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Attitudes Toward HIV-Positive Status Disclosure Among U=U-Aware Sexual and Gender Minority Individuals in the USA: a Consensual Qualitative Research Approach

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Abstract

Introduction The U=U (i.e., undetectable equals untransmittable) campaign is founded upon biomedical advancements that have positioned HIV as a manageable condition with effectively zero risk of transmission. In spite of these developments, attitudes of sexual and gender minority populations regarding the necessity of seropositive status disclosure remain unexamined.
Methods The current study analyzed qualitative data regarding the necessity of seropositive status disclosure from 62 sexual minority men as well as transgender and gender non-conforming individuals who have sex with men from 2020 to 2021.
Results The majority of participants believed disclosure to be necessary and invoked several social and structural factors that informed their attitudes. Participants cited HIV criminalization laws, the ethics of non-disclosure, and disclosure as a means of educating sex partners when appraising the necessity of disclosure. Participants also presented concerns regarding U=U efficacy and HIV stigma.
Conclusions Findings indicate that the disclosure of seropositive status to sex partners is still important to U=U-aware sexual and gender minority individuals. The majority of the study sample, irrespective of HIV status, believed seropositive status disclosure was necessary in advance of sex.
Policy Implications Findings suggest opportunities for public health messaging to remediate concerns about U=U efficacy, combat misinformation, and clarify out-of-date information on HIV criminalization.

Keywords HIV · Sexual and gender minority · HIV disclosure · HIV criminalization · U=U · Treatment as prevention

Introduction

Although HIV diagnoses declined 9% between 2015 and 2019 in the USA, sexual and gender minority (SGM) individuals remain disproportionately impacted by HIV (Centers for Disease Control and Prevention, 2021a). In fact, sexual minority men (SMM) accounted for 69% of new HIV diagnoses nationwide in 2019 (CDC, 2021a). Though less studied, research suggests that transgender populations accounted for 2% of HIV diagnoses in 2019, while additional work indicates that approximately 14% of transgender women and 3% of transgender men in the USA are currently living with HIV (Becasen et al., 2018; CDC, 2021a). Though SGM groups have been exceptionally impacted by the epidemic, advancements in antiretroviral therapies and the introduction of pre-exposure prophylaxis (PrEP) offer optimistic prospects in the fight against HIV (Grant et al., 2014; Rodger et al., 2019).

Clinical trials have found that when people living with HIV (PLWH) take their medication as prescribed, and maintain an undetectable viral load, there is effectively zero risk of HIV transmission to seronegative partners even without the use of PrEP or barrier protections (Bavinton et al., 2018; Rodger et al., 2019). In the wake of these findings, information regarding undetectable status and its implications

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for HIV prevention has become a fixture of public health campaigns in the USA and abroad (Prevention Access Campaign, 2020). This information has been succinctly captured by the Prevention Access Campaign with the expression, "undetectable equals untransmittable" (U=U) (Prevention Access Campaign, 2020).

Although researchers have begun to look into how U=U might impact sex partner choice and communication about HIV risk between partners (Newcomb et al., 2016; Philpot et al., 2018), little has been said about how adopting U=U as an HIV prevention strategy might change the percieved importance of serostatus disclosure. Research has shown that disclosure of seropositive status is an important factor that informs HIV prevention strategies (e.g., Newcomb et al., 2016; Obermeyer et al., 2011) and serves as a determinant of health outcomes among SGM populations living with HIV (e.g., Evangeli & Wroe, 2017; Shrestha et al., 2019; Turan et al., 2017). For example, one recent study on opioid users living with HIV suggests that viral suppression may be associated with non-disclosure of one's seropositive status to partners (Shrestha et al., 2019). Concurrent with such findings, HIV stigma has long been examined as a consistent and formidable barrier to status disclosure among PLWH (e.g., Fletcher et al., 2016; Overstreet et al., 2013; Stutterheim et al., 2011; Wolitski et al., 2009). Enacted HIV stigma (i.e., the overt discrimination of PLWH) in particular has been linked to poor health outcomes for those living with HIV, including anxiety pertaining to serostatus disclosure (Earnshaw & Chaudoir, 2009; Sayles et al., 2008).

The development and dissemination of U=U has prompted state lawmakers to reconsider outdated and stigmatizing laws that have specifically criminalized the behavior of PLWH (Hoppe, 2018). In 2011, 33 states had such laws on the books (Lehman et al., 2014). Although they vary in their specifics, they generally make it a crime for PLWH to engage in sexual behavior without first disclosing their HIV-positive status to their partners (Hoppe, 2018). Even low or no risk sexual behaviors have been subject to arrest and prosecution (Lehman et al., 2014). In recent years, states have begun to amend or repeal their HIV-specific laws. Lawmakers in Michigan, for example, amended their law in 2018 so that PLWH were no longer subject to prosecution for failure to disclose if they had an undetectable viral load (Thanawala, 2019). Research has shown that PLWH are not more likely to disclose their status in states with HIV disclosure laws than those living in states without them nor do SMM in states with status disclosure laws report riskier behaviors that could result in increased HIV infections (Burris et al., 2007; Galletly et al., 2012a, b; Harsono et al., 2017).

In spite of this information, the public discourse regarding disclosure practices has been a complex one. A study in Australia found that 76.3% of seronegative SMM expected PLWH to disclose their status prior to sex (Murphy et al., 2015). Furthermore, a 2010 study found that, overall, 65% of SMM in the USA believed that non-disclosure of seropositive status to a sex partner ought to be illegal; 38% of SMM living with HIV shared in this stance (Horvath et al., 2010). Two studies published in 2012 similarly found that 54% and 88% of PLWH, respectively, supported criminalizing HIV status non-disclosure (Galletly et al., 2012a, b). Notably, the studies cited above regarding attitudes toward non-disclosure of seropositive status predate the widespread dissemination of U=U. Thus, further research is needed considering advances in HIV prevention and treatment.

Research concerning HIV status disclosure has focused primarily on correlates of HIV status disclosure among PLWH or attitudes towards non-disclosure more broadly (e.g., Fair & Albright, 2012; Overstreet et al., 2013; Vyavaharkar et al., 2011). The current qualitative analysis contributes to our understanding of HIV status disclosure by parsing the social and structural factors that inform attitudes toward seropositive status disclosure considering the shifting biomedical and legislative context of the epidemic today. Examining the factors that may shape such attitudes might be of particular value in order to clarify how public health messaging could better combat HIV stigma and U=U misinformation while improving U=U promotion amongst those at greatest risk.

Methods

Participants and Recruitment

Data reported here were collected as part of a mixed-method study about the acceptability of U=U among SMM and transgender and gender nonconforming individuals who have sex with men. Between December 2020 and June 2021, we posted advertisements on social media, dating/hookup applications, and online forums targeted to SGM groups inviting people to participate in a study about sexual health. Advertisements indicated that participants who completed an online survey could enter a raffle for one of five $200 gift cards and might be invited to also participate in a telephone interview for compensation of $75. Clicking on the advertisement redirected interested individuals to the survey on Qualtrics. The first page included the survey's consent form informing potential participants about the study's procedures and confidentiality. Only participants who provided consent could proceed to the survey.

The first few questions of the survey determined eligibility. To be included, participants had to report: (a) being at least 18 years old; (b) living in the USA; (c) fluency in

English; (d) identifying as a cisgender man or as a transgender or gender nonconforming individual; and (e) having had sex with a cisgender man in the previous 12 months. Those who were eligible were then asked further questions about their sexual health history and recent sexual behaviors. To assess awareness and perceived effectiveness of U=U, we presented participants with the CDC statement on HIV treatment as prevention (CDC, 2020) and asked if they had previously heard about it and how effective they thought being virally suppressed was at preventing HIV transmission. The online survey was initiated 1996 times, and 1443 unique participants were eligible and completed the entire survey.

At the end of the survey, participants were offered to enter their contact information if they were willing to be contacted about participating in a telephone interview. In consideration of budget constraints and the estimated number of interviews necessary to obtain thematic saturation, we interviewed 62 participants. To limit heterogeneity of the qualitative subsample, we only interviewed participants who met these additional criteria: (f) were no more than 60 years old; (g) had at least one casual sex partner in the prior 6 months; (h) had anal or vaginal penetrative sex in the previous 6 months; (i) had not used PrEP in the previous 6 months; and (j) indicated awareness of U=U. We excluded PrEP users and people who did not engage in penetrative sex as they would benefit less from the protection provided by viral suppression. To ensure the racial/ethnic diversity of this subsample, we aimed to interview no more than 30 participants who identified as non-Hispanic White. To be able to compare attitudes of HIV positive and negative individuals, one-third of participants recruited had to report having been diagnosed with HIV. Finally, to maximize a diversity of perspectives on the topic, we aimed to interview substantial numbers of participants who — based on their survey answers — represented different attitudes: Some who thought U=U was effective, some who thought it was ineffective, some who had relied on U=U as an HIV prevention strategy, and some who had not. Reliance on U=U was defined as having engaged in condomless penetrative sex with a serodifferent partner while the one living with HIV was virally suppressed, and the HIV-negative partner was not taking PrEP.

Procedures

We used a semi-structured interviewing technique in which the ordering of topics could be adapted to the flow of the conversation (Denzin & Lincoln, 2005). Initial questions were nondirective and broad, inviting participants to share their thoughts on the topic of interest (Lavrakas, 2008). As necessary, interviewers then asked follow-up questions to elicit more details until a participant's attitude on a topic was well-described and clear. Some of the topics discussed included the following: Participants' perceptions of HIV, what they knew about U=U, how they had accrued that knowledge, and their attitudes about and experiences with having sex with serodifferent partners. Related to the topic of this paper, participants responded to a series of questions and probes regarding their attitudes toward seropositive status disclosure today (e.g., "In light of the science behind U=U, do you believe that PLWH should disclose their status to partners before having sex? Do you believe that U=U has made seropositive status disclosure less important?"). These questions were framed to capture participant opinions on the necessity of the practice today, not to capture their own disclosure practices should they be living with HIV.

Interviews were conducted by one of two cismale interviewers and lasted on average 80 minutes (min: 43, max: 118). According to the preference of the participant, interviews could be conducted over the phone or via an audio-only web-based call. Interviews were audio recorded and then submitted to a HIPAA-approved service for transcription. The Institutional Review Board at Columbia University Irving Medical Center approved all procedures.

Analytic Plan

As a first step to analysis, the study team created a list of structural codes consistent with broad topics covered in the interview guide (MacQueen et al., 1998). Using Dedoose version 9, the lead and senior authors applied the structural codes to all transcripts, discussing discrepancies until they reached agreement on their application. For the present manuscript, they further analyzed excerpts pertaining to attitudes regarding seropositive status disclosure. These excerpts were entered into a matrix on a spreadsheet and were initially categorized into broad attitudes (i.e., yes, PLWH ought to disclose; no, PLWH ought not to be required to disclose; or ambivalent, unsure whether disclosure is needed). These attitudinal categories were cross-tabulated with participants' HIV status and are presented in Table 2. One participant who did not provide answers to the question related to this analysis was excluded from analysis.

Data were then analyzed using a consensual qualitative research (CQR) approach — an inductive approach to qualitative analysis (Hill et al., 1997). All meaning units were first succinctly summarized in order to capture the core idea of the utterance. Core ideas were then cross-analyzed to determine a set of categories. Categories at this stage were broad (e.g., existing risk, stigma avoidance, ethics and social norms) and were gradually refined as some subsumed others (e.g., ethics and social norms, existing risk, and HIV prevention strategies were subsumed by sexual ethics). Via this iterative process, five factors emerged that informed attitudes regarding seropositive status disclosure: (1) Sexual ethics, (2) HIV criminalization, (3) scientific knowledge, (4) enacted stigma, and (5) public health events. Validity in

the development of these categories was ensured through periodic peer debriefing during the process (Morse, 2015). All raw data were then recoded per this coding scheme. As meaning units could have included reference to multiple social or structural factors, any number of codes could have been used per meaning unit. To ensure reliability, the lead and senior authors coded a selection of excerpts independently until they reached agreement on the application of the final coding scheme.

Results

The characteristics of interview participants are presented in Table 1. They ranged in age from 20 to 60 years old, with a median age of 36. There were 14 participants (22.6%) who identified as Latinx of any racial identity. Among participants who did not identify as Latinx, 24 (38.7%) identified as White, 10 (16.1%) as multiracial, 6 (9.7%) as Black, 6 (9.7%) as Asian, and 2 (3.2%) as Middle Eastern. Most participants ($n = 51$, 82.3%) identified as cisgender men while 5 (8.1%) had been assigned male sex at birth and identified as non-binary or gender nonconforming and 6 (9.7%) identified as transgender men (had been assigned female sex at birth and identified as men). Participants were geographically dispersed across the continental USA. Most ($n = 26$, 41.9%) came from the US Census region of the South (including participants from the District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, North Carolina, Oklahoma, Texas, and Virginia), 18 (29.0%) from the West (Arizona, California, Colorado, Nevada, New Mexico, Oregon, Washington), 10 (16.1%) from the Midwest (Illinois, Indiana, Kansas, Michigan, Missouri, Ohio, and Wisconsin), and 8 from the Northeast (Connecticut, Massachusetts, New York, and Pennsylvania). Every participant had earned at least a high school degree and the vast majority ($n = 60$, 96.8%) had at least some college education. Three-quarters of participants ($n = 47$, 75.8%) identified as gay, while 10 (16.1%) identified as queer and 5 (8.1%) as bisexual. As per the eligibility criteria, every participant had to report at least one casual sex partner in the previous 6 months. Most participants ($n = 58$, 93.5%) reported at least two different sex partners in that time period (including relationship and casual partners). There were 41 participants who reported being HIV negative upon their last test and, as per the inclusion criteria; none of them used PrEP in the previous 6 months. Among the 21 who reported living with HIV, all reported being undetectable at their last viral load test.

Table 2 presents participants' attitudes pertaining to whether PLWH ought to disclose their status prior to sex, based on their responses in qualitative interviews. The majority of the sample (75.4%) thought that PLWH ought to disclose status to their partners prior to sex, an opinion expressed by both the majority of HIV negative or unknown participants (73.1%) as well as those living with HIV (80%).

Table 1 Participant characteristics ($n = 62$)

	n	%
	62	(100)
Age (median; range)	36	20–60
Race/ethnicity		
Asian	6	(9.7)
Black	6	(9.7)
Latinx (any race)	14	(22.6)
Middle Eastern	2	(3.2)
White	24	(38.7)
Multiracial	10	(16.1)
Sex/gender identity		
Cisgender man	51	(82.3)
Nonbinary/nonconforming (assigned male at birth)	5	(8.1)
Transgender man	6	(9.7)
Census region		
Northeast	8	(12.9)
South	26	(41.9)
Midwest	10	(16.1)
West	18	(29.0)
Education		
Technical school degree	2	(3.2)
Some college (no degree earned)	20	(32.3)
Associate's degree	4	(6.5)
Bachelor's degree	18	(29.0)
Graduate degree	18	(29.0)
Income (past year)		
Under $25,000	16	(25.8)
$25,000 to $49,999	22	(35.5)
$50,000 to $99,999	14	(22.6)
$100,000 or more	9	(14.5)
Prefer not to answer	1	(1.6)
Sexual identity		
Gay	47	(75.8)
Queer	10	(16.1)
Bisexual	5	(8.1)
Relationship status		
Single	49	(79.0)
In a relationship with one or more partners	13	(21.0)
HIV status		
Negative or unsure	41	(66.1)
Positive (all currently undetectable)	21	(33.9)
Total sex partners in the past 6 months		
One	4	(6.5)
Two	13	(21.0)
3 or 4	11	(17.7)
5 to 9	19	(30.6)
10 or more	15	(24.2)

Table 2 Summary of attitudes

	Full sample (n = 61)		HIV negative (n = 41)		HIV positive (n = 20)	
	n	%	n	%	n	%
Should PLWH disclose status prior to sex?						
Yes	46	75.4	30	73.1	16	80.0
No	5	8.1	3	7.3	2	10.0
Ambivalent	10	16.3	8	19.5	2	10.0

Ten (16.3%) participants expressed ambivalence about the necessity of disclosure, most of them (80.0%) being HIV negative or unknown. Lastly, a minority of participants (8.1%) believed that PLWH should not have to disclose; 7.3% among those who were HIV negative or unknown and 10.0% among participants with HIV.

Following the analysis of the qualitative data, five factors emerged that shaped the attitudes summarized above: (1) Sexual ethics, (2) HIV criminalization, (3) scientific knowledge, (4) enacted stigma, and (5) public health events. Sexual ethics and enacted stigma were invoked by those who held ambivalent opinions on the need for seropositive status disclosure and by those who believed disclosure was necessary. Scientific knowledge was invoked by participants who believed PLWH should disclosure their HIV status, need not disclose their status, as well as amongst those who were ambivalent. Participants who cited HIV criminalization and public health events expressed that PLWH ought to disclose seropositive status to sex partners.

Sexual Ethics

A notable factor shaping participants' attitudes was their concern with the morality of seropositive status disclosure. Participants represented in this category framed non-disclosure of seropositive status as unethical due to a number of reasons. These reasons included participants' belief that sexual partners are generally expected to disclose important information to their partners, participants' belief in the risk of HIV transmission in spite of undetectable status and the consequent responsibility to disclose, as well as participants' belief that non-disclosure would undermine agency in making informed decisions regarding sexual health.

Expected Disclosures As mentioned above, participants in this section indicated that non-disclosure was morally questionable. They believed there were broad social norms that made it reasonable to expect status disclosure from sex partners living with HIV. To illustrate these norms, some participants placed seropositive status disclosure parallel to other types of personal disclosures commonly expected between sex or relationship partners. For example, the participant below believed it would be unfair of him not to tell a new partner that he was bisexual and in a non-monogamous relationship — asserting that not disclosing seropositive status would be a similar lack of transparency.

> I'm a bisexual man who is in a non-monogamous relationship. It would be unfair for me to go up to someone who wants to be in a monogamous relationship and portray wanting to be in a monogamous relationship. It's unfair to the other person that they're not getting what they exactly wanted. I'm a firm believer in transparency and of people's right to do with their body what they choose and with whom they choose. (P57: age 41, cisman, Latinx, HIV+)

In some cases, participants compared the expectation of seropositive status disclosure to other norms of disclosure unrelated to sex. Similar to the above participant's emphasis on "transparency," another one considered non-disclosure of seropositive status as akin to not disclosing structural damage to a home before purchase.

> I still think you should disclose because I feel like that'd be like you going and buying a house and me not telling you that the sewer backs up in the house. You would want to sue me, because I didn't disclose that information to you. (P55: age 29, cisman, White, HIV−)

The participants below also believed that self-disclosures are an expected facet of any social interaction — especially within the LGBTQ+ community. Fittingly, these participants believed that seropositive status disclosure would simply be another piece of personal information to disclose to sex partners comparable to sexual position, age, or relationship status.

> I always ask, but I think someone who is HIV positive should disclose that, especially in the gay community. ... I mean, I disclose that I'm a bottom. There's a lot of things to disclose that are not obvious to people. I just

think that is one of the realities of the gay community. (P59: age 51, cisman, Middle Eastern, HIV−)

It's definitely important to be upfront and just say, "Here's the mixed bag you got in this case." Not everyone's safe, but everyone's got something that should be disclosed, if it's not age, if it's not marriage or if it's not something. There's always something that needs to be told, I think, with most people. (P38: age 45, cisman, White, HIV+)

Ongoing Risks Participants also framed their attitudes towards seropositive status disclosure and its ethical implications through the lens of existing risk of HIV transmission — in spite of scientific evidence that PLWH who also have an undetectable viral load cannot transmit HIV. Both seropositive and negative participants shared in this perspective. In their view, having an undetectable viral load did not confer PLWH the freedom to forgo status disclosure with their partners. For example, when asked whether PLWH who also have an undetectable viral load ought to still disclose status provided U=U, the participant below responded:

I still think so, yes. Like I said, there's still that slight chance. It's not 100%. There's still that slight chance that it's possible regardless of the fact. So in my opinion, I still do. (P1: age 35, cisman, Latinx, HIV+)

Upon reflection, another participant explained that seropositive status disclosure was still needed because sex partners had a right to know about possible risks of transmission — a notion that emerged among participants who questioned the morality of non-disclosure.

If I was living with HIV, I would want any potential partners to know just because I think it's their right to know that, because I wouldn't want to put anybody in danger if I was positive. (P47: age 54, cisman, White, HIV−)

The participant below framed his response around the notion of a partner's "right to know," not purely as a form of mitigating risk of transmission, but as a form of undergirding the health of the broader community.

I feel that they [HIV negative or unknown partners] have a right to know, because there is still that off chance of something happening. And they need to know, if they catch it, where it came from, that way they know to go back and tell other people, "Hey, I came in contact with it on this date. We were together on this date. You may want to get checked," or anything like that. Because if they don't know who they caught it from, they're not going to know who to tell. (P39: age 30, cisman, White, HIV+)

Decision-Making Finally, participants also expressed that PLWH ought to disclose their status prior to sex in order to give potential HIV-negative partners the opportunity to consider their own HIV prevention options. One participant remarked:

Well, if they don't have it on their profile, I feel like they would need to disclose that just so that the other person is aware whether they need to bring condoms or take PrEP before having that. That's how I feel about it. (P24: age 28, gender non-conforming, Latinx, HIV−)

These attitudes indicate that non-disclosure in these cases may be understood as undermining individual agency in sexual health decision-making, which was ethically dubious to some participants.

I think this is still very critical information, and also I think there's still possibilities. For example, if someone tells me that okay, he is negative, probably I just use condoms. But if someone tells me U=U—and let's say if I still want to have sex with him—I will probably not only use condoms, but also take PrEP. (P25: age 38, cisman, Asian, HIV−)

HIV Criminalization

The ethical concerns described above appealed to tacit social norms surrounding disclosures to sex partners. Other participants also invoked legal mandates regarding disclosure of seropositive status prior to sex. Notably, both HIV-negative and HIV-positive participants described how this structural factor played a role in their decision-making process. Some participants living with HIV — as shown below — believed seropositive status disclosure was necessary out of fear of legal recourse in the event of seronegative partners learning of undisclosed HIV-positive status after a sexual encounter as opposed to out of concern regarding the potentiality of transmission.

And not only from a moral standpoint, but from a legal standpoint, because if I don't disclose and they find out, the fact that I could be charged with a felony from that status, that's huge. (P62: age 59, cisman, White, HIV+)

While the participant above expressed that there may be legal consequences to non-disclosure of seropositive status, the participant below (who reported seronegative status) also spoke to this notion and indicated a critical stance of such

mandates. The participant below also provided some conditions in respect to his attitude toward disclosure (i.e., that one may not need to disclose if adherent to antiretroviral medications, and that seronegative partners have an obligation to inquire about the status of sex partners).

> I do not think they should be jailed for it, for not discussing it. If they're not on medications, I think they should disclose. But I think if you're undetectable, if your partner's not asking you, there's responsibility there, but it may not cover the liability legally, but I think it takes two to tango and if it's voluntary sex, then everyone needs to be asking if it's of a concern. (P41: age 35, cisman, Middle Eastern, HIV−)

Some referred to HIV criminalization laws as perfunctory measures that, by virtue of existing, make seropositive status disclosure socially compelled. When asked whether PLWH ought to disclose their status prior to sex, one participant responded:

> That's a hard question. I think it's something very personal, but I also know that there are laws that state that you have to, at least in certain places. I mean I can tell you what I would do. I would [disclose]. I think the answer to your question is yes. (P60: age 36, cisman, White, HIV−)

Another participant living with HIV thought that seropositive status disclosure was important because he knew, based on conversations with peers, that some HIV-negative partners might hold him liable for not doing so. Nevertheless, he felt that HIV criminalization laws were detrimental to sexual responsibility.

> I do [believe PLWH should disclose]. Does it happen all the time? Obviously not. I speak of this because I had a recent experience with a friend whose partner—they've been together for a year—just found out that he was HIV positive. Another friend of ours said, "Can't he be held criminally liable?" We jumped down a whole rabbit hole that I'm not going into. It's my responsibility to tell somebody ... it's their responsibility to ask as well. And it's going to be a, "he said, he said" fight. If it ever came to that level, I can always say, "Yes, I told you sitting in McDonald's parking lot when we stopped by to get a hamburger." You can't prove I told you, I can't prove that you didn't. So there has to be ... there's a responsibility on both parties. (P53: age 43, cisman, White, HIV+)

The participant below had a definitive and affirmative response to the necessity of seropositive status disclosure and cited HIV criminalization while responding. Yet, he framed non-disclosure primarily as an ethical concern as opposed to a necessity by virtue of legal mandate.

> Definitely. Even with the statistics, even if they have stigma or not, I feel like it's courteous to at least mention it, because it's their health and they should be able to know ahead of time. Obviously, I know it's actually illegal not to, but I just feel like on a moral stance, I feel like we should. (P12: age 22, cisman, Multiracial, HIV−)

Scientific Knowledge

The scientific basis for U=U was another structural influence that participants cited in their responses. As previously mentioned, scientific knowledge of this kind served as an influence for all three attitudes regarding the necessity of seropositive status disclosure (i.e., yes, no, and ambivalent responses). All participants who indicated that PLWH need not disclose their status prior to sex cited U=U in their responses. Namely, these participants expressed that as U=U indicates that PLWH who have an undetectable viral load pose effectively zero risk of HIV transmission to seronegative partners, seropositive status disclosure was unnecessary.

> I think if they're undetectable, that they should not need to disclose. I think as long as they know that they're undetectable, that shouldn't be something they have to do. (P35: age 39, transman, Multiracial, HIV−)

The participant above was definitive in his stance that undetectable status ought to relieve PLWH of the obligation to disclose. Others shared in this outlook, such as the participant below.

> I think they should disclose their status if they don't know if they're undetectable. If they think that they could spread their HIV, then they should disclose their status. If they don't think that they could ever spread it, then why should they have to, unless they want to? (P45: age 27, cisman, Multiracial, HIV+)

The participant below expressed that although seropositive status disclosure ought not to be required due to the scientific basis for U=U, seropositive status disclosure to sex partners would still be the ethical option for PLWH. Such an utterance is emblematic of the multiple factors that inform attitudes simultaneously — in this case, both scientific knowledge and sexual ethics. This participant likewise expressed that HIV criminalization laws would be unnecessary considering U=U.

> I don't think it should be required. Perhaps it's the ethically right thing to do. But because of the way that undetectability works, if someone's undetectable, I don't think they should have to disclose that they're HIV positive. I don't think it should be compelled,

> legally, but perhaps ethically it may be the right thing to do. (P13: age 29, cisman, White, HIV+)

Notably, participants also indicated that scientific knowledge of this kind provides a means of avoiding enacted HIV stigma from partners who may not have adequate knowledge of the implications of undetectable status as well as a means to avoid being positioned as an educator for HIV-negative partners. The role of educator for HIV-negative sex partners was one some participants understood could be burdensome — as shown by the participant below.

> I wouldn't want to if I don't need to—to tell someone that. Not just my HIV status, in fact. For example, other disease history. At least from my perspective, if I feel like my risk to transmit, my risk to infect someone is low enough and I know that they're low enough, then I would rather not need to disclose that. That is stemming from my understanding of how difficult it is to explain to someone else the idea of infectiousness, that someone is not infective even if they might be carrying the virus, something like that. I completely understand if someone feels that they are U=U, that they won't transmit disease to someone else, then it's easier, probably makes lives a lot better to just not disclose it. (P40: age 36, cisman, Asian, HIV−)

While some thought educating sex partners about U=U might be a burden, some participants who expressed that seropositive status ought to be disclosed prior to sex — or who were ambivalent in their opinion regarding seropositive status disclosure — thought that disclosure ought to be used precisely for the sake of educating others. When asked if PLWH ought to disclose their status to sex partners, a participant responded that disclosure was "also a way to educate people" (P14: age 52, cisman, Latinx, HIV+). Participants also indicated, as shown below, that HIV stigma served as a barrier to disclosure of seropositive status. Although participants believed that HIV stigma might inhibit seropositive status disclosure, the implications of undetectable status were cited as a tool that may ease the disclosure process while actively eroding stigmatizing beliefs in respect to HIV positive status.

> Just because I feel it's important to be upfront, and even if you're undetectable, I feel it's information that should be shared. I still feel it should be disclosed. Although I get why someone would not disclose because of stigma, but I also feel if we all talk about it more, maybe there would be less stigma. (P36: age 41, transman, White, HIV−)

The participant below shared in this outlook while directly implicating a "public perception problem" as it may pertain to awareness or belief in U=U that seropositive status disclosure would help remediate.

> I can understand why somebody who has HIV and is undetectable wouldn't want to necessarily tell that to somebody else because it is a personal thing. I just think it's for the best, if people are just open about their status and we kind of just set up precedent about it's okay to have HIV and if you're a U=U, you can't really transmit it to other people. So I think it's almost like a public perception problem as well. (P17: age 22, cisman, White, HIV-)

Enacted Stigma

As shown above, some participants believed that the science behind U=U justified non-disclosure and enabled PLWH with an undetectable viral load to avoid HIV stigma. Indeed, HIV stigma informed the attitude of many participants regarding status disclosure, particularly the threat of enacted stigma. Participants who were in favor of, or ambivalent about, seropositive status disclosure thought that informing potential partners as early as possible could mitigate negative reactions from them. Yet, the participant below expressed that PLWH may be victim to physical violence on the part of seronegative sex partners who would learn of their status after a sexual encounter as opposed to before.

> I can see it both ways, to be perfectly honest. I think it should be one of those things that doesn't matter. "Hey, what's your status?" "I'm undetectable." Cool, moving on. In reality, I know that that's not the case, and I know that telling people is going to open them up for ... Worst case scenario, bodily harm. People might get super angry or do something stupidly ... I guess it's just ignorance at that point. (P20: age 28, cisman, White, HIV−)

The following participant also emphasized the notion of seropositive status disclosure as an admission that may be met with a "bigoted tantrum" irrespective of the timing of seropositive status disclosure. However, he thought that facing this earlier might be better than later.

> I do think that if you're undetectable and testing yourself regularly, it can be a part of a larger relationship conversation, but you're also just risking somebody throwing a bigoted tantrum later on versus now. I feel like pulling the Band-Aid off is a thing too. (P48: age 36, cisman, White, HIV−)

While the participant below also expressed that sex partners may become violent in the case of serostatus disclosure after a given sexual encounter, this participant also cited collective deficits in awareness of U=U as drivers of HIV stigma.

> People don't even know what U=U is. So I think it's important to at least disclose it because if you don't and then the person finds out, then they might go crazy on you. They might think, "Oh my God, you purposefully gave me HIV." And then they'll freak out and do all this crazy stuff, even though that's not the case. I wish for a world where that disclosure isn't necessary, but I think that it's just … It would just be unrealistic to say, no, a person shouldn't have to disclose it. (P42: age 21, cisman, Latinx, HIV−)

When asked whether PLWH ought to disclose, one participant living with HIV drew from his own decision-making process regarding disclosure. Similarly to those participants cited above, this participant expressed that disclosure was necessary prior to sex with a new partner as a means of meeting discriminatory behavior directly. He also expressed that disclosure online or via text message served as a means of simultaneously avoiding physical violence outright.

> It's still a hard conversation because with all the stigma and all the shit that goes with being HIV positive, it's still scary because it's like, how's this person going to react? Disclosing over text is much safer because if they've got a propensity for violence, I don't have to worry about them lashing out and taking a swing at me. It's much easier just to get it out of the way in the front, because then if somebody doesn't want to meet, you're not out much time expenditure, you're not out any emotional investment. It's through a text message, so the risk of any kind of violent behavior is mitigated. (P62: age 59, cisman, White, HIV+)

Public Health Events

Participants also invoked the AIDS crisis of the 1980s and 1990s in the USA as well as the coronavirus disease 2019 (COVID-19) — severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) — pandemic when expressing their belief that PLWH ought to disclose their status to sex partners prior to a sexual encounter. Notably, participants who drew these parallels all reported HIV-negative status. References to the AIDS crisis informed some participants' attitudes that seropositive status ought to be disclosed. For instance, the following participant remained fearful of HIV, recalling how critical disclosure was early in the epidemic.

> I think probably a lot of this comes from a generational thing because I was around to see the AIDS epidemic in the '80s, and during that time, there were people who were positive then that wouldn't tell other people they were positive. They would end up infecting other people, and I guess I still have kind of a phobia about that. (P47: age 54, cisman, White, HIV−)

One particular participant, as shown below, speculated that the AIDS crisis might currently shape disclosure practices of older generations of PLWH broadly. This participant believed that those who lived through the AIDS crisis might be less likely to disclose their status due to stigma initially propagated during the crisis itself.

> Guys with HIV, at least from my experience, if they're my age and they lived through the '80s and the '90s, it's not really something that they disclose readily. But maybe it's my perception as almost a middle-aged gay man, that younger people have their whole lives, put everything out there that they ever do on Instagram or Snapchat and whatnot, they're more likely apt to just say it, simply because that's how they've been brought up. (P2: age 47, cisman, Latinx, HIV−)

However, this same participant expressed that disclosure of seropositive status was necessary due to perceived high risk of transmission today — a belief that may also be shaped by the participant's generational outlook on living with HIV and sex with serodifferent partners.

> It's one thing to fuck around with your life. Do whatever the fuck you want to do, but whenever you're possibly exposing somebody else, you need to tell them, so that way that other person can make that decision for themselves, whether they want to take part in a high risk behavior. (P2: age 47, cisman, Latinx, HIV−)

The COVID-19 pandemic, which was ongoing during the study, informed some participants' attitudes on disclosure. The participant below proffered a response to the interview that captured a direct comparison of non-disclosure of COVID-19 infection to undisclosed HIV positive status in spite of awareness of U=U.

> I'm not really sure how to explain this but, to me, it feels like if you're about to make me work a shift with someone who was detected COVID positive, that they just chose not to disclose that ... Even if they are undetectable, I would still like to have that information. It's just how I am. (P58: age 21, non-binary, Black, HIV−)

Another provided a similar response, while emphasizing a notion of collective responsibility in respect to disclosure prior to sex.

> I think it's something that you owe to the person you're having sex with, to tell them, like you would probably if you had COVID or something. I think we all have a responsibility to each other to discuss that and if someone didn't tell me that or lied to me and then I found out … you can't really trust someone. (P11: age 39, cisman, White, HIV−)

Discussion

While a small body of work has speculated that U=U may usher in a shift in norms pertaining to HIV prevention (e.g., Calabrese & Mayer, 2019; Haire & Kaldor, 2013), study findings indicate that the disclosure of seropositive status to sex partners is still important to SGM individuals who are U=U-aware. Overall, a majority of the study sample, irrespective of HIV status, believed seropositive status disclosure was necessary in advance of sex. The impact of U=U on the perceived importance of seropositive status disclosure may be moderated by a number of social and structural factors that may simultaneously shape attitudes of SGM individuals regarding the necessity of seropositive status disclosure today.

Analyses found five categories of factors that informed these attitudes: Sexual ethics, HIV criminalization, scientific knowledge, enacted stigma, and public health events. Findings suggest that all of the aforementioned factors may influence attitudes in conjunction and irrespective of participant HIV status (with the exception being public health events, a factor invoked only by seronegative participants). While participants described perceived negative consequences of non-disclosure when invoking HIV criminalization, sexual ethics, enacted stigma, and public health events, participants described perceived positive consequences of disclosure when invoking scientific knowledge and sexual ethics in their responses.

Those who discussed scientific knowledge and sexual ethics believed there were positive consequences to disclosure. For instance, they thought it provided seronegative partners agency in their HIV prevention strategies, a finding also reported in other studies (e.g., Newcomb et al., 2016; Obermeyer et al., 2011). Participants likewise expressed that the importance of disclosure was connected to factors that informed perceived negative consequences of non-disclosure (i.e., public health events, HIV criminalization, enacted stigma, and sexual ethics). In spite of awareness of U=U, participants claimed that HIV still presented a risk to seronegative partners. Research has shown that while a majority of PLWH accurately reports an undetectable viral load, roughly 20% may report an undetectable viral load when medical records or laboratory testing may indicate otherwise (Mustanski et al., 2018). While not overtly specified by this study sample, some perception of HIV risk may be linked to the abovementioned discrepancy in viral load reporting. Regardless of their understanding of HIV transmission risk, some participants compared undisclosed HIV-positive status to undisclosed COVID-19 infection or expressed that not disclosing such status to sex partners connoted the same risk today as that at the height of the AIDS crisis.

Although recent research has indicated increasing awareness and acceptance of U=U among SGM individuals (e.g., Carneiro et al., 2021; Rendina, Cienfuegos-Szalay, Talan, Jones, & Jimenez, 2020), our findings suggest that misinformation about U=U persists. In such a context, SGM individuals may continue to doubt the efficacy of U=U irrespective of HIV status. It is worth noting we did not interview seronegative participants currently using PrEP for this study. As an active PrEP prescription may signal increased HIV-related knowledge or engagement with HIV-related care, it is possible that including PrEP users might have yielded a sample of SGM individuals who were better informed about U=U and thought differently about the importance of serostatus disclosure. In spite of this caveat, comparisons between HIV today and HIV during the AIDS crisis or COVID-19 constitute a salient finding. Considering the possibility that COVID-19 may signal a multiplicity of pandemics to come in future years, public health messaging may be useful in clarifying false equivalencies between HIV and other viruses as they emerge (Morens & Fauci, 2020).

Participants in the current study also felt that disclosure provided an opportunity to educate others about U=U or to dismantle HIV stigma with peers, which we believe is a novel finding. Fittingly, research has found that those who are aware of U=U are more likely to disclose their status than those who are unaware, suggesting that U=U may be a tool to attenuate HIV stigma (Okoli et al., 2021). Such a finding calls attention to the apparent tension between perspectives regarding disclosure as a means of avoiding legal liability (i.e., as a reaction to HIV criminalization) or mitigating chances of enacted stigma — described below — and perspectives regarding disclosure as a means of sharing information in order to make seropositive status disclosure safer for PLWH.

HIV criminalization was also invoked when participants expressed perceived negative consequences of non-disclosure of seropositive status. Participants believed that disclosure after the fact might be met with criminal prosecution. Those living with HIV described fear of legal recourse in the event of non-disclosure while those who reported HIV negative status expressed that criminalization laws mandated disclosure irrespective of their views on such laws. Recent research has found that such laws are, in fact, a contributor to psychological distress of PLWH while failing to mitigate sexual transmission risk (Breslow & Brewster, 2020; Galletly et al., 2012a).

Although many states nationwide have HIV-specific criminal statutes, those in several states, such as those in California, Georgia, Michigan, and North Carolina, have recently been amended while legislators of other states have considered doing the same (CDC, 2021b; Lehman et al., 2014; Lyle, 2020; Thanawala, 2020; Van Slooten, 2021). In the face of such policy changes, public health messaging could help to clarify the implications these amended laws have for seropositive status disclosure practices. While some efforts

have been made to call attention to shifting legislation in this respect (e.g., CDC, 2021b), further work may be needed to disseminate information about new laws that are informed by U=U as they emerge in order to correct misinformation and mitigate HIV stigma nationwide.

Besides legal mandates, findings also show that SGM populations consider seropositive status disclosure to be an ethical concern. The study sample expressed that non-disclosure was comparable to a number of other forms of non-disclosure that would be considered a misrepresentation of identity or of placing seronegative partners at risk of infection without their knowledge or consent. Research on the ethics of seropositive status disclosure earlier in the epidemic in the USA framed disclosure as a moral obligation (Stein et al., 1998; Wein, 1989). While seropositive status disclosure has been understood as a determinant of various health outcomes for PLWH (e.g., Shrestha et al., 2019; Turan et al., 2017), as well as a means to inform HIV prevention strategies for those who are not (e.g., Newcomb et al., 2016; Obermeyer et al., 2011), public health messaging today frames seropositive status disclosure as a means to honor individual sexual health agency and prevent legal liability (CDC, 2021c). Though, broadly, public health interventions have struggled to facilitate HIV status disclosure practices among sex partners (Conserve, Groves, & Maman, 2015). Considering U=U, public health campaigns may incorporate an understanding of the psychosocial barriers to disclosure (i.e., stigma, minority stress, etc.) in guidance around seropositive status disclosure (Camacho-Gonzalez et al., 2015; Halkitis, Kingdon, Barton, & Eddy, 2016). Furthermore, public health interventions may also consider the intersection of the multiple barriers to and facilitators of seropositive status disclosure per the categories derived in the current study. In so doing, messaging may reframe seropositive status disclosure as a means of stigma dismantling as opposed to an indicator of individual morality or solely a means to avoid legal liability.

In respect to stigma, participants referred to enacted HIV stigma as a factor that informed their stance that PLWH should disclose their status in advance of sex. Notably, participants expressed that PLWH may endure or be victim to physical violence and other acts of overt discrimination on the part of seronegative partners regardless of the timing of such a disclosure. This finding demonstrates that enacted stigma may be a perceived negative consequence of disclosure as well as non-disclosure among SGM individuals irrespective of U=U. This finding therefore casts attention on how serostatus disclosure can be made safer for PLWH. While U=U awareness has shown to be increasing among SGM populations, disparities in respect to acceptance of the science have been drawn along the lines of HIV status (Carneiro et al., 2021; Rendina et al., 2020). Public health campaigns may therefore emphasize U=U efficacy so as to unburden PLWH from the threat of enacted stigma in the event of serostatus disclosure before a given sexual encounter.

Study findings must be viewed in light of several limitations. The study relied on a relatively small convenience sample and thus the findings cannot be generalized to the population of SGM individuals who have sex with men. Our online recruitment strategy used dating/hookup applications, social media, and online forums and the perspectives of people who do not use these technologies could differ. There could also be self-selection bias as participants self-enrolled into the online survey and chose to provide contact information to potentially participate in the interview. Furthermore, social desirability bias may contextualize some findings considering that participants were aware that interviewers had a background in public health (Paulhus, 1984). For instance, some participants might have emphasized the importance of seropositive status disclosure believing that this was the answer that public health workers would favor.

Nonetheless, the current study indicates that SGM individuals view seropositive status disclosure as important for a multitude of reasons, citing a variety of social and structural factors that may shape their attitudes. Though a minority of participants expressed awareness and acceptance of U=U in their attitude that disclosure was now unnecessary, others cited the ethics of disclosure, sexual health agency, stigma dismantling, and HIV criminalization as informing their stance on disclosure being a necessity. Participants likewise cited misinformation regarding HIV and expressed doubt in U=U efficacy in communicating their stance on disclosure. As such, public health policy and messaging would be of utility in remediating concerns regarding U=U efficacy, combating misinformation or out-of-date information about HIV and HIV criminalization, and uprooting HIV stigma so as to make seropositive status disclosure safer for PLWH.

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Declarations

Ethics Approval All procedures performed in this study involving human participants were in accordance with the ethical standards of the author's institution and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Conflict of Interest The authors declare no competing interests.

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