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'… if U equals U what does the second U mean?': sexual minority men's accounts of HIV undetectability and untransmittable scepticism

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ABSTRACT

The everyday meaning and use of HIV 'undetectability' raises significant questions about the social and sexual significance of this state of viral suppression. We conducted in-depth, semi-structured interviews with 25 sexual minority men living in Vancouver, Canada, including men living with HIV. Interviews were audio-recorded, transcribed verbatim and analysed using grounded theory. Most participants understood being undetectable to signify that someone living with HIV is at a 'low,' 'lower,' or 'slim to no' risk of sexually transmitting HIV, as opposed to meaning 'uninfectious' or 'untransmittable'. Men discussed how undetectability was communicated in-person and online, including via sexual networking apps, and revealed how it is sometimes confused or conflated with another biomedical advance in HIV-prevention, namely pre-exposure prophylaxis (PrEP). HIV-negative men expressed significant scientific scepticism, a reluctance to incorporate a partner's low viral load or undetectable HIV status into their sexual decision-making, and an enduring fear associated with knowingly having sex with someone who is HIV-positive. We describe this as a form of *untransmittable scepticism*. While international campaigns have worked to communicate the scientific message that 'undetectable equals untransmittable' (U = U), the sexual stigma attached to HIV remains durable among some gay, bisexual, queer and other men who have sex with men.

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Introduction

Knowledge that antiretroviral medications suppress HIV viral load to undetectable levels, thus preventing transmission of the virus—or treatment as prevention (TasP)—heralds a much-celebrated revolution in biomedical HIV prevention at a population-level. Across serostatus, the concept of HIV undetectability or being 'undetectable' appears

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to be increasingly used among many gay, bisexual, and other men who have sex with men (Grace et al. 2015; Gaspar 2019; Klassen et al. 2019). However, as research focused on the HIV treatment care cascade has illuminated, significant challenges remain in supporting all people living with HIV in reaching and maintaining an undetectable HIV status, thwarting both the individual and population-level benefits of this state of viral suppression (Gardner et al. 2011).

National and international campaigns have worked to disseminate the scientific message that 'undetectable equals untransmittable' (U = U) (Prevention Access 2016; British Columbia Centre for Excellence in HIV/AIDS 2016). Originally launched in 2015, the U = U campaign seeks to communicate the scientific and social implications of HIV undetectability which is expressed at the bottom of its messaging primer and scientific consensus statement in hashtag form: #*UequalsU*, #*factsnotfear* and #*sciencenotstigma* (Prevention Access 2016; CATIE 2018). The U = U slogan has been gradually incorporated into public health messaging, physician communication with patients, and community position statements in Canada over the last five years (CATIE 2019; Gay Men's Sexual Health Alliance 2018). More recent campaigns in Canada have also worked to convey this message, including the 'Can't Pass It On' campaign originating in the UK that also has the twin aims of helping to 'end stigma around HIV and end HIV transmissions altogether' (Terrence Higgins Trust 2019).

'Undetectability' refers to an HIV viral load (measured in copies per mL of blood) that is not detectable by standard viral load testing. The evidence behind the U = U messaging comes from a series of large, methodologically rigorous clinical trials that have taken place over the last decade (CATIE 2018). Generally speaking, these studies examined serodiscordant couples (i.e. where one partner was living with HIV and on suppressive therapy, and the other partner was HIV-negative) not using condoms, with the main outcome being within-couple HIV transmission.

The first study (HPTN 052), enrolled 1763 heterosexual couples and demonstrated a 96% reduction in the relative risk of HIV transmission in those with suppressed viral load (Cohen et al. 2016). Next, the PARTNER study enrolled both couples of sexual minority men ($n = 340$) and heterosexual couples ($n = 279$), and demonstrated no linked, within-couple HIV transmissions (Rodger et al. 2016). Following this, the PARTNER2 study enrolled 783 couples of sexual minority men followed over eight years and found no linked transmissions from an undetectable partner (Rodger et al. 2019). Finally, the Opposites Attract observational cohort study enrolled 358 serodiscordant male couples, followed over 588 couple-years, with no linked transmissions (Bavinton et al. 2018). Taken together, this research represents over 100,000 condomless sex acts, with no linked HIV transmissions. These studies elucidate an evolution in scientific knowledge of the impacts of HIV undetectability for men who have sex with men, with evidence regarding male anal sex moving from qualified to definitive after the release of these most recent findings in 2018. Eisinger, Dieffenbach, and Fauci (2019, 452) explain that 'even though the clinical data underpinning the concept of U = U have been accumulating for well over a decade, it is only recently that an overwhelming body of evidence has emerged to provide the firm basis to now accept this concept as scientifically sound'.

As two decades of research has shown, understanding viral load as a signifier of health or treatment success—and reduced risk of HIV transmission—is not 'new'

information for many sexual minority men living with HIV or their partners (Race 2001; Flowers 2001). However, how undetectability is understood by gay, bisexual, queer and other men who have sex with men at this stage of the epidemic raises significant questions about the evolving social and sexual significance of this state of viral suppression among a diverse population who continue to be disproportionality affected by HIV (Grace et al. 2015; Holt et al. 2018). For example, qualitative research in Vancouver, British Columbia (BC) has longitudinally traced the significance of undetectability for sexual minority men recently diagnosed with HIV. For many, undetectability was conceptualised as a virologic achievement that facilitated their disclosure of HIV-status (or undetectable status) and served as a source of mental comfort or a 'return to normalcy'; however, for some, undetectability served as source of 'discomfort', 'contention' or 'confusion' (Grace et al. 2015, 347).

Knowledge of the prevention benefits of suppressive HIV therapy joins another remarkable advancement in the shifting biomedical HIV-prevention landscape: the use of pre-exposure prophylaxis, or PrEP, by HIV-negative individuals at risk of acquiring HIV (Martinez-Lacabe 2019). Like with undetectability, the scientific consensus on the efficacy of PrEP at preventing HIV acquisition is clear (Spinner et al. 2016). However, PrEP has only recently become available in many parts of Canada (Grace et al. 2018; Newman et al. 2018).

Drawing from traditions of critical social science in HIV research, we concur with Adam (2019, 196–197) who cautions that:

> Biomedical solutions often turn out to depend on social and psychological considerations related to the organisation of the production and distribution of medication, experience and integratability in the demands of work and home life, and moral precepts regarding respectable or acceptable conduct.

Through this investigation of undetectability, we sought neither to specifically examine the so-called 'treatment optimism' hypothesis (Zimmerman and Kirschbaum 2018) nor to trace sexual minority men's behavioural patterns of 'risk compensation' (Hojilla et al. 2016). Instead, our objective was to inductively learn from diverse sexual minority men across different HIV serostatuses to understand how HIV undetectability has meaning for them as active scientific citizens, including its sexual significance and contested interpretations amidst an evolving and uneven landscape of biomedical HIV prevention strategies.

Methods

Participant recruitment

Between December 2016 and June 2017, we recruited a demographically diverse sample of 25 sexual minority men—including gay, bisexual, queer and other men who have sex with men—in Vancouver, Canada through the clinic sites of the British Columbia Centre for Disease Control and through the online sexual networking applications Scruff and Squirt. Individuals were eligible to participate if they identified as male; were 18 years of age or older; had sex with other men in the last six months; were fluent in English; and were available for an in-person interview.

A community-advisory board provided feedback throughout the process of participant recruitment to help ensure that we achieved a heterogeneous sample of sexually

active participants. After recruiting the first 12 participants, we further focused the sampling frame to ensure that over half of participants (52%) had 5 or more reported sexual partners in the past 6 months.

Of the 25 participants recruited for interviews, the majority were white (64%) and identified as gay (76%). The median age of the participants was 43 (range 18–57) years. Eight participants (32%) were living with HIV. Within the last year, nine (36%) reported being diagnosed with syphilis, ten (40%) with gonorrhoea, and seven (28%) with Chlamydia (see Table 1).

Data collection

In one-on-one, in-depth semi-structured interviews that lasted approximately 45 minutes, we asked participants to describe their knowledge and attitudes in relation to the following interrelated interview domains: syphilis and other sexually transmitted infections (STI); perceptions of STI risk; experiences with healthcare providers; measures taken to prevent STIs; the role of substance use in sexual activity and decision-making; HIV viral load and undetectability; pre-exposure prophylaxis (PrEP); and the role of social networks in their lives (Nath et al. 2019). The interview guide was developed in consultation with the community-advisory board. Members of the board also provided feedback during the process of data collection.

Participants received an honorarium of $30 CAD. Ethics approval was obtained from the University of British Columbia Research Ethics Board prior to conducting the study. The interviews took place in a private room at the British Columbia Centre for Disease Control or at a satellite clinic located within a LGBTQ community centre. Under the supervision of the first author, interviews were conducted by three trainees who occupied diverse intersecting social locations (e.g. some identifying as sexual and gender minorities; males and females; different racial and ethnic backgrounds) and work experiences (e.g. graduate students and staff at community-based agencies).

Data analysis

Data were systematically analysed using QSR NVivo 10 according to the tradition of grounded theory. Consistent with the principles of grounded theory, the data analysis was divided into three steps: open, axial, and selective coding (Corbin and Strauss 2008). Interviews were first open-coded by the second author, with review and coding feedback from the first and third authors. We next combined categories with their subcategories, sought explanations for differences, and explored relationships between categories. The selective-coding stage of the analysis involves the integration and refinement of the theoretical explanation (Corbin and Strauss 2008; Charmaz 2006). In this part of the analysis, the first author wrote down the essence of the story, which binds all codes and categories together and explains the feelings in the social scene (Glaser and Strauss 1967). Data collection progressed using theoretical sampling, in which the emerging theory was further explored by deliberately seeking out new participants with characteristics and experiences that would expand or challenge the theory.

Table 1. Characteristics of participants ($n = 25$).

Variable	Number of participants	%
Age		
18-29 years	7	28
30-40 years	5	20
41-51 years	7	28
52+	6	24
Sex at birth		
Male	24	96
Female	1	4
Ethnicity		
Asian	3	12
South Asian	1	4
White	16	64
Latino/Hispanic	1	4
Mixed	1	4
Black	1	4
Indigenous	2	8
Sexual orientation		
Gay	19	76
Straight	1	4
Queer	1	4
Other	4	16
Highest level of education		
Did not complete high school	2	8
High school	5	20
College	15	60
Graduate	3	12
Annual income (CAD)		
<$20,000	5	20
$20,000-39,000	8	32
$40,000-59,000	7	28
$60,000-79,000	3	12
$80,000-99,000	1	4
Prefer not to answer	1	4
Prior syphilis diagnosis (within last 12 months)		
Yes	9	36
No	15	60
Missing	1	4
Prior gonorrhoea diagnosis (within last 12 months)		
Yes	10	40
No	13	52
Unsure	1	4
Missing	1	4
Prior Chlamydia diagnosis (within last 12 months)		
Yes	7	28
No	16	64
Unsure	1	4
Missing	1	4
HIV Status		
Negative	15	60
Positive	8	32
Unsure	2	8
Number of men participants reported having had sex within last 6 months		
1-5	11	44
6-10	8	32
11-15	2	8
16-20	1	4
20+	2	8
Missing	1	4

Findings

Understandings of undetectability: conceptualisations of 'low(er)' risk

Most participants were single at the time of the interview. Of those in partnerships (e.g. boyfriends, husbands), none of the men we interviewed reported being in a sexually monogamous relationship. The majority of the accounts we draw upon are participants' reflections of how HIV undetectability was understood and entered into decision-making in the context of casual sex, sometimes within a network of casual sex partners they had sex with on a recurring basis. Pseudonyms are used to protect the confidentiality of participants.

The majority of men we interviewed, both living with HIV and HIV-negative, indicated that they understood—in general or specific terms—the meaning of viral load as a marker of HIV treatment success. Some participants explained the association of a low viral load with undetectability, sometimes quantifying this relationship (e.g. saying that undetectable referred to a viral load less than 40 copies of the virus per mL of blood).

Most participants described a general awareness that being 'undetectable' was associated with a greatly reduced likelihood of HIV-positive people sexually transmitting HIV. However, many men believed that the term undetectable was a signifier of being at 'low' or 'lower' risk of transmitting HIV rather than 'no' risk of transmission. At times, participants detailed—and even quantified—their beliefs regarding how effective they understood antiretrovirals to be at preventing onward transmission, with Owen saying that undetectable meant 'it's like 99.9 percent … they're not transmitting the virus' (25 years old, HIV-negative).

Participants expressed tension between their understandings of undetectability and its use in HIV science. For example, Markus explained his understanding of undetectability like this, noting that he was sceptical of the current state of 'new' scientific knowledge 'in the laboratory stages':

> I don't know what that means [undetectability]. So, meaning they had it [HIV] but it's undetectable in the last testing, right? That I understand is not 100% good … this is all new I'll say. It's still in the laboratory stages. It's not something we can be 100% sure of. We don't know if we're [gay men] still able to be susceptible to HIV (57 years old, HIV-negative).

Other participants described that knowing a sexual partner was undetectable signalled that they should 'assume that they don't have the virus, but you still have to be aware' (Paul, 23 years old, HIV-negative).

However, for some HIV-negative participants, the issue of HIV status was ultimately reduced to binary terms in their reflections: you are HIV-positive or you are not. Benjamin, a 34-year-old HIV-negative participant, explained that he did not differentiate between undetectable and HIV-positive because 'either way, they have the capacity to pass it [HIV] on'. Leo, another HIV-negative participant, said that he simply did not believe in the notion of 'being undetectable': 'I don't believe in that [being undetectable]. I think you are still at risk [of contracting HIV] if you are negative' (44 years old).

A couple of participants shared that they were quite knowledgeable about HIV prevention strategies, including the use of PrEP, but remained sceptical to the idea of undetectability meaning untransmittable because they felt many factors contributed

to an undetectable status. A specific concern for these participants was their understanding that being undetectable at one point in time did not guarantee maintaining this status in the future.

Several men living with HIV discussed undetectability in relation to their own serostatus. For instance, Matthew, a 54-year-old man living with HIV, described undetectability as taking his daily dose of medication: 'all it means to me is I take my three pills every day … Or that if I got tested they have a hard time finding HIV in my blood'. Emile, a 67-year-old man living with HIV, used his knowledge of viral load to describe being undetectable for over 20 years: 'Basically, with the new tests now, they do a viral load and if it's less than 40, then it's classed as undetectable. And I've been that way since 1997'.

Only two of the men interviewed, Everett who was living with HIV, and Jason who was HIV-negative, described being undetectable meaning 'untransmittable' or 'not transmittable'. As Everett put it: 'Undetectable means that you're not transmittable. So, that's pretty much my knowledge. I mean, like, I keep myself healthy' (31 years old, HIV-positive). Markus, who was living with HIV, said that he had not incorporated the idea of untransmittable explicitly into his definition of undetectability. However, in his reflections he referenced key scientific advances in the field including specific policy strategies and guidelines (e.g. The 2008 Swiss Federal Commission for AIDS-related Issues statement that HIV is not transmitted when a person is under fully suppressive therapy; *see* Rojas et al. 2012), and the recent international U = U campaign:

> … now everybody is signing on to the declaration and countless studies have increasingly made the point that undetectable means … I'm trying to think, if U equals U what does the second U mean? It's this declaration group organisations are signing on to. Undetectable means uninfectious? (57 years old).

Communicating with (potential) sexual partners: online exchanges, HIV stigma and PrEP

Men's accounts revealed some of the everyday ways in which undetectability was communicated or discussed either online or in-person with potential sexual partners. The vast majority of participants interviewed used sexual networking applications, such as Grindr, Scruff and Tinder to meet partners. Participants described how undetectable status is communicated online on these platforms. For example, some men described that those living with HIV often explicitly state (or check) that they are undetectable in their online profiles.

Even among participants who said that they did not (fully) understand what undetectability meant, everyone we interviewed described that they had been exposed to the term undetectable because of its common usage in the gay community and, in particular, on sexual networking applications. However, participants explained that aside from noting whether one was undetectable, the online exchange of information about undetectability or HIV did not often go further. As Zachary explained: 'Nobody really has a conversation about it [undetectability online], as long as I'm 'undetectable' … ' (35 years old, HIV-positive). Some participants explained that the term 'viral load' was no longer used between prospective partners online,

especially now that most people living with HIV were undetectable, resulting in a discursive shift. For example, Nathan who was living with HIV said: 'Actually, lately, when I first became undetectable, it [viral load] was asked, but not anymore, it's hardly ever asked, it's just 'undetectable'. The viral load is not questioned' (47 years old).

Some HIV-negative participants conveyed that because only HIV status was relevant to them in their decisions about who to have sex with, this was the information (HIV status) that they were concerned with being communicated when looking for sexual partners. Isaac, a 28-year-old HIV-negative participant, expressed that information on undetectability was not as important to him as HIV status: 'I think I would more rather want to know if he's HIV-positive […] I think it's more important than to tell me they are HIV-positive rather than, oh, 'I'm HIV-positive and I'm undetectable'. Isaac went on to say that he was not interested in having sex with anyone who was living with HIV. Similarly, Alexander shared that undetectability did not have discursive significance for him:

> [I]f someone tells me they are undetectable, I don't think about it anyway except that they're HIV-positive. I say to someone that that has really no bearing to me. You're either positive or you're not. (47 years old, HIV-negative).

In reflecting on how information about undetectability is communicated online and in person, the theme of stigma emerged in the narrative attributions of some participants. Accounts of HIV-related stigma and undetectability differed in our sample, in part, according to HIV serostatus. On the one hand, some of the men we interviewed who were living with HIV talked about undetectability leading to a reduction in HIV stigma, and not being as stigmatised in Vancouver compared to other provinces in the country, when revealing their undetectable status:

> It's very common around Vancouver for people to be positive and undetectable, so it's not that big of an issue […] Alberta [province adjacent to British Columbia] is not as open as it is here, it's very hush-hush, you know? (Zachary, 35 years old).

In another rich excerpt, Nathan reflected on his exchanges about undetectability with potential sexual partners and his observation of generational differences in how this knowledge was being incorporated into sexual decision-making by some gay men:

> I think the undetectable has led to a new destigmatisation of it [HIV]. I think it's also a generational thing which has shocked me. There's people I know who lived through all their friends dying of AIDS, who are a little bit older than me, who will not have sex with someone who is HIV-positive and they have almost a kind of phobia around it […] the younger generation tends to have integrated [HIV science knowledge] into their world view and their understanding. [HIV] just is kind of almost a non-issue with people (47 years old, HIV-positive).

In contrast, several HIV-negative participants admitted to harbouring stigma towards people who were living with HIV, including those who were undetectable, and 'screening them out' when looking for sexual partners online. Paul, an HIV-negative participant, shared: 'I wouldn't mind [having sex] if their viral loads are like undetectable but at the same time, I'm not going to lie. I do have a little bit of stigma around that because I'm OCD [obsessive-compulsive disorder]' (23 years old).

Finally, HIV pre-exposure prophylaxis, or PrEP, was a recurring theme when some participants discussed communicating about undetectability with (possible) sexual

partners. Men's accounts revealed that some of them appeared to be either confused about the relationship between PrEP and undetectability and/or that PrEP is being used as a term in-person and online by some people to refer to all ART-based HIV prevention taken by HIV-negative or HIV-positive partners.

For example, when talking about how PrEP use and undetectable HIV status are commonly indicated in one's profile on online sexual networking applications, Alexander confused or conflated these two biomedical concepts when he implied that taking PrEP confers undetectability: 'Yes, it [undetectable] comes right after the word PrEP: 'I'm on PrEP and undetectable.' All the time. Especially the last six months' (47 years old, HIV-negative). Leo explicitly talked about how he understood undetectability in relation to PrEP. When asked what undetectable meant to him, he shared, 'It means they are taking PrEP' (44 years old, HIV-negative). Zachary also shared a similar reflection: 'There's a lot of undetectable [people] who are on PrEP' (35 years old, HIV-positive).

Undetectability and sexual behaviour: undetectable equals HIV equals some risk

The lack of resonance for many participants of the idea that undetectability means untransmittable appeared to have impacted how knowledge of undetectability was incorporated into their sexual desires, partner selection practices and sexual decision-making. Those who said they believed that undetectability meant a 'low risk' of transmitting HIV said that they were either not inclined to have condomless anal sex with partners with an undetectable HIV status or reported not wanting to have sex with them at all. Owen, a 25-year-old HIV-negative participant, discussed feeling conflicted about the idea of a sexual partner being undetectable, and not knowing whether undetectable really meant untransmittable. In talking through how he thought about undetectability in relation to his sexual behaviours, he concluded that there was still a risk of acquiring HIV with undetectable partners and therefore he 'might be more inclined to use protection'—which he saw as meaning condoms—with them: '… I'm not entirely sure if being undetectable puts you at the same level as someone who's HIV-negative'.

Several HIV-negative participants, who said only HIV status mattered in their sexual decision-making (i.e. accounts of HIV is HIV), echoed similar sentiments of wanting to use condoms with undetectable partners. Leo, an HIV-negative participant who stated that he would always use condoms with undetectable partners, reflected that he might be considered 'hypocritical' for having condomless anal sex with HIV-negative partners, but insisting on condom use with partners who are HIV-positive and undetectable:

> Well, my experience has been that people come up to me saying 'I'm undetectable, you can fuck me bare', like, they want me to fuck them bare, so I say no. Like, regardless if you think you're undetectable, or whether it's 99.99% undetectable, it doesn't matter. I appreciate that you were honest with me, it goes a long way, but I still want to use a condom in such a case. Not that it's … it may make it a little hypocritical, like when a guy says, 'I'm HIV-negative' and I'll go bareback sometimes … (44 years old).

Leo's account suggests that in trying to prevent HIV infection (by limiting himself to HIV-negative sexual partners) he may have been inadvertently exposing himself to partners with undiagnosed and untreated HIV.

Some participants stated explicitly that they would not want to have sex with undetectable partners (or anyone living with HIV), with or without a condom, because of the risk of contracting HIV. For these participants, the apparent risk calculus was fairly straightforward: they understood that the risk of contracting HIV was 'higher' if they had sex with someone who was undetectable than if they had sex with someone who was HIV-negative. These participants explained it was 'not worth the risk' because, as Matteo put it: 'they had the capacity to pass it [HIV] on' (34 years old, HIV-negative).

In another example of this theme, James reported that although he knew 'it [was] completely fine' to have sex with an undetectable partner and that 'they [were] normal', he was deeply 'uncomfortable' with the idea of having sex with undetectable partners (28 years old, HIV-negative). He explained that his personal discomfort arose from a person's positive HIV status, which was 'such a huge thing' and difficult for him to 'get past'.

In a contrasting account to those above, Liam shared his journey in becoming comfortable having pleasurable, erotic, condomless sex with his undetectable partner:

> I mean one of my lovers who I've had for a really long time has been undetectable … So, we used to use a condom and then we stopped because I trusted, trust him. Yeah, so I have experience with someone who is undetectable and have had unprotected [condomless] sex with him and kind of gone through this journey of him being on that drug for a very long time and as the kind of results come out, how and when people are undetectable they aren't actually able to pass HIV to a partner (30 years old, HIV-negative).

Despite his experience with a long-term sexual partner who was undetectable, and knowledge of the scientific significance of undetectability, Liam went on to report that he would still use a condom for the first time with someone who said that they were undetectable. For Liam, having condomless sex required developing trust with HIV-positive partners who were undetectable.

Finally, Nathan, who was living with HIV, shared some very different reflections on his experiences of having sex with men who said that they were HIV-negative and wanted to have condomless sex with him. Nathan described a recent sexual encounter in which he said that a sexual partner he encountered was eager to have condomless sex with him because of his knowledge of undetectability: 'I met a neg guy that is not on PrEP and doesn't even care, is just like 'Well, I don't mind if you fuck me without a condom, I know you're undetectable'' (47 years old, HIV-positive).

Discussion

The majority of participants we interviewed understood being undetectable to signify that someone living with HIV is at a 'low,' 'lower,' or 'slim to no' risk of sexually transmitting the virus—perceptions largely consistent with 'low risk' TasP messages at the time they were interviewed. Only two participants described undetectability using terms such as uninfectious, untransmittable, or not infectious. Participants' apparent definitional resistance to the idea of undetectability meaning uninfectious ranged from complete disbelief or rejection of this framing (e.g. 'I don't believe in that') to thinking there was still a small chance they could get HIV (e.g. U does not equal U).

A few HIV-negative participants noted that undetectable was not a relevant concept to them as HIV-positive means HIV-positive or HIV is HIV (Grace et al. 2015). In short, for some of the participants the second U of the Prevention Action Campaign's mantra (2016) seemed to equal unease, unsure, unimportant, or scientifically uncertain. We describe this as a form of *untransmittable scepticism*—an apparent belief in the general promise of undetectability but a hesitancy or reservation to fully embrace the mentality that it means zero risk (Martinez-Lacabe 2019).

Of course, these participant reflections contrast to how recent literature related to the U = U message have shifted to frame the significance of undetectability unequivocally: 'The evidence is in: If you are HIV+, take treatment and maintain an undetectable viral load, you can have sex knowing that you won't pass HIV to your sex partner. In short, when HIV is undetectable, it's untransmittable' (CATIE 2017, para 1). Participants in this study were more comfortable with the idea of HIV treatment serving as an important HIV prevention strategy greatly reducing the risk of HIV transmission (more akin to TasP messaging focused on the prevention benefits of treatment) than accepting the idea of zero risk of transmission. In short, the cognitive impasse for some participants appeared to be—to borrow and recast a message from recent population-level HIV prevention campaigns—*getting to zero* (Katz and Jha 2019), or untransmittable, from the idea of a slim or low chance of HIV transmission. The U = U campaign has recently clarified why it sees any reference to even 'negligible' risk as undercutting the aims of the messaging, given this word is 'often misconstrued as still a risk to take into consideration in sexual and reproductive health decisions' (Prevention Access 2016, editor's note).

Men discussed how the discourse of undetectability circulates in-person and online, including via sexual networking applications. Our research builds upon Race (2015, 263) who considers the ways in which undetectability discourse has been 'mobilized to mitigate any alarm associated with HIV positivity—that is, a prevention identity *in itself*' (emphasis in the original). Adding to earlier qualitative research in BC, some participants living with HIV talked about their undetectable status leading to multiple positive outcomes including a reduction in their experiences of HIV-related stigma (Grace et al. 2015). A number of these men drew upon recent exchanges with prospective sexual partners to discuss differences in understanding HIV undetectability across axes of both generation or age (i.e. the view that younger guys were more accepting of biomedical advancements in HIV prevention) and geography (i.e. the experience that BC men were more knowledgeable or understanding) (Klassen et al. 2019).

Building on the important theme of stigma-reduction, Eisinger, Dieffenbach, and Fauci (2019, 452) note the legal implications of HIV undetectability and how conceptually U = U: 'bridges the best of biomedical science with current concepts in behavioural and social science by removing the sense of fear and guilt that a person may be harming someone else, as well as the feeling of self-imposed and external stigma that many people with HIV experience'. In Canada—which has the shameful distinction of being a global leader in criminally prosecuting cases of alleged HIV non-disclosure—undetectability has emerged as a scientific construct that has recently entered into criminal law discourse (Kazatchkine, Bernard, and Eba 2015; Housefather

2019). This move speaks not only to the significance of undetectability as an important concept mobilised to help limit the overly broad use of the criminal law, but also to the broader point of how this scientific idea has gradually and differentially moved overtime across discursive communities. This includes the mobilisation of undetectability within an expert consensus statement on HIV and the criminal law in efforts to describe why this concept is significant to help end prosecutions of HIV non-disclosure (Barré-Sinoussi et al. 2018).

For another example of these discursive travels, our findings also raise questions concerning how diffusion of undetectability knowledge has been slowly taken up and internalised not only by sexual minority men but also by HIV physicians and healthcare providers. Such acceptance has likely increased over time, driven by emerging research and a gradual awareness of the idea and its evidence base. A case in point of the gradual uptake of U = U messaging among healthcare providers can be found on the updated endorsement signature page of the U = U consensus statement (Prevention Access 2016, Endorsements Updated: May 5, 2019). In 2017, the US Centers for Disease Control and Prevention came out in support of the U = U campaign (2019) and in 2018, Canada became the first government to officially sign on to the U = U global campaign (Abadsidis 2018).

Our findings underscore the importance of healthcare providers discussing the meaning and significance of HIV undetectability with patients, including albeit not limited to, those who are living with HIV (Calabrese and Mayer 2019). This idea parallels the narrative accounts of some of the first wave of Canadian PrEP users who experienced initial resistance from healthcare providers when first trying to access this HIV prevention strategy prior to its more widespread availability and use (Grace et al. 2018).

The accounts of some HIV-negative men we interviewed revealed an enduring fear and stigma associated with knowingly having sex with someone who is HIV-positive, regardless of whether they communicate their undetectable status. These participants were more comforted by someone saying they were HIV-negative than they were undetectable, even for those who recognised this may appear somewhat illogical or hypocritical. As such, for some participants, serosorting—or selecting sexual partners of the same HIV status (and not based on viral load status)—was still occurring (Grace et al. 2014). Our findings expand upon Gaspar's (2019) critical analysis of HIV-negative gay men's limited 'undetectable optimism' in Toronto, Ontario. Like this earlier qualitative study, some of our participants were likewise sceptical or resistant to fully incorporating knowledge of undetectability into their sexual behaviours. These findings appear to contrast with those of Klassen et al. who explain how, in the same provincial context of BC, many of the sexual minority men they interviewed in late 2015 'viewed sex with HIV-positive undetectable partners as lower risk than sex with those who claimed to be HIV-negative' (2019, 10).

Our results help to reveal the cognitive difference between the caution many participants seemed to exercise with regards to fully embracing undetectability as a concept informing their sexual decision-making with the everyday sexual risks they said they were willing to take with people who profess (but may not really know) their HIV status, and therefore cannot know their viral load if they are living with HIV. These

accounts must be read amidst an enduring and evolving history of HIV-stigma that biomedical treatment and prevention advances alone have not, and will not, resolve.

Further evaluation, including longitudinal mixed methods research on the understanding and dissemination of U = U messaging by both sexual minority men and healthcare providers is required. Such research should consider how active scientific citizens are understanding HIV undetectability, how such understandings are incorporated into sexual decision making, and how they relate to other advances in HIV prevention such as PrEP. Over time, it is possible that a more widespread understanding and incorporation of HIV undetectability messages into sexual decision-making will be found, leading to a reduction in what we have termed untransmittable scepticism. We argue that HIV research must examine not only the diffusion of knowledge and sexual health literacy (McDaid et al. 2020) among diverse communities in and beyond sexual minority men, but also trace how the multiple forms of stigma related to HIV and sexuality more broadly may shift over time, as well as consider persistent barriers to accessing the biomedical, social and economic determinants that influence the ability to 'achieve' undetectability.

Limitations

Given the dominant public health construction of all condomless anal sex as both an 'unprotected' and 'risky' act for HIV transmission, social desirability (Latkin et al. 2016) may have influenced some participants' reflections on undetectability and sexual behaviour. As such, we may have missed uncovering many participant accounts of those more fully embracing undetectability messaging with full acceptance and/or excitement. While our sample is not representative of all sexually active gay, bisexual, queer, and other men who have sex with men, we do believe that we have captured a diverse set of experiences that help to reveal the understandings and attitudes of a heterogeneous group of Canadian sexual minority men. The perspectives of the individuals we interviewed focused on the sexual transmission of HIV among sexual minority men and further research with other people across diverse identities and social locations, including people who inject drugs and women is required (Allan, Whitbread, and Torres 2019).

It is also important to note that the interviews were conducted at a time relatively early in widespread U = U messaging (early 2017) and immediately before the British Columbia government implemented its public program for HIV PrEP. The timing of these interviews likely represents a point just prior to a significant cultural shift in how (some) sexual minority men in Vancouver understand a number of key biomedical concepts of HIV transmission (Grace et al. 2014). Because of this the temporality of our interviews is an important limitation and points to how the knowledge and attitudes surrounding the use of antiretroviral medication as a highly effective HIV treatment and prevention strategy may have changed over time (Holt et al. 2016), including the limited confusion we discovered between the meaning of HIV undetectability and the use of PrEP for HIV prevention (e.g. men who mistakenly said that PrEP confers undetectability).

Conclusion

In this paper we have documented the everyday understandings and uses of HIV undetectability for sexual minority men. Importantly, our research uncovered that most participants—both living with HIV and HIV-negative—understood undetectability as a marker of HIV treatment success and a 'low risk' of being able to sexually transmit HIV. Many men discussed their reluctance to incorporate a partner's undetectable HIV status into their sexual decision-making and revealed fears associated with knowingly having sex with someone who is HIV-positive. While international campaigns have worked to communicate the scientific message that 'undetectable equals untransmittable,' or U = U, the sexual stigma attached to HIV and condomless anal sex remain durable among some sexual minority men even in Vancouver, BC, where TasP has been strongly supported since the advent of combination therapy.

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