

# Providers PrEP: Identifying Primary Health care Providers' Biases as Barriers to Provision of Equitable PrEP Services

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**Background:** Despite their disparately high HIV incidence and voiced willingness to use pre-exposure prophylaxis (PrEP), Black cisgender women's knowledge and uptake of PrEP are low, especially relative to White cisgender women and men who have sex with men. Mounting evidence demonstrates that health care provider recommendations are a critical factor in women's awareness, willingness, and ability to uptake PrEP. Health care providers may make clinical judgments about who is (not) a good candidate for PrEP based on unconscious and conscious stereotypes and prejudice.

**Setting:** We conducted an online experiment among N = 160 health care providers with prescribing privileges in the 48 HIV hotspot counties.

**Method:** Providers received 1 of 4 vignettes about a PrEP eligible woman. Vignettes varied by patient race and substance use status. Then, providers reported their willingness to discuss PrEP with the patient and willingness to prescribe PrEP to her.

**Results:** We tested 2 models predicting providers (1) willingness to discuss and (2) willingness to prescribe PrEP, contingent on their

racial attitudes. Providers who scored high on a modern racism measure were less willing to discuss and prescribe PrEP to the Black patient. These effects were mediated by provider perceptions of patients' abilities to adhere to PrEP, but not their expectations of risk compensatory behaviors.

**Conclusions:** Our findings highlight the importance of applying an intersectional lens in documenting the processes that exacerbate inequities in PrEP use. This study provides evidence to support the development of interventions that address the mechanisms that work to thwart optimal care.

**Key Words:** pre-exposure prophylaxis, racial bias, patient-provider (*J Acquir Immune Defic Syndr* 2021;88:165–172)

## BACKGROUND

Black cisgender women (CGW) in the United States accounted for 60% of new HIV diagnoses among CGW, despite representing less than 13% of the population.<sup>1</sup> HIV is highly preventable through consistent use of condoms and HIV pre-exposure prophylaxis (PrEP).<sup>2</sup> Condom use, however, is potentially limited by partner power discordance<sup>3</sup> and dependent on partner cooperation, highlighting the need for women-controlled HIV prevention options.

PrEP with daily oral tenofovir disoproxil fumarate/emtricitabine reduces HIV transmission by up to 92% in CGW.<sup>2</sup> PrEP can be initiated autonomously before risk exposure, circumventing the need for partner cooperation. In circumstances where CGW engage in sexual activity under the influence of alcohol and/or drugs, PrEP has the additional advantage of not requiring skills enactment while under the influence. Yet, despite their disparately high HIV incidence and their voiced willingness to use PrEP,<sup>4–6</sup> Black CGW's knowledge<sup>7,8</sup> and uptake of PrEP are low, especially relative to White CGW and men who have sex with men (MSM).<sup>9–12</sup>

Mounting evidence demonstrates that health care provider recommendations are a critical factor in women's awareness, willingness, and ability to uptake PrEP.<sup>6</sup> As a biomedical intervention, primary health care providers are gatekeepers to the provision of information about PrEP<sup>13</sup> and access to prescriptions. However, in clinical settings, Black people routinely experience racism, sexism, and stigma<sup>14–17</sup> that cultivates medical distrust,<sup>18</sup> results in lower quality clinical encounters,<sup>19,20</sup> reduces health care quality,<sup>21</sup> and delays indicated treatment.<sup>22–25</sup> There is growing evidence that health care providers make clinical judgments about the

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appropriateness of PrEP for a patient based on unconscious and conscious stereotypes and prejudice<sup>15,26,27</sup> that likely disadvantage women, drug users, the poor, and Black people.<sup>15,28</sup> Black CGW face unique barriers to PrEP awareness and access in clinical encounters because they are situated at the intersection of multiple disadvantaged social locations.

Intersectionality framework,<sup>29–33</sup> which declares that privilege and disadvantage are conferred differently for people at different social locations, suggests that power dynamics interlock with stigma in clinical encounters to erect barriers to communication and equitable care and therefore PrEP uptake. From this perspective, power dynamics between patient and provider are central to understanding inequitable diffusion of PrEP.<sup>13</sup> As such, there is a critical need to identify the ways biases shape health care providers' willingness to discuss and prescribe PrEP to Black CGW and to develop strategies to mitigate them (Fig. 1).

We anticipated that health care providers' clinical decisions related to PrEP would be informed by racial biases when the patient was Black (vs. White). For example, experimental evidence shows that medical students are less likely to prescribe PrEP to Black MSM compared with White MSM because of expectations of risk compensation, which are likely rooted in stereotypes about Black hypersexuality.<sup>15</sup> This evidence is not conclusive, however. In a replication of that research, Calabrese et al<sup>34</sup> found little evidence for racist clinical decision making among medical students in the provision of PrEP to a gay male patient. Still, other evidence shows that health care providers' (un)willingness to prescribe ARVs is shaped by stereotypes about patient adherence, particularly for minorities, substance users, women, and the poor.<sup>19,28</sup>

Stereotypes of hypersexuality may extend to Black women and be complicated by other stereotypes about Black people, women, drug users, and poor people. Pervasive stereotypes about Black women as hypersexual, irresponsible, and/or nonadherent<sup>35,36</sup> may create barriers to PrEP access in the form of racially biased clinical judgments and actions, particularly among providers who otherwise endorse racist perspectives. We hypothesized that providers would be significantly less willing to communicate about PrEP (H1) and prescribe (H2) PrEP to Black relative to White CGW, particularly among providers who otherwise exhibit racism. We expected that differences in willingness to discuss and provide PrEP would be mediated by providers' expectations of patients' risk compensation (H3a) and adherence to the

PrEP regimen (H3b). Furthermore, we examined whether and how patients' substance use history interacts with patients' racial categorization in their relation to providers' willingness to discuss and prescribe PrEP. Given the tenets of intersectionality and empirical evidence of provider bias in relation to people who use illicit substances,<sup>28</sup> it is likely that these factors interact in the context of clinical decision making. As there is a dearth of research documenting the ways these factors intersect in this context, we posed a research question: Would providers demonstrate biased clinical decision making that varies according to the intersection of CGW patients' substance use history and racial characteristics?

## METHODS

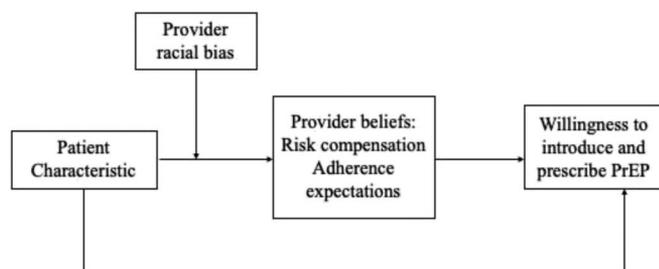
### Participants and Procedures

We conducted an online experiment using Qualtrics. Health care providers recruited through the Qualtrics Medical Professional Panel were invited to eligibility screening for a study to understand their perspectives on biomedical HIV prevention tools, including PrEP. Eligible participants were US health care providers with an active medical license (ie, obstetrics, gynecology, family, general, internal, emergency, or preventative medicine) in 1 of 48 hotspot counties designated in the Ending the Epidemic initiative.<sup>37</sup> Participants were screened at the start of the survey to ensure that they had prescribing privileges, were aware of PrEP, and served patient populations that include adult Black women. Participants were compensated per their agreement with Qualtrics.

Eligible participants (N = 160) completed demographic measures. Participants were then randomly assigned (using Qualtrics randomization functionality) to receive 1 of 4 vignettes. Vignettes varied on the patient's race (Black/White) and recent noninjection substance use history (absent/present). After reviewing the assigned vignette, participants were presented with randomization check measures and then asked to report their likelihood of discussing and prescribing PrEP to the patient. Next, respondents were asked to respond to mediator and moderator variables. Institutional Review Board approval for this study was obtained from The George Washington University Institutional Review Board.

### Stimuli

Vignettes (see Appendix, Supplemental Digital Content, <http://links.lww.com/QAI/B690>) were adapted from the case vignette used to test the impact of provider bias in PrEP prescription for MSM<sup>15</sup> and antiretroviral therapy provision.<sup>38</sup> Vignettes describe a (Black/White) CGW patient who is HIV-negative, insured, and in an ostensibly monogamous relationship. The patient does not have a history of injection substance use but (does/does not) have a recent history of noninjection substance use, including alcohol, opioids, and marijuana, which qualifies as problem use based on a brief screening. She reports a recent history of sexually transmitted infection and inconsistent condom use. She otherwise has no physical complaints, no current medications, and no drug allergies.



**FIGURE 1.** Conceptual model of the impact of implicit bias on PrEP provision.

## Measures

### Racism

We used the Color-Blind Racial Attitudes Scale (CoBRAS)<sup>39</sup> to assess modern forms of racism. We scored the scale using the mean of 3 subscales [Unawareness of Racial Privilege: 7 items (Cronbach  $\alpha$  = 0.85), Institutional Discrimination: 7 items (Cronbach  $\alpha$  = 0.78), and Blatant Racial Issues: 6 items (Cronbach  $\alpha$  = 0.82)], each response was measured using 6-point Likert scales (strongly disagree to strongly agree). Measures were coded such that higher values reflect more endorsement of racist views.

### Risk Compensation

We assessed risk compensation expectations by asking participants to rate “how likely would this patient be to have more unprotected sex if she started taking PrEP?” (1 = extremely unlikely to 7 = extremely likely).

### Adherence

We assessed adherence expectations using a 7-point scale “If you were to prescribe PrEP to this patient, would the patient be adherent?” (“definitely not” to “definitely yes”).

### PrEP Discussion

We assessed willingness to discuss PrEP using a 7-point Likert scale “Would you initiate a discussion about PrEP with this patient?” Higher values reflect more willingness to communicate (“definitely not” to “definitely yes”).

### PrEP Prescription

We assessed willingness to prescribe PrEP using a 7-point Likert scale “Would you prescribe PrEP to this patient?” Higher values reflect more willingness to prescribe (“definitely not” to “definitely yes”).

### Manipulation Checks

We included manipulation checks to ensure that participants attended to relevant aspects of the patient’s characteristics. Respondents were asked whether the patient had a recent history of problem substance use and to identify the patient’s racial categorization (ie, White, Black/African American, or others).

### Analysis

The full analytic sample includes N = 160 respondents who completed all relevant survey measures. We replicated the analyses using a restricted analytic sample (N = 140) of respondents who completed all relevant survey measures and passed race manipulation checks. The results of supplemental analysis are available in the Appendix, Supplemental Digital Content, <http://links.lww.com/QAI/B690>.

### Randomization and Manipulation Checks

We performed analysis of variance for mean comparisons, using SPSS statistical software (version 27). To check randomization, we tested for significant differences between conditions for respondent characteristics that should be

randomly distributed across conditions (ie, years in practice, specialization, and extent of PrEP knowledge). Manipulation checks tested whether experimental conditions were successful in highlighting the race and substance use status of the patient in the vignette.

## Bivariate Analysis

### Moderated Mediation Analysis

We tested whether any interaction between provider bias and patient race on willingness to discuss PrEP with and prescribe PrEP to patients are mediated by beliefs about risk compensation and adherence. We conducted moderated mediation analyses (model 7) using the Process macro for SPSS.<sup>40</sup> We estimated one moderated mediation model for each outcome (ie, discussion or prescription).

Process estimates the relationship between the independent (ie, patient race) and dependent (ie, discussion or prescription) variables (ie, path “c”). Then, it estimates the conditional effects of the independent variable on the mediators (ie, adherence or risk compensation expectations; paths “a”). Next, it estimates the relationships between the proposed mediators and the dependent variable, controlling for other mediators in the model (paths “b”). The macro estimates the significance of mediation paths ( $a \times b$ ), and the remaining direct effect of the independent variable on the dependent variable. The coefficients for the mediators and the remaining direct effect of the dependent variable (path “c-prime”) are unstandardized regression weights (B). Statistical significance of the mediation path is determined by the 95% confidence intervals that are computed using bootstrapping based on 5000 resamples. We inspected the index of moderated mediation to determine whether moderated mediation was significant. We probed significant interaction terms by estimating mediation pathways at low, moderate, and high values of the moderator.<sup>41,42</sup>

## RESULTS

### Sample Characteristics

Participants were N = 174 health care providers, practicing in 1 of 48 HIV hotspot counties,<sup>37</sup> with a mean of 21.06 (SD 8.59) years of experience, practicing in 139 different zip codes. The sample was 69% White, 19% Asian, 2.9% Black, and 1.1% Hawaiian or Pacific Islander; 8% identified as other. The average age of the participants was 52.43 (SD 9.56) years. Their specializations included internal medicine (47.2%), family medicine (37.4%), infectious diseases (4.9%), obstetrics and gynecology (3.7%), emergency medicine (1.8%), preventative medicine (0.6%), and other specializations (4.3%). On average, respondents reported that they were “moderately familiar with PrEP” (mean = 3.23, SD 1.10, range: 1 to 5). There were no significant differences by condition in professional specialization (F3, 156 = 0.42, ns), PrEP knowledge (F3, 156 = 0.41, ns), or years in practice (F3, 156 = 1.12, ns). Respondents reported that they were “somewhat comfortable” (mean 6.19, SD 1.21, range: 1 to 7) discussing HIV risk factors with patients and they “rarely” to “sometimes” (mean 2.53, SD

1.05, range: 1 to 5) prescribed PrEP in the past 12 months. There were no significant differences between condition for comfort discussing HIV risk ( $F(3, 156) = 0.44$ , ns) or PrEP prescribing experience ( $F(3, 156) = 0.44$ , ns). Descriptive statistics and correlations for the main study variables are shown in Table 1. Across conditions, health care providers' responses to the COBRA tended toward the midpoint of the scale. The COBRA comprises Institutional Discrimination (mean 3.41, SD 0.99), Blatant Racial Issues (mean 2.32, SD 0.99), and Unawareness of Racial Privilege (mean 3.13, SD 1.06) subscales. Expectations of risk compensation tended above the midpoint of the scale. On average, providers were moderately confident that the patient would be adherent. Most respondents maybe, probably, or definitely would discuss (80%) or prescribe (78.7%) PrEP to this patient.

### Randomization and Manipulation Checks

Randomization to condition was successful; 50.6% ( $n = 81$ ) of respondents were assigned to the substance use condition and 51.9% ( $n = 83$ ) read about a Black vs. White patient. The substance use [ $F(1, 158) = 46.69$ ,  $P < 0.001$ ] and race [ $F(1, 149) = 399.59$ ,  $P < 0.001$ ] manipulation checks were in the expected directions, indicating that the manipulations were interpreted as intended. Eighty-one percent ( $n = 140$ ) answered the race manipulation check correctly, and  $n = 104$  also responded correctly to the substance use manipulation check. Given the intrinsic nature of the manipulation, participants were exposed to the manipulation despite their abilities to correctly identify it.<sup>43</sup> As prejudice and discrimination may operate consciously or nonconsciously, we anticipated that the induction may have affected respondents, independent of their abilities to identify the manipulated characteristic. Thus, the analyses reported here were conducted on the full analytic sample. Tables reporting the replication of these analyses among the restricted sample of participants who responded correctly to the manipulation checks are available in the Supplemental Digital Content (see Appendix, <http://links.lww.com/QAI/B690>).

### Hypothesis Tests

We hypothesized that among health care providers, racial bias would impede equitable provision of PrEP. As presented in Table 2, there was a significant interaction between patient race and provider racism on expectations of

patient adherence to PrEP. In turn, adherence expectations significantly affected providers' willingness to discuss and prescribe PrEP. Providers' racism did not interact with patients' racial characteristics to shape perceptions of risk compensation, however. Furthermore, perceptions of risk compensation were not significantly associated with providers' willingness to discuss or prescribe PrEP to CGW.

Figure 2 illustrates the interaction between provider racial bias and patient racial characteristics on adherence expectations. When scores on the modern racism scale were low, providers reported expectations of adherence favorable toward Black CGW. When modern racism scores were moderate, providers' expectations of the patient's ability to adhere aligned across Black and White CGW. By contrast, providers who scored higher on the modern racism scale had more positive expectations for White patients' adherence relative to expectations for Black patients' adherence.

We further proposed biased expectations regarding compensatory sexual behavior and adherence as mechanisms of inequitable communication and clinical decision making. As summarized in Table 3, mediation analyses demonstrated statistically significant mediation of an interaction between provider racism and patient race on discussion and prescription through adherence expectations. Mediation of the interaction between racism and patient race on willingness to discuss and prescribe PrEP through expectations of risk compensation was not statistically significant. Remaining direct effects of patient racial characteristics on providers' willingness to discuss or prescribe PrEP were nonsignificant when the proposed mediation paths were included in the model.

Although we did not hypothesize interactions between race and substance use, intersectionality framework suggests that interactions are plausible and likely. We proposed a research question to understand whether providers' PrEP relevant clinical decisions depend on the substance use history of their patients and whether the impact of that history varies by patient race. Substance use was associated with adherence expectations, but there were no other main effects of the substance use and no interactions between substance use and race manipulations on intentions to discuss or prescribe PrEP.

## DISCUSSION

Although tenofovir disoproxil fumarate/emtricitabine is currently the only Food and Drug Administration–approved

**TABLE 1.** Correlations and Means for Study Variables (N = 160)

Variable	Mean	SD	Range	1	2	3	4	5
1. Racism	2.99	0.84	1–6	1				
2. Risk compensation expectations	2.63	.88	1–5	0.26†	1			
3. Adherence expectations	3.36	0.86	1–5	−0.29†	−0.54†	1		
4. Discussion intention	5.60	1.45	1–7	−0.10	0.02	0.19*	1	
5. Prescription intention	5.51	1.50	1–7	−0.05	−0.08	0.30†	0.74†	1

\* $P < 0.05$ .

† $P < 0.001$ .

**TABLE 2.** Moderated Mediation of the Effects of Patient Race on Discussion and Prescription Intentions (N = 160)

Predictor	B	SE	t	P	LL CI	UL CI
Mediator model (DV: risk compensation, “a path”)*						
Constant	3.38	0.71	4.74	<0.001	1.97	4.79
Patient race†	0.33	1.01	0.33	0.74	-1.66	2.33
Racism	0.20	0.22	0.91	0.36	-0.244	0.64
Bias × race	-0.06	0.33	-0.18	0.86	-0.70	0.59
Substance use (factor)	0.34	0.27	1.24	0.22	-0.20	0.88
Mediator model (DV: adherence, “a path”)						
Constant	4.52	0.45	10.16	<0.001	3.64	5.40
Patient race	1.55	0.63	2.46	<0.05	0.30	2.80
Racism	0.34	0.14	2.46	<0.05	0.07	0.61
Bias × race	-0.49	0.20	-2.38	<0.05	-0.89	-0.08
Substance use (factor)	-0.43	0.17	-2.54	<0.05	-0.77	-0.10
Dependent variable model (DV: discussion, “b path”)						
Constant	3.04	0.68	4.45	<0.001	1.69	4.39
Factor: patient race	0.03	0.22	0.15	0.88	-0.41	0.47
Risk compensation	0.06	0.07	0.93	0.35	-0.07	0.19
Adherence	0.40	0.10	3.94	<0.001	0.20	0.61
Substance use (factor)	0.22	0.23	0.98	0.33	-0.23	0.67
Dependent variable model (DV: prescription, “b path”)						
Constant	2.63	0.69	3.83	<0.001	1.27	3.99
Factor: patient race	0.33	0.22	1.48	0.14	-0.11	0.77
Risk compensation	0.10	0.07	1.53	0.13	-0.03	0.23
Adherence	0.44	0.10	4.31	<0.001	0.24	0.65
Substance use (factor)	-0.23	0.23	-0.99	0.32	-0.68	0.22

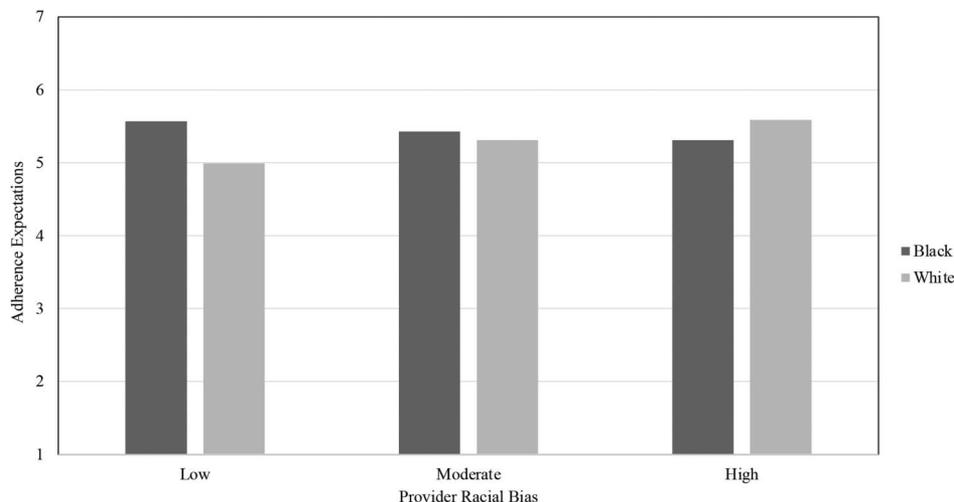
\*a path: conditional effect of the IV on mediators; b path: direct effect of mediator on DV, controlling other mediators.

†Patient race: Black =1, White = 0 patient.

PrEP regimen for CGW, approval of the dapivirine vaginal ring and a long-acting cabotegravir injectable PrEP are anticipated. Both offer promising woman-controlled, long-acting alternatives to daily oral PrEP. Along with the other tools in the HIV prevention toolbox, these innovations contribute to a real possibility of reducing the disparate burden of HIV carried by Black CGW and to ending the HIV epidemic. Equitable dissemination of HIV prevention inno-

variations depends on equitable diffusion of knowledge about innovations and access to them, however. Health care providers are gatekeepers who play a critical mediating role in information and access inequities, which can either perpetuate and magnify or reduce health disparities depending on provider’s attitudes and behavior.

Given the crucial importance of medical providers in the equitable provision of HIV prevention for CGW and



**FIGURE 2.** Interaction between racial bias and patient race on providers’ perception of patients’ ability to adhere (N = 160).

**TABLE 3.** Indirect Effects of Patient Race on Discussion and Prescription Intentions, Moderated by Racism (N = 160)

Mediator		Index	Boot SE	t	LL CI	UL CI
DV: discussion						
Remaining direct effect (c' path)		0.03	0.22	0.15	0.88	-0.41
Risk compensation		0.00	0.03		-0.08	0.06
Adherence		-0.20	0.10		-0.42	-0.02
Probe of mediation through adherence at 16th, 50th, and 84th percentiles	2.00	0.23	0.14		0.00	0.53
	2.95	0.05	0.07		-0.09	0.21
	3.80	-0.11	0.10		0.34	0.07
DV: prescription						
Remaining direct effect ("c' path")		0.33	0.22	1.48	-0.11	0.77
Risk compensation		-0.01	0.04		-0.11	0.06
Adherence		-0.22	0.10		-0.44	-0.03
Probe of mediation through adherence at 16th, 50th, and 84th percentiles	2.00	0.26	0.13		0.00	0.53
	2.95	0.05	0.08		-0.11	0.21
	3.80	-0.13	0.11		-0.38	0.06

Analyses include proposed mediators simultaneously and control for substance use condition.

accumulated evidence that providers' racial biases serve as barriers to equitable HIV prevention care,<sup>24,25</sup> we performed an experiment to understand the specific ways that provider biases obstruct provision of PrEP for Black CGW. We conducted this study among providers with prescription privileges in locations that carry heavy disease burden because these providers serve as critical gatekeepers of PrEP. We tested 2 models predicting providers' willingness to communicate and prescribe PrEP to women, contingent on their racial biases. Providers who scored low on a modern racism measure were more willing to discuss and prescribe PrEP to Black CGW (Table 3). These effects were mediated by provider perceptions of Black patients' abilities to adhere to PrEP, but not their expectations of risk compensatory behaviors.

This research contributes to the mounting evidence that although providers know about PrEP, they are not linking Black CGW to PrEP in accordance with the demonstrable need.<sup>11,44</sup> A 2017 survey demonstrated that among 527 nurse practitioners, internal, family, HIV, and infectious disease doctors in 10 cities, more than 86% were aware of PrEP<sup>45</sup>; however, compared with HIV care providers, primary care providers are significantly less willing to prescribe PrEP.<sup>45</sup> *Even among HIV care providers*, CGW face significant barriers to access, as a 2016 study demonstrated that HIV care providers are most likely to prescribe PrEP for MSM and least likely to prescribe it for heterosexual women and men and injection drug users.<sup>28</sup> This literature, corroborated by this study, suggests that provider *willingness* to recommend and prescribe PrEP to Black CGW may present significant barriers to equitable provision.

The CGW patient in the vignette was eligible for PrEP, given that she presented with a recent STI diagnosis and reported inconsistent condom use, in addition to her geographic risk in an HIV hotspot. Per both the WHO and CDC guidelines, it would have been not only appropriate but

indicated for all providers to *discuss* PrEP with this patient. Our data show that providers were not only less than unanimous in their willingness to discuss PrEP with this CGW but also that their unwillingness was racially biased, based on presumptions about adherence to PrEP. This finding illustrates an important mechanism by which gaps in awareness and knowledge of HIV prevention innovations emerge and widen. Racially biased treatment that produces knowledge gaps not only impedes access and patients' abilities to self-advocate in their HIV prevention but also cultivates distrust, which further impedes optimal health care.<sup>46</sup> The spiral of biased treatment, distrust, and suboptimal care will continue and become more deeply entrenched as advances in scientific knowledge reveal important limitations and side effects of PrEP. Although increasing numbers and types of biomedical prevention tools can be beneficial in giving individuals more prevention options from which to choose, these compounding factors can also thwart efforts to end the epidemic and close inequities in HIV infection.

Our findings also highlight the importance of applying an intersectional lens in documenting the processes that exacerbate inequities in HIV prevention broadly and PrEP use, particularly. Previous research highlighted how medical students' willingness to prescribe PrEP to MSM were shaped by racially biased expectations of risk compensation. Although racial bias in providers' evaluations of patients is evident in this study, it is based on a different set of stereotypes. When considering whether to discuss and prescribe PrEP, racial biases manifested in expectations that Black CGW will be less able to adhere to PrEP relative to White CGW. Thus, there is an analogous process at work to disadvantage Black people, but the specific pathways of effects may vary across patient populations (ie, MSM or CGW). Consistent with the intersectionality framework, these results illustrate the importance of understanding the ways racial bias affects patient-provider communication and also

shapes clinical decision making differently for groups at different intersectional locations.

### LIMITATION

Owing to the pilot nature of this study, the sample size may limit the ability to detect small interaction effects. Even with sample size limitations, we identified significant moderated mediation for one hypothesized pathway, however. Relatedly, we proposed and analyzed only 2 mediating pathways for 2 outcomes, although there are likely many pathways by which racial bias affects clinical judgments and actions that were unspecified in our analysis. Still, we demonstrate 2 important pathways for 2 outcomes using an experimental design with a high degree of internal validity. Despite the strengths of the design, we acknowledge that theoretical decisions about a fictitious patient may differ from judgment and decision making in a clinical setting.

### CONCLUSIONS

There is a critical gap in evidence-based interventions aimed to reduce provider bias in their interactions with populations of Black CGW to reduce HIV infections. This study provides evidence to support the development of interventions that address the mechanisms that work to thwart optimal care. There is also a dearth of empirical evidence of the ways provider biases obstruct provision of PrEP for Black CGW. This knowledge is critical to the development of interventions designed to train health care providers to identify and overcome biases in their interactions with Black CGW. This study provides empirical knowledge of how biases shape health care providers' willingness to discuss and prescribe PrEP to Black CGW.

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### REFERENCES

- Bradley EL, Williams AM, Green S, et al. Disparities in incidence of human immunodeficiency virus infection among Black and White women—United States, 2010–2016. *Morbidity Mortality Weekly Rep.* 2019;68:416.
- Murnane PM, Celum C, Nelly M, et al. Efficacy of pre-exposure prophylaxis for HIV-1 prevention among high risk heterosexuals: subgroup analyses from the partners PrEP study. *AIDS.* 2013;27:2155–2160.
- Flash CA, Dale SK, Krakower DS. Pre-exposure prophylaxis for HIV prevention in women: current perspectives. *Int J Womens Health.* 2017;9:391–401.
- Tekeste M, Hull S, Dovidio JF, et al. Differences in medical mistrust between black and white women: implications for patient-provider communication about PrEP. *AIDS Behav.* 2018;23:1–12.
- Patel AS, Goparaju L, Sales JM, et al. PrEP eligibility among at-risk women in the southern United States: associated factors, awareness, and acceptability. *J Acquir Immune Defic Syndr.* 2019;80:527.
- Wingood GM, Dunkle K, Camp C, et al. Racial differences and correlates of potential adoption of preexposure prophylaxis: results of a national survey. *J Acquir Immune Defic Syndr.* 2013;63(suppl 1):S95–S101.
- Goparaju L, Praschan N, Warren-Jeanpiere L, et al. Stigma, partners, providers and costs: potential barriers to PrEP uptake among US women. *J AIDS Clin Res.* 2017;8:730.
- Ojikutu BO, Bogart LM, Higgins-Biddle M, et al. Facilitators and barriers to pre-exposure prophylaxis (PrEP) use among black individuals in the United States: results from the national survey on HIV in the black community (NSHBC). *AIDS Behav.* 2018;22:3576–3587.
- Bush S, Ng L, Magnuson D, et al. Significant Uptake of Truvada for Pre-exposure Prophylaxis (PrEP) Utilization in the US in Late 2014–IQ2015. 2015.
- Wu H, Mendoza MC, Huang YA, et al. Uptake of HIV preexposure prophylaxis among commercially insured persons—United States, 2010–2014. *Clin Infect Dis.* 2016;64:144–149.
- Siegler AJ, Mouhanna F, Giler RM, et al. The prevalence of PrEP use and the PrEP-to-need ratio in the fourth quarter of 2017, United States. *Ann Epidemiol.* 2018;28:841–849.
- Flash CA, Stone VE, Mitty JA, et al. Perspectives on HIV prevention among urban black women: a potential role for HIV pre-exposure prophylaxis. *AIDS Patient Care STDs.* 2014;28:635–642.
- Krakower DS, Mayer KH. The role of healthcare providers in the roll-out of PrEP. *Curr Opin HIV AIDS.* 2016;11:41.
- Fray NA, Caldwell KL. Communication between middle SES black women and healthcare providers about HIV testing. *J Natl Med Assoc.* 2017;109:115–125.
- Calabrese SK, Earnshaw VA, Underhill K, et al. The impact of patient race on clinical decisions related to prescribing HIV pre-exposure prophylaxis (PrEP): assumptions about sexual risk compensation and implications for access. *AIDS Behav.* 2014;18:226–240.
- Dovidio JF, Penner LA, Albrecht TL, et al. Disparities and distrust: the implications of psychological processes for understanding racial disparities in health and health care. *Soc Sci Med.* 2008;67:478–486.
- Williams DR, Mohammed SA. Racism and health I: pathways and scientific evidence. *Am Behav Scientist.* 2013;57:1152–1173.
- Lee C, Ayers SL, Kronenfeld JJ. The association between perceived provider discrimination, health care utilization, and health status in racial and ethnic minorities. *Ethn Dis.* 2009;19:330.
- Stone VE. Physician contributions to disparities in HIV/AIDS care: the role of provider perceptions regarding adherence. *Curr HIV AIDS Rep.* 2005;2:189–193.
- Cooper-Patrick L, Gallo JJ, Gonzales JJ, et al. Race, gender, and partnership in the patient-physician relationship. *JAMA.* 1999;282:583–589.
- Johnson RL, Roter D, Powe NR, et al. Patient race/ethnicity and quality of patient-physician communication during medical visits. *Am J Public Health.* 2004;94:2084–2090.
- Link BG, Phelan JC. Conceptualizing stigma. *Annual Rev Soc.* 2001;27:363–385.
- Major B, Mendes WB, Dovidio JF. Intergroup relations and health disparities: a social psychological perspective. *Health Psychol.* 2013;32:514.
- Penner LA, Dovidio JF, West TV, et al. Aversive racism and medical interactions with Black patients: a field study. *J Exp Soc Psychol.* 2010;46:436–440.
- Nelson A. Unequal treatment: confronting racial and ethnic disparities in health care. *J Natl Med Assoc.* 2002;94:666.
- Calabrese SK, Krakower DS, Mayer KH. Integrating HIV preexposure prophylaxis (PrEP) into routine preventive health care to avoid exacerbating disparities. *Am J Public Health.* 2017;107:1883–1889.
- Burgess D, Van Ryn M, Dovidio J, et al. Reducing racial bias among health care providers: lessons from social-cognitive psychology. *J Gen Intern Med.* 2007;22:882–887.
- Adams LM, Balderson BH. HIV providers' likelihood to prescribe pre-exposure prophylaxis (PrEP) for HIV prevention differs by patient type: a short report. *AIDS Care.* 2016;28:1154–1158.
- Bowleg L. The problem with the phrase women and minorities: intersectionality—an important theoretical framework for public health. *Am J Public Health.* 2012;102:1267–1273.
- Choi KH, Bowleg L, Neilands TB. The effects of sexism, psychological distress, and difficult sexual situations on us women's sexual risk behaviors. *AIDS Educ Prev.* 2011;23:397–411.

31. Crenshaw K. Demarginalizing the intersection of race and sex: a black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. *U Chi Legal F.* 1989;10:139.
32. Cho S, Crenshaw KW, McCall L. Toward a field of intersectionality studies: theory, applications, and praxis. *Signs J Women Cult Soc.* 2013; 38:785–810.
33. Bowleg L. Intersectionality: an underutilized but essential theoretical framework for social psychology. In: *The Palgrave Handbook of Critical Social Psychology.* Berlin, Germany: Springer; 2017:507–529.
34. Calabrese SK, Earnshaw VA, Krakower DS, et al. A closer look at racism and heterosexism in medical students' clinical decision-making related to HIV pre-exposure prophylaxis (PrEP): implications for PrEP education. *AIDS Behav.* 2018;22:1122–1138.
35. Brown Givens SM, Monahan JL. Priming mummies, jezebels, and other controlling images: an examination of the influence of mediated stereotypes on perceptions of an African American woman. *Media Psychol.* 2005;7:87–106.
36. van Ryn M, Burke J. The effect of patient race and socio-economic status on physicians' perceptions of patients. *Soc Sci Med.* 2000;50:813–828.
37. HHS UDoHHS. *Ending the Epidemic.* Available at: <https://www.hiv.gov/federal-response/ending-the-hiv-epidemic/overview>. Accessed July 3, 2019.
38. Bogart LM, Catz SL, Kelly JA, et al. Factors influencing physicians' judgments of adherence and treatment decisions for patients with HIV disease. *Med Decis Making.* 2001;21:28–36.
39. Neville HA, Lilly RL, Duran G, et al. Construction and initial validation of the color-blind racial attitudes scale (CoBRAS). *J Couns Psychol.* 2000;47:59.
40. Hayes AF. *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach.* New York, NY: Guilford Press; 2013.
41. Hayes AF, Montoya AK. A tutorial on testing, visualizing, and probing an interaction involving a multicategorical variable in linear regression analysis. *Commun Methods Measures.* 2017;11:1–30.
42. Bauer DJ, Curran PJ. Probing interactions in fixed and multilevel regression: inferential and graphical techniques. *Multivariate Behav Res.* 2005;40:373–400.
43. O'Keefe DJ. Message properties, mediating states, and manipulation checks: claims, evidence, and data analysis in experimental persuasive message effects research. *Commun Theor.* 2003;13:251–274.
44. Jones JT, Smith DK, Wiener J, et al. Assessment of PrEP awareness, PrEP discussion with a provider, and PrEP use by transmission risk group with an emphasis on the southern United States. *AIDS Behav.* 2021;20:1–7.
45. Petroll AE, Walsh JL, Owczarzak JL, et al. PrEP awareness, familiarity, comfort, and prescribing experience among US primary care providers and HIV specialists. *AIDS Behav.* 2017;21:1256–1267.
46. Johnson RL, Saha S, Arbelaez JJ, et al. Racial and ethnic differences in patient perceptions of bias and cultural competence in health care. *J Gen Intern Med.* 2004;19:101–110.