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

Robert A. Bonacci, MD, MPH1,2, Dawn K. Smith, MD, MS, MPH2, Bisola O. Ojikutu, MD, MPH3,4,5

1Epidemic Intelligence Service, Centers for Disease Control and Prevention, Atlanta, Georgia;
2Division of HIV Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP), Centers for Disease Control and Prevention, Atlanta, Georgia;
3Division of Global Health Equity, Brigham and Women’s Hospital, Boston, Massachusetts;
4Division of Infectious Diseases, Brigham and Women’s Hospital, Boston, Massachusetts;
5Harvard 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 communities.
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.\textsuperscript{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.\textsuperscript{4} The initiative has set a target for PrEP to be prescribed to $\geq 50\%$ of individuals who have an indication for PrEP by 2025.\textsuperscript{5}

As of 2018, only 18\% of an estimated 1.2 million individuals with an indication for PrEP received a prescription for PrEP.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{9,10}

Recent public health modeling explored the impact of a combination of HIV prevention and treatment strategy across 6 U.S. cities.\textsuperscript{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 \textit{PrEP provision} as the necessary steps to prescribe PrEP (including access to and linkage to PrEP care and prescribing PrEP) and \textit{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{18,21} Concerns about side effects also decrease the willingness to use PrEP.\textsuperscript{20–22} Competing priorities for food, shelter, employment, and other health needs (physical and psychosocial) may reduce PrEP uptake.\textsuperscript{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.\textsuperscript{19,20,22,24–32} Social and sexual networks may impact awareness of PrEP and enforce norms and expectations regarding PrEP use or nonuse.\textsuperscript{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.\textsuperscript{26,36–39} Lack of clinician awareness and knowledge of PrEP impedes prescribing.\textsuperscript{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.\textsuperscript{27} Clinical guidelines for PrEP, ultimately operationalized at the clinician level, may fail to identify some individuals at increased risk of HIV infection.\textsuperscript{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. Questions regarding which clinical settings are most appropriate to prescribe PrEP, known as the purview paradox, contribute to a lack of PrEP prescribers. 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.

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. 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. Policy decisions, including whether to expand Medicaid or offer jurisdictional PrEP assistance programs, affect access. 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. Distrust of medical professionals and the government mediates the likelihood of PrEP uptake for both Black and H/L communities.

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. 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. 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. 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) to PrEP and other sexual health services.

The Health Department screened >3,000 people and linked >35% to PrEP. In Chicago, Dehlin et al. 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.

Bridging the individual and network levels, Reback and colleagues 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. 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. 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. PrEP Chicago, a clinical trial in progress, trains young Black MSM as peer change agents to use social media platforms to increase PrEP uptake. 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. 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.

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. 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). 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.

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. 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. 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. 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). In addition, a few states have expanded assistance to include medical visit- and laboratory-related costs. 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. Oral PrEP coverage without cost sharing is now mandatory after the 2019 grade-A recommendation by the U.S. Preventive Services Task Force. 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.

**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. 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. This effect persisted beyond the spring shutdowns, according to a national analysis that found a 20% decrease in PrEP prescriptions through September 2020. Nationally, telehealth visits across all types of outpatient clinical services grew rapidly, increasing by >2,000% from January to June 2020.

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.\(^\text{109}\) 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.\(^\text{110}\) For example, Black and H/L individuals may have more difficulty in accommodating video telehealth visits because they have less broadband Internet access nationally.\(^\text{75}\) 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.\(^\text{111}\)

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.\(^\text{112,113}\) 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.

ACKNOWLEDGMENTS

BOO received support from the Harvard University Center for AIDS Research, an NIH-funded program (P30 AI060354).

No financial disclosures were reported by the authors of this paper.

REFERENCES

1. Grant RM, Lama JR, Anderson PL, et al. Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. N Engl J Med. 2010;363(27):2587–2599. 10.1056/NEJ-Moa1011205. [PubMed: 21091279]
2. Baeten JM, Donnell D, Ndase P, et al. Antiretroviral prophylaxis for HIV prevention in heterosexual men and women. N Engl J Med. 2012;367(5):399–410. 10.1056/NEJ-Moa110524. [PubMed: 22784037]
3. Thigpen MC, Kebaabetswe PM, Paxton LA, et al. Antiretroviral pre-exposure prophylaxis for heterosexual HIV transmission in Botswana. N Engl J Med. 2012;367(5):423–434. 10.1056/NEJ-Moa110711. [PubMed: 22784038]
4. Fauci AS, Redfield RR, Sigounas G, Weahkee MD, Giroir BP. Ending the HIV epidemic: a plan for the United States. JAMA. 2019;321(9):844–845. 10.1001/jama.2019.1343. [PubMed: 30730529]
5. PrEP coverage. America’s HIV Epidemic Analysis Dashboard (AHEAD). https://ahead.hiv.gov/indicators/prep-coverage/. Accessed May 5, 2021.
6. Harris NS, Johnson AS, Huang YA, et al. Vital signs: status of human immunodeficiency virus testing, viral suppression, and HIV preexposure prophylaxis - United States, 2013–2018. MMWR Morb Mortal Wkly Rep. 2019;68(48):1117–1123. 10.15585/mmwr.mm6848e1. [PubMed: 31805031]
7. Nunn AS, Brinkley-Rubinstein L, Oldenburg CE, et al. Defining the HIV pre-exposure prophylaxis care continuum. AIDS. 2017;31(5):731–734. 10.1097/QAD.0000000000001385. [PubMed: 28060019]
8. Hess KL, Hu X, Lansky A, Mermin J, Hall HI. Lifetime risk of a diagnosis of HIV infection in the United States. Ann Epidemiol. 2017;27(4):238–243. 10.1016/j.annalsofepidemiology.2017.02.003. [PubMed: 28325538]
9. Jones CP. Confronting institutionalized racism. Phylon (1960-). 2002;50(1/2):7–22. 10.2307/4149999.
10. Bailey ZD, Feldman JM, Bassett MT. How structural racism works - racist policies as a root cause of U.S. racial health inequities. N Engl J Med. 2021;384(8):768–773. 10.1056/NEJMms2025396. [PubMed: 33326717]
11. Nosyk B, Zang X, Krebs E, et al. Ending the HIV epidemic in the USA: an economic modelling study in six cities. Lancet HIV. 2020;7(7):e491–e503. 10.1016/S2352-3018(20)30033-3. [PubMed: 32145760]
12. Nosyk B, Krebs E, Zang X, et al. “Ending the Epidemic” will not happen without addressing racial/ethnic disparities in the United States human immunodeficiency virus epidemic. Clin Infect Dis. 2020;71(11):2968–2971. 10.1093/cid/ciaa566. [PubMed: 32424416]
13. Finlayson T, Cha S, Xia M, et al. Changes in HIV pre-exposure prophylaxis awareness and use among men who have sex with men in 20 urban areas, 2014 and 2017. MMWR Morb Mortal Wkly Rep. 2019;68(27):597–603. 10.15585/mmwr.mm6827a1. [PubMed: 31298662]

14. Kanny D, Jeffries WL 4th, Chapin-Bardales J, et al. Racial/ethnic disparities in HIV pre-exposure prophylaxis among men who have sex with men in 20 urban areas, 2014 and 2017. MMWR Morb Mortal Wkly Rep. 2019;68(27):597–603. 10.15585/mmwr.mm6827a1.

15. Centers for Disease Control and Prevention. Core indicators for monitoring the Ending the HIV Epidemic initiative (early release): National HIV Surveillance System data reported through December 2020; and preexposure prophylaxis (PrEP) data reported through September 2020. Atlanta, GA: Centers for Disease Control and Prevention. https://www.cdc.gov/hiv/pdf/library/reports/surveillance-data-tables/vol-2-no-2/cdc-hiv-surveillance-tables-vol-2-no-2.pdf. Published March 2021. Accessed May 5, 2021.

16. NCHHSTP AtlasPlus. Centers for Disease Control and Prevention. https://www.cdc.gov/nchhstp/atlas/index.htm. Updated May 5, 2021.

17. Jenness SM, Maloney KM, Smith DK, et al. Addressing gaps in HIV pre-exposure prophylaxis care to reduce racial disparities in HIV incidence in the United States. Am J Epidemiol. 2019;188(4):743–752. 10.1093/aje/kwy230. [PubMed: 30312365]

18. 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(11):3576–3587. 10.1007/s10461-018-2067-8. [PubMed: 29468493]

19. Taggart T, Liang Y, Pina P, Albritten T. Awareness of and willingness to use PrEP among Black and Latina adolescents residing in higher prevalence areas in the United States. PLoS One. 2020;15(7):e0234821. 10.1371/journal.pone.0234821. [PubMed: 32628674]

20. García M, Harris AL. PrEP awareness and decision-making for Latino MSM in San Antonio, Texas. PLoS One. 2017;12(9):e0184014. 10.1371/journal.pone.0184014. [PubMed: 28953905]

21. Ojikutu BO, Amutah-Onukagha N, Mahoney TF, et al. HIV-related mistrust (or HIV conspiracy theories) and willingness to use PrEP among Black women in the United States. AIDS Behav. 2020;24(10):2927–2934. 10.1007/s10461-020-02843-z. [PubMed: 32239358]

22. Smith DK, Toledo L, Smith DJ, Adams MA, Rothenberg R. Attitudes and program preferences of African-American urban young adults about pre-exposure prophylaxis (PrEP). AIDS Educ Prev. 2012;24(5):408–421. 10.1521/aeap.2012.24.5.408. [PubMed: 23016502]

23. Mayer KH, Agwu A, Malebranche D. Barriers to the wider use of pre-exposure prophylaxis in the United States: a narrative review. Adv Ther. 2020;37(5):1778–1811. 10.1007/s12325-020-01295-0. [PubMed: 32232664]

24. Garcia J, Parker C, Parker RG, Wilson PA, Philbin M, Hirsch JS. Psychosocial implications of homophobia and HIV stigma in social support networks: insights for high-impact HIV prevention among Black men who have sex with men. Health Educ Behav. 2016;43(2):217–225. 10.1177/10901981155999398. [PubMed: 27037286]

25. Calabrese SK, Dovidio JF, Tekeste M, et al. HIV pre-exposure prophylaxis stigma as a multidimensional barrier to uptake among women who attend planned parenthood. J Acquir Immune Defic Syndr. 2018;79(1):46–53. 10.1097/QAI.0000000000001762. [PubMed: 29847480]

26. Quinn K, Dickson-Gomez J, Zarwell M, Pearson B, Lewis M. A gay man and a doctor are just like, a recipe for destruction”: how racism and homonegativity in healthcare settings influence PrEP uptake among young Black MSM. AIDS Behav. 2019;23(7):1951–1963. 10.1007/s10461-018-2375-z. [PubMed: 30565092]

27. Golub SA. PrEP stigma: implicit and explicit drivers of disparity. Curr HIV/AIDS Rep. 2018;15(2):190–197. 10.1007/s11904-018-0385-0. [PubMed: 29460223]

28. Brooks RA, Cabral A, Nieto O, Fehrenbacher A, Landrian A. Experiences of pre-exposure prophylaxis stigma, social support, and information dissemination among Black and Latina transgender women who are using pre-exposure prophylaxis. Transgend Health. 2019;4(1):188–196. 10.1089/trgh.2019.0014. [PubMed: 31482134]
29. Brooks RA, Landrian A, Nieto O, Fehrenbacher A. Experiences of anticipated and enacted pre-exposure prophylaxis (PrEP) stigma among Latino MSM in Los Angeles. AIDS Behav. 2019;23(7):1964–1973. 10.1007/s10461-019-02397-9. [PubMed: 30649635]

30. Eaton LA, Driffin DD, Smith H, Conway-Washington C, White D, Cherry C. Psychosocial factors related to willingness to use pre-exposure prophylaxis for HIV prevention among Black men who have sex with men attending a community event. Sex Health. 2014;11(3):244–251. 10.1071/SH14022. [PubMed: 25010553]

31. Kimball D, Rivera D, Gonzalez M 4th, Blashill AJ. Medical mistrust and the PrEP cascade among Latino sexual minority men. AIDS Behav. 2020;24(12):3456–3461. 10.1007/s10461-020-02916-z. [PubMed: 32405726]

32. 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. 2019;23(7):1737–1748. 10.1007/s10461-018-2283-2. [PubMed: 30264207]

33. Johnson LM, Green HD Jr, Koch B, et al. Role of social networks and social norms in future PrEP use in a racially diverse sample of at-risk women and members of their social networks. J Acquir Immune Defic Syndr. 2021;86(4):422–429. 10.1097/QAI.0000000000002571. [PubMed: 33196549]

34. Quinn KG, Christenson E, Spector A, Kelly JA. The influence of peers on PrEP perceptions and use among young Black gay, bisexual, and other men who have sex with men: a qualitative examination. Arch Sex Behav. 2020;49(6):2129–2143. 10.1007/s10508-019-01593-x. [PubMed: 32016815]

35. Phillips G 2nd, Neray B, Birkett M, Felt D, Mustanski B. Role of social and sexual network factors in PrEP utilization among YMSM and transgender women in Chicago. Prev Sci. 2019;20(7):1089–1097. 10.1007/s11121-019-00995-6. [PubMed: 30712223]

36. 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(4):1122–1138. 10.1007/s10461-017-1979-z. [PubMed: 29151200]

37. Calabrese SK, Earnshaw VA, Underhill K, Hansen NB, Dovidio JF. 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(2):226–240. 10.1007/s10461-013-0675-x. [PubMed: 24366572]

38. Ogunbajo A, Storholm ED, Ober AJ, et al. Multilevel barriers to HIV PrEP uptake and adherence among Black and Hispanic/Latinx transgender women in Southern California. AIDS Behav. 2021;25(7):2301–2315. 10.1007/s10461-021-03159-2. [PubMed: 33515132]

39. Biello KB, Bazzi AR, Mimiaga MJ, et al. Perspectives on HIV pre-exposure prophylaxis (PrEP) utilization and related intervention needs among people who inject drugs. Harm Reduct J. 2018;15(1):55. 10.1186/s12954-018-0263-5. [PubMed: 30419926]

40. Petroll AE, Walsh JL, Owczarzak JL, Bogart LM, Kelly JA. PrEP awareness, familiarity, comfort, and prescribing experience among U.S. primary care providers and HIV specialists. AIDS Behav. 2017;21(5):1256–1267. 10.1007/s10461-016-1625-1. [PubMed: 27885552]

41. Calabrese SK, Willie TC, Galvao RW, et al. Current US guidelines for prescribing HIV pre-exposure prophylaxis (PrEP) disqualify many women who are at risk and motivated to use PrEP. J Acquir Immune Defic Syndr. 2019;81(4):395–405. 10.1097/QAI.0000000000002042. [PubMed: 30973543]

42. Ojikutu BO, Mayer KH. Hidden in plain sight: identifying women living in the United States who could benefit from HIV preexposure prophylaxis. J Infect Dis. 2020;222(9):1428–1431. 10.1093/infd/jiaz416. [PubMed: 31549150]

43. Adimora AA, Schoenbach VJ, Doherty IA. HIV and African Americans in the southern United States: sexual networks and social context. Sex Transm Dis. 2006;33(7):S39–S45 (suppl). 10.1097/olq.0000228298.07826.68. [PubMed: 16794554]

44. Aral SO, Adimora AA, Fenton KA. Understanding and responding to disparities in HIV and other sexually transmitted infections in African Americans. Lancet. 2008;372(9635):337–340. 10.1016/S0140-6736(08)61118-6. [PubMed: 18657713]
45. Krakower D, Ware N, Mitty JA, Maloney K, Mayer KH. HIV providers’ perceived barriers and facilitators to implementing pre-exposure prophylaxis in care settings: a qualitative study. AIDS Behav. 2014;18(9):1712–1721. 10.1007/s10461-014-0839-3. [PubMed: 24965676]

46. Silapaswan A, Krakower D, Mayer KH. Pre-exposure prophylaxis: a narrative review of provider behavior and interventions to increase PrEP implementation in primary care. J Gen Intern Med. 2017;32 (2):192–198. 10.1007/s11606-016-3899-4. [PubMed: 27761767]

47. Siegler AJ, Bratcher A, Weiss KM, Mouhanna F, Ahlschlager L, Sullivan PS. Location location location: an exploration of disparities in access to publicly listed pre-exposure prophylaxis clinics in the United States. Ann Epidemiol. 2018;28(12):858–864. 10.1016/j.annepidem.2018.05.006. [PubMed: 30406756]

48. Ojikutu BO, Bogart LM, Mayer KH, Stopka TJ, Sullivan PS, Ransome Y. Spatial access and willingness to use pre-exposure prophylaxis among Black/African American individuals in the United States: cross-sectional survey. JMRI Public Health Surveill. 2019;5(1): e12405. 10.2196/12405. [PubMed: 30859481]

49. Siegler AJ, Mehta CC, Mouhanna F, et al. Policy- and county-level associations with HIV pre-exposure prophylaxis use, the United States, 2018. Ann Epidemiol. 2020;45:24–31 e3. 10.1016/j.annepidem.2020.03.013. [PubMed: 32336655]

50. Page KR, Martinez O, Nieves-Lugo K, et al. Promoting pre-exposure prophylaxis to prevent HIV infections among sexual and gender minority Hispanics/Latinxs. AIDS Educ Prev. 2017;29(5):389–400. 10.1521/aap.2017.29.5.389. [PubMed: 29067815]

51. Okoro ON, Whitson SO. Sexual health, HIV care and pre-exposure prophylaxis in the African immigrant population: a needs assessment. J Immigr Minor Health. 2020;22(1):134–144. 10.1007/s10903-019-00873-x. [PubMed: 30714945]

52. McDonald KM, Sundaram V, Bravata DM, et al. Closing the quality gap: a critical analysis of quality improvement strategies (volume 7: Care Coordination). Rockville, MD: Agency for Healthcare Research and Quality (U.S.). [PubMed: 30678776]

53. Vargas RB, Cunningham WE. Evolving trends in medical care-coordination for patients with HIV and AIDS. Curr HIV/AIDS Rep. 2006;3(4):149–153. 10.1007/s11904-006-0009-y. [PubMed: 17032573]

54. Mizuno Y, Higa DH, Leighton CA, Roland KB, Deluca JB, Koenig LJ. Is HIV patient navigation associated with HIV care continuum outcomes? AIDS. 2018;32(17):2557–2571. 10.1097/QAD.0000000000001987. [PubMed: 30102661]

55. Wheeler DP, Fields SD, Beauchamp G, et al. Pre-exposure prophylaxis initiation and adherence among Black men who have sex with men (MSM) in three U.S. cities: results from the HPTN 073 study. J Int AIDS Soc. 2019;22(2):e25223. 10.1002/jias.25223. [PubMed: 30768776]

56. Desrosiers A, Levy M, Dright A, et al. A randomized controlled pilot study of a culturally-tailored-counseling intervention to increase uptake of HIV pre-exposure prophylaxis among young Black men who have sex with men in Washington, DC. AIDS Behav. 2019;23 (1):105–115. 10.1007/s10461-018-2264-5.

57. Fox A, Payton T, Pettigew K, Thomas C, Drezner K. Increasing access to PrEP through dedicated navigation. In: Paper presented at: 2019 National HIV Prevention Conference; March 18–21, 2019. [PubMed: 31815532]

58. Wheeler DP, Fields SD, Beauchamp G, et al. Pre-exposure prophylaxis initiation and adherence among Black men who have sex with men (MSM) in three U.S. cities: results from the HPTN 073 study. J Int AIDS Soc. 2019;22(2):e25223. 10.1002/jias.25223. [PubMed: 30768776]

59. Dehlin JM, Issema R, Eavou R, et al. The motivational PrEP cascade guides interpretation of early PrEP linkage to care for young Black men who have sex with men: the case of Chicago’s PrEPLine. AIDS Educ Prev. 2019;31(6):491–504. 10.1521/aap.2019.31.6.491. [PubMed: 31815532]

60. Dehlin JM, Stillwagon R, Pickett J, Keene L, Schneider JA. #PrEP4Love: an evaluation of a sex-positive HIV prevention campaign. JMRI Public Health Surveill. 2019;5(2):e12822. 10.2196/12822. [PubMed: 3120141]

61. Reback CJ, Clark KA, Rünger D, Fehrenbacher AE. A promising PrEP navigation intervention for transgender women and men who have sex with men experiencing multiple syndemic health disparities. J Community Health. 2019;44(6):1193–1203. 10.1007/s10900-019-00705-x. [PubMed: 3137438]
61. Blackstock OJ, Platt J, Golub SA, et al. A pilot study to evaluate a novel pre-exposure prophylaxis peer outreach and navigation intervention for women at high risk for HIV infection. AIDS Behav. 2021;25(5):1411–1422. 10.1007/s10461-020-02979-y. [PubMed: 32748159]

62. Ramsey SE, Ames EG, Brinkley-Rubinstein L, Teitelman AM, Clarke J, Kaplan C. Linking women experiencing incarceration to community-based HIV pre-exposure prophylaxis care: protocol of a pilot trial. Addict Sci Clin Pract. 2019;14(1):8. 10.1186/s13722-019-0137-5. [PubMed: 30832717]

63. Kelly JA, Amirkhanian YA, Walsh JL, et al. Social network intervention to increase pre-exposure prophylaxis (PrEP) awareness, interest, and use among African American men who have sex with men. AIDS Care. 2020;32(sup2):40–46. 10.1080/09540121.2020.1739207. [PubMed: 32167374]

64. Young LE, Schumm P, Alon L, et al. PrEP Chicago: a randomized controlled peer change agent intervention to promote the adoption of pre-exposure prophylaxis for HIV prevention among young Black men who have sex with men. Clin Trials. 2018;15(1):44–52. 10.1177/1740774517730012. [PubMed: 28862483]

65. Patel VV, Ginsburg Z, Golub SA, et al. Empowering with PrEP (E-PrEP), a peer-led social media-based intervention to facilitate HIV pre-exposure prophylaxis adoption among young Black and Latinx gay and bisexual men: protocol for a cluster randomized controlled trial. JMIR Res Protoc. 2018;7(8):e1375. 10.2196/11375. [PubMed: 30154071]

66. Patel V, Rios N, Horvath K, et al. Empowering with PrEP (E-PrEP) - a peer-delivered online social network intervention for PrEP adoption among young Black and Latinx men who have sex with men: cluster randomized controlled trial. JMIR Res Protoc. 2018;7(8): e1375. [PubMed: 30154071]

67. Patel RR, Harrison LC, Patel VV, et al. HIV pre-exposure prophylaxis programs incorporating social applications can reach at-risk men who have sex with men for successful linkage to care in Missouri, USA. J Assoc Nurses AIDS Care. 2017;28(3):428–430. 10.1016/j.jana.2017.01.003. [PubMed: 28216178]

68. Liu A, Coleman K, Bojan K, et al. Developing a mobile app (LYNX) to support linkage to HIV/sexually transmitted infection testing and pre-exposure prophylaxis for young men who have sex with men: protocol for a randomized controlled trial. JMIR Res Protoc. 2019;8(1):e10659. 10.2196/10659. [PubMed: 30681964]

69. Biello KB, Marrow E, Mimiaga MJ, Sullivan P, Hightow-Weidman L, Mayer KH. A mobile-based app (MyChoices) to increase uptake of HIV testing and pre-exposure prophylaxis by young men who have sex with men: protocol for a pilot randomized controlled trial. JMIR Res Protoc. 2019;8(1):e10694. 10.2196/10694. [PubMed: 30617042]

70. Rouffiac AE, Whiteley L, Brown L, et al. A mobile intervention to improve uptake of pre-exposure prophylaxis for Southern Black men who have sex with men: protocol for intervention development and pilot randomized controlled trial. JMIR Res Protoc. 2020;9(2):e15781. 10.2196/15781. [PubMed: 32130196]

71. Jones J, Dominguez K, Stephenson R, et al. A theoretically based mobile app to increase pre-exposure prophylaxis uptake among men who have sex with men: protocol for a randomized controlled trial. JMIR Res Protoc. 2020;9(2):e16231. 10.2196/16231. [PubMed: 32130178]

72. Sullivan PS, Zahn RJ, Wiatrek S, et al. HIV prevention via mobile messaging for men who have sex with men (M-Cubed): protocol for a randomized controlled trial. JMIR Res Protoc. 2019;8(11):e16439. 10.2196/16439. [PubMed: 31730043]

73. van den Berg JJ, Silverman T, Fernandez MI, et al. Using eHealth to reach Black and Hispanic men who have sex with men regarding treatment as prevention and preexposure prophylaxis: protocol for a small randomized controlled trial. JMIR Res Protoc. 2018;7(7): e11047. 10.2196/11047. [PubMed: 30012549]

74. Pew Research Center. Mobile fact sheet. Washington, DC: Pew Research Center. https://www.pewresearch.org/internet/fact-sheet/mobile/. Published April 7, 2021. Accessed May 5, 2021.

75. Pew Research Center. Internet/broadband fact sheet. Washington, DC: Pew Research Center. https://www.pewresearch.org/internet/fact-sheet/internet-broadband/. Published April 7, 2021. Accessed May 5, 2021.

76. Clement ME, Johnston BE, Eagle C, et al. Advancing the HIV pre-exposure prophylaxis continuum: a collaboration between a public health department and a federally qualified health
center in the Southern United States. AIDS Patient Care STDS. 2019;33(8):366–371. 10.1089/apc.2019.0054. [PubMed: 31233329]

77. Kamis KF, Marx GE, Scott KA, et al. Same-day HIV pre-exposure prophylaxis (PrEP) initiation during drop-in sexually transmitted diseases clinic appointments is a highly acceptable, feasible, and safe model that engages individuals at risk for HIV into PrEP care. Open Forum Infect Dis. 2019;6(7):ofz310. 10.1093/ofid/ofz310.

78. Piper KN, Escoffery C, Sales JM, Sheth AN. Models of HIV pre-exposure prophylaxis care used in Title X family planning clinics in the Southern U.S. J Adolesc Health. 2021;68(3):480–487. 10.1016/j.jadohealth.2020.10.005. [PubMed: 33160826]

79. Brant AR, Dhillon P, Hull S, et al. Integrating HIV pre-exposure prophylaxis into family planning care: a RE-AIM framework evaluation. AIDS Patient Care STDS. 2020;34(6):259–266. 10.1089/apc.2020.0004. [PubMed: 32484743]

80. Sheth AN, Hussen SA, Escoffery C, et al. Pre-exposure prophylaxis integration into family planning services at Title X clinics in the Southeastern United States: protocol for a mixed methods hybrid type I effectiveness implementation study (phase 2 ATN 155). JMIR Res Protoc. 2020;9(9):e18784. 10.2196/18784. [PubMed: 32975528]

81. Wood BR, Mann MS, Martinez-Paz N, et al. Project ECHO: telementoring to educate and support prescribing of HIV pre-exposure prophylaxis by community medical providers. Sex Health. 2018;15 (6):601–605. 10.1071/SH18062. [PubMed: 30318034]

82. Ard KL, Edelstein ZR, Bolduc P, et al. Public health detailing for human immunodeficiency virus pre-exposure prophylaxis. Clin Infect Dis. 2019;68(5):860–864. 10.1093/cid/ciy573. [PubMed: 30020422]

83. Edelstein Z, Salcuni P, Restar A, Myers J, Tsoi B, Daskalakis D. Early adopters and incident PrEP prescribing in a detailing campaign, 2014–2015. In: Paper presented at: Conference on Retroviruses and Opportunistic Infections; February 22–25, 2016. https://www.croi-conference.org/abstract/early-adopters-and-incident-prep-prescribing-detailing-campaign-2014-2015/. Accessed May 5, 2021.

84. Standard nurse protocols for registered professional nurses in public health 2020. Georgia Department of Public Health Office of Nursing. https://dph.georgia.gov/media/65951/download. Updated April 12, 2021. Accessed May 5, 2021.

85. Overcoming PrEP access challenges with new nursing protocols. Centers for Disease Control and Prevention. https://www.cdc.gov/endhiv/action/stories/dekalb-county-nursing.html. Updated October 16, 2020. Accessed May 5, 2021.

86. Lopez MI, Cocohoba J, Cohen SE, Trainor N, Levy MM, Dong BJ. Implementation of pre-exposure prophylaxis at a community pharmacy through a collaborative practice agreement with San Francisco Department of Public Health. J Am Pharm Assoc (2003). 2020;60(1):138–144. 10.1016/j.japh.2019.06.021. [PubMed: 31405804]

87. Lopez MI, Grant RM, Dong BJ. Community pharmacy delivered PrEP to STOP HIV transmission: an opportunity not to miss!. J Am Pharm Assoc (2003). 2020;60(4):e18–e24. 10.1016/j.japh.2020.01.026. [PubMed: 32165026]

88. Tung EL, Thomas A, Eichner A, Shalit P. Implementation of a community pharmacy-based pre-exposure prophylaxis service: a novel model for pre-exposure prophylaxis care. Sex Health. 2018;15 (6):556–561. 10.1071/SH18084. [PubMed: 30401342]

89. State specific Tele-PrEP services. NASTAD. https://www.nastad.org/maps/state-specific-tele-prep-services. Accessed December 21, 2020.

90. Hoth AB, Shafer C, Dillon DB, Mayer R, Walton G, Ohl ME. Iowa TelePrEP: a public-health-partnered telehealth model for human immunodeficiency virus preexposure prophylaxis delivery in a rural state. Sex Transm Dis. 2019;46(8):507–512. 10.1097/OLQ.0000000000001017. [PubMed: 31295217]

91. Refugio ON, Kimble MM, Silva CL, Lykens JE, Bannister C, Klauser JD. Brief report: PrEPTECH: a telehealth-based initiation program for HIV pre-exposure prophylaxis in young men of color who have sex with men. A pilot study of feasibility. J Acquir Immune Defic Syndr. 2019;80(1):40–45. 10.1097/QAI0000000000001873. [PubMed: 30272632]
92. Siegler AJ, Mayer KH, Liu AY, et al. Developing and assessing the feasibility of a home-based preexposure prophylaxis monitoring and support program. Clin Infect Dis. 2019;68(3):501–504. 10.1093/cid/ciy529. [PubMed: 29982304]

93. Siegler AJ, Brock JB, Hurt CB, et al. An electronic pre-exposure prophylaxis initiation and maintenance home care system for nonurban young men who have sex with men: protocol for a randomized controlled trial. JMIR Res Protoc. 2019;8(6):e13982. 10.2196/13982. [PubMed: 31199326]

94. HIV.gov. Mail order now an option for Ready, Set, PrEP. Washington, DC: HIV.gov; Published January 25, 2021. https://www.hiv.gov/blog/mail-order-now-option-ready-set-prep.

95. HUD Exchange. 2019 AHAR: part 1 – PIT estimates of homelessness in the U.S Washington, DC: Department of Housing and Urban Development. https://www.hudexchange.info/resource/5948/2019-ahar-part-1-pit-estimates-of-homelessness-in-the-us/. Published January 2020. Accessed May 5, 2021.

96. Doblecki-Lewis S, Kobetz E, Byrne J, et al. PrEP on the Go! Implementation Mobile PrEP, STI, and HIV Prevention Services in South Florida. Open Forum Infect Dis. 2019;6(suppl 2):S65.

97. State PrEP assistance programs. NASTAD. https://www.nastad.org/prepcost-resources/prep-assistance-programs. Accessed December 21, 2020.

98. Washington State Department of Health. Pre-exposure prophylaxis drug assistance program (PrEP DAP). Olympia, WA: Washington State Department of Health; Published May 2019. https://www.doh.wa.gov/Portals/1/Documents/Pubs/150-055-PrEPDAPBrochure.pdf.

99. Ohio Department of Health. Prevention assistance program interventions (PAPI). https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/hiv-prevention/PAPI/PAPI. Updated July 19, 2021. Accessed August 9, 2021.

100. Hollingsworth A, Raman S, Sacks D, Wen K. Does providing insurance coverage reduce the spread of infectious disease? The impact of Medicaid expansions on HIV diagnoses [abstract]. Paper presented at: Association for Public Policy Analysis and Management Fall Res Conference; 2019. virtual. https://appam.confex.com/appam/2019/webprogram/Paper31657.html. Accessed May 5, 2021.

101. Baugher AR, Finlayson T, Lewis R, et al. Health care coverage and preexposure prophylaxis (PrEP) use among men who have sex with men living in 22 U.S. cities with vs without Medicaid expansion, 2017. Am J Public Health. 2021;111(4):743–751. 10.2105/AJPH.2020.306035. [PubMed: 33476242]

102. U.S. Preventive Services Task Force, Owens DK, Davidson KW, et al. Preexposure prophylaxis for the prevention of HIV infection: U.S. Preventive Services Task Force recommendation statement. JAMA. 2019;321(22):2203–2213. 10.1001/jama.2019.6390. [PubMed: 31184747]

103. Landovitz R, Donnell D, Clement M, et al. HPTN083 interim results: pre-exposure prophylaxis (PrEP) containing long-acting injectable cabotegravir (CAB-LA) is safe and highly effective for cisgender men and transgender women who have sex with men (MSM, TGW). Paper presented at: IAC Conference; July 6–10, 2020. virtual. https://programme.aids2020.org/Abstract/Abstract/10750. Accessed August 9, 2021.

104. HPTN, HIV Prevention Trials Network. HPTN 084 study demonstrates superiority of CAB LA to oral FTC/TDF for the prevention of HIV. Durham, NC: HPTN, HIV Prevention Trials Network. https://www.hptn.org/news-and-events/press-releases/hptn-084-study-demonstrates-superiority-of-cab-la-to-oral-ftctdf-for. Published November 9, 2020. Accessed May 5, 2021.

105. Introduction to COVID-19 racial and ethnic health disparities. Centers for Disease Control and Prevention. Updated December 10, 2020. https://www.cdc.gov/coronavirus/2019-ncov/community/health-equity/racial-ethnic-disparities/index.html. Accessed May 5, 2021.

106. Krakower D, Solleveld P, Levine K, Mayer K. Impact of COVID-19 on HIV preexposure prophylaxis care at a Boston community health center. Paper presented at: IAC Conference; July 6–10, 2020. virtual. https://programme.aids2020.org/Abstract/Abstract/11755TaggedEnd. Accessed August 9, 2021.

107. Marsh T COVID-19 causes a drop in fills for HIV prevention medications. GoodRx. 10 20, 2020 https://www.goodrx.com/blog/covid-19-causes-drop-in-hiv-medication-fills/. Accessed December 21, 2020.
108. Patel SY, Mehrotra A, Huskamp HA, Uscher-Pines L, Ganguli I, Barnett ML. Trends in outpatient care delivery and telemedicine during the COVID-19 pandemic in the U.S. JAMA Intern Med. 2021;181(3):388–391. 10.1001/jamainternmed.2020.5928.

109. PrEP during COVID-19. Centers for Disease Control and Prevention. Updated May 15, 2020. https://www.cdc.gov/nchhstp/dear_colleague/2020/dcl-051520-PrEP-during-COVID-19.htmlTaggedEnd. Accessed December 21, 2020.

110. Rodriguez JA, Betancourt JR, Sequist TD, Ganguli I. Differences in the use of telephone and video telemedicine visits during the COVID-19 pandemic. Am J Manag Care. 2021;27(1):21–26. 10.37765/ajmc.2021.88573. [PubMed: 33471458]

111. Beyrer C, Sullivan P, Adimora AA, Mayer K. HIV in the USA: priorities for the new administration. Lancet. 2020;396(10266):1862–1863. 10.1016/S0140-6736(20)32524-1. [PubMed: 33271131]

112. CDC awards $109 million to local areas and states for federal initiative to end the HIV epidemic in the U.S Centers for Disease Control and Prevention. https://www.cdc.gov/nchhstp/newsroom/2020/EHE-initiative-press-release.html. Published July 31, 2020. Accessed December 21, 2020.

113. CFAR/ARC Ending the HIV Epidemic supplement awards. NIH, National Institute of Allergy and Infectious Diseases. Updated September 28, 2020. https://www.niaid.nih.gov/research/cfar-arc-ending-hiv-epidemic-supplement-awards. Accessed May 5, 2021.
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, 232 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                                                           | Program description | N/A                                                                                      | N/A                                                                                 | 94,97–99   |
| 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.