



Published in final edited form as:

J Acquir Immune Defic Syndr. 2021 April 15; 86(5): e126–e133. doi:10.1097/QAI.0000000000002614.

Constructions of HIV Risk Among a Diverse Sample of HIV-Negative Young Men who have Sex with Men who are Repeat Testers

Jennifer K. Felner, PhD, MPH^a, Maria Luisa Mittal, MD^b, Martin Hoenigl, MD^b, K. Rivet Amico, PhD^c, David J. Grelotti, MD^d, Alex Eanes, MPH^{c,e}, Kristen Hess, MPH^{c,f}, Jessica Crawford, MPH^c, Laramie R. Smith, PhD^b

^aSan Diego State University, Institute for Behavioral and Community Health and School of Public Health, 9245 Sky Park Court, Suite 224, San Diego, CA 92123

^bUniversity of California San Diego, Department of Medicine, Division of Infectious Diseases and Global Public Health, 9500 Gilman Drive MC 0507, La Jolla, CA 92093

^cDepartment of Health Behavior & Health Education, University of Michigan School of Public Health, 1415 Washington Heights, Ann Arbor, MI 48109

^dHIV Neurobehavioral Research Program, Department of Psychiatry, University of California San Diego School of Medicine, 200 Dickinson St, Suite B, San Diego, CA 92103

^eNASTAD, 444 North Capitol Street NW, Suite 339, Washington, D.C. 20001

^fClinical Trials Administration, Renown Health, 1155 Mill Street, G14, Reno, NV 89502

Abstract

Introduction.—To end the HIV epidemic, HIV prevention and pre-exposure prophylaxis (PrEP) promotion efforts must reach young men who have sex with men (YMSM) at greatest risk for HIV. This study qualitatively explored whether an objective used to objectively assess HIV risk aligned with how YMSM conceptualize their risk for HIV, and the factors that shape YMSM's risk perceptions.

Methods.—Interviews with a racially/ethnically diverse sample of HIV-negative YMSM (ages 19–24, 60% Latinx; n=20) examined conceptualizations of HIV risk within the context of repeat HIV testing. Iterative, applied thematic analysis examined how participants conceptualized and constructed their HIV risk, and compared participants' descriptions of their risk with a validated quantitative assessment of HIV risk that reliably predicts HIV seroconversion in this group.

Results.—Objective quantitative assessments of HIV risk poorly aligned with participants' perceived HIV risk. Participants described their current risk in relative terms (relative to past risk, relative to friends'/peers' risk), and described age/developmental stage and changes in knowledge about HIV prevention as key factors in risk changes over time. Other factors included substance use and trust/mistrust in sexual partners and scientific advances in HIV prevention (e.g., U=U and

PrEP). Factors that influenced participants' perceived HIV risk were similar regardless of objective risk assessment.

Conclusions.—Quantitative assessments of risk may poorly align with risk perception among YMSM. While objective metrics can effectively target YMSM at greatest risk for HIV transmission, interventions to improve prevention behaviors and PrEP uptake may be more effective when tailored to bridge the disconnect between objective HIV risk assessments and YMSM's constructions of risk.

Keywords

HIV; sexual minorities; Latino; Latinx; men who have sex with men; youth

1 Introduction

Men who have sex with men (MSM) bear the greatest burden of HIV infection in the U.S. Approximately 60% of incident HIV infections occur among MSM with risk behaviors in the highest quartile of a specific risk group, i.e., highest number of male sexual partners, greatest number of sexual acts involving condomless anal intercourse, substance use.¹⁻⁴ Young MSM (YMSM) (i.e., < 24 years old), are disproportionately in the highest risk quartile, and have HIV incidence rates twice that of older MSM.^{5,6} MSM of color – particularly Black and Latinx MSM – evidence HIV disparities relative to their White counterparts.^{5,7,8} These disparities have been explained by socio-structural factors that may influence individual-level opportunities and behavior, such as insurance status, income inequality, racial/ethnic segregation, and intersecting systems of LGBTQ stigma and racism.⁹⁻¹¹

In San Diego, California, 43% of new HIV diagnoses are among Latinx MSM.¹² This is evident in testing outcomes at a San Diego HIV testing program, where Latinx participants represent 30% of MSM program participants overall and about 40% of MSM at highest risk for HIV infection.¹³ The ability to reliably identify YMSM at greatest risk for HIV seroconversion is an important step in providing timely, targeted, interventions to prevent HIV transmission.^{14,15} Our own research suggests HIV risk can be efficiently quantified between testing events (i.e. increasing risk, decreasing risk, stable risk) through the San Diego Early Test (SDET) score. The SDET is a validated risk-behavior assessment predictive of HIV seroconversion based on weighted responses to survey items (bacterial sexually transmitted infection in the past 12-months, condomless receptive anal sex with partner living with HIV/AIDS, condomless receptive anal sex with 5 or more male partners, or 10 or more male partners).^{13,16} Yet, prior quantitative research finds low congruency between validated HIV risk assessments and individual self-reported perceptions of risk.¹⁷⁻²⁰ This discrepancy is likely due to individual, interpersonal, and socio-structural factors not easily captured via standardized risk assessments that shape individual perceptions of risk. Thus, validated risk assessments, even if accurately predictive of HIV seroconversion, may have limited utility for decreasing HIV disparities.

The present study aims to qualitatively examine discrepancies between an objective measure of HIV risk – the SDET risk score – and individual perceptions of risk among a racially/

ethnically diverse group of YMSM. Specifically, we explore how YMSM construct their perceived HIV risk, and the extent to which factors that YMSM attribute to risk vary by SDET score. This information may be critical for the development of culturally-relevant interventions to mitigate persistent HIV disparities among YMSM and more broadly to end the HIV epidemic.²¹²²

2 Methods

Study data come from semi-structured qualitative interviews with 20 YMSM accessing free HIV testing at a community storefront testing site operated by the Early Test program of the San Diego Primary Infection Research Consortium. The study design has been described previously.²³ Briefly, for each testing encounter, behavioral HIV risk was assessed and categorized using the SDET score for the previous 3 months.³¹⁶²⁴ Participants were purposively recruited based upon the three SDET HIV risk categories determined by comparing SDET scores between the most recent and the previous testing encounter: Increasing risk between encounters (n=10; “increasing risk”), decreasing risk between encounters (n=5, “decreasing risk”), or stable risk between encounters (n=5, “stable risk”).

Eligible participants were between 18 and 24-years-old, identified as MSM, tested negative for HIV at least once within the last year, had a repeat negative test within the 14–21 days before study participation, and did not have a history of pre-exposure prophylaxis (PrEP) use within the last year. Three interviewers (JF, MLM, LS) conducted interviews in English or Spanish with participants in a clinical setting. Interviews lasted on average 49 minutes (range: 30–72) and were guided by a semi-structure set of open-ended questions to capture participants’ emotional, cognitive, and behavioral attributions and responses to receiving repeat negative HIV test results. Interview questions relevant to the analysis in this article are presented in Box 1. Participants completed a demographic survey and provided written informed consent prior to participation. All study procedures were approved by the University of California, San Diego Institutional Review Board.

Interviews were audio recorded and transcribed verbatim, with identifying information removed from transcripts. Data were managed using computer assisted qualitative data analysis software, Dedoose version 8. Themes were identified via applied thematic analysis,²⁵²⁶ characterized by organizing narrative excerpts into responses to interview questions (deductive) and iteratively reviewing content for main themes (inductive). A codebook of themes was revised as needed and 10% of transcripts were double coded with discrepancies resolved via consensus (coders: KRA, AE, KS, JM, KRA). Coders were blinded to participants’ risk groups. The study team leveraged a social constructivist paradigmatic lens²⁷ to identify key themes through analysis of coded excerpts, examination of code repetition and co-occurrence, and group-level discussion.²⁵²⁶

Characteristics of the sample are summarized in Table 1. Participants were on average age of 23 ± 1 years (range 19–24) and more than half identified as Latinx (60%). Table 2 provides each participant’s two most recent SDET scores used to establish their HIV risk categorization and their self-reported perceived quantitative estimation of their HIV risk in response to the interview question, “*Now that you have tested several times, what do you*

think your chances of getting HIV are- say from 0% - no way to 100% -definitely?’. As discussed in the next section, we observed little consistency in participants’ perceived chances of contracting HIV (as discussed during the interview) and their SDET risk score (i.e., increasing, decreasing, stable risk).

3 Findings

We identified two overarching themes related to how participants construct risk: *Risk is Relative and Contextual*, and *“Trust” and “Belief” Shape Constructions of Risk*, as well as sub-themes that capture nuances related to how participants construct risk within their own sociocultural contexts. In the following sections, we summarize these overarching themes and sub-themes, as well as aspects of the themes that may be less common but were of relevance to some participants’ HIV risk perceptions and behaviors.

3.1 Risk is Relative and Contextual

All participants’ narratives included discussions of their own HIV risk as relative to others’ and the influence of context on their construction of risk. Generally, participants across HIV risk categories (increasing risk, stable risk, decreasing risk) conceptualized risk as dependent on various factors:

It depends on the person and how they feel about whether they are going to use condoms or whether they’re sleeping with someone who has used [PrEP].

–Age 21, Latinx, Increasing Risk

It depends on your activity, where you are, what you’re doing, how many people you’re doing it with.

–Age 23, Latinx, Stable Risk

It really depends on my behavior and how I carry myself and how I engage other gay men.

–Age 24, Latinx, White, Decreasing Risk

The factors that shaped participants’ constructions of risk within various contexts included age, developmental stage, and relatedly, changes in knowledge about HIV and HIV risk over time. Participants also discussed perceptions of their own risk relative to their friends’/peers’ risk, and risk within the context of substance use.

3.1.1 Age, Developmental Stage, and Knowledge—Age and developmental stage emerged as salient in participants’ perceptions of their changes in risk over time. Many described decreasing risk from their mid to late teens to their late teens to early twenties. For example, one participant estimated his past risk between 50–80% when he was 17–18 years old, compared to a current risk of less than 20% at age 19. He explained that the change in risk was partly in response to behavioral changes after learning that a friend who he perceived as low risk was living with HIV:

I would never say that I don’t have a chance of contracting HIV, because I’m not abstinent. But it’s much lower now, especially after finding out that my friend had

contracted HIV, and I knew he was what I believe to be very sensible and safe person.

–Age 19, Native American, Decreasing Risk

Other participants suggested that changes in professional status, such as finishing college and beginning full-time work, influenced risk:

I feel like the older I get the less risk I would probably [have], just because I have tried to establish myself career-wise, so getting more busy, and with that I'm just tired all the time and just don't want to meet people. I just want to be at home with a bottle of wine, watch some TV, and go to bed.

–Age 22, Asian, Increasing Risk

Participants also described decreasing risk over time as a function of becoming more knowledgeable about HIV risk and the importance of regular testing. This change in knowledge and behavior often occurred after spending time with older or “more experienced” friends. Some participants explained that they now share similar information with friends to help them decrease their risk:

When I really started experimenting with men [at age 17–18], one of my friends told me [about] the risk of HIV because he knew that I had never really messed around with guys, so he just gave me a heads up. I didn't really know what HIV was. I think he was just doing it to look out for me; he's a more experienced person. [Now,] I just give everybody a warning that just move in [to the area]; and when I meet friends, I always tell them to be careful, get tested, and how to use protection.

–Age 23, Latinx, Increasing Risk

3.1.2 Friends'/Peers' Risk—Participants discussed their own risk in relation their friends'/peers'. Many suggested that their risk was substantially lower – this was especially true for those in the increasing risk categories. Reasons cited by participants for increasing risk in their friends, but not for themselves, included having multiple sexual partners and being less selective of one's partners:

I just think that a lot of my friends are not really careful, they're not as aware of things. I am more like aware and I do pay attention to a lot of things, so it is like I won't just go with anybody randomly, and my friends don't, you know, like they would just like go with like any random guy, and would just be like, “oh, like it doesn't really matter”.

–Age 20, Latinx, White, Increasing Risk

One participant reflected on differential risk between himself and two friends living with HIV. He suggested that while they shared similar backgrounds with him – men of color who are college educated – their risks may have been higher due to sex with multiple partners and/or “open relationships”, whereas he was able to “control the flow of who I'm with” regardless of relationship status (Age 22, Latinx, Stable Risk).

While many considered themselves at lower risk than their friends/peers, some participants, particularly those in the decreasing risk category, discussed their HIV risk as the same or

higher than their friends'/peers' risk. For example, one participant discussed how luck influences his friends' lower HIV risk, but not necessarily his own. He also suggested that he constructs his self-assessment of risk based on factors other than his actual behavior:

I want to say that I feel like my risk is higher [than my friends' risk] only because of my mental self-sabotage. I feel like all my friends – the cards are in their favor, but I wouldn't be able to get that luck, I guess. [...] And I want to say I probably have less sex than my friends do, so, yeah, I'm pretty sure it's just my perception [I'm at higher risk].

–Age 24, Latinx, Decreasing Risk

This may partially explain why some of the participants categorized as “decreasing risk” tended to perceive themselves at higher risk for HIV, i.e., their perception of being at higher risk translated into fewer risk behaviors.

3.1.3 Substance Use—Generally, participants described substance use as contributing to risk and changes in risk over time. While some indicated that substance use broadly affected risk, other participants suggested that only certain substances – particularly illicit drugs – confer greater risk. For example, one participant explained that alcohol and marijuana use increases risk by decreasing inhibitions:

I smoke a lot of pot and I feel like this high I get from it – not that it blinds me, but it makes me feel more at ease. Just like drinking – it just makes you feel carefree, and for that reason it does increase my risk.

–Age 24, Latinx, White, Decreasing Risk

In contrast, another participant explained that while alcohol and marijuana do not confer more risk, illicit drugs do – a perception informed and/or validated by a provider at a recent HIV testing encounter:

I feel like [there is] less risk if [a sexual partner] took out alcohol or weed. I know how I react under those substances, so it's not a mystery to me. But I know that if you take, I want to say it's crack or a crystal meth (there was a list one of the times I got tested), these increase your chances of getting HIV. And so, every time talk about heavy drugs pop out, I tend to try to steer away.

–Age 23, Latinx, Stable Risk

At least one participant, however, indicated that feelings of safety within the context of sexual encounters were more important factors in how “risky” his behavior might be than was substance use:

Even weed or poppers – honestly those substances wouldn't be the cause of like [unsafe sex]. If I feel like if I'm in a safe environment then I am more prone to engage in more risky behavior. [Safety relates to] the company and respectful boundaries.

–Age 24, Latinx, Black, Increasing Risk

3.2 “Trust” and “Belief” Shape Constructions of Risk

Concepts of trust of potential partners and belief in the information they provide regarding their HIV-status and testing history (e.g., having recently tested negative for HIV) emerged as a salient factor in participants’ constructions of HIV risk within specific sexual encounters and relationships. Indeed, more than half of the participants discussed these issues without specific prompting from the interviewers, and nearly all participants alluded to them, even if not discussed directly. This theme emerged with respect to whom participants considered to be trustworthy and thus conferred low HIV risk, and the extent to which participants questioned their own judgement for trusting (or not trusting) a partner. In addition, participants reflected on how much they could trust the information provided by a partner regarding their testing history (i.e., if and when they were last tested), HIV-status, and medication adherence.

3.2.1 Partners and Relationships—One of the central ways in which participants assessed risk within sexual relationships related to how well they knew a partner or potential partner. Several participants suggested that those with whom they had previously had sex and/or were within their social circles categorically conferred less HIV risk. This perception of less risk related to participants’ assumption that a friend or acquaintance would be forthcoming about their HIV status:

You would just assume by association that you’d be honest and up front with your status.

–Age 24, Latinx, Increasing Risk

At least some participants acknowledged that knowing someone does not minimize all risk; however, this acknowledgment did not necessarily translate into minimized risk:

There has been a few times where I haven’t used protection but it’s with someone that I feel like I can trust but at the end of day, regardless of the fact that I can trust them, there’s still that possibility [that they are putting me at risk].

–Age 22, Latinx, Decreasing Risk

Participants also reflected on how they constructed risk in the context of a new sexual relationship based on a potential partner’s HIV-status as indicated on geosocial dating apps. Some explained that they do not trust a potential partner simply because of they claim to be HIV-negative. This mistrust may involve complex internal negotiation regarding HIV prevention:

I don’t [trust people who tell me they are HIV-negative]. I swear everybody who says that they’re clean is lying to me, I’m like, “They just want to get in,” but then I’m like, “Okay, it’s illegal to lie [about that]. If I do get positive from this person and then I find out that they know [they are positive], they are going to jail, and their life is ruined.” And then I tell myself, “But they’re still lying”.

–Age 24, Latinx, Decreasing Risk

Other participants problematized the concepts of trust and belief with respect to HIV risk altogether, explaining that what may appear as dishonesty about one’s HIV- and STI-status

is more likely a lack of knowledge about one's status. One participant explained how a recent experience with a partner who did not know their status led him to abstain from sex to avoid future risk. Interestingly, this participant was categorized quantitatively as "increasing risk":

I thought I could trust these people a little bit more. But it's not even that because when I called the person up and said, "Hey, I was just treated for gonorrhea and chlamydia. You were the only person I've been with. You might want to go and get tested," he had no idea. That was the tipping point for me to kind of just keep my legs closed and my mouth shut and focus on myself right now.

–Age 24, Latinx, White, Increasing risk

3.2.2 Does “Undetectable=Untransmittable”? and PrEP adherence—Several participants discussed mistrust with respect to a potential partner's testing history, HIV-status, and the potential for someone with an undetectable viral load to transmit HIV to a partner. In some instances, participants indicated that while they had heard of the phrase “undetectable=untransmittable” or “U=U”, they did not know what it meant or were unsure for whom or when it would apply:

The Grindr app says “undetectable”, but they're positive. And so, I looked that up, and then it said that [someone who is undetectable cannot transmit HIV], but even though it says that, for some reason I cannot wrap my mind around [it] because if we were to use a condom and something were to happen, I could get HIV, maybe, somehow. So, yeah, even when I see that – and when some guys message me and they're positive – I just don't even respond because I just don't want to have that experience. I don't know.

–Age 21, Latinx, Increasing Risk

Other participants indicated that while they understood and trusted the scientific basis for U=U, including that an individual with an undetectable HIV viral load cannot transmit HIV, they questioned how viral loads might fluctuate over time, thus altering the efficacy of U=U:

I've had two encounters that were known somebody had HIV, but one was undetectable, and condoms were used. So, that wasn't a chance [of contracting HIV] at all, to me. But I would think statuses fluctuate with undetectable, and you can spike one day. You never know.

–Age 24, White, Increasing Risk

Participants frequently discussed PrEP during the interviews, often unprompted by the interviewers. Some explained that although a partner being on PrEP might suggest less risk, there remains a level of uncertainty, including the possibility that a partner might be dishonest by saying they are on PrEP, or taking PrEP as indicated, when they are not:

At the end of the day you don't know if they are telling the truth [about PrEP]. You don't know if they're taking the medication on time., so there could be a lot of factors that could still put you at risk for that.

–Age 24, Black, Stable Risk

Absent from these discussions of PrEP was the recognition that it would be their own PrEP use and adherence to PrEP that could ultimately mitigate their personal HIV risk.

4 Discussion

Our findings suggest YMSM's perceived HIV risk and constructions of their risk are dynamic and contextually dependent, and may have limited congruency with a validated metric predictive of HIV seroconversion. This may partially explain why HIV prevention efforts, including PrEP promotion, targeting higher risk YMSM fall short of being adopted at a scale necessary to end the HIV epidemic. Participants in our study described their risk in relative terms, making comparisons between their current and past risk. Participants also cited age, developmental stage, and becoming more educated about sexual health and HIV prevention as reasons for risk reduction. This was true for participants in all risk categories, suggesting that as YMSM move through developmental stages and gain more exposure to HIV prevention messaging and/or greater exposure to diverse social contexts, they may consider themselves to be at lower risk for acquiring HIV (even when objective measures suggest otherwise). In addition, some participants explained that substance use is a key factor in their construction of risk within a sexual encounter, although others perceived context as more important than substance use.

Several participants, including some in the "increasing risk" category, suggested that other YMSM engage in more risky sexual behavior than they themselves do, aligning with quantitative evidence of low risk perception among MSM who report high risk-conferring behavior.^{28,29} In suggesting that their HIV risk was substantively lower than other YMSM's risk, participants in our study may have been symbolically or discursively distancing themselves from more stigmatized "others" – which may be especially relevant for YMSM of color who often face increased stigma at the intersections of race/ethnicity and sexual identity or behavior.^{30–32} This perception of greater risk among other YMSM may also be related to participants' repeat negative HIV tests and related optimism regarding their own risk. Additional qualitative research is needed to examine the roles of stigma and optimism as a result of repeat negative testing in YMSM's constructions of risk.

Emerging across participant narratives were themes of trust, belief, and risk within sexual relationships, and regarding scientific advances in HIV prevention, such as "U=U" and PrEP. Indeed, even participants in the increasing risk category – who would theoretically engage in more risk behaviors, perceived a partner with an undetectable viral load as conferring risk. This echoes prior research on the perceived relational aspects of HIV risk and mistrust³³ and concerns regarding reliability of U=U and efficacy of PrEP.^{34–38}

Generally, participants did not discuss factors influencing risk beyond the individual and interpersonal levels of the social ecology (with the exception of discussions of the context of substance use). This was surprising given prior research documenting the complex interplay between individual- and group-level HIV risk and socio-structural factors.^{10,39,40} The absence of these discussions, however, may be related to the interview questions, and/or that complex processes may be more readily identified by researchers rather than individuals discussing their own HIV risk. Future research should examine how YMSM construct

perceptions of risk within broader socio-structural contexts, and how they conceptualize factors beyond the individual- or interpersonal-level as influencing risk.

4.1 Limitations and Strengths

The use of qualitative methods and sampling by risk category may limit the extent to which our findings are generalizable to YMSM broadly. It is also unclear how our findings may be relevant across YMSM by identity or social position (e.g., income, housing status) or who do not engage in repeat HIV testing, or how these findings might extend to other groups disproportionately impacted by HIV (e.g. transgender women, persons who inject drugs). In addition, the interview questions related to current and future risk may be conceptually unaligned with quantitative risk scores assessing risk between testing encounters (recent risk) that were used to recruit and categorize participants (increasing, stable, decreasing). Finally, participants may have not shared some information related to sexual behavior given the context of the interviews (a clinical setting).

A strength of this study is our emphasis on YMSM's perceptions and narrative discussions of HIV risk rather than more traditional approaches measuring and understanding risk in HIV prevention research (e.g., surveys). In addition, the use of a validated risk score predictive of HIV seroconversion in this population to characterize YMSM's HIV risk between their two most recent HIV testing events,³¹⁶ and the comparison of participant narratives across risk categories, is a strength.

4.2 Implications for Clinical Practice and Education

In the era of PrEP and U=U,⁴¹ efforts to end the HIV epidemic would benefit from targeting YMSM disproportionately burdened by HIV, particularly YMSM of color. To be effective, such efforts should be tailored for YMSM who may have low perceived risk for acquiring HIV at a time when objective risk metrics predict increased risk. This study's findings suggest that messaging related to the efficacy and purpose of PrEP and U=U may not be received by YMSM, or that the message is not being interpreted as intended. This may be related to a lack of clear and consistent messaging about PrEP and U=U to younger MSM in secondary schools or clinical settings (e.g., pediatric clinics). Thus, when messages are disseminated to YMSM, there may be confusion or preconceived ideas about prevention strategies.

PrEP providers should discuss with YMSM how PrEP can help protect them from unexpected risk behaviors among people they trust, while also acknowledging the multiple barriers to PrEP uptake, including experiences of stigma within healthcare settings and concerns about negative side effects.²³⁴²⁻⁴⁴ Additionally, educators and providers can continue to address U=U concerns (e.g., reluctance to trust a person's adherence to therapy when they mention they are undetectable) by clarifying the protective role PrEP adherence has when use is under an individual's control, rather than the control of a sexual partner, and doing this among younger MSM (ideally before sexual activity begins). By tailoring provider-patient interactions to the unique needs and perceptions of YMSM, there may be increased uptake of interventions by targeting points in time when HIV risk is increasing and mitigate HIV disparities among YMSM in the U.S.

Acknowledgements

The authors thank the participants in this study who shared their insights, ideas, and experiences to contribute to fighting the HIV epidemic. This work would not be possible without the critical contributions of these young men.

Conflicts of Interest and Sources of Funding:

K.R.A reports an educational grant from Gilead Sciences through the University of Michigan completed in 2018; D.J.G consulted for Greenwich Bioscience, Inc.; M.H. received research funding from Gilead and Pfizer. L.R.S. is a co-investigator on a research study supported by Gilead Sciences.

Research reported in this article was supported by NIMH R21MH113477 (PI: Hoenigl). Dr. Felner was supported by the California Tobacco-Related Disease Research Program (TRDRP) grant T29FT0265 and National Institute on Drug Abuse (NIDA) grant T32DA023356. Dr. Mittal was supported by NIDA grants T32DA023356 and 3R01DA040648-02S1. Dr. Smith was supported by National Institute of Mental Health (NIMH) grant R01MH123282. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health/NIDA/NIMH or TRDRP.

References

1. Hoenigl M, Little SJ, Grelotti D, et al. Grindr Users Take More Risks, but Are More Open to Human Immunodeficiency Virus (HIV) Pre-exposure Prophylaxis: Could This Dating App Provide a Platform for HIV Prevention Outreach? *Clinical Infectious Diseases* 2019;71(7):e135–e40. doi: 10.1093/cid/ciz1093
2. Menza TW, Hughes JP, Celum CL, et al. Prediction of HIV Acquisition Among Men Who Have Sex With Men. *Sexually Transmitted Diseases* 2009;36(9):547–55. doi: 10.1097/olq.0b013e3181a9cc41 [PubMed: 19707108]
3. Hoenigl M, Weibel N, Mehta SR, et al. Development and Validation of the San Diego Early Test Score to Predict Acute and Early HIV Infection Risk in Men Who Have Sex With Men. *Clinical Infectious Diseases* 2015;61(3):468–75. doi: 10.1093/cid/civ335
4. Smith DK, Pals SL, Herbst JH, et al. Development of a Clinical Screening Index Predictive of Incident HIV Infection Among Men Who Have Sex With Men in the United States. *JAIDS Journal of Acquired Immune Deficiency Syndromes* 2012;60(4):421–27. doi: 10.1097/qai.0b013e318256b2f6 [PubMed: 22487585]
5. Garofalo R, Hottot AL, Kuhns LM, et al. Incidence of HIV Infection and Sexually Transmitted Infections and Related Risk Factors Among Very Young Men Who Have Sex With Men. *JAIDS Journal of Acquired Immune Deficiency Syndromes* 2016;72(1):79–86. doi: 10.1097/qai.0000000000000933 [PubMed: 26745827]
6. Hoenigl M, Chaillon A, Morris SR, et al. HIV Infection Rates and Risk Behavior among Young Men undergoing community-based Testing in San Diego. *Scientific Reports* 2016;6(1):25927. doi: 10.1038/srep25927 [PubMed: 27181715]
7. Mustanski B, Morgan E, D'Aquila R, et al. Individual and Network Factors Associated With Racial Disparities in HIV Among Young Men Who Have Sex With Men. *JAIDS Journal of Acquired Immune Deficiency Syndromes* 2019;80(1):24–30. doi: 10.1097/qai.0000000000001886 [PubMed: 30365451]
8. Hess KL, Hu X, Lansky A, et al. Lifetime risk of a diagnosis of HIV infection in the United States. *Annals of Epidemiology* 2017;27(4):238–43. doi: 10.1016/j.annepidem.2017.02.003 [PubMed: 28325538]
9. Sullivan PS, Rosenberg ES, Sanchez TH, et al. Explaining racial disparities in HIV incidence in black and white men who have sex with men in Atlanta, GA: a prospective observational cohort study. *Annals of Epidemiology* 2015;25(6):445–54. doi: 10.1016/j.annepidem.2015.03.006 [PubMed: 25911980]
10. Bauermeister JA, Connochie D, Eaton L, et al. Geospatial Indicators of Space and Place: A Review of Multilevel Studies of HIV Prevention and Care Outcomes Among Young Men Who Have Sex With Men in the United States. *The Journal of Sex Research* 2017;54(4–5):446–64. doi: 10.1080/00224499.2016.1271862 [PubMed: 28135857]

11. Quinn KG. Applying an intersectional framework to understand syndemic conditions among young Black gay, bisexual, and other men who have sex with men. *Social Science & Medicine* 2019;112779. doi: 10.1016/j.socscimed.2019.112779 [PubMed: 31898991]
12. County of San Diego Health and Human Services Agency. HIV/AIDS in men who have sex with men: San Diego county 2015, 2016.
13. Hoening M, Anderson CM, Green N, et al. Repeat HIV-testing is associated with an increase in behavioral risk among men who have sex with men: a cohort study. 2015;13(1) doi: 10.1186/s12916-015-0458-5
14. Grossman CI, Purcell DW, Rotheram-Borus MJ, et al. Opportunities for HIV combination prevention to reduce racial and ethnic health disparities. 2013;68(4):237–46. doi: 10.1037/a0032711
15. Marrazzo JM, Del Rio C, Holtgrave DR, et al. HIV Prevention in Clinical Care Settings. *JAMA* 2014;312(4):390. doi: 10.1001/jama.2014.7999 [PubMed: 25038358]
16. Dijkstra M, Lin TC, de Bree GJ, et al. Validation of the San Diego Early Test Score for Early Human Immunodeficiency Virus Infection Among Amsterdam Men Who Have Sex With Men. *Clinical Infectious Diseases* 2019;70(10):2228–30. doi: 10.1093/cid/ciz895
17. Pringle K, Merchant RC, Clark MA. Is Self-Perceived HIV Risk Congruent with Reported HIV Risk Among Traditionally Lower HIV Risk and Prevalence Adult Emergency Department Patients? Implications for HIV Testing. 2013;27(10):573–84. doi: 10.1089/apc.2013.0013
18. Mackellar DA, Valleroy LA, Secura GM, et al. Perceptions of Lifetime Risk and Actual Risk for Acquiring HIV Among Young Men Who Have Sex with Men. *AIDS and Behavior* 2007;11(2):263–70. doi: 10.1007/s10461-006-9136-0 [PubMed: 16791527]
19. Sewell WC, Blankenship SA. Perceived HIV risk as a predictor of sexual risk behaviors and discrimination among high-risk women. *AIDS Care* 2019;31(6):675–80. doi: 10.1080/09540121.2018.1533234 [PubMed: 30318900]
20. Alexovitz KA, Merchant RC, Clark MA, et al. Discordance of voluntary HIV testing with HIV sexual risk-taking and self-perceived HIV infection risk among social media-using black, Hispanic, and white young-men-who-have-sex-with-men (YMSM). *AIDS Care* 2018;30(1):81–85. doi: 10.1080/09540121.2017.1381327 [PubMed: 28959902]
21. Fauci AS, Lane HC. Four Decades of HIV/AIDS — Much Accomplished, Much to Do. *New England Journal of Medicine* 2020;383(1):1–4. doi: 10.1056/nejmp1916753
22. Eisinger RW, Folkers GK, Fauci AS. Ending the HIV Pandemic: Optimizing the Prevention and Treatment Toolkits. *Clinical Infectious Diseases* 2019 doi: 10.1093/cid/ciz998
23. Hess KM, Crawford J, Eanes A, et al. Reasons Why Young Men Who Have Sex with Men Report Not Using HIV Pre-Exposure Prophylaxis: Perceptions of Burden, Need, and Safety. *AIDS Patient Care STDS* 2019;33(10):449–54. doi: 10.1089/apc.2019.0150 [published Online First: 2019/10/05] [PubMed: 31584856]
24. Lin TC, Gianella S, Tenenbaum T, et al. A Simple Symptom Score for Acute HIV Infection in a San Diego Community Based Screening Program. *Clinical Infectious Diseases* 2017 doi: 10.1093/cid/cix1130
25. Ryan GW, Bernard HR. Techniques to Identify Themes. *Field Methods* 2003;15(1):85–109. doi: 10.1177/1525822x02239569
26. Guest G, MacQueen KM, Namey EE. *Applied Thematic Analysis*: Sage 2012.
27. Creswell JW. *Research Design Qualitative, Quantitative, and Mixed Methods Approaches*. 4th ed. Thousand Oaks, CA: SAGE Publications 2014.
28. Bennett CL, Marks SJ, Rosenberger JG, et al. Factors Associated with the Discordance between Perception of Being HIV Infected and HIV Sexual Risk Taking among Social Media–Using Black, Hispanic, and White Young Men Who Have Sex with Men. *Journal of the International Association of Providers of AIDS Care (JIAPAC)* 2020;19:232595822091926. doi: 10.1177/2325958220919260
29. Mao L, Adam P, Kippax S, et al. HIV-Negative Gay Men’s Perceived HIV Risk Hierarchy: Imaginary or Real? *AIDS and Behavior* 2013;17(4):1362–69. doi: 10.1007/s10461-012-0406-8 [PubMed: 23314802]

30. Daftary A HIV and tuberculosis: The construction and management of double stigma. *Social Science & Medicine* 2012;74(10):1512–19. doi: 10.1016/j.socscimed.2012.01.027 [PubMed: 22444460]
31. Turan JM, Elafros MA, Logie CH, et al. Challenges and opportunities in examining and addressing intersectional stigma and health. *BMC Medicine* 2019;17(1) doi: 10.1186/s12916-018-1246-9
32. Levison JH, Levinson JK, Alegría M. A Critical Review and Commentary on the Challenges in Engaging HIV-Infected Latinos in the Continuum of HIV Care. *AIDS and Behavior* 2018;22(8):2500–12. doi: 10.1007/s10461-018-2187-1 [PubMed: 29948334]
33. Syvertsen JL, Bazzi AR, Martinez G, et al. Love, Trust, and HIV Risk Among Female Sex Workers and Their Intimate Male Partners. 2015;105(8):1667–74. doi: 10.2105/ajph.2015.302620
34. Maticotta JJ, Rosales-Perez FJ, Carrillo CM. HIV Preexposure Prophylaxis and Treatment as Prevention — Beliefs and Access Barriers in Men Who Have Sex with Men (MSM) and Transgender Women: A Systematic Review. *Journal of Patient-Centered Research and Reviews* 2020;7(3):265–74. doi: 10.17294/2330-0698.1737 [PubMed: 32760758]
35. Rendina HJ, Parsons JT. Factors associated with perceived accuracy of the Undetectable = Untransmittable slogan among men who have sex with men: Implications for messaging scale-up and implementation. *Journal of the International AIDS Society* 2018;21(1):e25055. doi: 10.1002/jia2.25055
36. Siegel K, Meunier É. Awareness and Perceived Effectiveness of HIV Treatment as Prevention Among Men Who Have Sex with Men in New York City. *AIDS and Behavior* 2019 doi: 10.1007/s10461-019-02405-y
37. Rendina HJ, Cienfuegos-Szalay J, Talan A, et al. Growing Acceptability of Undetectable = Untransmittable but Widespread Misunderstanding of Transmission Risk: Findings From a Very Large Sample of Sexual Minority Men in the United States. *JAIDS Journal of Acquired Immune Deficiency Syndromes* 2020;83(3)
38. Peng P, Su S, Fairley CK, et al. A Global Estimate of the Acceptability of Pre-exposure Prophylaxis for HIV Among Men Who have Sex with Men: A Systematic Review and Meta-analysis. *AIDS and Behavior* 2018;22(4):1063–74. doi: 10.1007/s10461-017-1675-z [PubMed: 28176168]
39. Rhodes T, Singer M, Bourgois P, et al. The social structural production of HIV risk among injecting drug users. *Social Science & Medicine* 2005;61(5):1026–44. doi: 10.1016/j.socscimed.2004.12.024 [PubMed: 15955404]
40. Halkitis PN, Wolitski RJ, Millett GA. A holistic approach to addressing HIV infection disparities in gay, bisexual, and other men who have sex with men: American Psychological Association, 2013:261–73.
41. Eisinger RW, Dieffenbach CW, Fauci AS. HIV Viral Load and Transmissibility of HIV Infection. *JAMA* 2019;321(5):451. doi: 10.1001/jama.2018.21167 [PubMed: 30629090]
42. Mayer KH, Agwu A, Malebranche D. Barriers to the Wider Use of Pre-exposure Prophylaxis in the United States: A Narrative Review. *Advances in Therapy* 2020;37(5):1778–811. doi: 10.1007/s12325-020-01295-0 [PubMed: 32232664]
43. Grov C, Whitfield THF, Rendina HJ, et al. Willingness to Take PrEP and Potential for Risk Compensation Among Highly Sexually Active Gay and Bisexual Men. *AIDS and Behavior* 2015;19(12):2234–44. doi: 10.1007/s10461-015-1030-1 [PubMed: 25735243]
44. Thomann M, Grosso A, Zapata R, et al. ‘WTF is PrEP?’: attitudes towards pre-exposure prophylaxis among men who have sex with men and transgender women in New York City. *Culture, Health & Sexuality* 2018;20(7):772–86. doi: 10.1080/13691058.2017.1380230

Box 1.**Selected individual interview questions**

What do you think your chances are of contracting HIV on a scale of 0 percent to 100 percent, 0% “I would never,” 100% is “Definitely”? [*Probe:*] Why?

How is your [HIV] risk any different than other people you know?

What kinds of things would affect your HIV risk?

Have you ever been concerned while waiting for the [test] result? [*Probes:*] Why? In what instances?

Table 1.

Participant characteristics

Characteristic	N	%
HIV Risk Category		
Increasing	5	25%
Stable	10	50%
Decreasing	5	25%
Ethnicity		
Latinx	12	60%
Non-Latinx	8	40%
Race		
White	5	25%
Asian	3	15%
Black	3	15%
Native American	1	5%
More than one race	1	5%
Other	3	15%
Not provided	4	20%
Average Age (range)	23 ± 1 (19–24)	

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 2.

Participant SDET risk categorization (generated prior to interview) and risk estimation (provided by participant during interview)

Participant	SDET Risk Score at time 1	SDET Risk Score at time 2	SDET Generated Risk Categorization	Participant % Risk Estimation During Interview
1	0	2	Increasing	30%
2	0	3	Increasing	<25%
3	2	8	Increasing	0%
4	3	5	Increasing	0%
5	5	8	Increasing	<25%
6	3	5	Increasing	50%
7	2	7	Increasing	15–20%
8	2	5	Increasing	50%
9	3	7	Increasing	25%
10	0	2	Increasing	--
11	7	5	Decreasing	50%
12	2	0	Decreasing	20–30% (with condoms); 70–80% (without condoms)
13	2	0	Decreasing	0–10%
14	5	0	Decreasing	60–70%
15	5	0	Decreasing	10–20%
16	0	0	Stable	--
17	0	0	Stable	10%
18	2	2	Stable	5%
19	5	5	Stable	75%
20	0	0	Stable	10%

Note: Lower scores denote less risk as determined by the SDET, range: 0–10.