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Sam Wilson Cole
Johns Hopkins Bloomberg School of Public Health

Jennifer L. Glick
LSU Health Sciences Center - New Orleans, jglic1@lsuhsc.edu

Nicola B. Campoamor
The Ohio State University College of Medicine

Travis H. Sanchez
Rollins School of Public Health

Supriya Sarkar
ViiV Healthcare

BMJ Open

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Sam Wilson Cole ,[1,2] Jennifer L Glick,[1,3] Nicola B Campoamor,[4] Travis H Sanchez,[5] Supriya Sarkar,[6] Vani Vannappagari,[6] Alex Rinehart,[6] Keith Rawlings,[6] Patrick S Sullivan,[5] John F P Bridges[4]

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For numbered affiliations see end of article.

Correspondence to
Dr Sam Wilson Cole; sbeckha4@jhu.edu

ABSTRACT

Introduction Cabotegravir long-acting injectable HIV pre-exposure prophylaxis (LA-PrEP) was shown to be safe and effective in multiple clinical trials. Increasing uptake and persistence among populations with elevated risk for HIV acquisition, especially among men who have sex with men (MSM), is critical to HIV prevention.

Objective This analysis aims to understand potential users' preferences for LA-PrEP, with audience segmentation.

Design Willingness to use and preferences for LA-PrEP were measured in HIV-negative, sexually active MSM in the 2020 American Men's Internet Survey. Respondents answered a discrete choice experiment with paired profiles of hypothetical LA-PrEP characteristics with an opt-out option (no LA-PrEP). Conditional and mixed logit models were run; the final model was a dummy-coded mixed logit that interacted with the opt-out.

Setting US national online sample.

Results Among 2506 MSM respondents, most (75%) indicated a willingness to use LA-PrEP versus daily oral PrEP versus no PrEP. Respondents were averse to side effects and increasing costs and preferred increasing levels of protection. Respondents preferred a 2-hour time to obtain LA-PrEP vs 1 hour, with a strong aversion to 3 hours. Overall, there was an aversion to opting out of LA-PrEP, with variations: those with only one partner, no/other insurance or who were Black, Indigenous or People of Colour were significantly less likely to prefer LA-PrEP, while those who were Hispanic/Latino, college educated and <40 years significantly preferred LA-PrEP.

Conclusions A large proportion of MSM expressed a preference for LA-PrEP over daily oral pills. Most respondents chose LA-PrEP regardless of cost, clinic time, side effects or protection level; however, preferences varied by sociodemographics. These varied groups likely require tailored intervention strategies to achieve maximum LA-PrEP uptake and persistence.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This study uses quantitative elicitation methods to measure preferences for long-acting injectable HIV pre-exposure prophylaxis (LA-PrEP) among gay, bisexual and other men who have sex with men in the USA.
⇒ The attributes of the discrete choice experiment (DCE) were selected by researchers and literature review but without formative, qualitative research and patient involvement.
⇒ The sample size (>2500) is large for DCE methods, allowing for the measurement of heterogeneity.
⇒ The study reports the heterogeneity of preferences for LA-PrEP with an opt-out option as the interaction term with various sociodemographics and behaviours. The opt-out option more closely mimics product choice in a real-world setting and found that overall, respondents preferred LA-PrEP to no PrEP, with variation by race, ethnicity, number of male partners, age and education.

INTRODUCTION

The efficacy and safety of oral pre-exposure prophylaxis (PrEP) on HIV transmission prevention is well established.[1] The US Food and Drug Administration (FDA) approved PrEP for men who have sex with men (MSM) in 2012[2] due to its effectiveness and cost-efficiency in protecting against HIV infection.[1] Despite the benefits of PrEP, uptake continues to be low in the USA; of the 1.2 million people for whom PrEP was recommended, only 25% were prescribed PrEP.[3] Optimal protection against HIV depends on PrEP adherence, which can be difficult for patients to achieve.[1 4] Potential barriers to oral PrEP adherence among MSM include daily logistics, PrEP-related stigma, psychosocial factors and side effects.[5]

Long-acting formulations of PrEP have been developed (eg, injections) or are in trials (eg, implants) with the hope that less frequent dosing will improve adherence, persistence and prevent HIV infections.[6] In 2021, the FDA approved a long-acting injectable PrEP (LA-PrEP)[7] after successful safety

and efficacy trials.[8–11] In pooled analysis, long-acting cabotegravir (CAB-LA), a version of LA-PrEP, showed a 79% reduction in relative risk compared with tenofovir disoproxil fumarate-based oral PrEP.[12] Since current data are from controlled trials, real-world effectiveness and implementation evaluations of LA-PrEP are needed.[12] Research to assess willingness to use and preferences for LA-PrEP among MSM can inform clinical and community programmes and messaging to increase uptake, adherence and persistence and maximise benefit.

Discrete choice experiments (DCE) are a quantitative analytical method to elicit preferences for real or hypothetical products or services by presenting respondents with a series of product/service profiles with varying features.[13 14] They have been used to understand patient preferences for biomedical HIV prevention[15] and specifically MSM's preferences for LA-PrEP and other HIV prevention products.[16–18] However, a sufficient understanding of the diversity of preferences within MSM groups is lacking. The primary objective of this study was to measure willingness to use daily oral (DO) versus LA-PrEP and explore preferences for various LA-PrEP attributes using DCE with segmentation among a US national sample of cisgender gay, bisexual and other MSM.

METHODS

Study design and analytical sample

This analytical sample comes from the 2020 American Men's Internet Survey (AMIS); data were collected from October 2020 to January 2021. The AMIS protocol and data cleaning are described elsewhere.[19] AMIS respondents were recruited online and were eligible if they resided in the USA or accompanying territories, were 15 years or older, reported male sex at birth and current male gender identity, and identified as gay or bisexual and/or reported at least one experience of oral or anal sex with a man in their lifetime.[20] Respondents 15–17 years were also eligible if they identified as gay or bisexual, even if they had never had sex with a man. Eligible men were asked to provide informed consent online; clicking yes to continue the survey indicated consent. Consenting respondents then completed the survey immediately online. The analysis was further restricted to those who reported oral or anal sex with a man in the past 12 months. There was no compensation for participation. Self-reported HIV-negative or unknown-status respondents were selected randomly to participate in the DCE module (n=2671). Based on an analysis of response patterns, 135 DCE respondents were dropped from the sample: respondents who answered all A or B in choice tasks, those who took less than 12 min to complete the survey and those who did not complete the survey. The final analytical sample comprised 2506 respondents. Sample sizes required for DCE are not well defined, and depend on the number of tasks, attributes and levels within attributes. However, a rule of thumb of at least 300 respondents has been suggested, though as few as 30–60 respondents may be enough for investigational work and hypothesis development.[21]

Measures

Primary outcome

Primary outcome measures included a DCE module on preferences for LA-PrEP. The DCE used a D-efficient design[22] with 12 tasks, created using Ngene software.[23] The four LA-PrEP attributes with three levels each were selected based on a literature review and consultation within the authorship team (see table 1). Respondents

Table 1 Discrete choice experiment attributes and levels for LA-PrEP

Attribute	Level 1	Level 2	Level 3
Side effects*	25% chance of moderate pain at injection site†	15% chance of headache	5% chance of rash‡
Level of protection¶	900 out of 1000‡	950 out of 1000	999 out of 1000†
Out-of-pocket cost§	US$10†	US$30	US$50/US$75‡
Total time for travel, tests and injection**	1 hour†	2 hours	3 hours‡

*Side effects: 25% chance of moderate pain at the injection site: In clinic trials of the PrEP injection, some people had mild-to-moderate pain or tenderness at the site of the shot, and it lasted 2–7 days. This is about the same as getting a influenza shot or a vaccine. 15% chance of headache: In clinical trials of the PrEP injection, a small proportion of people reported headaches in the couple of days after they got the shot. 5% chance of rash: In clinic trials of the PrEP injection, a very small proportion of people reported a mild rash, which cleared up on its own.
†Hypothesised as the most favourable level.
‡Hypothesised to be least favourable.
§Out-of-pocket cost: Fees (eg, deductibles, coinsurance or copayments) that you pay directly to a business in order to receive the injection. The cost listed is per shot (every couple of months). For example, US$100 means you pay US$100 every 2 months to get one shot.
¶Level of protection: This is how well the PrEP injection works to prevent HIV. That is, while getting the PrEP injection, how many people out of every 1000 people are protected from getting HIV.
**Total time spent obtaining PrEP: In order to get the injection, patients will need to travel to a health provider or clinic, get laboratory tests done, get the injection and travel home again. The times listed below represent the total time spent, including travel to and from the providers, time waiting at the clinic and time getting the shot itself.
LA-PrEP, long-acting injectable HIV pre-exposure prophylaxis; PrEP, pre-exposure prophylaxis.

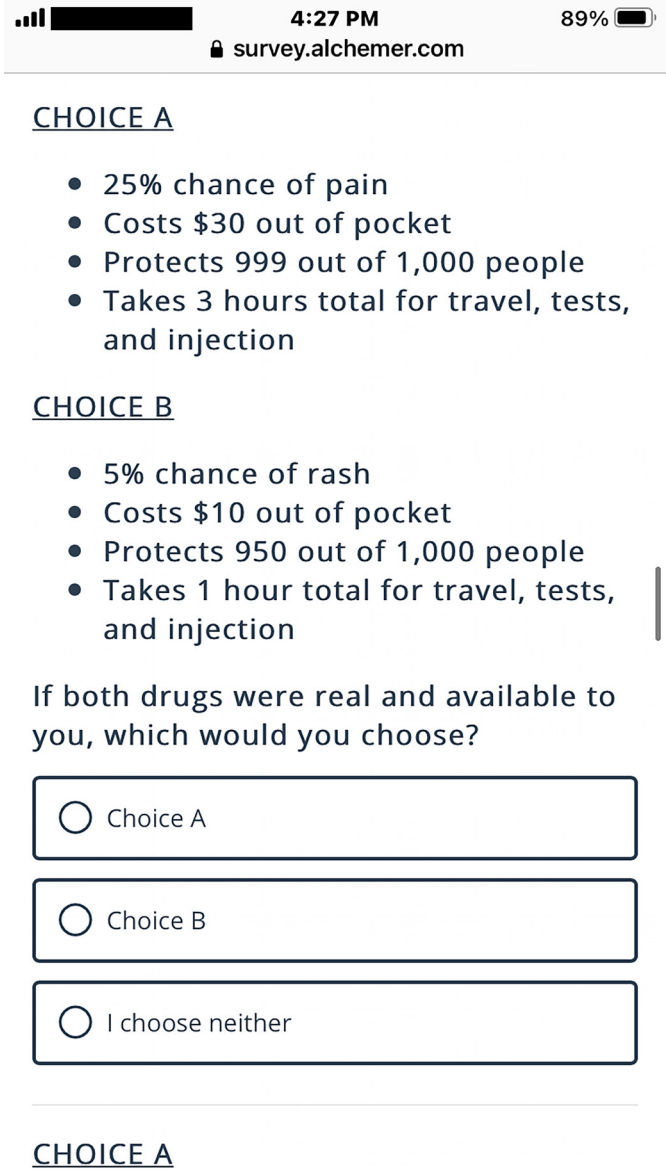

Figure 1 DCE example choice task (mobile version). DCE, discrete choice experiment.

were shown paired profiles of hypothetical LA-PrEP alternatives and instructions to choose either profile A, B or C (the opt-out, ie, neither version of LA-PrEP). To clarify the meaning of each attribute and level, non-technical explanations were provided before the choice tasks (see table 1 footnotes.) See figure 1 for an example task as it appeared to respondents.

Given that most AMIS respondents completed the survey on smartphones, a vertical presentation of the choice tasks was used. This presentation enabled respondents to see an entire task with answer options on the mobile screen without scrolling or swiping. A sensitivity analysis for an up/down bias was conducted to determine if respondents more often choose A over B because it is the top choice visually. Up/down bias was insignificant and not included in the final model.

Secondary outcomes

Secondary outcomes included awareness of and willingness to use LA-PrEP and a direct elicitation of LA-PrEP versus DO PrEP (see table 2).

Covariates

Sociodemographic characteristics: age, race (American Indian/Alaskan Native, Asian, Native Hawaiian/Pacific Islander, black/African American, vs white), ethnicity (Hispanic/Latino vs none), education, urbanicity (using population density of county using the US National Center for Health Statistics Rural–Urban classification scheme)[24] and healthcare insurance type. Oral PrEP knowledge and use: willingness to use oral PrEP, current PrEP use and prior oral PrEP use (ever). Sexual history in the past 12 months: condomless anal sex with a male partner, diagnosis of sexually transmitted infection (STI), number of male sexual partners and male partner type.

Analysis

Direct elicitation

Direct elicitation responses were analysed with sociodemographics and other characteristics using cross tabs,

Table 2 PrEP preferences measures used in web-based survey of MSM, 2020

Domain	Questionnaire items		Response options
Awareness of LA-PrEP	Before today, have you ever heard of an injectable form of PrEP that you get every couple of months as a way to reduce the risk of getting HIV?		Yes/no
Willingness to use LA-PrEP	How likely would you be to use this injectable form of PrEP, if it was available, to reduce the risk of getting HIV		5-point Likert
Direct Elicitation for LA vs DO PrEP Preference	If both drugs were real and available to you, which would you choose?		
	Choice A: PrEP injection	Choice B: PrEP pills	A, B or neither
	A shot every 2 months	A pill every day	
	Some pain/tenderness at injection site, lasting 2–5 days	Small chance of mild nausea, diarrhoea for the 1st couple months	
	99% effective if taken properly	90% effective if taken properly	
	1 clinic visit every 2 months	1 clinic visit every 3 months	

DO, daily oral; LA-PrEP, long-acting injectable HIV pre-exposure prophylaxis; MSM, men who have sex with men.

frequencies and χ^2 statistics for significance. DCE: For the initial analysis, a conditional logit (clogit in Stata V.17) model was fit using effects coding, followed by mixed-effects logit (mixlogit in Stata V.17)[25] with interaction terms related to the opt-out option to produce mean preference weight estimates and normalised coefficients.[13] Variables used to interact with the likelihood of opting out were fixed and included being in a racialised minority group, identifying as Hispanic, living in a rural area, having some college, technical school, college diploma or more (compared with high school, General Education Diploma (GED) or less education), being over the age of 40, having other/no insurance (compared with private insurance), having only one male sex partner, having a casual male sex partner (compared with having only a main male sex partner) and never having used PrEP. The attributes included in the DCE were randomised, with the least favourable attribute as the reference category.

Patient and public involvement

Patients were involved in this study as research participants but did not contribute to the conceptualisation, design, recruitment or interpretation of the study. Preliminary results were disseminated at an international HIV conference and through media coverage.

RESULTS

The 2506 DCE respondents were primarily white and aged 15–39 (table 3). Most respondents had either a technical degree or attended some college, or had a college degree or postgraduate education. Four in five respondents lived in urban areas, and most reported having private insurance. Nearly three-quarters of respondents reported having condomless anal sex and having two or more male sexual partners, and a small proportion reported an STI diagnosis in the past 12 months. Although most (n=2074; 83%) reported never having used oral PrEP, more than half of those (n=1332, 53%) said they would be willing to use oral PrEP.

Although only some respondents had heard of LA-PrEP (n=510/2504, 20%), almost two-thirds (n=1500, 60%) were willing to use it (30% very likely, 30% somewhat likely, 12% neither likely nor unlikely, 8% somewhat unlikely and 14% very unlikely). Given the hypothetical choice between LA-PrEP, DO PrEP or neither, three-quarters (74%) said they would choose LA-PrEP, 15% would choose DO PrEP and only 9% would select neither option (table 3). In bivariate analysis, the preference for LA-PrEP was significantly associated with younger age, black/African American race, Hispanic ethnicity and private insurance. Those who reported recent condomless anal sex, STI diagnosis, having both main and casual male sex partner types, 2+ male sex partners, ever using DO PrEP and willingness to use DO PrEP were more likely to prefer LA-PrEP.

Both conditional (with effects coding) and mixed-effects logit (with dummy coding) models were run to estimate LA-PrEP preferences for attribute levels (see table 4). A positive coefficient indicates the respondents favour the attribute level while a negative coefficient indicates they disfavour it. In the mixed logit model, rash and pain were less favourable than headache, and LA-PrEP showed increasingly less favorability as out-of-pocket costs increased. Respondents favoured the highest levels of protection; the coefficient for the highest level was 2.7 times higher than the middle level. Respondents slightly preferred 2 hours vs 1 hour for total time spent obtaining PrEP (including travel, wait time and HIV testing), with 3 hours being unfavourably too long.

The opt-out option allows respondents to choose neither version of LA-PrEP in each choice task and indicates respondents who would rather not have LA-PrEP. Thus, a negative coefficient is interpreted as favouring LA-PrEP (whatever the given attributes), while a positive coefficient indicates that LA-PrEP is unfavourable. The average opt-out was −0.787, indicating an overall preference for LA-PrEP versus no LA-PrEP. Key variables (sociodemographics, sexual history and DO PrEP use) were interacted with the opt-out variable, measuring preference to opt in (negative coefficient) or opt out (positive coefficient) stratified by these various factors (see bottom of table 4 and figure 2). Those with only one male sex partner, no/other insurance and who were of racialised minority groups preferred no LA-PrEP versus LA-PrEP. Urbanicity, casual male sex partnerships and no previous oral PrEP use (past 12 months) were not significantly associated with opting out. Those who were Hispanic/Latino, those with a college education and respondents <40 years old all preferred LA-PrEP to no LA-PrEP. The younger age group had the strongest preference (−0.959) for LA-PrEP relative to the other interacted variables.

DISCUSSION

This analysis measured awareness of and willingness to try LA-PrEP and conducted a DCE to explore preferences for LA-PrEP features among over 2500 gay, bisexual and other MSM in the 2020 AMIS. Although only 20% had heard of LA-PrEP, 60% were willing to try it, and 73% would choose LA-PrEP over DO PrEP or no PrEP. The DCE indicated that a highly effective product with low out-of-pocket costs most appealed to respondents. Logistical challenges (ie, time spent obtaining LA-PrEP) and side effects mattered to respondents but were less important factors than cost and effectiveness, suggesting potential LA-PrEP users may be willing to tolerate some inconvenience for a low-cost, highly effective product.

This study included an opt-out option, allowing respondents to indicate a preference not to use LA-PrEP, given the features presented. Such an experiment more closely mimics product choice in a real-world setting, where people can decline to use the product. However, this DCE did not consider preferences for other types of PrEP or HIV prevention behaviours. Overall, opting out of LA-PrEP was not preferred, meaning respondents

Table 3 Characteristics of 2506 US men who have sex with men, by preference for injectable PrEP, daily oral PrEP or neither, 2020

Variable	Total n (%)	Injectable PrEP n (%)	Daily oral PrEP n (%)	Neither n (%)	P value (χ2)
Full sample	2506 (100.0)	1842 (73.5)	378 (15.1)	235 (9.4)	–
Sociodemographics					
Age (years)					
15–39	1951 (77.9)	1497 (81.3)	282 (74.6)	129 (54.9)	**<0.001**
40+	546 (21.8)	345 (18.7)	96 (25.4)	106 (45.1)	**<0.001**
Race					0.186
Racialised minority groups	379 (15.2)	259 (14.1)	77 (20.4)	32 (13.7)	–
American Indian/Alaska Native	30 (1.2)	18 (1.0)	7 (1.9)	3 (1.3)	0.460
Asian	74 (3.0)	53 (2.9)	13 (3.4)	6 (2.6)	0.898
Black/African American	256 (10.2)	175 (9.5)	53 (14.0)	21 (8.9)	**0.014**
Native Hawaiian/ Pacific Islander	19 (0.8)	13 (0.7)	4 (1.1)	2 (0.9)	0.789
White	1962 (78.3)	1456 (79.0)	277 (73.3)	190 (80.9)	0.029
Ethnicity					**0.014**
Hispanic	486 (19.4)	379 (20.6)	63 (16.7)	32 (13.6)	
Non-Hispanic	2020 (80.6)	1463 (79.4)	315 (83.3)	203 (86.4)	
Education					**0.013**
<High school diploma	48 (1.9)	28 (1.5)	9 (2.4)	10 (4.3)	
High school diploma or equivalent	410 (16.4)	279 (15.1)	83 (22.0)	36 (15.3)	
Some college or technical degree	917 (36.6)	697 (37.8)	121 (32.0)	83 (35.3)	
College degree or higher	1123 (44.8)	833 (45.2)	163 (43.1)	105 (44.7)	
Urbanicity					
Urban	1997 (79.7)	1485 (80.6)	293 (77.5)	180 (76.6)	0.175
Rural	503 (20.1)	352 (19.1)	84 (22.2)	55 (23.4)	0.151
Health insurance type					**<0.001**
Private	1727 (68.9)	1305 (70.8)	248 (65.6)	142 (60.4)	
Public	304 (12.1)	194 (10.5)	58 (15.3)	44 (18.7)	
Other	141 (5.6)	93 (5.0)	23 (6.1)	20 (8.5)	
None	269 (10.7)	216 (11.7)	34 (9.0)	17 (7.2)	
Sexual history, past 12 months					
Condomless anal sex					**<0.001**
Yes	1794 (71.6)	1364 (74.0)	259 (68.5)	140 (59.6)	
No	712 (28.4)	478 (26.0)	119 (31.5)	95 (40.4)	
STI diagnosis					**<0.001**
Yes	260 (10.4)	226 (12.3)	23 (6.1)	11 (4.7)	
No	2195 (87.6)	1616 (87.7)	355 (93.9)	224 (95.3)	
Number of male sex partners					**<0.001**
1	671 (26.8)	436 (23.7)	113 (29.9)	105 (44.7)	
2+	1835 (73.2)	1406 (76.3)	265 (70.1)	130 (55.3)	
Male partner types					**<0.001**
Casual only	889 (35.5)	660 (35.8)	134 (35.4)	80 (34.0)	
Main+casual	954 (38.1)	742 (40.3)	133 (35.2)	59 (25.1)	
Main only	638 (25.5)	426 (23.1)	108 (28.6)	89 (37.9)	
Oral PrEP use and willingness, past 12 months					

Continued

Table 3 Continued

Variable	Total n (%)	Injectable PrEP n (%)	Daily oral PrEP n (%)	Neither n (%)	P value (χ2)
Ever used PrEP					**<0.001**
Yes	432 (17.2)	371 (20.1)	48 (12.7)	6 (2.6)	
No	2074 (82.8)	1471 (79.9)	330 (87.3)	229 (97.4)	
Willing to use oral PrEP among those who have never used					**<0.001**
Yes	1332 (64.2)	1057 (51.0)	223 (10.8)	27 (1.3)	
No	742 (35.8)	414 (20.0)	107 (5.2)	202 (9.7)	

Bold indicates significance at p<0.05 level.
Some percentages do not total to 100 due to missingness.
PrEP, pre-exposure prophylaxis; STI, sexually transmitted infection.

were more likely to choose LA-PrEP than not, regardless of varying attributes. However, this opt-out preference varied by key participant characteristics. Younger, Hispanic/Latino and college-educated MSM preferred LA-PrEP. At the same time, those who were in racialised minority groups, had only one male sex partner, had no/other insurance and had never used DO PrEP preferred no LA-PrEP.

These findings suggest heterogeneity in preferences for modalities of PrEP among American MSM; not all MSM were interested in LA-PrEP. Disinterest could be because they do not perceive risk (eg, have only one male

Table 4 Conditional and random-parameter (mixed) logit results of a DCE on PrEP preferences among US men who have sex with men, 2020

		Conditional logit, effects coding		Mixed-effects logit		
Attribute	Level	Coefficient	SE	Coefficient	SE	SD
Side effects	Headache	0.188	0.01	Ref	–	–
	Rash	0.000	0.01	−0.502	0.05	1.41
	Pain	−0.188	0.01	−1.012	0.04	0.93
Out-of-pocket cost	US$10	0.497	0.03	Ref	–	–
	US$30	0.169	0.01	−0.737	0.03	−0.11
	US$50	−0.202	0.02	−1.782	0.06	1.01
	US$75	−0.464	0.02	−2.374	0.071	1.67
Level of protection	900 out of 1000 people	−0.998	0.01	Ref	–	–
	950 out of 1000 people	−0.036	0.01	1.505	0.05	2.06
	999 out of 1000 people	1.034	0.01	4.117	0.11	4.84
Total time obtaining PrEP	1 hour	0.021	0.01	Ref	–	–
	2 hours	0.306	0.01	0.114	0.04	−0.56
	3 hours	−0.327	0.01	−1.180	0.04	−1.14
Opt-out	Only one male partner	0.406	0.04	0.352	0.06	–
	No/other insurance	0.241	0.05	0.296	0.07	–
	Racialised minorities	0.371	0.05	0.166	0.07	–
	Never used PrEP before	0.495	0.05	0.115	0.08	–
	Rural	0.108	0.04	0.042	0.07	–
	Casual male partner(s)	0.109	0.04	0.074	0.06	–
	Hispanic	−0.211	0.05	−0.367	0.07	–
	College education	−0.467	0.04	−0.377	0.07	–
	Age <40	−1.105	0.04	−0.959	0.06	–
	Average opt-out	−0.277	0.07	−0.787	0.12	–

DCE, discrete choice experiment; PrEP, pre-exposure prophylaxis.

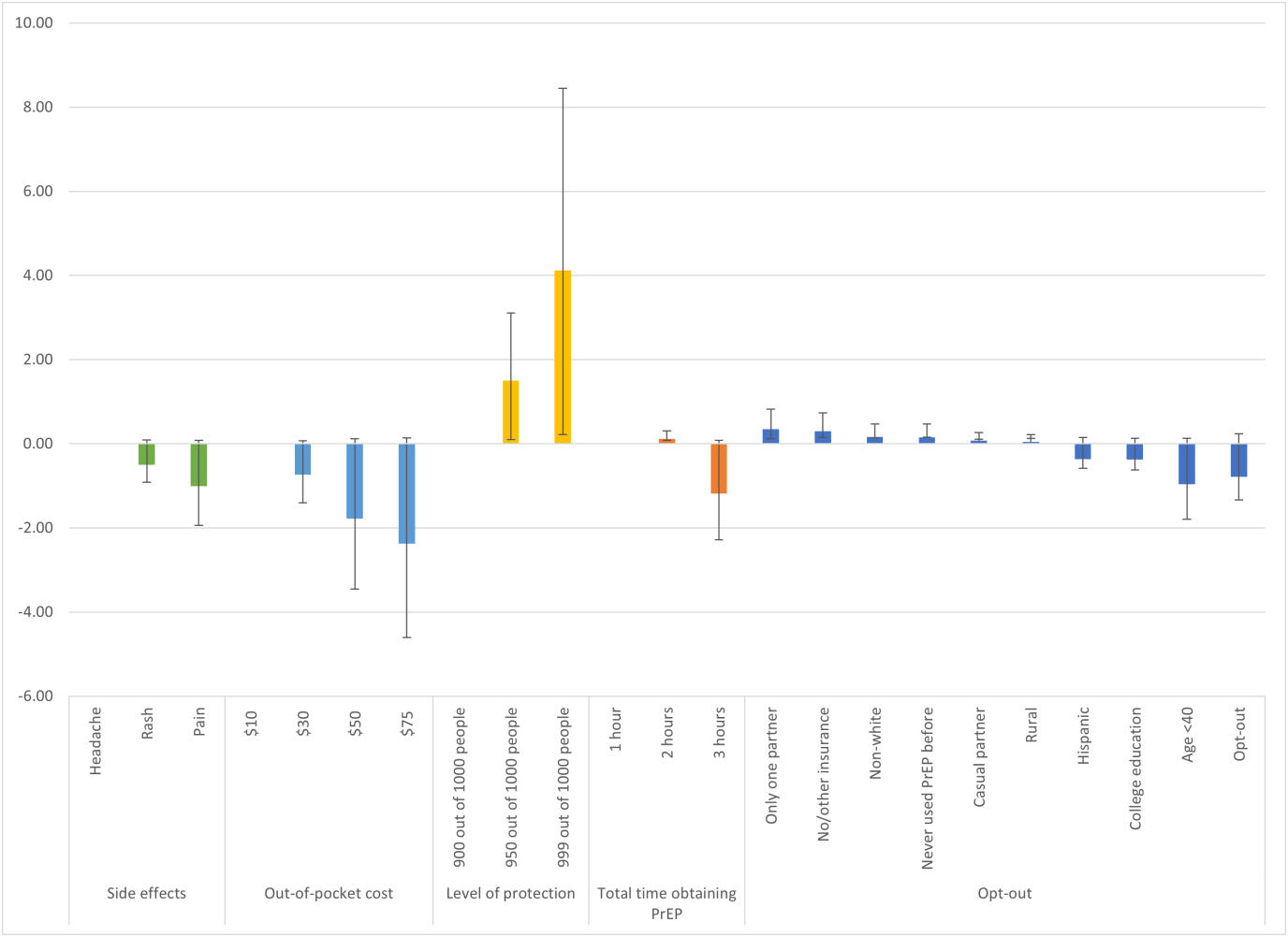

Figure 2 Mixed-effects model results of a DCE on PrEP preferences among US men who sex with men, 2020. DCE, discrete choice experiment; PrEP, pre-exposure prophylaxis.

sex partner or consistently use condoms), lack insurance and worry about costs or are unsure about PrEP generally. Non-Hispanic racialised minority respondents were more likely to opt-out of LA-PrEP. Considering racialised minority MSM have a disproportionate HIV burden in the USA,[3] PrEP programming should seek to identify and overcome barriers racialised minority MSM face, differentiated by subgroup. More data, specifically including racialised and ethnic minority populations separately, is essential to elucidate differences that are lost when all racialised and ethnic minority populations are aggregated. LA-PrEP services should tailor messaging and programming to these populations while also continuing to provide DO PrEP and reducing barriers to accessing HIV prevention and care.

Almost two-thirds of respondents (60%) in this sample were highly willing to try LA-PrEP and preferred it to DO PrEP, given a hypothetical choice. The same proportion was found in another study among MSM in Australia (60% willingness).[26] Higher proportions were found in MSM in the northeastern USA (79%)[27] and Nigeria (88%).[28] While 73% of the AMIS sample would choose LA-PrEP over DO PrEP or neither, only 44% of MSM in Nigeria[28] and 42% of MSM in Brazil, Mexico and Peru preferred LA-PrEP over other modalities.[29] Together, these studies suggest high proportions of MSM in disparate settings are interested in LA-PrEP; however, these are hypothetical willingness studies, and real-world studies are needed. The logistical challenges of service delivery, uptake and adherence remain.[12] Real-world choice and effectiveness should be monitored and evaluated to understand the impact of LA-PrEP on HIV prevention alongside DO PrEP as well as other prevention measures. The clinical and staffing burdens of implementing LA-PrEP are also of concern[30] and understudied. Implementation research exploring the barriers and facilitators in the clinic, laboratory, pharmacy and insurance systems is vital.

High effectiveness and cost were the most important features of LA-PrEP for this sample, as in other DCE among MSM,[31–35] indicating these features may be critical aspects to emphasise during LA-PrEP implementation to improve uptake by US MSM. LA-PrEP (as CAB-LA) has proven to be more efficacious than TDF-based oral PrEP at preventing HIV acquisition, likely due to both pharmacokinetics and more attainable adherence (avoiding the daily burden of oral PrEP).[12] Unsurprisingly, respondents

preferred an effective product. Respondents preferred 99.9% effectiveness 2.7 times more than the next (95.0%) level. The magnitude of differences suggests users may not choose an LA injectable product that is 'merely' 90% or 95% effective. Thus, highlighting the high efficacy of LA-PrEP in trials could be critical to LA-PrEP promotion campaigns. LA-PrEP remains out of reach to most at US$3700 per dose,[36] plus additional costs for associated services such as labs, nurse visits and travel. Increased and ongoing investment in insurance-based and federal programmes that provide LA-PrEP and PrEP-related labs and visits to the client at no or highly reduced cost could reduce this burden.[37] Programmatic strategies that link clients to resources to help them obtain LA-PrEP for free or low cost, even without insurance, could boost uptake, especially among those most in need of prevention.

The logistics involved in obtaining LA-PrEP (the need for repeated provider visits, lab testing, adhering to bimonthly appointments, visit location, provider type, nurse-vs-self-administration, etc), have been of concern to implementation scientists and potential PrEP users.[16 17 38 39] This study operationalised 'logistics' as time spent obtaining LA-PrEP, including travel, labs and the injection. Respondents slightly preferred 2 hours (travel, wait time, labs, etc) to receive each LA-PrEP injection rather than the shorter 1-hour option. A 2015 study found that US patients spend, on average, 2 hours for all healthcare visits, including travel, waiting time and time with the provider.[40] Respondents may feel that 1 hour was insufficient time to obtain proper service based on experience, thus favouring the 'average' 2-hour window. Qualitative research and programmatic monitoring and evaluation could illuminate this finding. As more people obtain LA-PrEP, implementation studies should track a variety of logistical challenges and measure patient-reported and provider-reported outcomes quantitatively and qualitatively to inform and improve services and sustain use over time.

Respondents in this and other studies were concerned about potential side effects.[12 39] The present analysis showed that pain at the injection site and the potential for rash were rated worse than a potential headache from LA-PrEP. A recent systematic review on CAB-LA safety showed very few adverse events were reported across all CAB-LA trials (HPTN 083, 083, 077 and ÉCLAIR), with injection site reactions or pain being the most common. Educating potential consumers on the rarity of side effects will be essential to promote uptake. Further, reactions and side effects should continue to be monitored, and efforts to reduce the burden of side effects should be explored as LA-PrEP is implemented in real-world settings.

Other literature shows that preferences for LA-PrEP vary across subgroups of MSM and locations[16 41] as in this study. Younger MSM in this sample preferred LA-PrEP, but in other studies, young and adolescent MSM preferred condoms and implants[41] or DO-PrEP.[29 42] In a latent class analysis on health decision-making among young MSM, all classes preferred DO-PrEP to other modalities; however, those in the class that shared decision-making between the provider and the patient were more likely than other classes to choose long-acting modalities (while still considering DO PrEP their first choice).[41] In another study of young MSM in the USA, the preference for LA-PrEP was associated with intimate partner violence (IPV) that involved the partners monitoring the respondents (vs physical, sexual or verbal IPV). In contrast, the preference for DO PrEP was associated with physical IPV.[43] In Nigeria, interest in LA-PrEP was associated with being single, inconsistent condom use and having a primary care provider.[28] Providers can recognise that PrEP choices may be constrained and influenced by factors other than simple preference and assist potential users in identifying the best PrEP modality for their specific circumstances. Further research among various subgroups of MSM is warranted to understand how best to meet the needs of vulnerable and stigmatised groups who face a disparate burden of HIV, such as adolescents and people in racialised minority groups, as well as transgender women and men, sex workers and people who inject drugs.[16]

This study has limitations. First, the respondents were recruited online, thus limiting the sample to people with internet access, which reduces generalisability and may have resulted in a skewed sample with higher socioeconomic status. Second, racialised minority MSM and Hispanic MSM were under-represented in this sample relative to their disproportionate burden with HIV, thereby limiting the utility of our findings for these groups. Additional research on these populations is necessary to tailor policies and programming, maximise PrEP uptake and reduce HIV disparities. Third, our data were collected before FDA approval of long-acting injectable cabotegravir for PrEP in December 2021.[7] Hence, awareness of the drug was low, and willingness to use it was theoretical. Now that LA-PrEP is available in the USA, new awareness, willingness and preference questions were implemented in subsequent AMIS surveys. Finally, the DCE attributes and levels were developed through a review of the literature and discussion within the study team; formative research with potential MSM consumers might have identified different and more meaningful attributes and levels.

LA-PrEP is safe and efficacious and has promise to increase uptake of and adherence to regimens for HIV prevention. There is a high willingness and preference for LA-PrEP over other modalities. However, logistics, inequitable access, individual preference and other implementation issues must be addressed to increase uptake. Listening to patient preferences is vital in developing programmes and streamlining clinical operations to reach PrEP-indicated patients.

Author affiliations
[1]Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA
[2]Query Research Consulting, Glen Burnie, Maryland, USA
[3]Department of Community Health Science & Policy (CHSP), Louisiana State University Health Sciences Center, New Orleans, Louisiana, USA

[4]Department of Biomedical Informatics, The Ohio State University College of Medicine, Columbus, Ohio, USA
[5]Epidemiology, Emory University School of Public Health, Atlanta, Georgia, USA
[6]ViiV Healthcare US, Durham, North Carolina, USA

X Patrick S Sullivan @pssinatl

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ORCID iD
Sam Wilson Cole http://orcid.org/0000-0002-9694-3091

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Correction: *Willingness and preferences for long-acting injectable PrEP among US men who have sex with men: a discrete choice experiment*

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The article has been corrected since it was published online. The authors would like to inform the readers that the incorrect version of figure 2 was published. Figure 2 has been updated now.

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