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Toward Greater Pre-exposure Prophylaxis Equity: Increasing Provision and Uptake for Black and Hispanic/Latino Individuals in the U.S.

Robert A. Bonacci, MD, MPH[1,2], **Dawn K. Smith, MD, MS, MPH**[2], **Bisola O. Ojikutu, MD, MPH**[3,4,5]

[1]Epidemic Intelligence Service, Centers for Disease Control and Prevention, Atlanta, Georgia;

[2]Division of HIV Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP), Centers for Disease Control and Prevention, Atlanta, Georgia;

[3]Division of Global Health Equity, Brigham and Women's Hospital, Boston, Massachusetts;

[4]Division of Infectious Diseases, Brigham and Women's Hospital, Boston, Massachusetts;

[5]Harvard Medical School, Boston, Massachusetts

Abstract

Pre-exposure prophylaxis (PrEP) is highly effective at preventing HIV acquisition and is a critical tool in the Ending the HIV Epidemic in the U.S. initiative. However, major racial and ethnic disparities across the pre-exposure prophylaxis continuum, secondary to structural inequities and systemic racism, threaten progress. Many barriers, operating at the individual, network, healthcare, and structural levels, impede PrEP access and uptake within Black and Hispanic/Latino communities. This review provides an overview of those barriers and the innovative and collaborative solutions that health departments, healthcare organizations, and community partners have implemented to increase PrEP provision and uptake among disproportionately affected communities. Promising strategies at the individual and network levels focus on increasing patient support throughout the PrEP continuum, positioning and training community members to expand knowledge of and interest in PrEP, and leveraging mobile technologies to support PrEP uptake. Healthcare-level solutions include expanding the venues and types of healthcare professionals that can provide PrEP, and structural- and policy-level options focus on financial assistance programs and health insurance expansion. Key research gaps include demonstrating that pilot studies and interventions remain effective at scale and across varied contexts. Although the last 2 decades have provided effective tools to end the HIV epidemic, realizing this vision for the U.S. will require addressing persistent and pervasive HIV-related disparities in Black and Hispanic/Latino

Address correspondence to: Robert A. Bonacci, MD, MPH, Division of HIV Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP), Centers for Disease Control and Prevention, 1600 Clifton Road Northeast, Mail Stop US8-4, Atlanta GA 30329. qdu0@cdc.gov.

SUPPLEMENT NOTE

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communities. Federal, state, and local partners should expand efforts to address longstanding health and structural inequities and partner with disproportionately affected communities to rapidly expand PrEP scale-up.

INTRODUCTION

Pre-exposure prophylaxis (PrEP) is highly effective for preventing HIV acquisition.[1–3] PrEP provision and uptake are critical components of the Ending the HIV Epidemic (EHE) in the U.S. initiative—a federal government initiative designed to achieve a 90% reduction in HIV incidence by 2030.[4] The initiative has set a target for PrEP to be prescribed to ≥50% of individuals who have an indication for PrEP by 2025.[5]

As of 2018, only 18% of an estimated 1.2 million individuals with an indication for PrEP received a prescription for PrEP.[6] Important disparities for Black or African American (referred to as Black in the remaining part of this paper) and Hispanic/Latino (H/L) individuals exist across the PrEP continuum—an implementation framework to identify individuals at high risk for HIV, enhance PrEP awareness, increase PrEP prescribing and uptake, and ensure adherence and retention in PrEP care.[7] For example, Black and H/L men who have sex with men (MSM) have an increased lifetime risk of HIV acquisition, approximately 40% and 20% respectively, compared with 9% for White MSM.[8] Structural inequities and systemic racism, operating through a complex network of historical and contemporary structures, policies, practices, and norms, form the root causes of these disparities.[9,10]

Recent public health modeling explored the impact of a combination of HIV prevention and treatment strategy across 6 U.S. cities.[11,12] The authors found that even under ideal implementation conditions, HIV incidence targets for the EHE initiative could not be met, and racial and ethnic disparities would persist without addressing social and structural barriers. Confronting the root causes of these racial and ethnic disparities will be necessary for the U.S. to achieve the goals of the EHE initiative. Interventions and policies grounded in a health equity approach and that focus on communities most affected by HIV and address barriers to HIV prevention should be implemented. This will require the federal government, health departments, and academic and other implementation partners to engage more effectively with disproportionately affected communities and to strengthen collaborative partnerships with community-based organizations (CBOs) and healthcare systems to overcome disparities in access to HIV prevention services, including PrEP.

This article reviews the scope of racial and ethnic disparities related to PrEP and barriers to PrEP uptake and provision that operate across multiple levels, including the individual, network, healthcare system, and structural levels. The authors define *PrEP provision* as the necessary steps to prescribe PrEP (including access to and linkage to PrEP care and prescribing PrEP) and *PrEP uptake* as the initiation of PrEP. The article highlights the current evidence-based and emerging strategies tailored to address those multilevel barriers and to promote more equitable PrEP provision and uptake.

DISPARITIES IN PRE-EXPOSURE PROPHYLAXIS

Similar to other domains of HIV prevention and care, Black and H/L individuals experience significant disparities across the PrEP continuum, although PrEP awareness and uptake have increased over time.[13] Recent U.S. HIV surveillance data revealed that fewer Black and H/L MSM, compared with White MSM, were aware of PrEP, had discussed PrEP with their healthcare provider, or had used PrEP.[14] Additional nationwide surveillance data showed that PrEP coverage was 8.0% for Black individuals, 13.7% for H/L individuals, and 61.1% for White individuals.[15] There are marked disparities for women, with PrEP coverage at just 9.0% compared with 25.8% for men, and these findings are amplified for Black women, who have a 13 times higher rate of new HIV diagnoses than White women.[15,16] To reduce PrEP disparities for Black and H/L communities, innovative and effective strategies that overcome the barriers described in the next section are needed. One modeling study suggested that implementing PrEP more equitably would not only reduce HIV incidence for Black MSM but also is required to reduce disparities in HIV incidence compared with that among White MSM.[17]

Individual- and Network-Level Barriers

Individual- and network-level barriers to PrEP expansion include intrapersonal characteristics (e.g., knowledge, attitudes, beliefs, and practices related to HIV prevention and PrEP) and interpersonal factors (e.g., relationships and social interactions) that mediate one's likelihood of using PrEP. Lack of awareness of PrEP and limited knowledge about its benefits and safety, which are more prevalent among Black and H/L individuals, impede PrEP uptake.[14,18–20] Previous studies have identified discordance between actual and perceived risk of HIV infection to be a barrier to PrEP use for Black men and women.[18,21] Concerns about side effects also decrease the willingness to use PrEP.[20–22] Competing priorities for food, shelter, employment, and other health needs (physical and psychosocial) may reduce PrEP uptake.[23] HIV-related and PrEP-related stigma, heterosexism, medical mistrust, and racism, whether perceived or experienced, impede Black and H/L individuals from seeking out and adhering to PrEP; many of these barriers operate at both the individual and network levels.[19,20,22,24–32] Social and sexual networks may impact awareness of PrEP and enforce norms and expectations regarding PrEP use or nonuse.[33–35] Overall, the existing literature poorly characterizes network-level barriers to PrEP uptake among Black and H/L individuals.

Healthcare System–Level Barriers

Healthcare system–level barriers to PrEP provision include clinician-related factors and those impacting prevention and care service delivery. Among clinicians, these barriers include unconscious bias, overt racism, sexism, homophobia, transphobia, and stigmatization of people with substance use disorders.[26,36–39] Lack of clinician awareness and knowledge of PrEP impedes prescribing.[40] Clinicians' concern about risk compensation, the worry that PrEP use will increase risk behaviors, decreases PrEP provision, despite risk compensation not having been shown to increase the rates of HIV infection among PrEP users.[27] Clinical guidelines for PrEP, ultimately operationalized at the clinician level, may fail to identify some individuals at increased risk of HIV infection.[41,42] Screening

for PrEP need based primarily on individual behaviors risks missing individuals with risk of HIV infection augmented by partner- or community-level factors, which is particularly relevant for heterosexual Black women.[43,44] Questions regarding which clinical settings are most appropriate to prescribe PrEP, known as the purview paradox, contribute to a lack of PrEP prescribers.[45,46] This paradox refers to whether primary care physicians, who primarily see HIV-negative patients but may feel uncomfortable with PrEP medications, or HIV specialists, who primarily care for people with HIV, see themselves as the primary prescribers of PrEP. Mistrust of clinicians and health institutions, often rooted in previous negative experiences with clinicians and healthcare systems, also operates at this level.[21,30–32]

Structural-Level Barriers

Structural-level barriers refer to systems, policies, practices, and societal norms that impact the PrEP continuum. Although PrEP assistance programs are available, financial barriers (both real and perceived), including the out-of-pocket cost of PrEP medications and laboratory services and lack of adequate and affordable health insurance, limit access to PrEP.[22,23] Similarly, distance to clinics that provide PrEP and their lower density among Black and H/L communities, in both urban and rural areas, make it more difficult to access PrEP services; lack of transportation operates similarly.[47,48] Policy decisions, including whether to expand Medicaid or offer jurisdictional PrEP assistance programs, affect access.[49] The lack of Medicaid expansion is particularly acute in the Southern U.S., where new HIV diagnoses are highly concentrated among Black and H/L communities. Immigration status and limited English proficiency limit PrEP and healthcare access for H/L and Black immigrant communities.[50,51] Distrust of medical professionals and the government mediates the likelihood of PrEP uptake for both Black and H/L communities.[20,21,30–32]

STRATEGIES TO PROMOTE EQUITABLE PRE-EXPOSURE PROPHYLAXIS PROVISION AND UPTAKE

Collectively, the multilevel barriers described in this paper restrict the equitable provision of PrEP to the communities most disproportionately affected by HIV. Addressing these barriers —and reducing the disparities—will require the implementation of effective strategies and interventions that are innovative, adequately resourced, sustainable, and culturally responsive. Those solutions, which are desperately needed to advance PrEP equitably, should be accompanied by efforts to directly confront the root causes of those disparities—that is, the structural inequities and racism that impede equitable HIV prevention, treatment, and care—to achieve the goals of EHE.

Most of the strategies and interventions described in this paper were designed to specifically serve Black and H/L individuals. When not race- or ethno-specific, strategies and interventions were included because they either enrolled a majority of Black or H/L participants (validating that they can benefit these communities) or because they generally promote improved PrEP implementation and merit consideration for disproportionately affected Black and H/L individuals. In addition, some of the studies in this review were pilot

studies or demonstration projects and although delivering promising results and important lessons learned, may not have been implemented at scale yet.

Individual and Network Level

Interventions to address the barriers at the individual and network levels have to date primarily targeted (1) navigation of patients through the PrEP continuum, (2) peer and social networks, and (3) mobile health applications (Table 1).

Care coordination and patient navigators have been used across numerous diseases and feature prominently in efforts to improve the provision of care and outcomes for people with HIV.[52–54] One demonstration study offering PrEP to Black MSM alongside culturally tailored HIV risk reduction counseling and case management reported that 79% of participants initiated PrEP, and 64% of whom were still using PrEP at 6 months.[55] Building on that study, an RCT pilot study for young Black MSM, implementing a culturally tailored PrEP counseling center staffed by Black MSM, reported that 6 participants (24%) in the intervention arm initiated PrEP compared with 0 (0%) in the control arm.[56] One barrier was that only half of the intervention participants saw a medical provider after the counseling intervention. Because the counseling intervention did not occur in a PrEP clinic, participants needed to make a separate appointment with a PrEP provider. Although counseling staff were trained to help navigate identifying a provider and making the appointment, the lack of PrEP onsite introduced another barrier to uptake. The Washington, DC Department of Health hired and embedded local community members as PrEP navigators at a health department (HD) sexually transmitted disease clinic and within CBOs to connect MSM and transgender women (TGW) of color to PrEP and other sexual health services.[57] The Health Department screened >3,000 people and linked >35% to PrEP. In Chicago, Dehlin et al.[58] implemented PrEPLine, a phone support line to assist Black MSM, TGW, and heterosexual women with navigating the PrEP continuum. Over 32 months, Chicago's PrEPLine generated 566 encounters, with 31% leading to PrEP initiation. Investigators attributed part of PrEPLine's success to being embedded within a citywide sex-positive PrEP marketing campaign, PrEP4Love, that focused marketing to Black MSM, TGW, and heterosexual women.[59]

Bridging the individual and network levels, Reback and colleagues[60] implemented a 5-session peer-led PrEP navigation program that linked urban MSM and TGW to PrEP. Approximately 90% of participants were successfully linked to PrEP, and 70%–80% reported continued PrEP use 3 months later. Another pilot study implemented peer-led PrEP outreach and navigation for women, predominantly Black and Hispanic/Latina, at sex worker and syringe exchange drop-in centers.[61] Of 52 participants, 38 (73%) reported PrEP interest, but ultimately, none received PrEP, primarily because only 3 (6%) attended an initial PrEP clinic visit. Study investigators suggested that providing PrEP on site at the mobile syringe sites and syringe exchange and sex worker drop-in centers (eliminating the need to travel to another location), in addition to offering same-day PrEP initiation (reducing the number of appointments), might reduce the burden on clients when considering starting PrEP. A novel intervention currently under study for women experiencing incarceration focuses on increasing PrEP uptake during incarceration and linkage to community-based

PrEP care, using motivational interviewing sessions and PrEP navigation services.[62] Across these care navigation interventions, implementers specifically tailored services to facilitate communication with and address the needs of communities with high PrEP need.

Network interventions for PrEP build on the importance of interpersonal relationships in promoting healthy behaviors. Training Black MSM with large social networks on how to advocate for and promote PrEP among their community, one pilot study found increases in PrEP knowledge and willingness to use PrEP among those leaders' social networks.[63] PrEP Chicago, a clinical trial in progress, trains young Black MSM as peer change agents to use social media platforms to increase PrEP uptake.[64] A third intervention layered another strategy, involving young Black and H/L MSM (the study population) in designing the intervention, whereby influential peers led a 6-week social media PrEP uptake campaign with friends they recruited.[65] In this cluster RCT, the peer-led intervention increased PrEP knowledge and decreased PrEP stigma compared with the control arm, although the number of participants initiating PrEP in both arms was similar.[66]

Accompanying the rise of electronic technologies such as smartphones is the widespread use of social media websites and applications to deliver PrEP uptake interventions. The evidence for electronic or mobile health interventions to increase PrEP uptake among Black and H/L MSM is nascent but growing. One St. Louis–based CBO created a profile on a geosocial networking application to address sexual health questions, primarily from young Black MSM, and promote HIV testing and PrEP linkage. Over a 13-month period, the CBO engaged 98 individuals, linking 6 to PrEP.[67] Other interventions to increase PrEP linkage and uptake, all currently under study, include theory-driven mobile applications (focused on young or urban MSM), a mobile messaging campaign (focused on Black MSM), and social media messages accompanying a website promoting HIV risk reduction (focused on Black and H/L MSM).[68–73] One limitation to these approaches is the exclusion of individuals without smartphones or Internet access. Recent data indicate that 15% of U.S. adults do not own a smartphone, whereas almost 25% lack home broadband Internet access, with less home broadband Internet access for Black and H/L individuals.[74,75]

A key limitation among individual-level interventions for Black and H/L individuals is the lack of studies designed specifically for women or individuals living in nonurban areas. Future research should focus on identifying effective interventions to increase PrEP use among these groups. Similarly, although multiple mobile health interventions are discussed in this review, most are research protocols in progress, the results from which could address an important gap in the current literature.

Healthcare System Level

Increasingly, strategies to improve PrEP provision for Black and H/L communities focus on expanding where PrEP is provided and who can deliver PrEP (Table 1).

The Durham County sexually transmitted disease clinic serving primarily Black and H/L patients created a referral pathway to connect HIV-negative clients to a partner federally qualified health center already offering PrEP services.[76] Of 196 referred patients, 60% presented for an initial PrEP appointment and 38% persisted in PrEP care for ≥3 months.

Denver's largest sexually transmitted disease clinic initiated a PrEP program with same-day starts, and nearly 40% of participants were H/L.[77]

Family planning clinics, including Title X clinics, can play an important role in addressing unmet HIV prevention needs for Black and Hispanic/Latina women.[78] One family planning clinic serving predominantly Black women implemented a pilot staff training program to increase PrEP provision, including same-day PrEP, and reported that HIV counseling and PrEP screening increased from 10% at 1 month to >50% at 6 months.[79] Another intervention currently under study trains PrEP clinical change teams at Southern Title X clinics to lead PrEP implementation for women within their family planning services.[80]

A complementary strategy to expand PrEP services is to increase the number and type of healthcare professionals who know how to prescribe PrEP. Project ECHO (Extension for Community Healthcare Outcomes), a telementoring model initially created to expand hepatitis C treatment across New Mexico, was used to successfully support PrEP prescribing by community practitioners.[81] Academic detailing, which entails sending trained representatives to deliver educational outreach to clinicians at their practice sites, has been used to increase clinicians' PrEP knowledge and prescribing. A 3-year detailing effort by the New York City HD reached >2,500 clinicians and increased the number of new PrEP prescribers.[82,83]

Innovations in PrEP provision have also grown to include nurse- and pharmacist-delivered PrEP programs. Using EHE funds from the Minority HIV/AIDS Fund, DeKalb County and the Georgia Department of Public Health recently implemented a protocol for PrEP evaluation and prescription by nurses in public health centers.[84,85] Through collaborative practice agreements, pharmacists may be permitted to initiate and manage a patient's medication under a protocol overseen by an associated physician. Tailoring this idea for HIV prevention, community pharmacy PrEP programs have demonstrated success in providing PrEP and reaching Black and H/L communities in San Francisco and other cities.[86–88]

Telehealth-based PrEP services demonstrate promise to reach communities where distance or time constraints are key barriers.[89,90] One pilot study found PrEPTECH telehealth PrEP services for young Black and H/L MSM to be feasible, with 21 of 25 participants initiating PrEP.[91] Next steps include a cost-effectiveness analysis of PrEPTECH and incorporating financial assistance referrals and insurance coverage information into the program.

Delivering some components of PrEP services at home is another way to overcome distance or time barriers to PrEP clinic visits. Although the initial PrEP initiation visit takes place in the clinic, most follow-up visits and laboratory specimen self-collection occur at home. This approach demonstrated promise in a recent feasibility study done in 3 U.S. cities, and an additional study focused on young, rural MSM is in progress.[92,93] Ready, Set, PrEP, a nationwide program that provides PrEP medications at no cost to individuals lacking prescription drug coverage, recently added a prescription mail-order option.[94] One limitation to home delivery of PrEP services is that homeless populations may be excluded without additional accommodation. Given that Black and H/L individuals experience homelessness at disproportionate rates compared with White individuals, disseminating programs widely

without considering how to accommodate homeless populations risks exacerbating the current PrEP disparities.[95] Mobile van outreach represents another way to bring PrEP services closer to disproportionately affected communities. Using a multi-lingual team and partnering with a CBO to advertise on social media, a PrEP mobile van successfully initiated 166 of 168 eligible individuals on PrEP, the vast majority of whom were H/L, in Miami.[96] Expanding the venues for PrEP prescribing and by whom can overcome important barriers that inhibit PrEP uptake in Black and H/L communities.

A major research gap at the healthcare system level is the absence of research on interventions addressing culturally incongruent practices, biases, phobias, and stigmatizing behaviors of clinicians and their potential impact on PrEP prescribing behaviors. Additional research is also needed to determine whether telehealth-based PrEP strategies will prove effective in reaching Black and H/L communities.

Structural Level

Although potentially more challenging to achieve given varied political and policy landscapes at the federal and state levels, overcoming structural-level barriers is critical to changing the landscape of PrEP and HIV prevention for Black and H/L communities. In addition to programs offered by pharmaceutical companies, some states have developed PrEP assistance programs to help cover medication costs and support PrEP uptake (Table 1).[97] In addition, a few states have expanded assistance to include medical visit– and laboratory-related costs.[98,99] States can also increase access to PrEP and preventive care through insurance coverage expansion (Table 1). Multiple studies have found increased PrEP coverage and use in states that expanded Medicaid, and 1 study reported a 5% decrease in the rate of HIV diagnoses among states that expanded Medicaid.[49,100,101] Oral PrEP coverage without cost sharing is now mandatory after the 2019 grade-A recommendation by the U.S. Preventive Services Task Force.[102] The approaching introduction of widespread generic tenofovir/emtricitabine may also impact PrEP costs and uptake. In addition, it will be important to monitor whether and how quickly new PrEP modalities such as cabotegravir injections will become available and covered by insurance or PrEP assistance programs after U.S. Food and Drug Administration approval.[103,104]

ADAPTING TO COVID-19

The coronavirus disease 2019 (COVID-19) pandemic has devastated Black and H/L communities across the U.S., who have experienced disproportionately high rates of COVID-19 cases, hospitalizations, and deaths.[105] It has also created enormous challenges for PrEP scale-up. In 1 Boston PrEP clinic, new PrEP starts decreased by 72%, and patients with an active prescription fell by 18% from January to April 2020.[106] This effect persisted beyond the spring shutdowns, according to a national analysis that found a 20% decrease in PrEP prescriptions through September 2020.[107] Nationally, telehealth visits across all types of outpatient clinical services grew rapidly, increasing by >2,000% from January to June 2020.[108]

To address the disruptions in PrEP clinical services due to COVID-19, the Centers for Disease Control and Prevention recommends (1) ensuring PrEP availability for all patients;

(2) continuing quarterly HIV testing through lab-only visits or HIV self-test collection; and (3) extending PrEP prescriptions to 90 days.[109] In addition to continuing in-person PrEP services where feasible, telehealth visits represent a rapidly scalable approach to provide PrEP safely. However, healthcare organizations must be cognizant that technology-based solutions may exacerbate inequities in PrEP provision, including for individuals without Internet-enabled devices or Internet access, with low digital literacy, or with limited English proficiency.[110] For example, Black and H/L individuals may have more difficulty in accommodating video telehealth visits because they have less broadband Internet access nationally.[75] For such individuals, clinics should consider strategies to assist patients with technology access or help them to attend in-person visits safely.

REMAINING QUESTIONS AND FUTURE DIRECTIONS FOR PRE-EXPOSURE PROPHYLAXIS

Although the U.S. has the necessary tools to achieve the goals of EHE, questions remain about how to incorporate and deploy them effectively in communities disproportionately affected by HIV.

In the near term, how rapidly emerging PrEP technologies, including long-acting injectable antiretrovirals and oral preventive medications, will increase PrEP delivery, adherence, and persistence remains to be seen. A better understanding of the disparities in and barriers to retention in PrEP care for Black and H/L individuals, especially among women, is needed. Broader questions include how future policies and laws might affect health insurance and healthcare access and whether effective efforts to confront systemic racism as a public health issue, which could increase awareness of and strategies to address the structural factors related to HIV risk and PrEP use, will materialize.[111]

Currently, the pipeline of strategies supported by the federal government focuses primarily on improving implementation along the PrEP continuum, especially for communities disproportionately affected by HIV. Initiatives being studied include HIV prevention communication efforts, telemedicine and mobile health for PrEP, increasing venues that offer PrEP, using social networks and social media to increase awareness, and increasing PrEP use among cisgender heterosexual women.[112,113] To significantly reduce disparities for PrEP and other effective HIV prevention methods, researchers must collaborate with community members to identify and implement interventions that have proven effective in addressing ongoing unmet needs for the Black and H/L communities.

CONCLUSIONS

This review identifies many key barriers and promising strategies to address PrEP scale-up in Black and H/L communities across the U.S. The barriers to PrEP uptake and provision operate across the individual, network, healthcare system, and structural levels. To reach the PrEP-related goals of EHE, the federal government, HDs, and academic and community partners must implement innovative and effective programs and policies that overcome these barriers. Key research gaps remain, particularly implementing and evaluating PrEP uptake strategies tailored to the needs of Black and H/L individuals living in nonurban areas and

women. At present, the Black and H/L communities continue to experience disproportionate rates of HIV infections with major disparities across the PrEP continuum. Increased provision and uptake of PrEP are urgently needed to achieve greater equity in reducing HIV infections. Increased efforts to end the HIV epidemic, accompanied by broader structural reforms that address the underlying social, economic, and political determinants of health, will be key to diminishing racial and ethnic HIV-related disparities and creating a healthier future for all.

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Table 1.

Strategies to Increase PrEP Uptake for Black and Hispanic/Latino Individuals

Intervention	Study type	Population of interest	Key study outcomes	References
Individual or network level				
HIV risk reduction counseling and client-centered care coordination	Open-label, nonrandomized study	Black MSM (*n*=226)	178 initiated PrEP; of these, 64% utilizing PrEP at 26 weeks	55
Culturally tailored PrEP counseling center led by Black MSM staff	Pilot RCT	Young Black MSM (*n*=50)	6 intervention group participants initiated PrEP compared with 0 in the control group at 3 months	56
Embedded PrEP navigators within health department STD clinic and CBOs	Program evaluation	MSM and TGW of color (*n*=4,044)	3,114 screened for PrEP, and 1,154 were linked to PrEP services	57
PrEP navigation through phone support line	Program evaluation	Primarily young Black MSM (*n*=566)	Of 566 PrEPLine encounters, 260 scheduled a PrEP appointment, and 170 initiated PrEP	58
Peer-led PrEP navigation program done over 5 sessions	Program evaluation	Urban, primarily Black and Hispanic/Latino MSM and TGW (*n*=187)	170 participants linked to PrEP, of whom, 117 reported using PrEP at 90 days	60
Peer-led PrEP outreach and navigation at sex worker and syringe exchange drop-in centers and mobile syringe exchange sites	Pilot program evaluation	Primarily Black and Hispanic/ Latina women (*n*=52)	38 participants reported PrEP interest; 13 scheduled a PrEP appointment, and none received PrEP	61
Motivational interviewing sessions and PrEP navigation	Pilot RCT	Women experiencing incarceration	In progress	62
Trained socially connected Black MSM through skill-building exercises to promote PrEP among friends	Pilot program evaluation	Black MSM (*n*=40)	Increases in PrEP knowledge, attitudes, and willingness to use PrEP; 3 participants newly initiated PrEP by end of the study	63
Train peer change agents to increase PrEP adoption among peers	RCT	Young Black MSM (*n*=423)	In progress	64
Influential peers developed and delivered a 6-week social media campaign addressing PrEP barriers	Cluster RCT	Young Black and Hispanic/Latino MSM (*n*=155)	By 12 weeks, intervention group had greater increases in PrEP knowledge and decreased stigma; PrEP initiation was similar between arms	65,66
CBO created a geosocial networking app profile to address sexual health questions	Pilot program evaluation	Young, primarily Black MSM (*n*=98)	98 individuals interacted with the profile; of 11 testing HIV negative, 6 linked to and initiated PrEP	67
Mobile app to support linkage to HIV/STD testing and PrEP services	Pilot RCT	Young MSM	In progress	68
Mobile app to increase HIV testing and PrEP uptake	Pilot RCT	Young MSM	In progress	69
Mobile messaging intervention to provide PrEP information and increase PrEP uptake	Pilot RCT	Young Black MSM in Southern U.S.	In progress	70
Mobile app providing a comprehensive portal for HIV prevention services	RCT	MSM in Southern U.S.	In progress	71
Mobile app providing HIV prevention information and text and video messages tailored to HIV status and risk	RCT	Urban MSM, including both HIV negative and positive (*n*=1,229)	In progress	72

Intervention	Study type	Population of interest	Key study outcomes	References
Culturally tailored, interactive website and social media messaging promoting HIV risk reduction	RCT	Black and Hispanic/Latino MSM, both HIV negative and positive	In progress	73
Healthcare system level				
Health department STD clinic created PrEP referral pathway to partner FQHC that already offered PrEP services	Program evaluation	Primarily Black and Hispanic/ Latino patients (*n*=196)	117 presented for initial PrEP appointment; of those, 84 filled a PrEP prescription, 74 of whom persisted in care for ≥3 months	76
Same-day PrEP program, with patient navigator assistance, embedded in safety net STD clinic	Program evaluation	Adults eligible for PrEP (*n*=131)	100 patients initiated same-day PrEP, 57 of whom had ≥2 follow-up visits	77
Integrate PrEP services into family planning clinic within an urban tertiary care hospital	Pilot program evaluation	Young, primarily Black women (*n*=515)	Over 6 months, 252 women screened for PrEP, 15 patients newly started PrEP; staff knowledge and comfort in discussing PrEP improved	79
Integrate PrEP services into Title X-Family planning clinic	Implementation study	Urban women in Southern U.S.	In progress	80
Distance telementoring, with monthly activities to educate and support PrEP prescribing by community clinicians	Pilot program evaluation	Community HIV clinicians	Improved PrEP knowledge, increased likelihood to prescribe, and addressed concerns about prescribing PrEP	81
Academic detailing for PrEP	Program description	Clinicians in New York City and New England	From 2014 to 2017, 2,500 New York City and >200 New England clinicians received PrEP detailing. Increased new PrEP prescribers	82,83
Creating nurse-driven protocols for PrEP evaluation and prescribing	Program description and protocol	Nurses	N/A	84,85
Community pharmacy PrEP program operating through collaborative practice agreement	Program evaluation	Adults eligible for PrEP or PEP, primarily Hispanic/Latino (*n*=59)	In 12-month period, 53 patients completed a PrEP visit, 51 of whom received PrEP; 6 received PEP	86
Community pharmacy PrEP program operating through collaborative practice agreement	Program evaluation	Adults eligible for PrEP (*n*=714)	In 3 years, 695 patients initiated PrEP, 513 of whom did so through same-day prescribing; only 19% were lost to follow-up	88
Health department partnered with university-affiliated pharmacists to provide telehealth PrEP services	Program evaluation	Adults eligible for PrEP (*n*=186)	127 patients received TelePrEP visits, 91% of whom initiated PrEP; 61% of eligible patients retained at 180 days	90
Cost-free PrEP services delivered by telehealth visits with a physician	Pilot program evaluation	Young, primarily Black and Hispanic/Latino MSM (*n*=25)	21 participants initiated PrEP, 11 of whom transitioned to a long-term PrEP provider at end of the study	91
Home-based PrEP monitoring and support, including specimen self-collection and behavioral surveys in place of quarterly follow-up visits	Pilot program evaluation	MSM already on PrEP (*n*=55)	53 participants received PrEP prescription renewals on the basis of at-home laboratory and behavioral surveillance results	92
Home-based PrEP care, comprised of a mobile app, telehealth visits, and specimen self-collection	RCT	Young rural MSM, with at least 50% Black and Hispanic/Latino MSM	In progress	93
Mobile van-based HIV prevention and PrEP services with a clinician and PrEP counselor	Program evaluation	Primarily Hispanic/Latino MSM (*n*=229)	168 patients sought PrEP, of which 166 initiated PrEP; of eligible patients on PrEP, 71% completed 3-month follow-up	96
Structural level				
PrEP drug assistance program to defray costs of PrEP and/or associated clinical services	Program description	N/A	N/A	94,97–99

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Intervention	Study type	Population of interest	Key study outcomes	References
Medicaid expansion	Policy analysis	N/A	N/A	49,100,101

app, application; CBO, community-based organization; FQHC, federally qualified health center; MSM, men who have sex with men; N/A, not applicable; PEP, postexposure prophylaxis; PrEP, pre-exposure prophylaxis; STD, sexually transmitted disease; TGW, transgender women.

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