

# Treatment Is More Than Prevention: Perceived Personal and Social Benefits of *Undetectable=Untransmittable* Messaging Among Sexual Minority Men Living with HIV

H. Jonathon Rendina, PhD, MPH,<sup>1,2</sup> Ali J. Talan, DrPH,<sup>1</sup> Jorge Cienfuegos-Szalay, MPH,<sup>1,2</sup>  
Joseph A. Carter, MA,<sup>1,2</sup> and Ore Shalhav, MPH<sup>1</sup>

## Abstract

Research suggests that the science of undetectable viral load (VL) status and HIV transmission—conveyed with the slogan “*Undetectable=Untransmittable*” or “U=U”—has gaps in acceptance despite robust scientific evidence. Nonetheless, growing acceptance of U=U creates conditions for a shift in the sociopolitical and personal implications of viral suppression. We conducted an online survey over a 23-month period in 2018 and 2019 among 30,361 adolescent and adult (aged 13–99) sexual minority men living with HIV (SMM-LHIV) across the United States. We examined the impact of U=U on self-image, potential for changing societal HIV stigma, whether SMM-LHIV had ever spoken with a provider about viral suppression and HIV transmission, and primary sources of hearing about U=U. Approximately 80% of SMM-LHIV reported that U=U was beneficial for their self-image and societal HIV stigma, 58.6% reported it made them feel “much better” about their own HIV status, and 40.6% reporting it had the potential to make HIV stigma “much better.” The most consistent factors associated with these beliefs centered around care engagement, particularly self-reported viral suppression and excellent antiretroviral therapy adherence. Two-thirds reported ever talking to a provider about VL and HIV transmission, although the primary sources for having heard about U=U were HIV and lesbian, gay, bisexual, transgender, and queer (LGBTQ) news media and personal profiles on networking apps. These findings demonstrate the significant personal and social importance of U=U for SMM-LHIV that go above-and-beyond the well-documented health benefits of viral suppression, suggesting that providers should consider routinely initiating conversations with patients around the multifaceted benefits (personal health, sexual safety and intimacy, increased self-image, and reduced social stigma) of viral suppression.

**Keywords:** treatment as prevention, viral load, HIV transmission, HIV stigma, sexual minority men, men who have sex with men

## Introduction

**S**EXUAL MINORITY MEN (SMM) are the group most affected by the domestic HIV epidemic, and SMM living with HIV (SMM-LHIV) representing more than half of all individuals living with HIV in the United States.<sup>1</sup> Empirical research suggests that early initiation of antiretroviral therapy (ART) and viral load (VL) suppression not only positively impact long-term health outcomes, but also reduce the risk of HIV transmission.<sup>2–7</sup> This approach, known as treatment as prevention (TasP), is estimated to be highly beneficial in both

simulation work and population-based data.<sup>4</sup> By achieving and maintaining high levels of VL suppression within a community, research has demonstrated substantial reductions in HIV transmission.<sup>8–10</sup> In the last decade, landmark clinical trials have continued to show no linked HIV transmissions among HIV serodifferent couples where the partner living with HIV had a suppressed VL. Most recently, looking specifically at serodifferent male couples, at least three studies have now demonstrated no linked HIV transmissions during condomless anal sex (CAS) when the partner living with HIV had a suppressed VL.<sup>2,3</sup>

<sup>1</sup>Department of Psychology, Hunter College of the City University of New York (CUNY), New York, New York, USA.

<sup>2</sup>Health Psychology and Clinical Science PhD Program, The Graduate Center of the City University of New York (CUNY), New York, New York, USA.

Scientific evidence has accumulated and reliably converged upon robust findings that a durably suppressed VL leads to no risk of transmission. In 2016, to increase advocacy for and education about these scientific breakthroughs, the Prevention Access Campaign launched the slogan “*Undetectable = Untransmittable*” or “U = U.”<sup>11</sup> The campaign aligns with public health efforts to destigmatize HIV as it promotes innovative biomedical HIV prevention efforts to not only reduce HIV transmission but also improve the overall health and well-being of people living with HIV. Despite efforts made by scientists and organizing by prominent HIV organizations, dissemination and acceptance of U = U have been met with some resistance.

While only a handful of published studies have examined U = U acceptability among the general public, recent research suggests that misinformation, disbelief, and lack of education/awareness all pose significant barriers to the U = U acceptance;<sup>12–15</sup> these and other studies have found that these gaps appear to be driven by limited engagement in HIV prevention or treatment services [e.g., HIV testing frequency, use of pre-exposure prophylaxis (PrEP), being prescribed, and adherent to ART].<sup>14–16,17</sup> Among SMM-LHIV specifically, recent research examining perceived accuracy of U = U found that those who were not virally suppressed and who reported low ART adherence also reported lower levels of belief in U = U messaging.<sup>18</sup> Data also show that increased ART adherence and consistent monitoring of VL are associated with increased knowledge and trust of TasP among SMM-LHIV, in particular.<sup>4,19</sup> Taken together, data suggest an association—potentially reciprocal in nature—between engagement in HIV treatment and prevention and greater acceptance and understanding of the science of VL suppression and HIV transmission.

Reaching viral suppression not only provides a benchmark for effective HIV management,<sup>20</sup> but U = U messaging re-frames it as a positive sexual health indicator, which may offer personal and psychological benefits<sup>19,21</sup> and opportunities for SMM-LHIV to regain control over their physical and sexual health as well.<sup>19,21</sup> An undetectable VL can relieve fears of rejection or even violence when disclosing one’s HIV status to a partner, and promote intimate partnerships for SMM-LHIV.<sup>22</sup> In addition to reducing HIV-related stigma<sup>23</sup> and correcting the belief that people living with HIV are “vectors” of transmission,<sup>4</sup> wide acceptance of U = U also challenges the rationale for HIV criminalization.<sup>22,24</sup> Providing a key agreement with scientific consensus, U = U advocates against laws that criminalize HIV transmission—laws that enable a state to charge individuals living with HIV for failing to disclose their status to their partner.<sup>24–27</sup> Both the basis and content of these laws are based on lack of knowledge, misinformation, and stigma rather than scientific evidence. By reducing fear and inaccuracies surrounding HIV transmission risk, U = U messaging can attenuate stigma and shame associated with HIV among populations that bear the greatest burden.<sup>23,28</sup>

The robust evidence backing the science of viral suppression and HIV transmission coupled with growing acceptance of the U = U message both create conditions for a marked shift in the sociopolitical and personal implications of HIV viral suppression. The present study sought to examine perceptions of the U = U message’s potential for impact on HIV stigma and self-image among a sample of SMM-LHIV. Further, given the potential for U = U to provide a new opportunity for patient–pro-

vider connection and enhanced motivation to engage in care and achieve viral suppression, we also sought to determine whether SMM-LHIV have discussed U = U with their providers and the primary sources through which they have learned about U = U.

## Methods

Data collection occurred during a 23-month span, from January 2018 through November 2019, as part of ongoing efforts to screen participants into several research studies for SMM. We advertised in online venues, including social media and sexual/dating networking sites and apps. Those who clicked the ads (e.g., “get a free at-home HIV test mailed to you”; “receive up to \$275 for joining”) were directed to the secure survey. Respondents aged 18 or older were directed to a page that contained informed consent; those who were aged 13–17 were directed to an assent page. The study received a waiver of parental consent. The informed consent/assent indicated the survey had no incentive, but they would be screened for multiple studies at once for which they could be compensated if they were eligible and enrolled. All procedures were approved by the Institutional Review Board of the City University of New York.

## Measures

**Biomedical status.** Participants reported their HIV status as positive, negative, or unknown (“I don’t know”). Those reporting a positive status were asked if their most recent VL test was undetectable, detectable, or unknown (“Not sure/don’t remember”).

**Sociodemographic characteristics.** Participants were coded as to whether they were recruited from a social media website, a networking site, or a networking app. Participants also self-reported their age, racial identity based on US Census categories, gender identity, sexual orientation, zip code (which we recoded into the primary regions of the United States), health insurance status, and their relationship status. For men in relationships, we asked the HIV status of their main partner, which we subsequently recoded into being of a seroconcordant (partner was also living with HIV) or serodifferent (partner’s HIV status was negative or unknown) relationship.

**ART adherence.** Participants respond to a single validated item for assessing antiretroviral adherence,<sup>29</sup> which read: “Over the past month (30 days), how good a job did you do at taking your HIV medication...?” Responses were on a Likert-type scale, and ranged from 1 (very poor) to 6 (excellent), and were recoded into a trichotomous indicator of “excellent adherence,” “less than excellent adherence,” and “currently not on ART.”

**Club drug use.** Participants were asked whether they had used any drugs that could be considered a club drug in the last 6 months, which included cocaine, crack, crystal meth, ecstasy, gamma-hydroxybutyrate (GHB), and/or ketamine. Responses were recoded into a dichotomous indicator of any recent club drug use.

**Recent CAS.** Participants were asked how many casual male sexual partners they had in the last 6 months; and how many times they engaged in anal sex with and without a

condom with these partners. This was recoded into a dichotomous indicator of any recent CAS with a casual male partner.

**U=U and potential impact on self-image.** We asked participants: “How does the Undetectable=Untransmittable message make you feel about your own HIV status?” Responses were on a 5-point Likert-type scale, ranging from 1 (“Much better”) to 5 (“Much worse”).

**U=U and potential impact on HIV stigma.** We asked participants: “How do you think the Undetectable=Untransmittable message will impact HIV stigma? It will get...” Responses were on a 5-point Likert-type scale, ranging from 1 (“Much better”) to 5 (“Much worse”).

**Provider conversations about viral suppression and HIV transmission risk.** Participants were asked, “Has one of your medical providers ever discussed the risk of HIV transmission during sex when you’re undetectable?” Responses were on a trichotomous scale, with options for 1 (“Yes”), 2 (“No”), or 3 (“Not sure”).

**Sources for hearing about or seeing U=U.** Finally, we asked people to report whether they had ever heard of or seen the U=U message across 17 different potential venues, with all responses as dichotomous yes/no.

### Statistical analyses

We used SPSS 25 for analyses. We began by calculating chi-square tests of independence comparing sociodemographic characteristics of the sample by self-reported biomedical status, focusing on subgroups with lower than 80% and greater than 90% undetectable as meaningful indicators of clinically significant differences. We then conducted three binary logistic regressions examining how U=U messaging makes participants feel about their HIV status (comparing “much better” to all lower responses), the potential for U=U messaging to impact HIV stigma (comparing “much better” to all lower responses), and examining whether a provider had ever discussed undetectable VL and HIV transmission risk—across all three models, the same set of factors examined in bivariate analyses were entered simultaneously to examine their independent associations with these three outcomes. Within these three models, we used likelihood ratio confidence intervals and estimated the marginal means (i.e., predicted probabilities) for each factor in the model to facilitate interpretability; we used a highly conservative alpha for significance testing ( $p < 0.001$ ) due to the large sample size, and also report 95% confidence intervals. Finally, we used descriptive statistics to characterize the sources (nonexclusive) through which participants reported having heard of U=U among the subset who indicated they had previously heard of or seen the message.

### Results

Overall, 38,200 individuals provided consent/assent and completed the survey in its entirety. We removed 1703 responses that were duplicate responses of previous surveys. An additional 6136 individuals did not provide valid regional data, identify as male, report male-identified casual or main partners, or provide answers for the U=U questions related to HIV status and stigma. A total of 30,361 SMM-LHIV pro-

vided full data for questions focused on U=U and thus comprised the analytic sample. For questions focused on providers discussing U=U and sources of hearing about U=U, the analytic sample is 17,147 due to having added these questions later during administration of the survey.

Sociodemographic characteristics of the full sample are presented in Table 1, broken down by biomedical status. Participant age ranged from 13 to 99 years, with an average of 40.4 years (median = 38.0). We identified significant differences in biomedical status by all sociodemographic variables examined except gender identity. We found several subgroups among whom fewer than 80% reported viral suppression—those aged 13–24, those recruited from a sexual networking website, and those whose responses were lower on the two outcomes related to U=U. Conversely, there were some subgroups among whom more than 90% reported viral suppression, namely those who were privately insured and those who were in a serodifferent relationship. More than four in five participants reported that U=U made them feel at least a little better about their HIV status, with more than half (58.6%) responding it made them feel much better. Similarly, more than three-quarters reported that U=U had the potential to improve societal HIV stigma, with 40.6% responding it would make it much better. Finally, two-thirds (66.7%) of participants reported they had ever had a medical provider discuss undetectable VL status and its impact on HIV transmission (notably, this does not mean that the provider endorsed the U=U message of zero risk of transmission).

Table 2 reports the regression results examining factors associated with perceived impact of U=U on participants’ own HIV status, perceived impact on societal HIV stigma, as well as whether their medical provider had ever discussed with them the issue of transmission risk with an undetectable VL. There were notable similarities across the two models examining perceived personal and social impact. Participants recruited later in time reported more positive views on the potential personal and social impacts of U=U. Compared with SMM who were undetectable, those who were detectable and unsure of their VL showed less positive views about the impact of U=U. SMM who identified as Hispanic/Latino showed significantly more positive views of both the personal and social impacts of U=U. Participants expressed significantly more positive views if they were in a serodifferent relationship compared with those who were single, and participants with excellent adherence versus those with less than excellent adherence or not prescribed ART at the time. The two models also had some effects that differed—those who engaged in recent CAS and those who identified as gay compared with bisexual reported more positive views about the personal impact of U=U, but not the social impact on stigma, and older participants reported significantly less positive views about the social impact on stigma, but not the personal impact. Finally, participants dating multiple people or with multiple partners reported significantly more positive views of the social impact on stigma compared with single participants.

On the right-hand side of Table 2, several similar findings emerged in terms of factors associated with having discussed the impact of viral suppression on transmission risk with a provider. Participants recruited later in time and younger participants had higher odds of having had a provider discussion. Participants who identified as Hispanic/Latino had

TABLE 1. DEMOGRAPHIC CHARACTERISTICS AND COMPARISONS BY STATUS

	<i>Self-reported biomedical status comparisons</i>							
	<i>Full sample</i> (N = 30,361)		<i>Undetectable</i> (n = 25,832)		<i>Detectable</i> (n = 2995)		<i>Unsure of viral load</i> (n = 1534)	
	n	%	n	%	n	%	n	%
Overall	30,361	100.0	25,832	85.1	2995	9.9	1534	5.1
Age					$\chi^2(6) = 591.99^*$			
13–24	1826	6.0	1332	72.9	310	17.0	184	10.1
25–39	14,227	46.9	11,689	82.2	1627	11.4	911	6.4
40–59	12,762	42.0	11,343	88.9	993	7.8	426	3.3
60+	1546	5.1	1468	95.0	65	4.2	13	0.8
Recruitment source					$\chi^2(4) = 20.32^*$			
Sexual networking website	376	1.2	292	77.7	52	13.8	32	8.5
Sexual networking app	29,420	96.9	25,071	85.2	2876	9.8	1473	5.0
Social media/other	565	1.9	469	83.0	67	11.9	29	5.1
Ethnicity					$\chi^2(2) = 8.93$			
Hispanic/Latino	6949	22.9	5847	84.1	707	10.2	395	5.7
Non-Hispanic/Latino	23,412	77.1	19,985	85.4	2288	9.8	1139	4.9
Race					$\chi^2(10) = 175.72^*$			
Black	6780	22.3	5523	81.5	768	11.3	489	7.2
White	17,658	58.2	15,349	86.9	1621	9.2	688	3.9
Asian or Pacific Islander	652	2.1	547	83.9	72	11.0	33	5.1
Native American or Alaskan Native	456	1.5	382	83.8	55	12.1	19	4.2
Multiracial	3080	10.1	2580	83.8	319	10.4	181	5.9
Other	1735	5.7	1451	83.6	160	9.2	124	7.1
Gender					$\chi^2(2) = 3.96$			
Cisgender male	30,128	99.2	25,642	85.1	2963	9.8	1523	5.1
Transgender male	233	0.8	190	81.5	32	13.7	11	4.7
Sexual orientation identity					$\chi^2(6) = 35.139^*$			
Gay	26,694	87.9	22,817	85.5	2582	9.7	1295	4.9
Queer	553	1.8	470	85.0	51	9.2	32	5.8
Bisexual	3014	9.9	2462	81.7	353	11.7	199	6.6
Straight	100	0.3	83	83.0	9	9.0	8	8.0
Region					$\chi^2(10) = 38.22^*$			
Northeast	5680	18.7	4887	86.0	533	9.4	260	4.6
Midwest	4443	14.6	3877	87.3	350	7.9	216	4.9
South	11,954	39.4	10,056	84.1	1275	10.7	623	5.2
West	8137	26.8	6890	84.7	822	10.1	425	5.2
US possession	137	0.5	113	82.5	15	10.9	9	6.6
Military overseas	10	0.03	9	90.0	0	0.0	1	10.0
Insurance					$\chi^2(4) = 955.05^*$			
Private insurance	14,721	48.5	13,361	90.8	929	6.3	431	2.9
Public insurance	11,294	37.2	9300	82.3	1326	11.7	668	5.9
Not insured	4346	14.3	3171	73.0	740	17.0	435	10.0
Relationship status					$\chi^2(8) = 184.28^*$			
Single	20,446	67.3	17,113	83.7	2197	10.7	1136	5.6
Partnered, seroconcordant	3476	11.4	2994	86.1	327	9.4	155	4.5
Partnered, serodifferent	4163	13.7	3811	91.5	241	5.8	111	2.7
Don't know partner's status	891	2.9	728	81.7	97	10.9	66	7.4
Dating multiple people/have multiple partners	1385	4.6	1186	85.6	133	9.6	66	4.8
U=U and feelings toward own HIV status					$\chi^2(8) = 1446.95^*$			
Much worse	190	0.6	93	48.9	66	34.7	31	16.3
A little worse	273	0.9	165	60.4	74	27.1	34	12.5
No different	5137	16.9	3753	73.1	878	17.1	506	9.9
A little better	6981	23.0	5685	81.4	881	12.6	415	5.9
Much better	17,780	58.6	16,136	90.8	1096	6.2	548	3.1
U=U and its potential impact on HIV stigma					$\chi^2(8) = 457.24^*$			
Much worse	454	1.5	302	66.5	104	22.9	48	10.6
A little worse	715	2.4	528	73.8	132	18.5	55	7.7

(continued)

TABLE 1. (CONTINUED)

	<i>Self-reported biomedical status comparisons</i>							
	<i>Full sample</i> (N = 30,361)		<i>Undetectable</i> (n = 25,832)		<i>Detectable</i> (n = 2995)		<i>Unsure of viral load</i> (n = 1534)	
	n	%	n	%	n	%	n	%
No different	5329	17.6	4235	79.5	677	12.7	417	7.8
A little better	11,524	38.0	9852	85.5	1136	9.9	536	4.7
Much better	12,339	40.6	10,915	88.5	946	7.7	478	3.9
Provider ever discussed undetectable VL and HIV transmission <sup>a</sup>					$\chi^2(2) = 250.06^*$			
Yes	11,430	66.7	10,027	87.7	972	8.5	431	3.8
No/not sure	5717	33.3	4514	79.0	732	12.8	471	8.2

<sup>a</sup>N = 17,147.

\*p < 0.001.

U = U, undetectable = untransmittable; VL, viral load.

significantly lower odds of reporting a provider conversation (58% vs. 53%), as did those who identified as white (54%) and as Asian, Hawaiian Native, or Pacific Islander (49%) relative to those who identified as black (59%). Participants in a serodifferent relationship had higher odds of reporting a provider discussion relative to single participants (61% vs. 56%), as did those who reported excellent adherence (63%) relative to those with less than excellent adherence (58%) or no ART prescription (45%).

Finally, Table 3 presents the data on sources of hearing about or seeing U = U in ascending order from the most to least common. Overall, 24.4% (n = 4183) reported having never heard of or seen the U = U message and another 5.0% (n = 857) reported being unsure whether or not they had. Among those who had heard of or seen the slogan, the most common sources were both HIV-related (54.5%) and lesbian, gay, bisexual, transgender, and queer (LGBTQ) news media (49.6%) along with profiles (50.8%) on dating or hookup apps. Conversations with friends, with medical providers, and with sex partners were each reported by approximately one-third of participants.

## Discussion

In the present study, we analyzed data from a large sample of adolescent and adult SMM-LHIV to examine how U = U is perceived to impact both self-concept as a person living with HIV and its potential impact on societal HIV stigma. Consistent with anecdotal information, we found that most SMM-LHIV endorsed that U = U made them feel better about their own HIV status and believed it would lead to improvements in societal levels of HIV stigma. Most notably, and consistent with parallel research findings on the acceptability of the U = U message and science of viral suppression, the factors most strongly and consistently associated with stronger beliefs in these personal and social benefits centered around engagement in HIV care—namely, reporting an undetectable status, excellent adherence, and having had a provider discuss viral suppression and HIV transmission with them. In addition, black and Latino SMM-LHIV were more likely to believe HIV stigma would get much better as a result of U = U messaging. We found that two-thirds reporting ever having discussed VL suppression and HIV transmission risk with a provider and 70% reported they had ever seen or heard the U = U slogan

previously, although the means of hearing about U = U was driven largely by the HIV and LGBTQ media and sexual networking, with approximately one-third reporting they had heard of U = U from a provider. (Notably, however, this does not imply that the provider endorsed zero risk of transmission; only slightly more than one-third reported having learned about U = U, specifically from a medical provider).

The two most consistent findings—echoing the literature on acceptability of U = U—were that self-reported undetectable VL and excellent ART adherence were associated with higher ratings of the personal and social benefits of U = U and a greater likelihood to have had discussed VL and HIV transmission risk with a provider. Taken together, these findings highlight the critical and likely reciprocal role that provider-based discussions around U = U have with metrics of HIV care engagement and success and the potential that U = U provides for wholistic approaches to care engagement that could enrich patients' personal and social lives by minimizing stigma. Thus, HIV researchers and practitioners should consider not only the HIV prevention benefits for HIV-negative SMM but also the significant personal and social benefits of U = U for SMM living with HIV. For example, learning about U = U from a provider may increase patient trust and re-engagement in care; in addition, achieving undetectable status may provide a new motivation, and the ongoing potential for U = U to reduce HIV stigma within the SMM communities. These benefits may have meaningful impacts on both psychological and physical well-being for SMM living with HIV, all of which warrants empirical investigation.

We analyzed a large and diverse nationwide sample of SMM-LHIV, although data were cross-sectional and self-reported and we were unable to objectively measure factors such as VL status or levels of ART adherence. We assessed the perceived impact of U = U on personal and social factors, although this direct questioning was hypothetical and future research should seek to understand the actual impact of U = U beliefs and dissemination on stigma and personal well-being. Finally, although several precautions were taken to safeguard the online recollection and validity of our data and we have a large sample, the online survey was anonymous and drew heavily from app-based recruitment and thus may not generalize to the broader population of SMM-LHIV in the United States.

Data clearly point to the significant promise of viral suppression for reducing HIV incidence,<sup>5,9,28,29</sup> and thus, it is of

TABLE 2. MULTIVARIABLE ANALYSES PREDICTING SOCIAL AND PERSONAL FEELINGS ABOUT UNDETECTABLE=UNTRANSMITTABLE (U=U) AND WHETHER A PROVIDER HAS DISCUSSED UNDETECTABLE=UNTRANSMITTABLE (U=U)

	<i>How does U=U make you feel about your own HIV status? (N=30,361)</i>			<i>How do you think U=U will impact HIV stigma? (N=30,361)</i>			<i>Has provider discussed transmission risk when undetectable? (N=17,147)</i>		
	<i>Adj. prob<sup>a</sup></i>	<i>AOR</i>	<i>AOR 95% CI</i>	<i>Adj. prob<sup>a</sup></i>	<i>AOR</i>	<i>AOR 95% CI</i>	<i>Adj. prob<sup>a</sup></i>	<i>AOR</i>	<i>AOR 95% CI</i>
Recruitment month (1 through 23)	—	1.02*	[1.02–1.02]	—	1.01*	[1.01–1.01]	—	1.03*	[1.02–1.04]
Age (per 10 years)	—	1.01	[0.99–1.03]	—	0.89*	[0.87–0.91]	—	0.82*	[0.80–0.85]
Biomedical status (ref. = undetectable)	0.61	—	—	0.45	—	—	0.66	—	—
Detectable	0.41	0.44*	[0.41–0.48]	0.36	0.69*	[0.64–0.76]	0.55	0.65*	[0.58–0.72]
Unsure of viral load	0.41	0.45*	[0.40–0.50]	0.36	0.68*	[0.60–0.76]	0.46	0.44*	[0.38–0.50]
Recruitment source (ref. = social media)	0.50	—	—	0.39	—	—	0.57	—	—
Networking app	0.45	0.80	[0.67–0.96]	0.37	0.91	[0.77–1.08]	0.52	0.82	[0.64–1.04]
Networking website	0.48	0.89	[0.68–1.18]	0.40	1.05	[0.80–1.38]	0.59	1.10	[0.60–2.08]
Ethnicity (ref. = not Hispanic/Latino)	0.45	—	—	0.36	—	—	0.58	—	—
Hispanic/Latino	0.50	1.24*	[1.16–1.33]	0.42	1.28*	[1.20–1.37]	0.53	0.83*	[0.76–0.91]
Race/ethnicity (ref. = black)	0.49	—	—	0.42	—	—	0.59	—	—
White	0.48	0.96	[0.90–1.03]	0.36	0.79*	[0.75–0.85]	0.54	0.80*	[0.74–0.88]
Asian or Hawaiian Native or Pacific Islander	0.48	0.96	[0.81–1.14]	0.41	0.98	[0.83–1.16]	0.49	0.66*	[0.53–0.83]
Native American or Alaskan Native	0.46	0.88	[0.72–1.07]	0.36	0.79	[0.65–0.96]	0.62	1.10	[0.83–1.46]
Multiracial	0.48	0.96	[0.87–1.06]	0.40	0.94	[0.86–1.03]	0.56	0.85	[0.75–0.97]
Other	0.46	0.89	[0.79–1.02]	0.38	0.87	[0.77–0.98]	0.54	0.80	[0.67–0.95]
Gender (ref. = cisgender male)	0.45	—	—	0.38	—	—	0.53	—	—
Transgender male	0.50	1.18	[0.89–1.57]	0.39	1.03	[0.79–1.36]	0.58	1.26	[0.92–1.74]
Sexual orientation identity (ref. = gay)	0.48	—	—	0.39	—	—	0.59	—	—
Queer	0.51	1.15	[0.96–1.38]	0.37	0.91	[0.76–1.09]	0.62	1.11	[0.86–1.43]
Bisexual	0.44	0.86*	[0.80–0.93]	0.38	0.94	[0.87–1.02]	0.59	0.98	[0.88–1.09]
Straight	0.47	0.98	[0.65–1.49]	0.41	1.06	[0.70–1.58]	0.43	0.51	[0.29–0.91]
Region by zip code (ref. = Northeast)	0.48	—	—	0.37	—	—	0.54	—	—
Midwest	0.47	0.97	[0.90–1.06]	0.36	0.97	[0.89–1.05]	0.58	1.14	[1.02–1.28]
South	0.49	1.05	[0.98–1.12]	0.38	1.05	[0.98–1.12]	0.56	1.08	[0.99–1.18]
West	0.48	1.00	[0.93–1.08]	0.38	1.04	[0.97–1.12]	0.54	0.98	[0.89–1.08]
US territory	0.58	1.51	[1.03–2.24]	0.50	1.68	[1.18–2.39]	0.53	0.93	[0.55–1.61]
Military overseas	0.35	0.58	[0.16–2.21]	0.33	0.82	[0.21–2.93]	0.59	1.20	[0.27–8.26]
Relationship status (ref. = single)	0.44	—	—	0.35	—	—	0.56	—	—
Partnered, seroconcordant	0.46	1.07	[0.99–1.15]	0.37	1.09	[1.01–1.17]	0.53	0.90	[0.81–1.01]
Partnered, serodifferent	0.51	1.30*	[1.21–1.39]	0.39	1.15*	[1.08–1.24]	0.61	1.24*	[1.12–1.38]
Don't know partner's status	0.48	1.17	[1.01–1.34]	0.40	1.22	[1.06–1.40]	0.50	0.79	[0.65–0.96]
Dating multiple people/multiple partners	0.49	1.19	[1.06–1.35]	0.42	1.35*	[1.21–1.51]	0.58	1.07	[0.94–1.21]
Recent club drug use (ref. = no)	0.48	—	—	0.38	—	—	0.56	—	—
Yes	0.47	0.98	[0.93–1.03]	0.39	1.05	[0.99–1.10]	0.55	0.97	[0.90–1.04]
Recent CAS (ref. = no)	0.45	—	—	0.37	—	—	0.55	—	—
Yes	0.50	1.21*	[1.09–1.33]	0.41	1.17	[1.06–1.29]	0.56	1.04	[0.90–1.19]
ART medication adherence (ref. = excellent)	0.60	—	—	0.47	—	—	0.63	—	—
Less than excellent	0.46	0.58*	[0.55–0.61]	0.37	0.66*	[0.63–0.69]	0.58	0.81*	[0.75–0.87]
Not prescribed ART	0.37	0.39*	[0.34–0.44]	0.33	0.58*	[0.51–0.65]	0.45	0.48*	[0.40–0.57]

<sup>a</sup>The adjusted predicted probabilities displayed are estimated marginal means based on the model and can be interpreted as the percentage of that group who endorsed the “much better” response to the question adjusted for all other factors in the model (e.g., 0.61 = 61%).

\* $p < 0.001$ .

95% CI, 95% profile likelihood confidence interval for the AOR; AOR, adjusted odds ratio; ART, antiretroviral therapy; CAS, condomless anal sex.

TABLE 3. SOURCES FOR HEARING ABOUT OR SEEING THE UNDETECTABLE=UNTRANSMITTABLE (U=U) SLOGAN

Source	n	%
Never heard of U=U slogan	<b>4183</b>	<b>24.4</b>
Unsure if ever heard of U=U slogan	<b>857</b>	<b>5.0</b>
Heard of U=U slogan (non-exclusive sources and nested percentages below)	<b>12,107</b>	<b>70.6</b>
HIV-related news media	6596	54.5
Profiles on a dating/hookup app	6147	50.8
LGBTQ news media	6006	49.6
Conversations with friends	4433	36.6
Advertisements on a dating/hookup app	4412	36.4
Discussions with a medical provider	4300	35.5
Websites	4275	35.3
Conversations with sex partners	4083	33.7
Materials in a medical provider's office	3547	29.3
Statements made by health organizations (e.g., CDC, NIH, health department)	3445	28.5
Posts from friends on social media	3443	28.4
Advertisements on social media	2677	22.1
Scientific media/literature	2657	21.9
Community events	2032	16.8
Mainstream news media	1942	16.0
Blog posts	1890	15.6

*N*=17,147 for the first three items in bold, subsequent percentages are nested within the *n*=12,107 who reported having heard of U=U previously). Data regarding sources are presented in ascending order.

CDC, Centers for Disease Control and Prevention; NIH, National Institutes of Health.

little surprise that significant enthusiasm within the scientific and public health literature has focused on the notion of TasP and led to a renewed focus on increasing rates of viral suppression. Added to the significant public health benefits of viral suppression for both people living with HIV and their partners, data from the present study show that there are also significant personal and social benefits of viral suppression and the U=U movement that are of importance to SMM-LHIV. The science of viral suppression and the U=U message provide these multi-pronged benefits, and providers should consider the potential of each—personal health, sexual safety and intimacy, increased self-image, and reduced social stigma—as opportunities to engage diverse patients in care, improve adherence, and maintain viral suppression.

#### Authors' Contributions

H.J.R. and A.J.T. were responsible for the study design, data collection, interpreting the results, and drafting of the article. J.C.-S. and J.A.C. were responsible for data analysis, interpreting the results, and drafting of the article. O.S. was responsible for data collection and revising the article. All authors read, revised, and approved a final version of the article.

#### Acknowledgments

The authors acknowledge the contributions of the staff and volunteers at the Hunter College PRIDE Health Research Consortium, especially Ruben Jimenez and Scott Jones. They are incredibly grateful to all those participants who gave their time and participation to this study and entrusted them with their information.

#### Author Disclosure Statement

No competing financial interests exist.

#### Funding Information

During the time of data collection for this study, several studies were contributing to the costs of advertising and screening for the survey, with data collection being supported by grants from the National Institute on Allergy and Infectious Diseases, the National Institute on Mental Health, the Eunice Kennedy Shriver National Institute on Child Health and Human Development, and the National Institute on Drug Abuse (UG3/UH3-AI133674, Principal Investigator: H.J.R.; R01-MH114735, Principal Investigator: H.J.R.; R01-DA041262, Principal Investigator: Starks; R34-DA043422, Principal Investigator: Starks; R01-DA045613, Principal Investigator: Starks; U19-HD089875, Principal Investigator: Naar). J.C.-S. was supported, in part, by a diversity supplement from the Eunice Kennedy Shriver National Institute on Child Health and Human Development (U19-HD089875-03S2; Naar) and J.A.C. was supported by the Research Initiative for Scientific Enhancement (RISE) Program at Hunter College through a training grant from the National Institute of General Medical Sciences (R25-GM060665, Principal Investigators: Ortiz and Miranda).

#### References

- Center for Disease Control and Prevention. Monitoring Selected National HIV Prevention and Care Objectives by Using HIV Surveillance Data—United States and 6 Dependent Areas, 2018. HIV Surveillance Supplemental Report 2020;25. Available at: <http://cdc.gov/hiv/library/reports/hiv-surveillance.html> (Last accessed July 24, 2020).
- Cohen MS, Chen YQ, McCauley M, et al. Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med* 2011;365:493–505.
- Rodger AJ, Cambiano V, Bruun T, et al. Risk of HIV transmission through condomless sex in serodifferent gay couples with the HIV-positive partner taking suppressive antiretroviral therapy (PARTNER): Final results of a multicentre, prospective, observational study. *Lancet* 2019;393:2428–2438.
- Eisinger RW, Dieffenbach CW, Fauci AS. HIV viral load and transmissibility of HIV infection: Undetectable equals untransmittable. *JAMA* 2019;321:451–452.
- Cohen MS, Chen YQ, McCauley M, et al. Antiretroviral therapy for the prevention of HIV-1 transmission. *N Engl J Med* 2016;375:830–839.
- Cohen MS, McCauley M, Gamble TR. HIV treatment as prevention and HPTN 052. *Curr Opin HIV AIDS* 2012;7:99.
- Rodger AJ, Cambiano V, Bruun T, et al. Sexual activity without condoms and risk of HIV transmission in serodifferent couples when the HIV-positive partner is using suppressive antiretroviral therapy. *JAMA* 2016;316:171–181.
- Castel AD, Befus M, Willis S, et al. Use of the community viral load as a population-based biomarker of HIV burden, *AIDS*: January 28th, 2012-Volume 26-Issue 3, p. 345–353. doi: 10.1097/QAD.0b013e32834de5fe.
- Centers for Disease Control and Prevention. HIV Treatment as Prevention. Available at: <https://cdc.gov/hiv/risk/art/index.html> (Last accessed July 24, 2020).

10. Das M, Chu PL, Santos G-M, et al. Decreases in community viral load are accompanied by reductions in new HIV infections in San Francisco. *PLoS One* 2010;5:e11068.
11. Prevention Access Campaign. Undetectable=Untransmittable. Available at: <https://preventionaccess.org/undetectable>, 2016 (Last accessed June 25, 2019).
12. Card KG, Armstrong HL, Lachowsky NJ, et al. Belief in treatment as prevention and its relationship to HIV status and behavioral risk. *J Acquir Immune Defic Syndr* 2018;77:8–16.
13. Rendina HJ, Parsons JT. Factors associated with perceived accuracy of the Undetectable=untransmittable slogan among men who have sex with men: Implications for messaging scale-up and implementation. *J Int AIDS Soc* 2018;21:e25055.
14. Siegel K, Meunier É. Awareness and perceived effectiveness of HIV treatment as prevention among men who have sex with men in New York city. *AIDS Behav* 2019;23:1974–1983.
15. Carneiro PB, Westmoreland DA, Patel VV, et al. Awareness and Acceptability of Undetectable=Untransmittable Among a U.S. National Sample of HIV-Negative Sexual and Gender Minorities. *AIDS Behav* 2020. <https://doi.org/10.1007/s10461-020-02990-3>.
16. Holt M, Draper BL, Pedrana AE, Wilkinson AL, Stoové M. Comfort relying on HIV pre-exposure prophylaxis and treatment as prevention for condomless sex: Results of an online survey of australian gay and bisexual men. *AIDS Behav* 2018;22:3617–3626.
17. Carter A, Lachowsky N, Rich A, et al. Gay and bisexual men's awareness and knowledge of treatment as prevention: Findings from the Momentum Health Study in Vancouver, Canada. *J Int AIDS Soc* 2015;18:20039.
18. Rendina HJ, Cienfuegos-Szalay J, Talan A, Jones SS, Jimenez RH. Growing acceptability of undetectable=untransmittable but widespread misunderstanding of transmission risk: Findings from a very large sample of sexual minority men in the United States. *J Acquir Immune Defic Syndr* 2020;83:215–222.
19. Seckinelgin H. HIV care cascade and sustainable wellbeing of people living with HIV in context. *J Int AIDS Soc* 2019;22:e25259.
20. Sevelius JM, Saberi P, Johnson MO. Correlates of antiretroviral adherence and viral load among transgender women living with HIV. *AIDS Care* 2014;26:976–982.
21. Turan B, Hatcher AM, Weiser SD, Johnson MO, Rice WS, Turan JM. Framing mechanisms linking HIV-related stigma, adherence to treatment, and health outcomes. *Am J Public Health* 2017;107:863–869.
22. Courtenay-Quirk C, Wolitski RJ, Parsons JT, Gómez CA. Is HIV/AIDS stigma dividing the gay community? Perceptions of HIV-positive men who have sex with men. *AIDS Educ Prev* 2006;18:56–67.
23. Tan RKJ, Lim JM, Chan JKW. “Not a walking piece of meat with disease”: Meanings of becoming undetectable among HIV-positive gay, bisexual and other men who have sex with men in the U=U era. *AIDS Care* 2020;32:325–329.
24. Chalmers J. The criminalisation of HIV transmission. *Sex Transm Infect* 2002;78:448–451.
25. Sweeney P, Gray SC, Purcell DW, et al. Association of HIV diagnosis rates and laws criminalizing HIV exposure in the United States. *AIDS* 2017;31:1483–1488.
26. Lehman JS, Carr MH, Nichol AJ, et al. Prevalence and public health implications of state laws that criminalize potential HIV exposure in the United States. *AIDS Behav* 2014;18:997–1006.
27. Barré-Sinoussi F, Abdool Karim SS, Albert J, et al. Expert consensus statement on the science of HIV in the context of criminal law. *J Int AIDS Soc* 2018;21:e25161.
28. Okoli C, Van de Velde N, Richman B, et al. Undetectable equals untransmittable (U = U): Awareness and associations with health outcomes among people living with HIV in 25 countries. *Sex Transm Infect* [Epub ahead of print]; DOI: 10.1136/sextrans-2020-054551, 2020.
29. Feldman B, Fredericksen R, Crane P, et al. Evaluation of the single-item self-rating adherence scale for use in routine clinical care of people living with HIV. *AIDS Behav* 2013;17:307–318.
30. Montaner JS, Lima VD, Barrios R, et al. Association of highly active antiretroviral therapy coverage, population viral load, and yearly new HIV diagnoses in British Columbia, Canada: A population-based study. *Lancet* 2010;376:532–539.
31. Khurana N, Yaylali E, Farnham PG, et al. Impact of improved HIV care and treatment on PrEP effectiveness in the United States, 2016–2020. *J Acquir Immune Defic Syndr* 2018;78:399–405.

Address correspondence to:

*H. Jonathon Rendina, PhD, MPH*

*Department of Psychology*

*Hunter College of the City University of New York*

*695 Park Avenue, Room N611*

*New York, NY 10065*

*USA*

*E-mail: hrendina@hunter.cuny.edu*