicating that the above described themes may be more proximally related to CAS with partners using biomedical prevention met on mobile dating apps.

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Our qualitative and quantitative findings indicate that some MSM may change their behavior in the context of biomedical prevention and increase rates of CAS. While this is inconsistent with some prior work^{2,4,15}, this discrepancy may be a result of recent increased availability of biomedical prevention or more awareness of the efficacy of biomedical prevention among MSM. Alternatively, this sample may not be representative of all MSM. Indeed, MSM who seek sex partners on mobile apps may live in more population dense areas (i.e., urban, suburban areas), have more biomedical prevention knowledge as a result of being more sexually active, or simply be more prone to risk behavior. Regardless, it is important to note that PrEP and UVL may significantly reduce the likelihood of HIV acquisition or transmission despite the fact that some MSM are not using condoms while using these strategies. In fact, individuals who note the barriers to condom use we identified through our qualitative research are precisely the individuals to whom we should promote biomedical prevention use.

There are several other limitations to these data that are worth noting. First, this was a brief cross-sectional survey and we were unable to make conclusions about the causal pathways that led to decisions about condom use with partners who use biomedical prevention. Further, there were low response rates to some items as a result of skip patterns in the questionnaire, so we had limited power to detect differences between HIV-negative and HIV-positive respondents for some items. In terms of the open-ended questions, some participants failed to provide responses and some responses were more detailed than others. As such, participants with stronger or more developed opinions may be overrepresented in these data. Our questionnaire also only gathered data on sexual behavior among MSM who had potential partners disclose biomedical prevention use, and we did not assess sexual behavior with partners who did not use such prevention strategies. This limits our understanding of how MSM may alter their behavior across partnerships. Finally, the sample was recruited from a single mobile dating application and contained a limited number of ethnic minorities.

Despite limitations, these analyses provide some of the first data examining how MSM make decisions about condom use after partners disclose biomedical prevention use (i.e., PrEP use, UVL). Our findings indicate that most MSM have had a potential partner disclose biomedical prevention use, and a substantial minority have met up with these partners and engaged in CAS. While this might seem concerning, qualitative data suggests that most MSM who had CAS made a calculated assessment of HIV transmission risk that often included accurate knowledge about risk in the context of biomedical prevention and use of other risk reduction strategies (i.e., seroadaptive behaviors). Mobile platforms may aid in disclosing HIV status and biomedical prevention use, which may be more difficult in face-to-face environments and is a critical component of making effective decisions about sexual risk. Even so, a substantial minority of MSM report indifference to the risk associated with CAS and inaccurate information about biomedical prevention, indicating that more research is needed to help MSM make accurate sexual risk appraisals in the context of biomedical prevention.

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References

1. CDC. Diagnoses of HIV Infection in the United States and Dependent Areas, 2013. HIV Surveillance Report. 2015; 25
2. Grant RM, Lama JR, Anderson PL, et al. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. *N Engl J Med.* 2010; 363(27):2587–2599. [PubMed: 21091279]
3. Cohen MS, McCauley M, Gamble TR. HIV treatment as prevention and HPTN 052. *Curr Opin HIV AIDS.* 2012; 7(2):99–105. [PubMed: 22227585]
4. Guest G, Shattuck D, Johnson L, et al. Changes in sexual risk behavior among participants in a PrEP HIV prevention trial. *Sex Transm Dis.* 2008; 35(12):1002–1008. [PubMed: 19051397]

5. Kubicek K, Arauz-Cuadra C, Kipke MD. Attitudes and perceptions of biomedical HIV prevention methods: voices from young men who have sex with men. *Arch Sex Behav.* 2015; 44(2):487–497. [PubMed: 25633499]
6. Grant, RM.; Anderson, PL.; McMahan, V., et al. Results of the iPrEx open-label extension (iPrEx OLE) in men and transgender women who have sex with men: PrEP uptake, sexual practices, and HIV incidence. 20th International AIDS Conference; 2014; Melbourne, Australia.
7. Cohen SE, Vittinghoff E, Bacon O, et al. High interest in preexposure prophylaxis among men who have sex with men at risk for HIV infection: baseline data from the US PrEP demonstration project. *J Acquir Immune Defic Syndr.* 2015; 68(4):439–448. [PubMed: 25501614]
8. Cohen MS, Chen YQ, McCauley M, et al. Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med.* 2011; 365(6):493–505. [PubMed: 21767103]
9. Rodger, A.; Bruun, T.; Cambiano, V., et al. HIV transmission risk through condomless sex if HIV+ partner on suppressive ART: PARTNER Study. Conference on Retroviruses and Opportunistic Infections (CROI); 2014; Boston, MA.
10. CDC. Vital Signs: HIV diagnosis, care, and treatment among persons living with HIV -United States, 2011. *MMWR.* 2014; 63(47):1113–1117. [PubMed: 25426654]
11. CDC. [Accessed May 18, 2015] Preexposure prophylaxis for the prevention of HIV infection in the United States -2014: a clinical practice guideline. 2014. <http://www.cdc.gov/hiv/pdf/PrEPguidelines2014pdf>
12. CDC. Recommendations for HIV prevention with adults and adolescents with HIV in the United States. 2014
13. Brooks RA, Landovitz RJ, Kaplan RL, Lieber E, Lee SJ, Barkley TW. Sexual risk behaviors and acceptability of HIV pre-exposure prophylaxis among HIV-negative gay and bisexual men in serodiscordant relationships: a mixed methods study. *AIDS Patient Care STDS.* 2012; 26(2):87–94. [PubMed: 22149764]
14. Golub SA, Kowalczyk W, Weinberger CL, Parsons JT. Preexposure prophylaxis and predicted condom use among high-risk men who have sex with men. *J Acquir Immune Defic Syndr.* 2010; 54(5):548–555. [PubMed: 20512046]
15. Liu AY, Vittinghoff E, Chillag K, et al. Sexual risk behavior among HIV-uninfected men who have sex with men participating in a Tenofovir preexposure prophylaxis randomized trial in the United States. *J Acquir Immune Defic Syndr.* 2013; 64(1):87–94. [PubMed: 23481668]
16. Beougher SC, Chakravarty D, Garcia CC, Darbes LA, Neilands TB, Hoff CC. Risks worth taking: safety agreements among discordant gay couples. *AIDS Care.* 2012; 24(9):1071–1077. [PubMed: 22292838]
17. Campbell CK, Gomez AM, Dworkin S, et al. Health, trust, or “just understood”: explicit and implicit condom decision-making processes among black, white, and interracial same-sex male couples. *Arch Sex Behav.* 2014; 43(4):697–706. [PubMed: 23912774]
18. Ostrow DE, Fox KJ, Chmiel JS, et al. Attitudes towards highly active antiretroviral therapy are associated with sexual risk taking among HIV-infected and uninfected homosexual men. *AIDS.* 2002; 16(5):775–780. [PubMed: 11964534]
19. Van de Ven P, Mao L, Fogarty A, et al. Undetectable viral load is associated with sexual risk taking in HIV serodiscordant gay couples in Sydney. *AIDS.* 2005; 19(2):179–184. [PubMed: 15668543]
20. van der Straten A, Gomez CA, Saul J, Quan J, Padian N. Sexual risk behaviors among heterosexual HIV serodiscordant couples in the era of post-exposure prevention and viral suppressive therapy. *AIDS.* 2000; 14(4):F47–54.21. [PubMed: 10770532]
21. Glaser, BG.; Strauss, AL. *The Discovery of Grounded Theory: Strategies for Qualitative Research.* Chicago, IL: Aldine Publishing Company; 1967.
22. Ryan GW, Bernard HR. Techniques to identify themes. *Field Methods.* 2003; 15(1):85.
23. MacQueen KM, McLellan E, Kay K, Milstein B. Codebook development for team-based qualitative analysis. *Field Methods.* 1998; 10(2):31.
24. Greene GJ, Fisher KA, Kuper L, Andrews R, Mustanski B. “Is this normal? Is this not normal? There's no set example”: sexual health intervention preferences of LGBT youth in romantic relationships. *Sex Res Soc Policy.* 2015; 12(1):1–14.

25. Magee JC, Bigelow L, Dehaan S, Mustanski BS. Sexual health information seeking online: a mixed-methods study among lesbian, gay, bisexual, and transgender young people. *Health Educ Behav.* 2012; 39(3):276--289.26. [PubMed: 21490310]
26. Greene GJ, Andrews R, Kuper L, Mustanski B. Intimacy, monogamy, and condom problems drive unprotected sex among young men in serious relationships with other men: a mixed methods dyadic study. *Arch Sex Behav.* 2014; 43(1):73–87. [PubMed: 24202113]
27. Golub SA, Starks TJ, Payton G, Parsons JT. The critical role of intimacy in the sexual risk behaviors of gay and bisexual men. *AIDS Behav.* 2012; 16(3):626–632. [PubMed: 21630012]
28. Buchbinder SP, Liu A. Pre-exposure prophylaxis and the promise of combination prevention approaches. *AIDS Behav.* 2011; 15(Suppl 1):S72–79. [PubMed: 21331801]
29. Mustanski B. The influence of state and trait affect on HIV risk behaviors: A daily diary study of MSM. *Health Psychol.* 2007; 26(5):618–626. [PubMed: 17845113]
30. Grov C, Golub SA, Mustanski B, Parsons JT. Sexual compulsivity, state affect, and sexual risk behavior in a daily diary study of gay and bisexual men. *Psychol Addict Behav.* 2010; 24(3):487–497. [PubMed: 20853934]

Table 1
Demographics Characteristics of Men Who Have Sex with Men Respondents to Surveys
on PrEP Disclosure (N = 668) and Undetectable Viral Load Disclosure (N = 727)

Demographic Characteristic	PrEP Disclosure, N (%)	UVL Disclosure, N (%)
Race/Ethnicity	--	--
White/Caucasian	479 (74.5)	515 (73.8)
Black/African American	41 (6.4)	49 (7.0)
Hispanic/Latino	89 (13.8)	95 (13.6)
Asian	17 (2.6)	18 (2.6)
Other	17 (2.6)	21 (2.9)
Sexual Orientation	--	--
Gay	565 (84.6)	609 (83.8)
Bisexual	75 (11.2)	86 (11.8)
Queer	16 (2.4)	17 (2.3)
Questioning/unsure/other	12 (1.8)	15 (2.1)
HIV Status	--	--
Negative	500 (74.9)	548 (75.4)
Positive	93 (13.9)	100 (13.8)
Don't know/never tested	75 (11.2)	79 (10.9)
Urbanicity	--	--
Urban	343 (51.3)	377 (51.9)
Suburban	224 (33.5)	245 (33.7)
Rural	83 (12.4)	85 (11.7)
Don't know	12 (1.8)	13 (1.8)

Total N differs for the race/ethnicity item due to 25 and 29 missing responses in the PrEP and UVL disclosure surveys, respectively, on this item.

Table 2
Sexual Partner Disclosure of Biomedical Prevention Use on Mobile Dating Apps

Quantitative Item	Response Options		Partner Disclosed PrEP Use		Partner Disclosed UVL	
	HIV- MSM, N (%)	HIV+ MSM, N (%)	HIV- MSM, N (%)	HIV+ MSM, N (%)	HIV- MSM, N (%)	HIV+ MSM, N (%)
1) When you've been on mobile dating apps looking for sex partners, has anyone ever told you that they are [on PrEP/HIV-positive but had UVL]?	Yes	58 (62.4)	246 (42.8)	426 (67.9)	90 (90.0)	<.001
	No	35 (37.6)	329 (57.2)	201 (32.1)	10 (10.0)	
2) If 1 = Yes; When someone on an app told you that they [were on PrEP/had UVL], how often did they say they were looking to have anal sex without a condom?	Never	14 (24.1)	72 (29.3)	155 (36.4)	13 (14.4)	<.001
	1-2 times	17 (29.3)	100 (40.7)	161 (37.8)	25 (27.8)	
	3-5 times	10 (17.2)	25 (10.2)	41 (9.6)	20 (22.2)	
	5+ times	17 (29.3)	49 (19.9)	69 (16.2)	32 (35.6)	
	Never	19 (43.2)	81 (46.6)	106 (39.1)	28 (36.4)	.791
3) If 2 = Never; When someone on an app told you that they [were on PrEP/had UVL] and they said they were looking to have sex without a condom, how often did they refuse to have anal sex unless it was without a condom?	1-2 times	13 (29.5)	53 (30.5)	92 (33.9)	24 (31.2)	
	3-5 times	6 (13.6)	14 (8.0)	38 (14.0)	12 (15.6)	
	5+ times	6 (13.6)	26 (14.9)	35 (12.9)	13 (16.9)	
	Never	18 (40.9)	130 (74.7)	227 (83.8)	22 (28.6)	<.001
	1-2 times	15 (34.1)	31 (17.8)	28 (10.3)	33 (42.9)	
4) If 2 = Never; When someone on an app told you that they [were on PrEP/had UVL] and said they were looking to have anal sex without a condom, how often did you actually meet up with them?	3-5 times	5 (11.4)	8 (4.6)	8 (3.0)	13 (16.9)	
	5+ times	6 (13.6)	5 (2.9)	8 (3.0)	9 (11.7)	
	Never	15 (57.7)	25 (56.8)	24 (54.5)	34 (61.8)	.058
	< half the time	8 (30.8)	9 (20.5)	7 (15.9)	16 (29.1)	
	Half the time	3 (11.5)	2 (4.5)	5 (11.4)	3 (5.5)	
5) If 4 = Never; When you met up with these partners, did you use a condom during anal sex?	> half the time	0 (0.0)	3 (6.8)	1 (2.3)	1 (1.8)	
	Always	0 (0.0)	5 (11.4)	7 (15.9)	1 (1.8)	

Note: PrEP = pre-exposure prophylaxis. UVL = undetectable viral load.

Table 3
Qualitative Codes and Endorsement of Codes as Reasons for Condomless Sex with Partners using Biomedical Prevention

Thematic Code	Axial Code	Code Endorsement (%), PrEP Disclosure		Code Endorsement (%), UVL Disclosure		p-value
		HIV- MSM	HIV+ MSM	HIV- MSM	HIV+ MSM	
Risk Assessment	HIV is risk lower with biomedical prevention	55.3	36.8	57.6	28.3	<.01
	I also have an undetectable viral load	--	21.1	--	28.3	--
	I am also on PrEP	10.5	--	15.2	--	--
Attitudes Toward	Seropositioning	13.2	0.0	21.2	4.3	<.05
	Serosorting	21.1	--	--	43.5	--
Condom Use	Condoms interfere with sexual functioning	7.9	21.1	9.1	8.7	.951
	Condomless sex is more pleasurable	13.2	10.5	18.2	4.3	<.05
Partner-Related	Trust and communication	15.8	5.3	21.2	15.2	.491
	Leaving decision up to the partner	5.3	26.3	<.05	2.2	.394
Influences	Horny/sexually aroused by partner	0.0	0.0	15.2	2.2	<.05
	Uncertainty/Indifference	13.2	5.3	9.1	13.0	.586

Note: PrEP = pre-exposure prophylaxis. UVL = undetectable viral load.