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What People Want From Sex and PrEP

Robert M Grant, MD, MPH[1,2,3] and **Kimberly A Koester, MA**[2]

[1]Gladstone Institutes, San Francisco, CA, USA

[2]University of California, San Francisco, CA, USA

[3]San Francisco AIDS Foundation, San Francisco, CA, USA

Abstract

Purpose of review: As demand for pre-exposure prophylaxis increases, we are learning more about what people want from sex and PrEP.

Recent findings: PrEP demand has reached a tipping point in the United States and is increasing rapidly. While the primary benefit of pre-exposure prophylaxis use is biological, to reduce risk of HIV infection, PrEP users often express an alternative set of social and emotional benefits that are provided by PrEP. These collateral benefits of PrEP have salience, affect, and are experienced in the present, which are compelling drivers of human behavior. PrEP use has been associated with feeling safe during sex, usually in contrast to ruminations related to fear of HIV or intimate partner violence or control. PrEP can create empowerment, or agency, defined as the capacity and autonomy to act on one's own behalf, because it provides control over one's vulnerability to HIV and relief to women and men who may otherwise worry about whether their partners will use a condom, take antiretroviral therapy, or disclose their HIV status accurately. Planning for sexual and social goals in calm moments is also empowering. These highly desired collateral benefits of PrEP could be undermined, or eliminated, if PrEP is implemented in ways that are coercive or that foment fear of sexual risk compensation, drug resistance, toxicity, or moral judgment.

Summary: Current PrEP implementation provides direct and indirect benefits that are highly desired.

Keywords

HIV; pre-exposure prophylaxis; sexual practices; agency

Introduction

The experience of PrEP users provides important insights into sexual practices and motivations to use PrEP, which go beyond wanting to stay free of HIV. We review emerging

Corresponding Author: Robert M Grant, MD, MPH 1650 Owens Street San Francisco, CA 94158 Tel 415-350-8909 Robert.grant@ucsf.edu.

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literature on the everyday experiences of PrEP users, which emphasizes the importance of benefits that are salient, experienced in the present, and have strong affect.

Demand for PrEP reached a tipping point in the United States

Knowledge and use of PrEP remained low for several years after the publication of research findings demonstrating safety and efficacy (1–4). More recent information indicates that PrEP demand in the United States hit a tipping point in late 2013, and has increased 332% during 2014 (5). The database used for this analysis reflects only 39% of prescriptions dispensed and does not account for dispensations supported by patient access programs, demonstration projects, nor prescriptions filled by public insurance. According to this limited database, 8512 persons had been dispensed PrEP. Thus one low estimate of the total numbers having received PrEP in the United States would be 21,825 (8512/0.39). Large increases in demand for PrEP during 2014 were reported in San Francisco (6–8) and New York (9).

The growing demand for PrEP in the United States is consistent with the high proportion of participants in open-label demonstration projects who elect to start PrEP when it is offered. Uptake of PrEP was 76% in the iPrEx open label extension (10), 60% in the US demonstration project in sexual health clinics (11), >95% in the Partners Demonstration Project (12), and 86% in the TDF2 open label extension (13). Uptake was high regardless of whether or not the person had prior experience in a PrEP trial, whether the person was in the United States or Africa, or whether the person was a man or a woman. Prior knowledge of PrEP was associated with about 1.5 fold higher uptake (11).

Even as demand grows, it is clear that not everyone vulnerable to HIV wants PrEP. The most common reasons for refusing PrEP when offered include fear of side effects and toxicity (10). Other reasons are fear of stigma arising from perceptions of promiscuity, sexual orientation, or HIV status. Some refuse PrEP because of inexperience with taking oral tablets, and perception of low HIV risk.

Insights from behavioral economics regarding PrEP demand.

Behavioral economics is a field that arose from psychology and economics to understand what drives human behavior (14, 15). Lineemayr identifies three common themes from behavioral economics that are likely drive the use, or non-use, of biomedical prevention strategies: *salience, present-bias,* and *affect* (16).

Salience is the tendency for people to act on information that first comes to mind rather than making use of all available knowledge. Salient information that can bias perceptions of risk and influence sexual behavior includes a prospective partner's healthy appearance (17, 18), although such perceptions about a partner's serostatus are often incorrect (19, 20). Effective PrEP use mitigates the consequences of HIV serostatus misperceptions.

Present-bias is the tendency of people to respond to short-term temptations at the expense of long-term benefits. Present concerns about social connections, staying in school, avoiding violence, finding housing and employment often eclipse concerns about HIV, which

becomes a threat over the long term (21). As noted below, PrEP's collateral benefits are typically experienced in the present, which makes them compelling drivers of PrEP demand.

Affect is when the decisions people make are impacted by their emotional state. Loewenstein characterizes hot and cold affective states that differ in how decisions are made (22). Sexual intercourse, and the period leading to it, are affectively hot states during which plans for condom use, serodisclosure, or non-penetrative sex may be forgotten. PrEP does not require action during hot states; rather PrEP is sought and taken during "cold" states during which longer term goals can be contemplated and pursued. PrEP provides an opportunity to plan for how sex often disrupts expectations and plans (23).

Importantly, the processes elucidated in behavioral economics commonly influence all decision-making, including decisions made by political leaders, organizations, scientists, health care providers, community advocates, and patients. Examples relevant to PrEP are the low level of knowledge of PrEP among general practitioners (*salience*), hesitancy to invest now to avoid paying more for the HIV epidemic later (*present-bias*), and fear of sex (*affect*).

PrEP works when taken

Belief in PrEP efficacy is an important motivator of adherence (24). Indeed, the tipping point in demand for PrEP in the U.S. came soon after publication that PrEP works well when taken (25–27) and this information circulated in social media (see post from Damon Jacobs on July 1, 2013 at https://www.facebook.com/groups/PrEPFacts/). Perhaps more importantly, PrEP demonstration projects were well underway providing salient, present, and affective anecdotes from PrEP users who were having sex and avoiding HIV infection (10, 11).

A comparative study of efficacy messaging compared 'gist' messages like "Prep works when taken" with quantitative messages like "PrEP is more than 90% effective when taken daily" (28). The gist messages were preferred and motivating for adherence. There was confusion and misunderstanding about how to interpret the quantitative messages. Aversion to ambiguity, another concept from behavioral economics, is known to undermine action (29). This bias is strong when choices that appear to have certain benefits are compared with choices having possibly greater but less certain benefits; If choices are made one at a time, ambiguity aversion is less important (29). If so, the science practice of quantitatively comparing efficacy between prevention interventions creates a quagmire that undermines the will to adopt any intervention at any level. These comparisons are less helpful when diverse interventions are compatible with each other, such as condoms, treatment, and PrEP. Simplifying the question to "should I take (or provide) PrEP?" and providing information that "PrEP works when taken" was pivotal for fostering demand and adherence. More effective management of ambiguity aversion could also increase uptake of HIV treatment.

Pleasure

PrEP users have reported that PrEP enhances sexual pleasure, and that this is sufficient motivation for their using PrEP (30). Sexual pleasure may have multiple dimensions including bonding (31), intimacy (32–34), spontaneity (24), and adventure (23), all of which are potentially enhanced by PrEP. Perhaps more importantly, PrEP is shaping users

relationship to sex in meaningful ways (40) thus creating an opportunity to expand our depth of understanding of sexual practices. Kane Race, cultural studies scholar, observed that PrEP has created opportunities to consider pleasures and perils of sexual practices more fully…

> "…one of the tacit commitments of HIV prevention science is to manage the affective intensities and complications of sex. These days it is possible to sit through entire conferences apparently devoted to HIV prevention in which the issue of sexual practice is barely mentioned…. One of the new prevention strategies that, despite its biomedical lineage, has thus far been unable to shake its contaminating associations with the apparent excesses of sexual pleasure is PrEP" (23).

Race pushes us to recognize that HIV prevention research has become arguably divorced from sex, or worse, is antagonistic towards sex. This may not be unusual given how few sex positive messages are available in the cultural milieu. The antagonism associated with sex and HIV prevention may be considered a form of stigma. Stigma of this nature is too often reinforced by medical providers who serve as gatekeepers to biomedical interventions and may subtly convey stigmatizing messages about sexual behavior rather than adopting a sexual wellness approach.

PrEP and intercourse without a condom.

PrEP is attractive to some people because it allows for sexual intercourse without a condom with less risk of HIV. Qualitative research has consistently shown that serodiscordant couples prioritize relationship factors i.e., intimacy over and above the use of condoms (35–39). When condoms are perceived to interfere with intimacy, they are less likely to be used (33). PrEP has created opportunities to recognize previously unarticulated concerns about condoms including decreases sensation, interference with erectile function, and disruption of spontaneity. PrEP is prefentially being taken up by people who are not using condoms consistently (10, 11).

Less fear during sex.

PrEP use reduces fear of HIV (40, 41). PrEP has created a space for users to voice the deeply felt fears associated with becoming infected with HIV (42) and for many PrEP has been an antidote to those fears. Feeling safe during sex is a present-oriented benefit that has strong affective value, and is salient (readily perceived). As such, this benefit of PrEP may be valued more highly than PrEP's actual capacity to prevent HIV infection, although the two are related. This benefit is best expressed by PrEP users themselves in the following quotes:

> "At the beginning of the interview I said HIV scared me. Even when I was being safe it scared me. I don't want to say it doesn't scare me, but I think it scares me less now, if that makes any sense? . . . So, in general, the anxiety, the HIV anxiety, is gone. I won't say it's gone-gone. But it's not in the front of my head as it used to be, where I was obsessively worried about it while sex was happening" *iPrEx OLE participant* (40).

> "PrEP would allow me to have sex without fear for the first time in my life. It would remove that month long hangover of psychological anguish after sex,

> worrying about whether or not I might have put myself at risk of HIV and looking for the slightest sign. If I get a cold or a rash my mind will instantly jump to conclusions because of the anxiety I have around HIV" *HIV seronegative gay man* (43).

As indicated by the previous quotes, fear of acquiring HIV infection has been a preoccupation for many gay men. In a survey conducted in New York, 49% percent of MSM reported thinking about HIV most of the time or all of the time during sex (44). Once PrEP became available, a set of "fringe" benefits (a phrase invented by Gilmore (41)) quickly surfaced including decreased anxiety, decreased depression, and decreased sexual compulsivity (45).

Notwithstanding predictions from theories of risk compensation, diminished fear of HIV has not been associated with increases in risky behavior (1–4, 46–48). In general, sexual practices remain unchanged or tend to become safer during PrEP use, both in the context of clinical trials and demonstration projects. Reasons for safer behavior may arise from testing and counseling services that are provided as part of PrEP services, although such testing and counseling of HIV negative people was not highly effective when offered as stand alone services (49). In addition, PrEP may lead to safer sexual practices by fostering relationships (31), increasing interactions with HIV positive people, and through daily contemplation of HIV during calm (affectively "cold" moments).

Less HIV stigma

HIV stigma negatively impacts both HIV positive and HIV negative people (42). PrEP diminishes HIV stigma, as revealed in the following quote from a gay man in the United States.

> "I'm a HIV positive man, I'm on treatment and I'm undetectable; so it's really unlikely I'm going to pass HIV on to my partner. But relationships can be a challenge as HIV can be a big barrier between me and guys I date. Sometimes sex lacks intimacy and you don't always get close to each other. There's always that fear in the back of your mind that HIV could be passed on. If we had PrEP it would take that fear away." *HIV positive gay man* (43).

Rather than serving as a wedge between people infected and uninfected with HIV, PrEP facilitates greater interaction between HIV negative and positive people, including the possibility of safer sexual interactions. Such interactions lead to increased sensitivity to HIV issues, and greater inclusion of HIV positive people in social networks that were previously exclusionary (50, 51). Among HIV seronegative people, such preference for sexual partners who are also seronegative, or serosorting, is not known to be effective (52). Acute HIV infection, delays in HIV testing, miscommunication are some ways that seronegative serosorting can fail to prevent HIV transmission. The social harms of serosorting have included its fostering HIV stigma, by excluding HIV positive people from social networks. Seronegative men on PrEP find that they have more opportunities for dating and partnerships, learn more about HIV, and in general are less inclined to be suspicious of a partner's purported negative HIV status.

Preservation of valued relationships

PrEP provides a way to further stabilize couples in serodiscordant relationships. Qualitative research identified that love in the relationship was a major driver of adherence and PrEP uptake (31). Serodiscordant status threatens these relationships creating a dilemma about whether to stay in the relationship despite the threat of HIV transmission. PrEP was perceived as a solution to this serodiscordant dilemma. These quotes come participants in a research study of PrEP for serodiscordant couples before PrEP was proven (31).

> "I feel stuck. I love my wife. I want to have sex. I don't like condoms. I don't want to get infected, either. It's not easy. It's difficult. It's a dilemma."

> "I wanted to stay married to my partner because we fell in love. What happened, happened. I found myself negative when she is positive. I still want to be with my wife. So when the doctor told us about this study, I saw it as an opportunity. You never know, it might work!"

Safer conception

PrEP has a role to play in safer conception. Couples had the highest level of adherence to PrEP during the peri-conception period (53). Safer conception technologies for serodiscordant couples in which the man is HIV positive include use of sperm donations, sperm washing with in vitro or in utero insemination, suppressive antiretroviral therapy, and PrEP. Given that growing families are appropriately risk adverse, such safer conception technologies are often used in combination (54). Assisted conception services are not available in all places, and can be expensive. There is some evidence that assisted reproductive services are not always desired (55) nor is it always available or affordable. PrEP provides an extra layer of protection for couples desiring pregnancy, allows use of the partner's semen for fertilization, and reinforces intimacy and strengthening relationships.

Agency

Some PrEP users reporting feeling empowered (56). The empowerment comes from having control over one's own protection, rather than relying on partners to use condoms, take antiretroviral therapy, or accurately disclose their HIV serostatus. Empowerment also comes from planning for sex and safety in calm (or cold) moments, which allows more proactive consideration of sexual and partnership goals. PrEP can be used anytime during the day and without the knowledge of sexual partners. As such, PrEP is one of the only prevention interventions that is controlled by the receptive partners.

Adaptability

People want prevention strategies that can be adapted to situations when HIV risk is most present and salient. PrEP is adaptable in that the tablet can be taken any time during the day, with or without food, and started and stopped as needed. The preferential use of PrEP during periods of highest risk is the basis for a novel concept of "prevention effective adherence" (57).

People move in and out of seasons of risk (58). Seasons of risk can begin with the breakup of a long-term relationship, with substance use, migration to a new city, or coming out as a

gay man. People want to stop PrEP if they find other ways to protect themselves. As such PrEP may serve as a bridge to a variety of protective, health-promoting conversations: relationship agreement with new or existing partner(s), to suppressive therapy with an HIV positive partner (59), to managing use of stimulants that may disrupt perceptions of risk, to access to clean injection materials, or becoming empowered to insist on condoms among sex work clients.

People seeking to adapt PrEP to their seasons of risk want some guidance on how to start and stop PrEP. Pharmological modeling and observed relationships between effectiveness and drug concentrations suggests that 5 to 7 doses of PrEP (using emtricitabine and tenofovir disoproxil fumarate) are required for full protection for rectal exposure to HIV (60). Fewer tablets appear to provide some protection (10). Full protection from vaginal exposure is less well known but likely requires a longer loading period; the Centers for Disease Control (CDC) estimates a 20-day period (61) which is consistent with pharmacological modeling of vaginal drug concentrations (62). Less information is available about how to stop PrEP, although it is reasonable to suggest using PrEP for 28 days after the last possible exposure to HIV (63). This emulates PEP recommendations and provides time for people to consider whether the most recent exposure to HIV will be the last.

One way to adapt PrEP dosing to people's sexual practices would be through non-daily dosing before and after sex. Dosing FTC/TDF PrEP before and after sex was shown to be effective in the Ipergay trial of MSM (64). The Ipergay participants reported frequent sexual activity (several times per week), leading to average use of 16 PrEP tablets per month. This level of PrEP use was associated with nearly 100% protection in the iPrEx open label extension, which recommended daily use of PrEP, although adherence varied (10). More evidence is needed on non-daily dosing and for now, daily PrEP dosing is recommended by the FDA and the CDC in the United States (61). In an open-label PrEP study that included a randomized comparison of daily versus sex-event driven dosing, daily dosing was associated with higher coverage of sex events with pre- and post sex dosing, higher adherence, and higher concentrations of drug (65–67). Higher concentrations of drug provide more forgiveness for occasional missed doses.

Uncertainties about implementation

These highly desired collateral benefits of PrEP could be undermined, or eliminated, if PrEP is implemented in ways that overly focus on "getting pills into bodies" (67). PrEP programs that are overly focused on the strictly biological aspects e.g., medical appointments and adherence, rather than on how PrEP may fit with people's sexual and social goals, could become tacitly or overtly coercive. Fomenting shame of sexual practices under the rubric of "risk compensation" is another hazard that could undermine implementation, agency, and adherence. Fear of drug resistance and toxicity is not warranted based on recent evidence, and inciting these fears undermines the creditability of antiretroviral medications used for both treatment and prevention.

Conclusion

Much will be learned from PrEP use. Further study to understand to the extent to which concepts such as agency, preservation of relationships, and pleasure resonate for young persons (particularly women) in high prevalence settings is an important next step in PrEP research. While the intended purpose of PrEP was to lower the incidence of HIV infection, PrEP users report being attracted to benefits that are salient, affective, and occur in the present. Such PrEP benefits include more pleasure, more intimacy, stronger relationships, feeling safer, less stigma, feeling empowered by planning for sexual and partnership goals, and ability to plan families. Creating an compelling narrative around sexual and social goals was an important lesson learned from successes in perinatal transmission prevention (68). Focus on these benefits will provide insights and connections that may bolster our struggle to end HIV transmission.

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Key points

- Demand for PrEP reached a tipping point in the United States in 2013, with rapidly expanding use during 2014.
- PrEP users report fringe benefits including feeling safer during sex, less anxiety, less HIV stigma, and stronger relationships.
- Insights from the field of behavioral economics suggest that PrEP's fringe benefits are compelling because they have salience, affect, and are experienced in the present.
- PrEP empowers users by allowing greater control over their HIV risk, rather than relying on partners to use condoms, take antiretroviral therapy, or accurately disclose their serostatus.
- PrEP inspires people to plan for sexual and social goals during calm moments, when multiple options can be considered with longer-term benefits.