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Behavioral and social science research to support accelerated and equitable implementation of long-acting preexposure prophylaxis

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Abstract

Purpose of review—The sociobehavioral research agenda for HIV prevention urgently needs to progress beyond research on end user preferences to examine how to best support patient access, engagement, and choice in the rollout of long-acting modalities. We outline critical challenges for an era of choice in biomedical prevention that could benefit from the rigorous application of sociobehavioral research methods.

Recent findings—Research in three areas could accelerate implementation of long-acting antiretrovirals for prevention: integrating dual process models into research on patient decision-making and behavior; identifying strategies that mitigate against unconscious and implicit biases in provider decision-making and behavior; and developing tools to support patient-centered communication that incorporate research in both of the first two areas.

Summary—We encourage the development of dual process models and measures to better understand patient behavior, including behavior related to initiating biomedical prevention, choice of prevention strategy, switching among strategies, and discontinuation. Second, there is the need to develop intervention research that targets provider behavior. Finally, we call for research to inform patient-centered communication tools that integrate an understanding of affective drivers of preexposure prophylaxis (PrEP) decision-making and protect against implicit bias in provider recommendations related to PrEP.

Keywords

HIV; long-acting antiretrovirals; preexposure prophylaxis; sociobehavioral research

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Conflicts of interest

There are no conflicts of interest.

INTRODUCTION

Biomedical prevention is recognized as a central component of global efforts to end the HIV epidemic, and multiple new long-acting formulations and delivery modalities are currently under development. Islatravir, a novel HIV nucleoside reverse transcriptase translocation inhibitor, is being tested both as a once-monthly oral pill in a Phase 2 study [1] and as an implant, which Phase 1 pharmacokinetic data suggest may protect against HIV for a full year [2]. A Phase 3 study testing the efficacy of long-acting Cabotegravir will reach full enrollment by the end of 2019, with efficacy results projected for the first quarter of 2022 [3]. There is substantial evidence that patients and their providers will enter an era of choice in biomedical HIV prevention methods in the near future.

Despite the promise of biomedical prevention choice, there are significant concerns about fundamental inequities in PrEP rollout. Fewer than 10% of Americans at substantial risk of HIV have adopted daily oral PrEP [4,5] and the rest of the world lags even further behind [6,7]. Based on 2016 US PrEP prescription data, of MSM with PrEP indication, 9% of white men initiated PrEP, compared with less than 1% of black and 2% of Hispanic/Latino men [8] despite the fact that 38% of MSM newly infected were black and 29% were Hispanic/Latino [9]. Differences in persistence on PrEP will further exacerbate these inequities, as recent studies suggest that youth, transgender women, publicly insured individuals, and those with comorbid mental health and substance use conditions have higher risk of PrEP discontinuation [10–18]. The fundamental challenge for expanding HIV prevention options is ensuring a concomitant expansion in PrEP coverage, that is, ensuring that the introduction of new PrEP modalities expands access and reduces disparities in PrEP uptake, rather than simply providing alternatives for patients already engaged in PrEP.

There is increasing awareness of the importance of sociobehavioral research to both ensure successful implementation of new modalities as they become available; and mitigate against the continuation of existing health inequities. Implementation of daily oral PrEP was delayed by lack of formative sociobehavioral research to understand how PrEP would not only be integrated into clinical practice, but into the lives of diverse, often times socially disadvantaged sexually active people, a pattern that many anticipate will be replicated with new modalities [19–22]. Despite this growing awareness, limited innovative, integrative sociobehavioral research has been done to prepare for implementation of emerging modalities. Studies conducted so far, including our own work, have focused primarily on understanding preferences among modalities [23,24,25–27], but have been limited in their application of sociobehavioral theory and methods. The sociobehavioral research agenda urgently needs to progress beyond research on *end user modality preferences* toward research supporting patient access, engagement, and choice within clinical settings and health systems.

Below, we outline three challenges of particular importance as we prepare for an era of choice in biomedical HIV prevention that are addressable through the rigorous application of sociobehavioral research methods. These include: first, integrating dual process models into research on patient decision-making and behavior; second, identifying strategies that mitigate against unconscious and implicit biases in provider decision-making and behavior;

and third, developing tools to support patient-centered communication that incorporate research in both of the first two areas and promote effective, equitable access and sustained engagement with emerging long-acting prevention modalities.

Challenge 1: integrating dual-process models into research on patient decision-making and behavior

As noted above, the majority of research on emerging PrEP modalities has focused on patient preferences, asking high-priority populations to use rational, deliberative processing to compare attributes, rate likelihood of uptake, or report rank choice among emerging options [23,24[■],28,29[■],30[■]]. Although the public health field has largely understood patient choice to be driven by rational decision-making processes, sociobehavioral scientists have long understood that people process information through two separate systems that operate in parallel to regulate thoughts, feelings, and behavior [31[■]]. Referred to as ‘dual process models,’ these frameworks distinguish between *System 1* (often called the ‘hot’ system), characterized by fast, automatic, and affect-based processing, and *System 2* (often called the ‘cold’ system), characterized by slow, effortful, rule-based and cognitive processing. Extensive research suggests that health behavior is guided by *both* effortful processing and by a non-conscious, impulsive, and affective system [32–34]. ‘Gut reactions,’ affective evaluations, and anticipated affective responses to health-related decisions significantly predict health behavior when standard cognitive predictors (e.g., attitudes, social norms, self-efficacy) are held constant [35]. The approach/avoidance impulse is another pathway through which System 1 factors operate to impact health behavior and decision-making [36–39]. Affectively-driven avoidance or denial plays a role in preventing individuals from learning about their health status (e.g., avoidance of breast cancer screenings, HIV testing) [40,41[■]], as well as from engaging in preventive behaviors (i.e., diabetes and heart disease risk-reduction) [42]. These findings may be particularly relevant to PrEP uptake and modality choice, as a negative affective reaction to a biomedical HIV prevention strategy – for example, a fear of needles – may engage an avoidance impulse that prevents a patient from learning more information about available prevention options. Avoidance of health information may be particularly strong among individuals who have experienced past discrimination or mistreatment in medical settings, suggesting that this impulse could especially impact engagement in PrEP decision-making in high-priority populations [43,44].

There are several indications that affective and implicit processes may influence PrEP uptake, adherence, and persistence. First, multiple studies have documented the ‘disconnect’ between patients’ objective risk profiles and their risk perception or whether they think of themselves as ‘PrEP candidates’ [45[■],46[■],47,48]. This inconsistency between ‘objective’ and ‘subjective’ risk assessment is a central component of past research on affective and implicit influences on health behavior [49,50]. Second, there is increasing evidence for the affective impacts of PrEP on patients, and for the importance patients place on these affective components in PrEP decision-making [51[■],52–54]. Finally, one of the consistent barriers to engagement in PrEP programs for highest priority populations has been medical mistrust [55–57]. While many patients have valid, rational reasons to mistrust providers and healthcare systems (including historical and present-day mistreatment and discrimination in

medical settings), this mistrust *operates* through affective and implicit processes to shape attitudes and behaviors [58,59]. Creating systems that recognize and address affective barriers to healthcare engagement has the potential to increase access in a manner that reduces health inequity.

Understanding affective processes impacting PrEP attitudes and intentions has important implications for long-acting PrEP. As noted above, our current strategies for encouraging uptake –engaging patients in risk assessments and/or providing them with cognitively-focused education about PrEP options–has achieved only limited success, especially in engaging highest priority populations. Some of the most effective PrEP messaging has focused primarily on its affective benefits [60], but it has been challenging to translate these ideas into patient education or clinical tools at the level of an individual client encounter. These challenges are likely to be exacerbated in an era of greater PrEP choice, when deciding among a menu of modalities will require dual-processing of both cognitive and affective evaluations [58,61,62].

Challenge 2: mitigate against unconscious and implicit biases in provider decision-making and behavior

The second challenge for sociobehavioral science research is the need for increased attention to the impact of provider behavior on PrEP outcomes, including both uptake and persistence. In the early days of PrEP rollout, attention was focused on providers' PrEP awareness and their willingness to prescribe according to centers for disease control and prevention (CDC) guidelines. Large-scale provider surveys conducted in 2013–2015 documented significant variability in providers' awareness of and willingness to integrate PrEP into their practice [63,64]. Less supportive providers indicated concerns about patient adherence, high cost of the medication, its efficacy for their patient population, and its potential to engender risk compensation. Consistent with what Krakower *et al.* [65] termed the 'purview paradox', most providers in these survey samples were supportive of PrEP as an intervention in the abstract, but were reluctant to integrate it into their own practice [66]. In more recent years however, data on PrEP integration into primary care, sexual health clinics, and infectious disease specialty care suggests that many providers have been able to move beyond the purview paradox and are actively prescribing PrEP to patients [67].

These trends suggest that both increasing provider awareness of PrEP guidelines and enhancing training around prescription practices can make a real difference for implementation. However, as noted above, systematic inequities in PrEP access, uptake, and retention limit their sustained impact on incidence in highest priority populations. The majority of current research on health inequities has focused on patient-level factors (e.g., low perceived risk, concerns about side effects) [68,69] or *systems-level* factors (e.g., the high cost set for Truvada by Gilead, limited availability of clinic appointments outside patients' work hours) [56,68–71]. However, there are several reasons to believe that *provider-level* factors may also play a significant role in promoting and sustaining health inequities.

Research suggests that the dual process models described above are equally important for understanding provider behavior, particularly in assessment of PrEP eligibility and

‘appropriateness.’ Studies of provider behavior demonstrate a susceptibility to a range of known decision-making biases, ranging from reliance on heuristics (e.g., availability, representativeness) to failure to consider alternative explanations or courses of action [72]. In their dual-process model of diagnostic reasoning, Croskerry [73] note two categories of biases that may be particularly relevant to PrEP. The first is the problem of automaticity, which refers to situations in which practiced or routine tasks are accomplished ‘without thinking.’ In the context of PrEP, routinization of risk assessment tools may prevent providers from recognizing the complex behavioral, relational, and contextual factors that inform the prevention needs and decisions of their patients. For example, traditional PrEP eligibility assessment tools (e.g., ‘In the past 6 months, have you had condomless anal sex with a partner whose HIV status you did not know?’) fail to consider future behavior (e.g., a patient who just broke up with a partner and may have this experience in the *next* 6 months), relationship dynamics (e.g., a patient who believes her partner is HIV-negative, but doesn’t know that partner has outside partners) or social networks (e.g., a patient who is highly anxious about HIV infection because they know the HIV prevalence rate in their community). Similarly, default beliefs about the acceptability and suitability of long-acting agents for particular subpopulations could lead to automatic prescription of specific formulations based on group identity rather than by providers’ attending to the specificities of individual patients’ lives.

Second, there is evidence that providers’ implicit biases and/or affective responses to patients can lead to inequitable diagnosis and treatment [74–76]. Like all members of society, healthcare providers are not immune to racism, sexism, classism, homophobia, or transphobia that can have insidious impacts on behavior and decision-making [77]. Some of the only experimental research conducted on provider behavior as it relates to PrEP prescription demonstrated that medical students were less likely to prescribe PrEP to Black patients compared with their white counterparts, and that this bias was mediated by beliefs about a greater likelihood of risk compensation among Black patients [78]. Survey studies indicate that providers are also less likely to prescribe PrEP to patients with multiple sex partners, those with a substance use history, and ‘high-risk heterosexuals,’ which may be code for people of color [79,80]. In the case of PrEP, the very factors that might make a patient need PrEP the most are the same factors that bias providers against prescribing it to them [81,82■].

Challenge 3: developing tools to support patient-centered communication

The first two challenges laid out above lead directly to the third challenge that sociobehavioral research could usefully address: the need for tools to support provider-patient communications around HIV prevention. Choosing among HIV prevention strategies is a preference-sensitive health decision, meaning there is no single ‘best’ option and several options with known harms and benefits can be considered. Preference-sensitive health decisions are best supported through patient-centered communication, comprised of elicitation and understanding of patient perspectives; understanding patients within their unique psychosocial and cultural contexts, and reaching a shared understanding of patient concerns and treatment options concordant with patient values [83]. Quality of physician communication has been strongly associated with patient satisfaction [84–89], with clear

negative consequences when communication is overly directive [90,91]. Studies show weaker, though still positive associations between communication skills and other patient outcomes such as recall of information from the clinical encounter, patient understanding of treatment recommendations, and adherence to therapy [92–98].

Such communication requires the use of specific behavioral skills, for example, utilizing open-ended questions, active empathetic listening, avoiding jargon and complexity, and showing interest in the patient as a person [99]. However, the ways in which PrEP programs have been operationalized have not prioritized providers' use of these behavioral skills. In contrast, the structure of PrEP services may promote the automaticity and related biases described above. For example, eligibility is commonly determined using close-ended risk behavior questions, often administered in a checklist format that prioritizes efficiency at the expense of communication. PrEP-related counseling has been focused on conveying information to potential users on the clinical aspects of the medication (e.g., side effects, dosing, adherence) while neglecting to understand patient values. A clinical encounter that requires a decision among multiple modalities is likely to exacerbate the challenge of PrEP decision-making and may rely even more on such behavioral skills to successfully initiate and sustain a patient on PrEP.

The use of decision aids as a tool to support patient-centered communication has been shown to decrease decisional conflict, increase knowledge and accurate risk assessment, and increase satisfaction with the decision-making process [100–103]. In addition, there is evidence that patient decision aids are particularly beneficial to patients who have been underserved by traditional healthcare systems, especially when tools are tailored to their needs [104–109]. Tools tailored for particular populations may be attentive to low literacy levels [105], and to the specific concerns of racial, sexual and sex minority patients [106,110–112]. Importantly, studies have demonstrated that the use of decision aids can be effective in protecting against implicit bias in providers' treatment recommendations [110,113,114].

CONCLUSION

We conclude with three recommendations for research in this area that could begin now to prepare the HIV prevention field for the mid-2020s and accelerate access to emerging PrEP modalities. First, we encourage the development of dual process models and measures to better understand patient behavior around HIV prevention, including behavior related to initiating biomedical prevention, choice of prevention strategy, switching among strategies, and discontinuation. Second, there is the need to develop intervention research with providers. The majority of provider research is survey-based or interview-based and there have been few interventions targeting provider behavior directly. The provider interventions that have been tried have not impacted patient behavior, likely because they did not prompt providers to ask more questions, show more empathy, or engage more deeply with patients [115]. Providers are an unrecognized 'hard to reach' or 'hard to engage' population [116] – but new strategies that focus on increasing the perception of relevance of the research to their own clinical practice could be developed. Third, we call for research to develop tools to support patient-centered communication that integrate an understanding of affective drivers

of PrEP decision-making and protect against implicit bias in provider recommendations related to PrEP. Such a research agenda could proactively prepare patients, providers, clinics, and health systems for a future in which availability of more HIV prevention options translates rapidly to greater population coverage of PrEP and subsequently, a higher number of HIV cases averted.

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KEY POINTS

- Behavioral and social science research has an important role to play in preparation for an era of choice in biomedical HIV prevention that includes long-acting antiretrovirals.
- Research is needed that integrates dual process models to understand patient decision-making and behavior.
- There is an urgent need to identify strategies that mitigate against unconscious and implicit biases in provider decision-making and behavior.
- Tools to support patient-centered communication should incorporate research on affective drivers of patient and provider behaviors.
- Designing HIV prevention services that respond to the findings of the above research areas could promote effective, equitable access, and engagement with emerging long-acting prevention modalities.