
Evolving attitudes to biomedical HIV prevention among gay, bisexual and queer men and non-binary people:

Key findings from the PrEPARE Project 2023

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CRICOS Provider Code 00098G

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Suggested citation:

MacGibbon, J., Yu, S., Broady, T.R., Bavinton, B.R., Calabrese, S.K., Murphy, D., Kolstee, J., Clackett, S., Gordon, T., Heath-Paynter, D., Molyneux, A., Ellard, J., Heslop, A., de Wit, J., and Holt, M. (2024). Evolving attitudes to biomedical HIV prevention among gay, bisexual and queer men and non-binary people: Key findings from the PrEPARE Project 2023. Sydney: Centre for Social Research in Health, UNSW Sydney. DOI: 10.26190/bptf-jj64

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Acknowledgements

During 2015–23, the PrEPARE Project was supported by the BBV & STI Research, Intervention and Strategic Evaluation (BRISE) program, funded by the NSW Ministry of Health. The Centre for Social Research in Health is supported by the Australian Government Department of Health, including surveillance funding for the national coordination of the PrEPARE Project during 2017–23.

We thank all the participants who completed questionnaires and the current and former members of the project reference group.

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Acronyms and abbreviations

AMR	Antimicrobial resistance
CAIC	condomless anal intercourse with casual male partners
CAIR	condomless anal intercourse with regular male partners
GBQ+	gay, bisexual and queer men and non-binary people
HIV	human immunodeficiency virus
IQR	interquartile range
M	mean
Mdn	median
NSW	New South Wales
NT	Northern Territory
PEP	post-exposure prophylaxis
PrEP	pre-exposure prophylaxis
Qld	Queensland
SD	Standard deviation
STI	sexually transmissible infection
TasP	treatment as prevention
Vic.	Victoria

Key findings from the 2023 survey

- In this national survey of gay, bisexual and queer men and non-binary people, the proportion of survey participants who reported they had ever used pre-exposure prophylaxis (PrEP) increased to 58% in 2023 from 49% in 2021.
- 50% of HIV-negative and untested/unknown status participants were taking PrEP at the time of the 2023 survey (up from 40% in 2021).
- In 2023, most current PrEP users were taking daily pills (65%), but the use of event-based PrEP dosing has increased substantially over time (from 5% in 2019 to 31% in 2023).
- Nearly one quarter (24%) of current PrEP users had been taking PrEP for a year or less.
- In 2023, 12% of the sample had previously tried but stopped PrEP. The most common reasons for stopping were having less sex (49%), being in a monogamous relationship (31%) or concerns about taking medication (18%).
- Among HIV-negative and untested or unknown HIV status participants who had never taken PrEP (35% of the sample in 2023), nearly all (95%) had heard of PrEP and over half (61%) knew someone who was taking PrEP (no change on either measure since 2021).
- For PrEP users, in 2023 the most preferred ways to take PrEP (assuming all were available) were monthly pills (29%) and long-acting injections (26%). Among non-users, the most preferred ways to take PrEP were event-based dosing (31%) and monthly pills (28%).
- Among HIV-negative and untested/unknown status participants who had never used PrEP, willingness to use PrEP was 32% in 2023 (unchanged from 32% in 2019). Concern about using PrEP was 37% in 2023 (no change since 2021).
- In 2023, willingness to have sex with someone using PrEP was 86% among participants living with HIV and 81% among HIV-negative and untested/unknown status participants (similar to 2021).
- Belief that HIV treatment prevents transmission was 56% in 2023. Belief that HIV treatment prevents transmission remained higher among participants living with HIV (83%), compared to PrEP users (70%), HIV-negative participants not taking PrEP (43%), and untested participants (23%).
- In 2023, most participants (83%) said they were familiar with the 'Undetectable = Untransmittable' (U=U) message, of whom 66% agreed the message was accurate (no change since 2021).
- Assuming that all methods were available and equally effective, in 2023 participants living with HIV indicated that their most preferred way of taking HIV treatment would be long-acting, removable implants (33%) or long-acting injections (23%).

Introduction

The PrEPARE Project is a repeated, cross-sectional study of Australian gay, bisexual and queer men and non-binary people's (GBQ+) attitudes to biomedical HIV prevention, particularly pre-exposure prophylaxis (PrEP) and HIV treatment as prevention (TasP). The study was first conducted in 2011 and has been repeated every two years. Data are collected using an online survey of Australian GBQ+ people.

This report focuses on the 2023 survey results, but also includes analyses of change over time in key measures, such as willingness to use PrEP and belief that HIV treatment prevents transmission. Comparisons between states and territories are also provided for selected findings, and aggregated data from most survey measures are included in the Appendices.

Method

Recruitment and procedures

For the 2023 survey round, data were collected between June and July using Qualtrics online survey software (Provo, UT). Data collection occurred at a similar time of the year in the six previous survey rounds. In 2023, the survey was promoted via paid advertisements on Meta social media platforms, Facebook and Instagram, and the dating/hook up app Grindr. The Meta advertisements identified the research team, study inclusion criteria and partner organisations, specifically Health Equity Matters and ACON. Two main images were interchangeably used alongside the advertisement body copy: “PrEP? U=U? Condoms? Do the Survey” and “What do you think about PrEP” (for examples, see **Figure 1**). Participants who provided consent in 2021 to be contacted about the 2023 survey were emailed with a direct link to the survey. Participants of a national mpox survey conducted in 2022 who provided consent to be contacted about sexual health and HIV prevention research were also emailed a direct link to the survey (MacGibbon, Cornelisse, et al., 2023). The most common sources from which participants entered the survey were direct email based on previous study participation (31.1%), Instagram (31.0%), Facebook (24.6%), and Grindr (12.1%), followed by other sources (1.2%).



Figure 1. Examples of participant recruitment imagery used in social media advertising

Participants were eligible to participate in the 2023 survey if they:

- Were aged 16 years or older
- Did not identify as female
- Did not identify as heterosexual, and
- Lived in Australia at the time of the survey.

The participant inclusion criteria have been adjusted since the project began in 2011. From 2017, recruitment materials and the survey were specifically adapted to include trans and gender diverse people who have sex with men, which had not been explicitly stated in previous survey rounds. In 2021 we started recruiting people aged over 16 years old. In prior rounds, we only recruited people aged 18 years or older.

Potential participants were directed to the Qualtrics survey platform that provided information about the study. Participants were asked to read the participant information and then indicate consent at the start of the survey. Ineligible participants were screened out automatically if they did not meet any of the inclusion criteria. The study was approved by the ethics committee of UNSW Sydney (HC230024) and endorsed by the community organisations ACON (D202301) and Thorne Harbour Health (THH/CREP 21-011).

In 2023, the study materials were professionally translated into Thai and Simplified Chinese. Pilot testing was conducted by native speakers, including members of the target population, and translations were then adjusted based on feedback. Meta advertisements appeared in English, Thai and Simplified Chinese according to users' language preferences for Facebook and Instagram. Grindr advertisements appeared in English only.

Measures

We collected data on demographics, current relationships, HIV testing and status, PrEP use and attitudes to PrEP, attitudes to HIV treatments and prevention, recent sexual practices, self-reported health, drug use, and expectations about HIV disclosure and discussions with partners before sex. Where relevant, survey measures are described in further detail in the results.

Attitudes towards PrEP, HIV treatments and condoms

The 2023 survey included 7 reliable scales that were used in previous survey rounds. All scale items were asked on a 5-point Likert-type scale ranging from 'Strongly disagree' (1) to 'Strongly agree' (5). Scales scores were calculated from the mean of the items on each scale (ranging from 1 to 5) with a score of ≥ 4 indicating positive agreement with the scale. For example, participants who scored ≥ 4 on the *Willingness to use PrEP* scale were categorised as willing to use PrEP. The scales, their target population (i.e., all participants or certain participants), summary statistics and Cronbach's alpha (internal consistency/reliability) are shown in **Appendix B**.

Results

Sample characteristics

In 2023, 2,568 participants who met eligibility criteria and provided informed consent began the survey. Incomplete survey responses were removed ($n = 511$). Responses with missing data on more than one scale ($n = 4$), and responses with excessive flat-lining on scales (i.e., answering every item the same way; $n = 7$) were identified and removed. The final sample therefore included 2,046 participants who fully completed the survey (representing a 79.7% completion rate). Participants were most likely to reside in the states of New South Wales (32.4%), Victoria (27.8%), and Queensland (18.6%; see **Table 1**). More than three-quarters of participants (77.3%) lived in the capital city of their state or territory. Around half (48.3%) lived in an inner metropolitan area¹, followed by 28.8% in an outer metropolitan area and 20.3% in regional and remote areas. A minority of participants (2.5%) did not provide their postcode.

Table 1. Residential location of participants (N = 2,046)

	<i>n</i>	%
State or territory		
Australian Capital Territory	86	4.2
New South Wales	663	32.4
Northern Territory	9	0.4
Queensland	380	18.6
South Australia	136	6.6
Tasmania	48	2.3
Victoria	568	27.8
Western Australia	156	7.6
Geographical region		
Inner metro	989	48.4
Outer metro	590	28.9
Regional and remote	415	20.3
No response	49	2.4

¹ Postcodes in central business districts (CBDs) and those immediately adjacent to capital city CBDs were coded as 'inner metropolitan'; other capital city postcodes were coded as 'outer metropolitan'; remaining postcodes were coded as 'regional and remote'.

Table 2 shows sample characteristics. The median age was 35 years (interquartile range = 27–46). Most participants were male (97.2%), of whom 44 (2.2%) were transgender men. A further 47 participants identified as non-binary (2.3%), of whom, 33 (70.2%) were assigned male at birth and 14 (29.8%) were assigned female at birth. Lastly, 10 participants used a different term to describe their gender (0.5%), nine of whom were assigned male sex at birth. Most participants identified as gay (81.7%), were Australian born (69.9%), and university educated (64.0%). Most participants were in full-time employment (68.0%). There were 45 (2.2%) participants who were Aboriginal and/or Torres Strait Islander. Comparisons of participant characteristics between states and territories are shown at **Appendix C, Table C-1**.

In 2023, most of the sample (90.6%) had access to Medicare. Of the 192 participants (9.4% of the sample) who did not have a Medicare card, 52.1% were students and 90.6% were born overseas, with 59.4% born in Asia and 18.2% born in Latin America and the Caribbean. A minority of participants (13.7%) had an Australian Health Care Card, which makes prescription medications cheaper, including PrEP.

We compared available demographic characteristics of incomplete versus complete survey responses to assess recruitment bias, specifically, to determine whether the incomplete responses were systematically different from the complete ones. Participants who did not complete the survey ($n = 511$) were more likely to be aged under 30 years old (45.6% of incomplete responses vs. 32.6% complete, $p < .001$); they were more likely to identify as bisexual, queer or another identity rather than gay (27.0% incomplete vs. 18.3% complete, $p < .001$); and they were more likely to be born overseas (38.9% incomplete vs. 30.1% complete, $p < .001$). The differences highlight potential difficulties for some groups to complete the survey and the need to implement strategies tailored to young people, non-gay identifying participants and overseas-born participants to sustain recruitment.

Table 2. Participant characteristics (N = 2,046)

	n	%
Age (median, interquartile range)	35	27–46
Gender		
Man/male ^a	1,989	97.2
Non-binary	47	2.3
Different identity	10	0.5
Sexuality		
Gay	1,672	81.7
Bisexual	277	13.5
Queer	80	3.9
Another term	17	0.8
Country of birth		
Australia	1,430	69.9
Overseas	616	30.1
Aboriginal and/or Torres Strait Islander (yes)^b	45	2.2
Education		
High school	399	19.5
Trade certificate	338	16.5
University degree	1,309	64.0
Employment status		
Full-time	1,391	68.0
Part-time	369	18.0
Student/unemployed/other ^c	286	14.0
Annual income (AUD)		
Less than \$40,000	343	16.8
\$40,000–\$79,999	509	24.9
\$80,000–\$120,000	545	26.6
More than \$120,000	520	25.4
Prefer not to say	95	7.4
Medicare coverage (yes)	1,854	90.6
Australian Health Care Card (yes)^d	280	13.7

Note: There were 16 participants aged 16 or 17 years old.

^a Includes 1,944 cisgender men and 44 transgender men.

^b Includes 40 Aboriginal participants (88.9%), three Torres Strait Islander participants (6.7%) and two participants who were both Aboriginal and Torres Strait Islander (4.4%).

^c Employment data were recoded from non-mutually exclusive options, with priority given to the option indicating the most hours worked. Students who reported full-time or part-time employment were classified into those groups.

^d Access to further subsidised health care and services, including medication such as PrEP.

HIV testing, status and treatment

Most participants (90.7%) had ever been tested for HIV (i.e., tested at least once). This level of testing for HIV has remained relatively stable among survey participants since 2015 ($p = .089$). In 2023, among the 1,855 participants who had been tested for HIV, 91.6% were HIV-negative ($n = 1,699$), 7.5% were living with HIV ($n = 139$) and a small minority did not know their HIV status (0.9%, $n = 17$). Among non-HIV-positive participants who had been tested for HIV, most (80.9%) reported that their last test was in the 12 months prior to the survey. There were no statistically significant differences in levels of HIV testing and self-reported HIV status between participants from different states and territories (see **Appendix C Table C-2**). Among participants living with HIV ($n = 139$), nearly all (95.0%) were currently taking antiretroviral treatment for HIV and 94.2% reported having an undetectable viral load (or 97.0% of those on treatment). Comparisons between the states and territories are not reported due to the relatively small number of participants living with HIV.

STI testing and diagnoses

Most participants (86.1%) reported that they had ever been tested for a sexually transmissible infection (STI) other than HIV (i.e., tested at least once). This proportion has decreased slightly from 89.1% in 2017 ($p = .029$). Most of the 1,761 participants who had been previously tested (82.0%) had been tested in the 12 months prior to the survey. Of those tested for STIs in the 12 months prior to the survey ($n = 1,444$), over one third (36.8%) had been diagnosed with an STI. The most common STI diagnoses among those tested were chlamydia (24.0%), gonorrhoea (19.2%) and syphilis (6.2%). There were no statistically significant differences in STI testing between participants from different states and territories. In relation to STI diagnoses, participants from Victoria were more likely to receive a diagnosis in the past year (41.3%), followed by New South Wales (38.9%), Queensland (34.4%), and the other states and territories (29.2%). There were no differences in the types of STIs diagnosed (see **Appendix C Table C-3**).

Current relationships

Of the whole sample in 2023, less than half ($n = 970$, 47.4%) were in a relationship at the time of the survey. Most participants in a relationship had a male partner (85.9%). Smaller proportions had a female partner (6.9%), a non-binary partner (1.2%), a partner that used a different term to describe their gender (0.2%), or multiple partners (5.9%). Participants with a male partner comprised 40.7% of the total 2023 sample, which is similar to previous rounds (42.4% in 2021). Of the 57 participants with multiple partners, most (95.0%) reported male partners, followed by female partners (28.0%) and non-binary partners (18.0%; non-mutually exclusive categories). Among the 970 participants in a relationship, most (65.6%) reported non-monogamous relationships, most (60.5%) had reached a relationship agreement with their partner(s) through mutual discussion (i.e., an explicit agreement), and most (72.6%) reported condomless anal sex with a regular partner. Among the 970 participants in a relationship, more than half (53.6%) reported having condomless anal intercourse with casual partners; a smaller number (9.2%) reported casual sex with condoms only. HIV-

negative and untested/unknown status participants were more likely than participants living with HIV to report being in a seroconcordant relationship (that is with a partner of the same HIV status; 83.4% vs. 37.5%, $p < .001$, see **Table 3**). Further details of participants' relationship characteristics, including the HIV status of relationship partners and partners' use of antiretrovirals as PrEP or treatment can be found in **Table 3**. There were no statistically significant differences in relationship agreements between participants from different states and territories (see **Appendix C Table C-4**).

Table 3. Characteristics of participants in a relationship (n = 970)

	Total (n = 970)	HIV-negative & untested/unknown (n = 903)	HIV-positive (n = 67)
Relationship partner gender			
Male partner	833 (85.9)	774 (85.7)	59 (88.1)
Female partner	67 (6.9)	64 (7.1)	3 (4.5)
Non-binary partner	12 (1.2)	10 (1.1)	2 (3.0)
Another term	1 (0.1)	1 (0.1)	0 (0.0)
Multiple partners ^a	57 (5.9)	54 (6.0)	3 (4.5)
Relationship type			
Monogamous	334 (34.4)	315 (34.9)	19 (28.4)
Non-monogamous	636 (65.6)	588 (65.1)	48 (71.6)
Relationship agreement^b			
Discussed rules	587 (60.5)	541 (59.9)	46 (68.7)
Rules are unspoken/assumed	189 (19.5)	177 (19.6)	12 (17.9)
No rules or agreement	192 (19.8)	183 (20.3)	9 (13.4)
Regular partner status incl. PrEP use and viral load^c			
HIV-negative not on PrEP	458 (50.2)	433 (51.0)	25 (39.1)
HIV-negative on PrEP	288 (31.5)	275 (32.4)	13 (20.3)
Person living with HIV	73 (8.0)	49 (5.8)	24 (37.5)
Don't know/untested	94 (10.3)	92 (10.8)	2 (3.1)
CAIR in last 6 months			
No anal sex with a regular male partner	213 (22.0)	194 (21.5)	19 (28.4)
Condoms only	53 (5.5)	52 (5.8)	1 (1.5)
Any condomless sex	704 (72.6)	657 (72.8)	47 (70.1)
CAIC in last 6 months			
No casual male partner(s) or no anal sex	361 (37.2)	345 (38.2)	16 (23.9)
Condoms only	89 (9.2)	85 (9.4)	4 (6.0)
Any condomless sex	520 (53.6)	473 (52.4)	47 (70.1)

Note. Data are n (%). CAIC= condomless anal intercourse with casual partners. CAIR= condomless anal intercourse with regular partners

^a The genders of multiple partners are reported in text but excluded from this table.

^b Two participants (0.2%) did not respond to this item.

^c Excludes the 57 participants who had multiple partners. Nearly all partners living with HIV were on treatment (95%) and had undetectable viral loads (89%).

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Sex in the previous six months

Since 2021 we have asked participants whether they had sex with male, female and/or non-binary partners in the six months prior to the survey. In 2023, most participants (89.9%) reported sex with male (cis or trans) partners and 81.0% of the sample had sex with male partners only. Smaller proportions of participants reported sex with female (cis or trans) partners (6.7%) and/or with non-binary partners (7.3%; non-mutually exclusive categories). A minority of participants (8.2%) did not have any sex in the six months before the 2023 survey. A small minority of the sample (1.3%) reported sex with female partners only, all of whom identified as bisexual or queer ($n = 25$ and $n = 2$, respectively). The type and gender of participants' sexual partners varied by HIV status and PrEP use, including whether participants did not have any recent partners, had male partners only, had male and female partners, and so on. Of note, participants who were untested or did not know their HIV status were much more likely to report having had no sex partners in the six months prior to the survey compared to the other groups (23.0% of untested participants vs. 1.1–13.7% for the other groups). By contrast, PrEP users were the least likely to report no partners (1.1% of PrEP users), and the most likely to report having male sex partners only (86.9% vs. 60.7–78.4%, respectively). Participants were asked how many male sexual partners they had had in the six months prior to the survey: 11.3% did not have any male partners, 47.0% had one to five male partners, 17.8% had six to ten male partners, and 23.9% had more than ten male partners.² These proportions remained similar to the 2021 survey ($p = .13$). In 2023, participants who had female and non-binary partners were asked how many partners they had. Among the total sample, 93.7% did not have any female partners, 5.8% had one to five female partners, and fewer than 1% had more than six female partners. Similarly, 93.4% of the sample did not have any non-binary partners, 6.3% had one to five non-binary partners, and less than 1% of the sample had more than six non-binary partners.

In 2023 we retained questions about condom use with male sexual partners and introduced new items about condom use with female and non-binary partners. First, in relation to sex with male partners, more than half (60.3%) the sample reported any condomless anal intercourse with regular male partners (CAIR) in the six months prior to the survey (the survey defined regular male partners as 'a boyfriend, partner or husband' or 'fuck buddies'). More than half (57.7%) the sample reported any condomless anal intercourse with casual male partners (CAIC) in the six months prior to the survey. The proportion of participants reporting CAIC has increased significantly from 28.2% in 2011 ($p = .001$, controlling for changes in demographic variables; see **Figure 2**), but has not changed since 2021 ($p = .376$). As we have noted in previous rounds, the reduction in condom use has coincided with the increasing use of PrEP and greater awareness of U=U observed in Australia (Holt et al., 2021; MacGibbon, Bavinton, et al., 2023; MacGibbon et al., 2021). Consistent with this observation, in 2023, condomless sex with casual male partners was concentrated among PrEP users (83.2%), followed by participants living with HIV (69.1%), HIV-negative participants (31.5%), then untested/unknown participants (28.1%; see **Figure 2**). Among the 128 participants who had sex with a female partner in the six months prior to the survey, 53.1% reported any penetrative condomless sex with regular female partners and 36.7% reported any penetrative condomless sex with casual female partners. Among the 136 participants who had sex with a non-binary partner in the six months prior to the survey, 25.0% reported any penetrative condomless sex with regular non-binary partners and 54.4% reported any penetrative condomless sex with casual non-binary partners. There were no differences in partners' HIV status or participants' recent sexual practices between the states and territories (see **Appendix C Table C-5**).

² There was a minor difference in the proportion of participants who reported sex with a male partner on this measure of partner numbers (88.7%) compared to the question about partner genders (89.8%).

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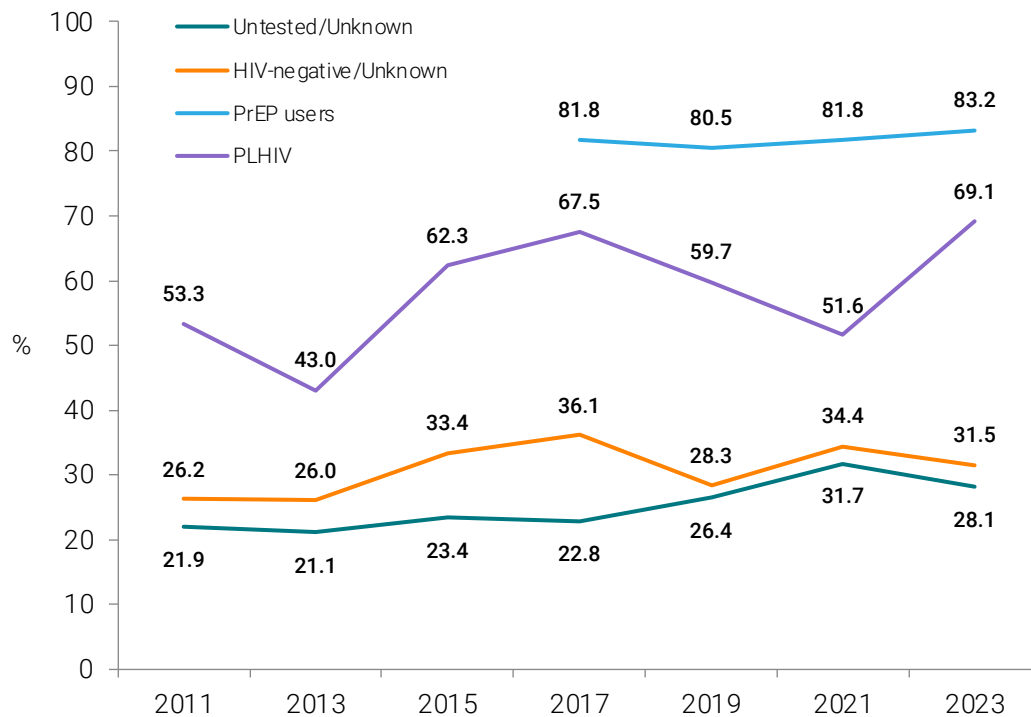


Figure 2. Condomless anal intercourse with casual male partners in the six months prior to survey reported by HIV-positive and HIV-negative & untested/unknown status participants

Use of PEP

Approximately one quarter (24.2%) of participants reported having ever taken post-exposure prophylaxis (PEP) after a suspected exposure to HIV, and 16.8% of HIV-negative and untested/unknown status participants [161/960; excluding PrEP users] had taken PEP in the year prior to the survey. The proportion of participants who had ever used PEP has steadily increased from 13.8% in 2013 ($p < .001$), however the 2023 figures remain similar to the 2021 survey round ($p = .279$; see **Figure 3**). Among participants who had ever taken PEP ($n = 495$), more than half had received PEP once (54.9%); the remainder had taken PEP two or more times (45.1%). In 2023, a greater proportion of participants from New South Wales had ever taken PEP (28.2%), followed by Victoria (24.6%), the other states and territories (23.2%), then Queensland (17.6%, $p = .002$; see **Appendix C Table C-6**).

Use of PrEP

In the 2023 survey, more than half of the participants (58.4%) reported having ever taken HIV pre-exposure prophylaxis (PrEP) to prevent HIV. This proportion has increased significantly from 3.0% in 2015 and from 48.7% in 2021 (both $p < .001$, controlling for changes in demographic variables; see **Figure 3**).

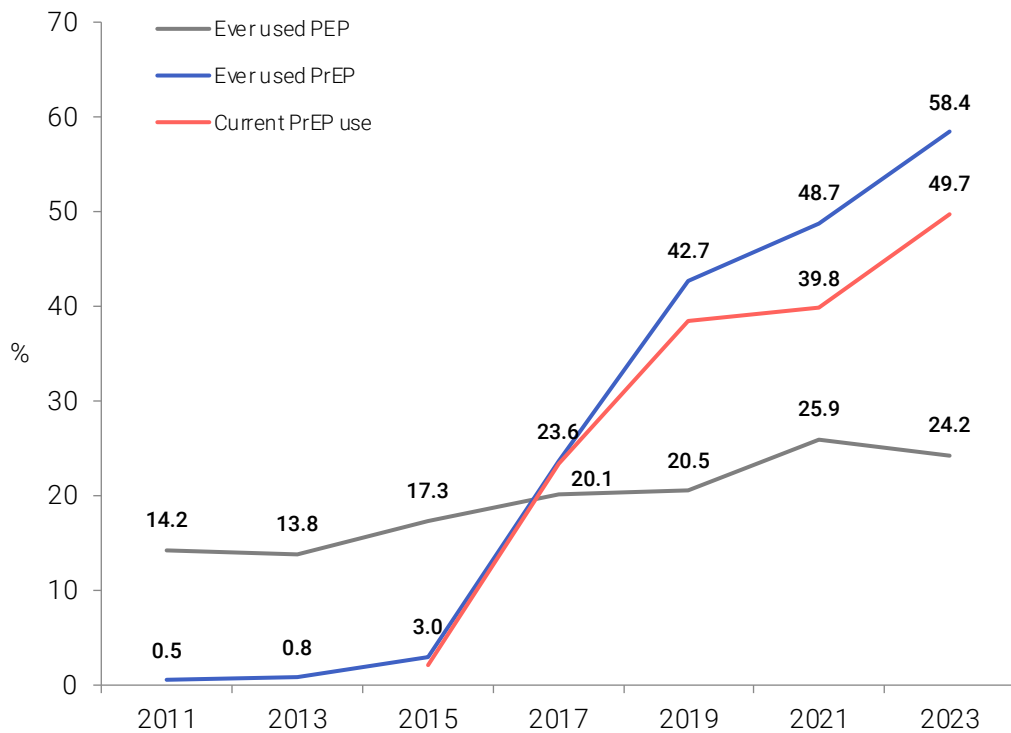


Figure 3. Participants who reported having ever received PEP and PrEP, and current PrEP use among non-HIV-positive participants

Of non-HIV-positive participants ($n = 1,907$), half (49.7%) were taking PrEP at the time of the survey. The proportion of current PrEP users has increased significantly from 2.1% in 2015, and from 39.8% in 2021 (both $p < .001$, controlling for changes in demographic variables). Among the 947 current PrEP users, most (64.6%) were taking PrEP daily, followed by on-demand '2-1-1' dosing (31.4%). A small number of participants were taking PrEP daily for limited periods of time (known as 'periodic PrEP'; 3.5%), and five participants were taking PrEP another way (0.5%). Nearly all PrEP users (98.7%) reported that they were HIV-negative; the remaining minority of PrEP users reported they did not know their HIV status (similar to 2021). Current PrEP users were asked where they had accessed PrEP (with non-exclusive response categories). Most current PrEP users (94%) had accessed PrEP via an Australian pharmacy, and a minority (6.7%) had purchased PrEP online from overseas. Smaller numbers had accessed PrEP from 'someone else' ($n = 7$) or another way ($n = 22$). Nearly one quarter (24.1%) of current PrEP users had been taking PrEP for a year or less; one fifth (20.6%) for one to two years; the remaining proportions were taking PrEP for two to four years (27.8%) or for more than four years (27.6%).

In 2023, there was no statistically significant difference in the proportions of participants who had ever taken PrEP between the states and territories ($p = .10$). However, there were greater proportions of current PrEP users in Victoria (54.2%) and New South Wales (50.8%) compared to the other states and territories (46.2%) and Queensland (44.8%; $p = .018$; see **Appendix C Table C-6**).

Reasons for stopping PrEP

Non-HIV-positive participants who had previously taken PrEP, but not in the six months prior to the survey ($n = 156$), as well as participants who indicated they had stopped PrEP temporarily ($n = 61$) or permanently ($n = 19$), were asked why they had stopped taking PrEP. **Table 4** shows the reasons given; the categories are not mutually exclusive. The two most common reasons for stopping PrEP have not changed since the 2019 survey; they were having less sex (48.7%) and being in a monogamous relationship (31.4%). In 2023, nearly one in five (18.2%) participants stopped PrEP owing to side effects from the medication; between 2021–2023, side effects changed from being the least common reason (reported by 10.5% of participants who stopped PrEP) to the third most common reason for stopping PrEP.

Table 4. Reasons for stopping PrEP ($n = 236$)

	n (%)
I was having less sex	115 (48.7)
I was in a monogamous relationship	74 (31.4)
I had side effects from the medication	43 (18.2)
I was no longer at risk of HIV	43 (18.2)
I couldn't afford it	35 (14.8)
I ran out of pills OR didn't have a prescription	34 (14.4)
I was concerned about taking medication	28 (11.9)

Awareness of PrEP

Among participants who were HIV-negative or did not know their HIV status, and had never taken PrEP ($n = 724$ or 35.4% of the sample), most (52.3%) had heard 'a little' about PrEP, a smaller proportion (43.1%) had heard 'a lot' about PrEP, while a minority (4.6%) had never heard about PrEP before the survey. The change in the proportion of participants who had heard a little or a lot about PrEP, from 95.3% in 2019 to 94.7% in 2021, was not statistically significant ($p = .67$).

Among the same group of participants (participants who had never taken PrEP), more than half (60.8%) knew at least one person taking PrEP, which was similar to the last survey (57.8% in 2021; $p = .276$). In 2023, approximately one quarter (24.0%) of non-HIV-positive participants who had never taken PrEP had discussed taking it with a doctor (no change from 24.2% in 2021, $p = .943$). In the same group, less than a fifth (17.5%) indicated that they intended to take PrEP in the next six months. There were no statistically significant differences in awareness of PrEP between participants from different states and territories (see **Appendix C Table C-7**).

Preferences for taking PrEP

Non-HIV-positive participants were asked about their preferred method of taking PrEP, assuming that all methods were available and equally effective. In 2023, among current PrEP users ($n = 947$), the most preferred way of taking PrEP was: monthly pills (29.1%), long-acting injections (26.2%), long-acting, removable implants (16.6%), event-based dosing (14.1%), and daily pills (13.0%). For event-based dosing, the survey stated “pills before and after sex (event-based or ‘on-demand’ dosing)”. For long-acting injections the survey suggested the time period would be every two months. Among non-PrEP-users ($n = 960$), the most preferred way of taking PrEP was: event-based dosing (30.9%), monthly pills (27.9%), long-acting injections (15.8%), long-acting, removable implants (12.2%), and daily pills (9.1%). It is worth noting that although daily pills remained the most common way PrEP users in the sample took PrEP in 2023 (64.6% of current users), daily pills were the least preferred dosing strategy among both groups. There were no statistically significant differences in preferences for taking PrEP between non-HIV-positive participants from different states and territories ($p = .704$; these comparisons are not reported in the appendices).

Attitudes toward taking PrEP

Three scales examined attitudes towards taking PrEP among HIV-negative and untested/unknown status participants who had never taken it before ($n = 724$). There were no statistically significant differences in attitudes towards taking PrEP between participants from different states and territories (see **Appendix C Table C-8**).

Willingness to use PrEP

In 2023, the mean score on the *Willingness to use PrEP* scale was 3.6 ($SD = 0.7$, $n = 724$). Based on a score of ≥ 4 on the scale, 31.5% of HIV-negative/unknown status participants were categorised as willing to use PrEP. This proportion has remained stable over the past two survey rounds (31.9% in 2019 and 32.1% in 2021; $p = .63$, controlling for changes in demographic variables; see **Figure 4**).

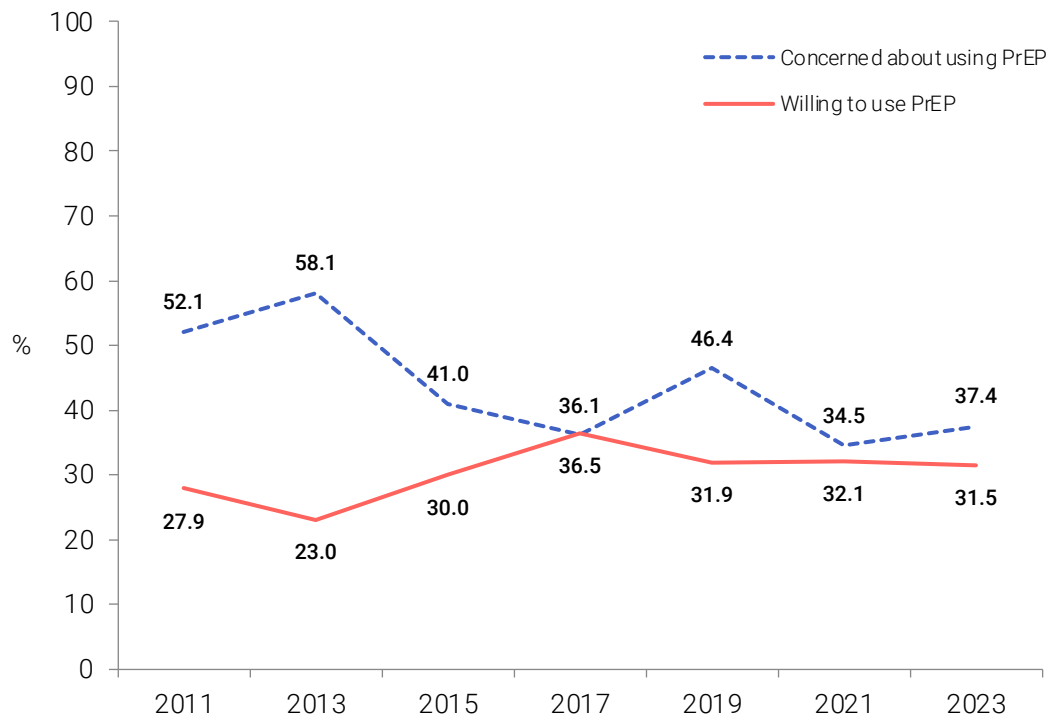


Figure 4. Willingness to use PrEP and concern about using PrEP among HIV-negative and untested/unknown status men who had never take

There were 325 HIV-negative and untested/unknown status participants who had never taken PrEP and who were categorised as suitable to take PrEP based on reported risk behaviour (for the criteria, see **Box 1**); this represented 36.9% of HIV-negative and untested/unknown participants, excluding current and recent PrEP users. Among PrEP suitable participants who had never used PrEP ($n = 251$), 32.7% were categorised as willing to use PrEP; this proportion has steadily decreased from 48.8% in 2017 and 39.0% in 2021 (both $p = .001$; controlling for demographic variables). While willingness to use PrEP among eligible/suitable men has decreased since 2017, it is worth noting that the proportion of participants deemed PrEP suitable, but who have never used PrEP, decreased from 43.5% in 2017 to 34.4% 2019, and has remained stable at this proportion between 2019–2023.

Box 1: Criteria used to determine PrEP suitability

Participants were categorised as suitable to take PrEP if they were HIV-negative or untested/unknown status participants who were not currently taking PrEP and who met any of the following criteria:

- Regular partner living with HIV with a detectable or unknown viral load, AND who had condomless anal intercourse with a regular partner in the previous 6 months.
- Any condomless anal intercourse with casual male partners in the previous 6 months.
- Any STI diagnosis in the previous 12 months.
- Any crystal methamphetamine OR any gamma hydroxybutyrate (GHB) use in the previous 6 months (2011–2021) OR any drug use for the purpose of sex in the last six months (2023).

These criteria are an approximation of the PrEP clinical guidelines used to define at-risk gay, bisexual and other men who have sex with men who are suitable for PrEP (ASHM, 2019). The guidelines outline other criteria which are not captured in the survey (e.g., anticipated risk and HIV-related anxiety). In 2023 we removed survey items about specific types of drugs used (i.e., crystal methamphetamine and GHB), and as a result, from 2023 we have used any drug use for the purpose of sex as a proxy for increased HIV risk associated with drug use (Takeuchi et al., 2023).

Concern about using PrEP

In 2023, the mean score on the *Concern about using PrEP* scale was 3.3 ($SD = 0.9$, $n = 724$). Based on a score of ≥ 4 on the scale, 37.4% of HIV-negative/unknown status participants were categorised as concerned about using PrEP. This represents a slight increase from 34.5% in 2021, however this change was not statistically significant when controlling for demographic variables ($p = .406$). Concern about using PrEP also remained lower than the most recent peak in this measure (46.4% in 2019). While there have been fluctuations on this measure since it was introduced in 2011, when controlling for the effect of demographic variables, including but not limited to age, gender identity and education, the change over time is not statistically significant ($p = .088$; see **Figure 4**). Among the 251 HIV-negative/unknown status men in 2023 who were categorised as suitable to take PrEP (see **Box 1**), and who had never taken PrEP, 36.7% were categorised as concerned about using PrEP. This proportion has remained stable since the last survey (35.7% in 2021). Again, noting fluctuations in concern among PrEP suitable participants, the change over time was not statistically significant after controlling for the effect of demographic variables ($p = .154$).

Reasons for not using PrEP

In 2023, the most common reasons for not using PrEP among suitable participants who had never taken PrEP ($n = 251$) were not having enough sex (38.7%), not being comfortable talking to a doctor about it (33.9%), using condoms (33.1%), concerns about side effects (31.9%), concerns about taking long-term medication (29.9%), and not knowing how to get PrEP (29.1%). Smaller proportions of participants reported they were not at risk

of HIV (11.6%) or that they did not want other people to see their pills (16.3%) as reasons for not using PrEP. Among this group of PrEP suitable participants who had never taken PrEP, the most preferred ways to take PrEP were monthly pills (30.7%), event-based dosing (28.7%), long-acting injections (15.4%), implants (11.6%), or daily pills (10.8%), assuming all were available and equally effective.

Reduced HIV concern from PrEP

The *Reduced HIV concern from PrEP* scale measured participants' general level of concern about acquiring HIV due to PrEP use in the community, with items such as "I am less worried about having sex without condoms because of PrEP" and "HIV is less of a threat because more people are taking PrEP". Among HIV-negative and untested/unknown status participants who had never taken PrEP ($n = 723$), the mean score on the scale was 3.4 ($SD = 0.9$). Based on a score of ≥ 4 on the scale, 33.2% of HIV-negative and untested/unknown participants were categorised as having reduced concern about HIV because of PrEP in 2023, and 66.8% were categorised as neutral or not having reduced concern about HIV. The proportion of participants who were categorised as having reduced concern about HIV because of PrEP remained similar to the last survey (34.8% in 2021, $p = .513$) but has increased significantly from 22.8% in 2017 ($p < .001$, controlling for changes in demographic variables; see **Figure 5**).

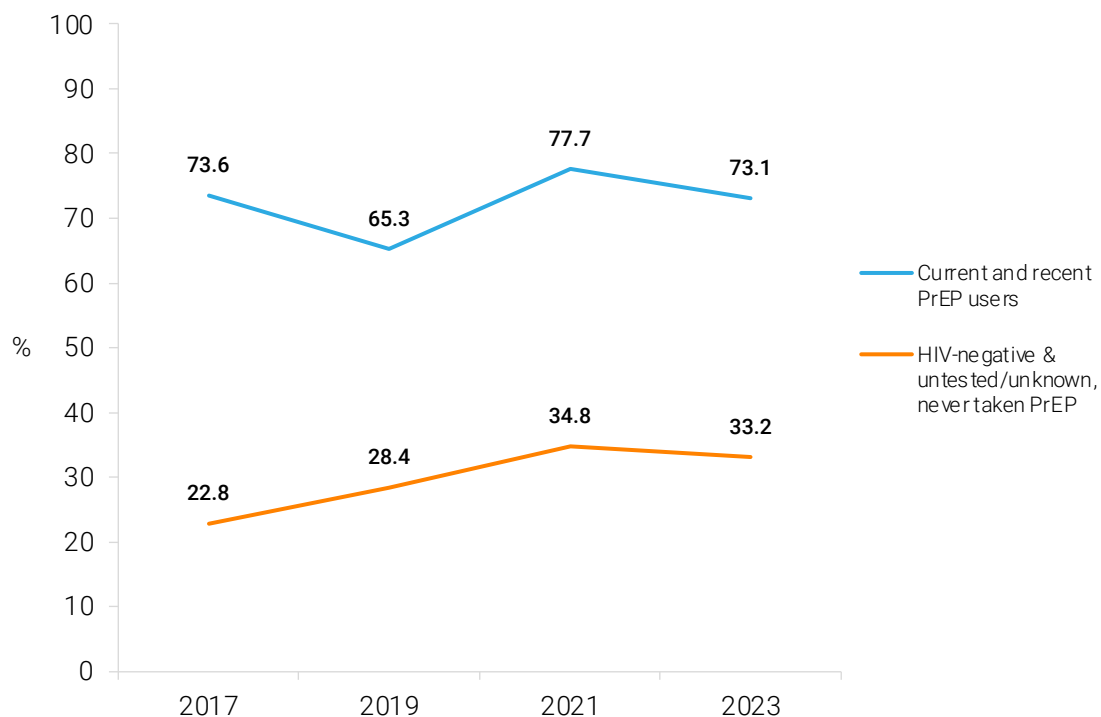


Figure 5. Reduced HIV concern from PrEP among HIV-negative and untested/unknown status men who had never taken PrEP, and sexual confidence and reduced HIV concern among current and recent PrEP users

Attitudes towards PrEP among participants taking PrEP

Another scale examined attitudes toward taking PrEP among HIV-negative and untested/unknown status participants who were currently taking or had recently taken PrEP ($n = 1,007$). In 2023, the mean score on the *Sexual confidence and reduced HIV concern from PrEP* scale was 4.2 ($SD = 0.7$). Based on a score of ≥ 4 on the scale, 73.1% of current or recent users were categorised as having increased sexual confidence and reduced HIV concerns because of PrEP, and 26.9% were categorised as neutral or as not having increased sexual confidence or reduced concerns about HIV. Overall, the proportion of participants classified as having increased sexual confidence and reduced HIV concern because of PrEP has fluctuated, with changes over time likely due to demographic characteristics such as age and education (both $p < .01$) rather than survey year ($p < .236$, controlling for changes in demographic variables; see **Figure 5**). There were no differences in the proportions of PrEP users who experienced increased sexual confidence and reduced HIV concern because of PrEP between the states and territories ($p = .286$).

In 2023 we introduced new survey items for current and recent PrEP users ($n = 1,008$) about their experiences of getting and taking PrEP, particularly in relation to cost, accessibility and side effects. All items were asked on a 5-point Likert-type scale ranging from 'Strongly disagree' (1) to 'Strongly agree' (5). The frequency and proportion of participants in agreement with each item are reported in **Table 5** (i.e., scores ≥ 4). Most participants agreed that getting PrEP was easy (72.9%), but smaller proportions agreed that attending sexual health appointments was affordable (65.7%), and only half agreed that PrEP was affordable (56.3%). These results should be interpreted within the context of current PrEP users' reported incomes; specifically, 61.9% of current PrEP users reported incomes above \$80,000 per annum compared to 42.7% of other HIV-negative and untested/unknown HIV status participants ($p < .001$). Among current and recent PrEP users, notable minorities reported difficulties getting and taking PrEP: 17.4% found it challenging to find a doctor to prescribe PrEP; 14.8% had side effects from PrEP; 12.5% struggled to pay for their sexual health care and PrEP; and 11.2% reported nausea from the medication.

Table 5. Accessibility and side effects from PrEP ($n = 1,008$)

	<i>n</i> (%)
Getting PrEP is easy	735 (72.9)
Attending sexual health appointments is affordable	662 (65.7)
PrEP is affordable	568 (56.3)
It's challenging to find a doctor to prescribe me PrEP	175 (17.4)
I get side effects from taking PrEP	149 (14.8)
I struggle to pay for my sexual health care and PrEP	126 (12.5)
PrEP medication makes me nauseous	113 (11.2)

PrEP cascade to assess uptake

We have developed PrEP cascades to assess implementation among HIV-negative and untested/unknown status men in Australia (Holt et al., 2020). The cascade drawn from the PrEPARE Project has eight steps (see **Figure 6**), with the first step identifying PrEP eligible/suitable participants. In 2023, we determined eligibility according to the PrEP suitability criteria outlined in **Box 1**. We assumed that all PrEP users were aware of PrEP, willing to use it, and had discussed PrEP with a doctor (steps 2–4 of the cascade), as past and current PrEP users were not shown survey items about these topics. Current and recent PrEP users who did not meet the PrEP suitability criteria were excluded from the cascade. The denominator (base) for the proportions in **Figure 6** is the total number of HIV-negative and untested/unknown status participants in each survey year. In the next paragraph each step in the cascade is used as the denominator for the following step; for example, of those who were eligible for PrEP, what proportion of participants were aware of it?

Of 1,907 HIV-negative and untested/unknown status participants in 2023, 1,213 (63.6%) were classified as eligible/suitable for PrEP in the first step of the cascade (of whom 89.4% reported condomless anal intercourse with casual partners in the six months preceding the survey). Nearly all eligible participants were aware of PrEP (1,205/1,213 = 99.3%). Most eligible and aware participants were willing to use PrEP (1,042/1,205 = 86.5%), which was a slight improvement from 83.5% in 2021, but was not statistically significant ($p = .075$). Most eligible, aware, and willing participants had discussed PrEP with a doctor (990/1,042 = 95.0%); this step in the cascade has improved substantially over time, and increased from 91.7% in 2021. Most participants who had discussed PrEP with a doctor had used PrEP (962/990 = 97.2%); of whom, most were using PrEP at the time of the survey, or had used PrEP within the six months prior to the survey and had stopped PrEP temporarily (876/962 = 91.1%). Most PrEP users had been tested for HIV and STIs in the three months preceding the survey (652/876 = 74.4%); this proportion has decreased significantly from 95.8% in 2017 ($p < .001$); this change may reflect the growing use of on-demand PrEP in the sample that would require less frequent HIV/STI testing for prescriptions. In 2023 in the last step of the cascade, most participants who had recently tested for HIV and STIs were classified as having reduced HIV concern and increased sexual confidence because of PrEP (626/652 = 96%).

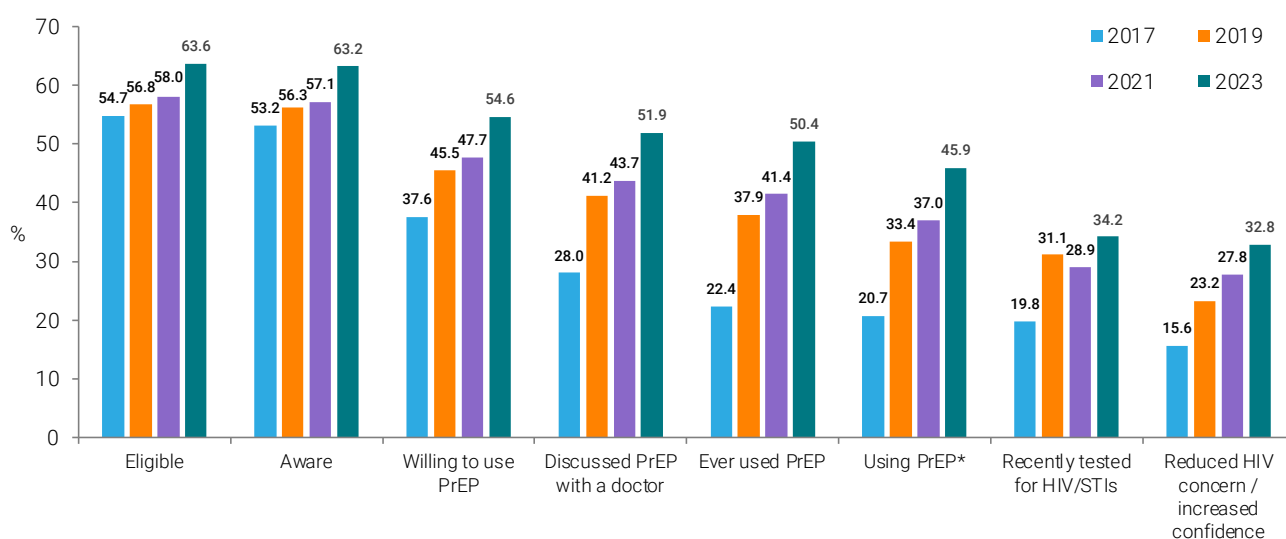


Figure 6. PrEP cascade for HIV-negative and untested/unknown status participants, 2017-2023

Key findings from the PrEPARE Project 2023

James MacGibbon, Simin Yu, Timothy R. Broady, Benjamin R. Bavinton, Sarah K. Calabrese, Dean Murphy, Johann Kolstee, Shawn Clackett, Tina Gordon, Dash Heath-Paynter, Angus Molyneux, Jeanne Ellard, Andrew Heslop, John de Wit, and Martin Holt

Attitudes towards other men taking PrEP

Another scale examined attitudes toward having sex with men on PrEP among all participants except current and recent PrEP users ($n = 1,019$). In 2023 we revised the 3-item *Willingness to have sex with men taking PrEP* scale by removing an item about willingness to have condomless sex with a PrEP user (“I would have sex without condoms with someone on PrEP”). Willingness to have sex with a PrEP user differs conceptually from willingness to have *condomless* sex with a PrEP user. As a result, removing the condomless sex item improved the internal reliability of the scale (from Cronbach’s alpha = .62 to .71 in 2023), and the improvement was observed in all survey rounds that included the scale (2015–2023). The mean score on the revised 2-item scale was 4.3 (SD = 0.8). Based on a score of ≥ 4 on the scale, 82.0% of participants in 2023 were categorised as willing to have sex with partners taking PrEP, and 18.0% were categorised as unwilling or neutral. With the new scale, there was no difference in 2023 between participants living with HIV and HIV-negative and untested/unknown status participants in willingness to have sex with partners who were taking PrEP (86.3% vs. 81.4%; $p = .156$). There has been a significant increase in the proportion of HIV-negative/unknown status men who reported willingness to have sex with men on PrEP, from 72.9% in 2015 to 81.4% in 2023 (overall, $p < .001$), although there was no significant change between 2021 and 2023 ($p = .106$, both controlling for the effect of demographic variables; see **Figure 7**). There were no statistically significant changes in willingness among participants living with HIV when controlling for the effect of demographic variables, since 2015 ($p > .10$). There were no differences in the proportions of participants who were willing to have sex with PrEP users between the states and territories ($p = .10$ for HIV-negative and untested/unknown status participants, and $p = .54$ for participants living with HIV; see **Appendix C Table C-9**).

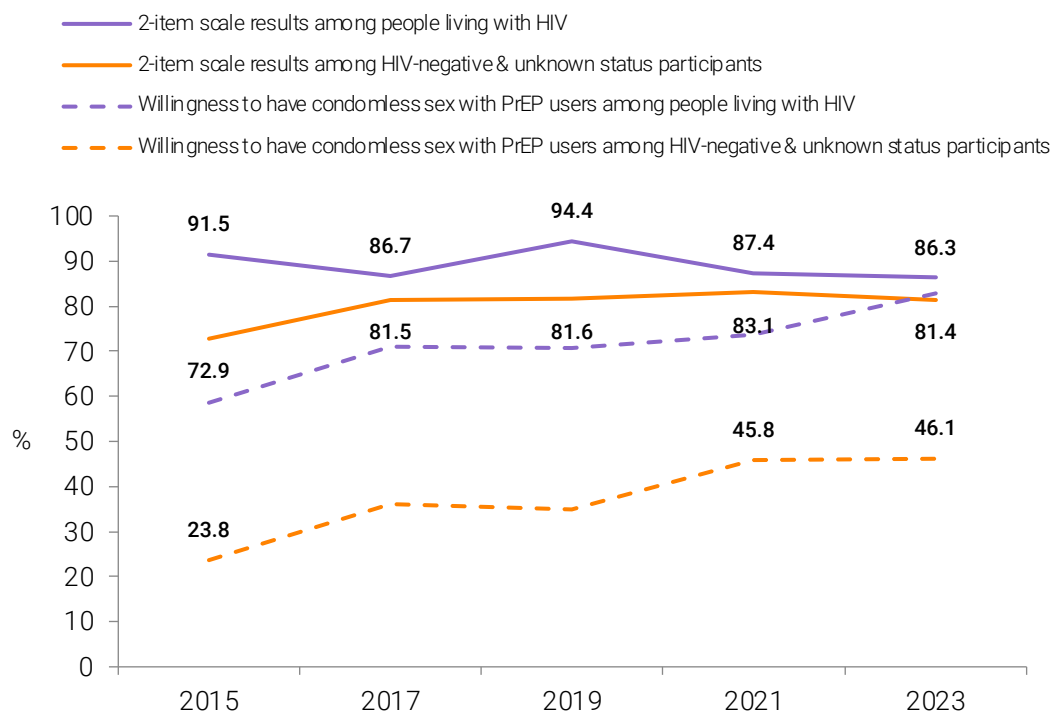


Figure 7. Participants who reported willingness to have sex with men taking PrEP

Attitudes towards HIV treatments

We have used a scale to assess attitudes of participants towards HIV treatment as prevention since 2013, and introduced survey items in 2021 assessing familiarity with the Undetectable = Untransmittable (U=U) message and its perceived accuracy. These questions were completed by all participants, and results are reported by HIV status. Another item measured preferences for HIV treatment modalities. Participants living with HIV were asked to rate potential alternative HIV treatment options to daily pills, such as weekly pills or long-acting injections.

HIV treatment prevents transmission

In 2023 we revised the 3-item *HIV treatment prevents transmission* scale by removing an item about the possibility for HIV treatments to end the HIV epidemic (“If every HIV-positive person was on treatment, the HIV epidemic would be over”). As we discussed in the 2021 survey report (MacGibbon et al., 2022), we have observed over successive survey rounds that some participants who scored highly on the first two scale items did not routinely endorse the third item, particularly participants living with HIV. We suspected that this pattern was, in part, due to community awareness that higher levels of diagnosis and treatment reduce but do not eliminate HIV transmission (Havlir et al., 2020). The removal of the third survey item improved the internal reliability of the scale (from Cronbach’s alpha = .70 to .76 in 2021; alpha = .75 in 2023 for the 2-item scale).

The mean score on the revised 2-item scale was 3.7 (SD = 1.1) among all participants (n=2,045), 3.7 (SD = 1.0) among HIV-negative and untested/unknown status participants (n = 1,906), and 4.4 (SD = 0.9) among participants living with HIV (n = 139). Based on a score of ≥ 4 on the scale, in 2023 56.4% of all participants were categorised as believing that HIV treatment prevents transmission, a statistically significant increase from 2.8% of all participants in 2013 ($p < .001$, controlling for the effect of demographic variables).

Scores on the HIV treatment prevents transmission (TasP) scale have remained higher among participants living with HIV compared to HIV-negative and untested/unknown status participants, regardless of our revision to the scale. In 2023 we stratified scores on the revised 2-item scale by HIV status and PrEP use (see **Figure 8**). Belief that HIV treatment prevents transmission was highest among participants living with HIV (82.7%), followed by current PrEP users (70.2%), HIV-negative participants not using PrEP (43.0%), and untested or unknown HIV status participants (23.0%; $p < .001$). There have been significant increases in belief in TasP among participants living with HIV, HIV-negative participants, and untested/unknown status participants since 2013, and among PrEP users since 2017 (all $p < .001$, controlling for the effect of demographic variables). Since 2019 scores on the revised scale have stabilised for all groups (adjusting for sampling) except HIV-negative participants not using PrEP, for whom belief increased from 36.4% in 2019 to 43.0% in 2023 ($p = .034$, controlling for the effect of demographic variables). Among participants living with HIV, there were no statistically significant differences in belief in TasP between states and territories. Among HIV-negative and untested/unknown status participants, greater proportions of residents of Victoria (58.8%) and New South Wales (56.5%) believed in TasP compared to the other states and territories (51.0%) and Queensland (48.4%; see **Appendix C Table C-10**).

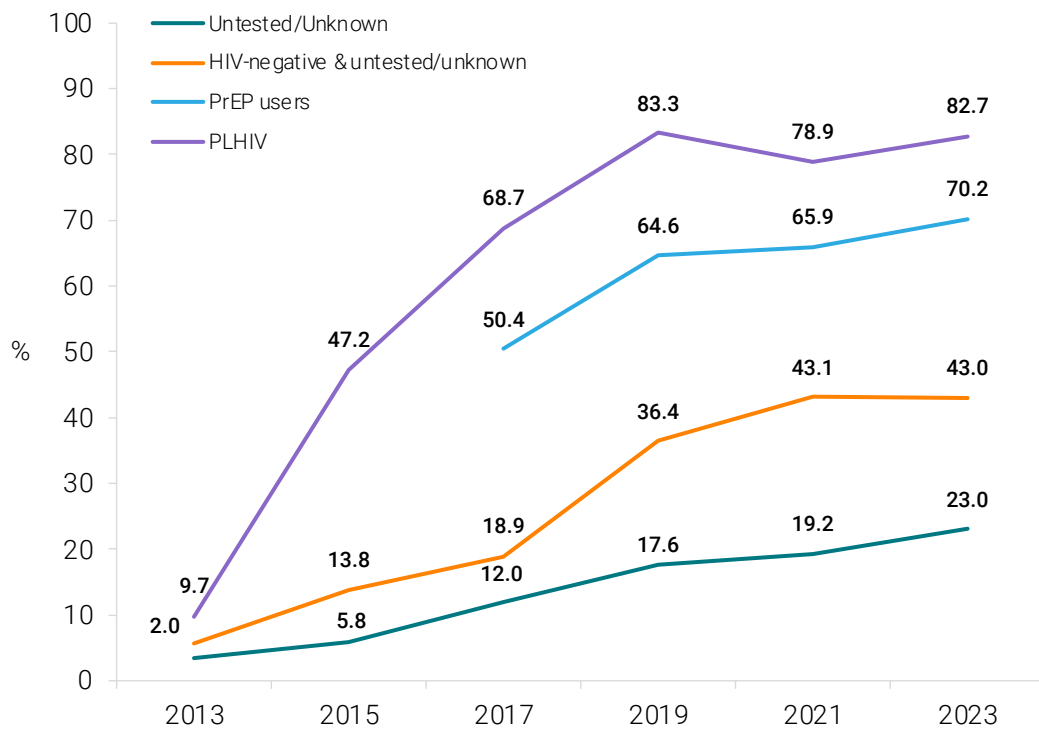


Figure 8. Participants who agreed that HIV treatment prevents transmission

Familiarity with and perceived accuracy of 'Undetectable = Untransmittable'

In 2023, 82.9% of participants were familiar with the Undetectable = Untransmittable (U=U) message (an increase from 78.6% in 2021, $p = .002$). As we observed in the 2021 survey (MacGibbon, Bavinton, et al., 2023), familiarity with U=U was highest among participants living with HIV (95.7%), followed by PrEP users (91.4%), HIV-negative participants (78.3%), and untested/unknown status participants (50.5%; $p < .001$). Participants who were familiar with the U=U message were asked how accurate they believed the message was. The Likert-type response item was adapted from Rendina and Parsons (2018). Among the whole sample, 54.9% believed the U=U message was 'accurate' or 'completely accurate', or 66.2% of participants who were familiar with the U=U message (similar to 52.9% and 67.3% in 2021, respectively, both $p > .50$). Following the same pattern as familiarity, perceived accuracy of U=U was highest among participants living with HIV (92.5%), followed by PrEP users (72.2%), HIV-negative participants not using PrEP (56.2%), and untested/unknown status participants (39.4%; $p < .001$). Among those who were familiar with the U=U message, less than half (47.5%) agreed they would have sex without condoms with a HIV-positive person who is undetectable (similar to 47.0% in 2021, $p = .544$), a marker of willingness to rely on U=U. This proportion increased to 62.2% of participants who were both familiar with the U=U message and believed it was accurate (similar to 62.4% in 2021, $p = .94$). Greater proportions of participants in NSW and Victoria were familiar with the U=U message, and perceived it as accurate, compared to Queensland and the other states/territories ($p = .009$ and $p = .002$, respectively; see **Appendix C Table C-10** for state-based comparisons by HIV status).

Preference for taking HIV treatment

Participants living with HIV ($n = 139$) were asked about their preferred method of taking HIV treatment, assuming that all methods were available and equally effective. In 2023, the most preferred methods of taking HIV treatment were long-acting, removable implants (33.1%), long-acting injections (“e.g., every 1–2 months”; 23.0%), weekly pills (22.3%), and daily pills (20.9%). We did not compare responses from participants from different states and territories due to relatively small group sizes.

Attitudes towards condoms

A scale assessing attitudes towards condoms has been included in the survey since 2011. In 2023, the mean score on the *Confidence in discussing condoms with partners* scale was 3.7 in the whole sample ($SD = 0.9$, $n = 2,046$), 3.8 ($SD = 0.9$) among HIV-negative and untested/unknown status participants ($n = 1,907$), and 4.4 ($SD = 0.9$) among participants living with HIV ($n = 139$). Based on scores of ≥ 4 on the scale, 57.7% of the whole sample was categorised as having confidence in discussing condoms with partners. In 2023 we stratified scale scores by HIV status and PrEP use (see **Figure 9**). Scores were highest among untested or unknown HIV status participants (72.4%), followed by HIV-negative participants not taking PrEP (67.5%), current PrEP users (49.6%), and participants living with HIV (37.4%; $p < .001$). Between 2011 and 2019, confidence in discussing condoms fell among untested and unknown HIV status participants, HIV-negative participants and participants living with HIV (all $p < .05$, controlling for the effect of demographic variables; see **Figure 9**). However, more recently, there has been some improvement on this measure among untested/unknown status participants and HIV-negative participants, with significant increases since 2019 for untested/unknown status participants, and since 2021 for HIV-negative participants ($p < .001$ and $p = .005$, respectively, controlling for the effect of demographic variables). Confidence discussing condoms has remained stable since 2019 for current PrEP users and participants living with HIV (both $p > .80$), noting that these two groups are much more likely rely on PrEP and having an undetectable viral load than condoms for HIV prevention. Among HIV-negative and untested/unknown status participants, greater proportions of residents of Victoria (39.9%) and New South Wales (37.3%) were confident discussing condoms compared to those in Queensland (33.4%) and the other states and territories (31.2%; $p = .028$). There were no statistically significant differences in attitudes towards condoms across states and territories among participants living with HIV (see **Appendix C Table C-11**).

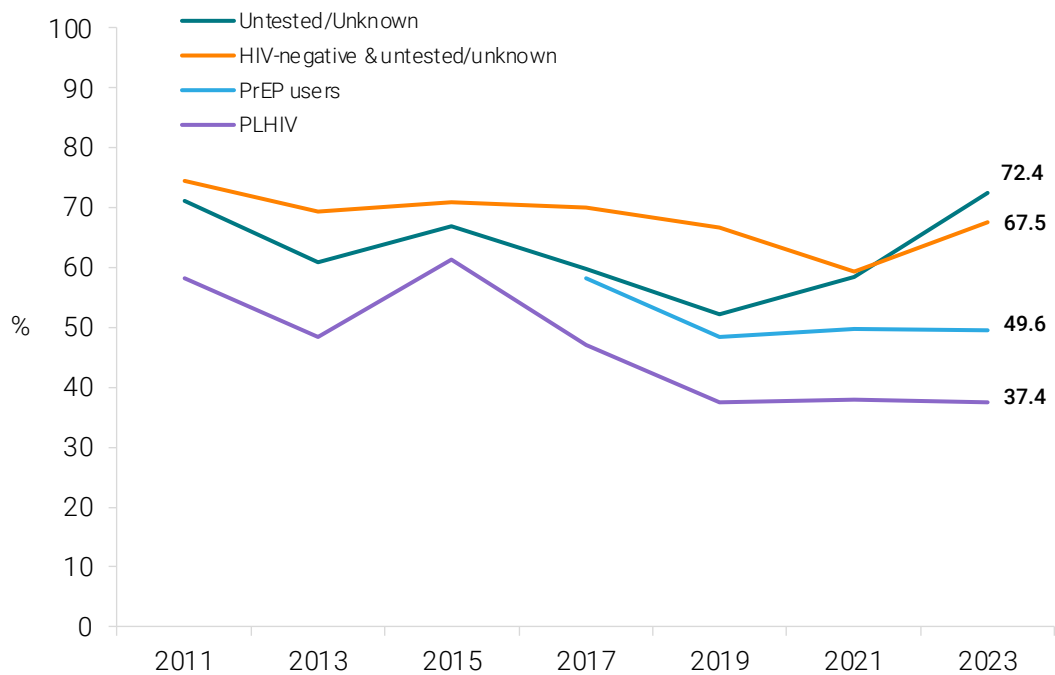


Figure 9. Participants that reported confidence in discussing condoms with partners

Attitudes toward STI prevention strategies

Since 2021 we have asked all participants about a range of STI prevention strategies, including some strategies that are not currently officially endorsed. The items were included as statements to which participants responded on a 5-point Likert-type scale ranging from ‘Strongly disagree’ (1) to ‘Strongly agree’ (5). We report the frequency and proportion of participants in agreement with each of the following items (i.e., Agree/Strongly agree):

- I use condoms to avoid getting STIs.
- I would take low dose antibiotics regularly if it would prevent me getting STIs.
- I would take an antibiotic pill after sex if it would prevent me getting STIs.

The proportion of participants who endorsed condom use to prevent STIs decreased slightly from 49.3% in 2021 to 45.1% in 2023 ($p = .017$). By contrast, the proportion of participants who endorsed the regular use of low dose antibiotics increased from 49.5% in 2021 to 54.0% in 2023 ($p = .013$). Similarly, the proportion of participants who endorsed the use of an antibiotic pill after sex increased from 70.0% in 2021 to 75.8% in 2023 ($p < .001$). In 2023, endorsement of antibiotics after sex (e.g., STI-PEP) was highest among participants who had not been tested for HIV or did not know their HIV status (81.1%), followed by PrEP users (78.1%), participants living with HIV (72.7%), and HIV-negative participants not taking PrEP (72.0%; $p < .001$).

In 2023 we asked all participants if they had ever used antibiotics for STI prevention. The survey did not specify types of antibiotics, such as doxycycline, but the question's explanatory text stated "this is sometimes referred to as doxy-PEP or doxy-PrEP". At time of the survey the availability of antibiotics for STI prophylaxis was generally limited to off-label prescriptions and an Australian clinical trial (The Syphilaxis Study, led by The Kirby Institute). Nevertheless, 157 (7.6%) participants had used antibiotics for STI prevention, of whom 34.0% had stopped permanently; 31.4% had stopped temporarily; 19.2% were taking two pills after sex (STI-PEP); 7.7% were taking daily pills (STI-PrEP); and 7.7% were taking it another way. The 157 participants who had used antibiotics for the prevention of STIs were asked how they got the antibiotics (non-mutually exclusive categories). Nearly half (46.8%) were prescribed the antibiotics by their doctor, while smaller proportions used antibiotics they already had (37.2%), were given antibiotics by someone they knew (10.3%), got them online without a prescription (10.3%), or got them through a clinical trial (5.8%). We asked all participants how much they knew about antimicrobial resistance (AMR). A third (37.9%) responded that they knew 'nothing' about AMR, 20.1% knew 'a little', 19.7% knew 'a moderate amount', 10.2% knew 'a lot', and 12.1% knew 'a great deal' about AMR. Of participants who had heard of AMR (i.e., those who knew something about it; $n = 1,271$), three quarters (76.2%) were concerned or very concerned about AMR; 18.8% were neither concerned nor unconcerned and fewer than 6% were unconcerned about AMR. Greater knowledge about AMR was significantly associated with greater levels of concern about AMR ($p < .001$).

Health status and illicit drug use

Self-reported health was assessed with a single item ('In general, do you feel your health is:') with five response options from 'Excellent' to 'Poor' (Australian Bureau of Statistics, 2019). Most participants (86.9%) rated their health as good, fair or excellent. There were no statistically significant differences between states and territories in self-assessed health status ($p = .77$).

In 2023 we simplified how we asked participants about drug use. In 2023, we only asked about *any illicit* drug use in the past six months, and one item about drug-enhanced sex: 'In the last 6 months, how often have you used drugs for the purpose of sex (e.g. MDMA, GHB, Crystal)?' In 2021, we reported that 66.6% of the sample had used any drugs in the six months before the survey (including amyl nitrite and erectile dysfunction medications). Excluding amyl and erectile dysfunction medications, the proportion reporting any illicit drug use was 39.9% in 2021. In 2023, 32.4% of participants reported using any illicit drugs in the six months before the survey, a decrease from 2021. It is likely that not having a list of specific drugs to prompt participants in 2023 has influenced the reduction in the proportion reporting any drug use. In contrast, similar proportions of participants reported using drugs for sex in 2021 and 2023 (15.1% and 16.1% respectively, $p = .44$). Greater proportions of participants in Victoria and New South Wales had used any illicit drugs and drugs for sex in the past six months compared to Queensland and the other states and territories (see **Appendix C Table C-12**, which also contains comparisons between states/territories).

Perceived likeliness of acquiring HIV

In 2023, 2.8% of HIV-negative and untested/unknown status participants reported that they considered it likely or very likely that they “will become HIV-positive”, which we regard as an indicator of perceived risk of HIV acquisition (similar to 3.2% in 2021, $p = .349$). Perceived risk was highest among the 196 untested/unknown status participants (5.6%), followed by the 764 HIV-negative participants (4.2%). Perceived risk was very low among the 947 PrEP users (1.1%). Of the small group of non-PrEP-users who perceived themselves as likely or very likely to acquire HIV ($n = 43$), 19 (53.5%) reported having condomless sex with casual partners, 6 (14%) reported consistent condom use, and 14 (32.5%) did not report any casual sex or did not have anal sex with casual partners. In the same group, 64.1% did not have a regular partner, and one had a partner living with HIV. Overall, the proportion of participants who considered themselves unlikely or very unlikely to acquire HIV has remained relatively stable since 2019 at around 85% ($p = .645$).

Discussion

The 2023 iteration of the PrEPARE Project was the seventh national survey of gay, bisexual and queer men and non-binary people that we have conducted on attitudes to HIV prevention, and biomedical prevention methods in particular. In this round we continued to evaluate community attitudes to help guide the maturing implementation of PrEP and treatment as prevention in Australia. In addition to the survey's legacy measures, we examined new topics such as the accessibility and side effects of PrEP among those already taking it, and interest in and use of antibiotics to prevent or manage sexually transmissible infections (STIs) other than HIV. A key strength of the 2023 survey was its large sample size of more than 2,000 participants, compared to roughly 1,300 participants in previous rounds. The larger sample size gives us greater confidence in reporting findings for subgroups of participants that had become smaller in the study over time; one example is HIV-negative and untested participants who have never used PrEP, a group which has become smaller over time as the number of PrEP users has grown. In 2023, we had over 700 participants who had never used PrEP before, which helped illuminate potential barriers for PrEP uptake among. In this report, we discuss positive trends and potential challenges for expanding PrEP access and adoption, particularly among those who have historically been less likely to use PrEP despite reporting some risk of HIV acquisition. We focus on the social determinants of PrEP use and consider the role of new prevention technologies that may enhance or complicate the ways that gay, bisexual and queer men and non-binary people engage with biomedical HIV prevention.

In relation to PrEP use, there is a continuing upward trend in trying and using PrEP among gay, bisexual and queer participants of the survey. In 2023, 58% of participants had ever used PrEP (up from 49% in 2021), and 50% of HIV-negative and untested participants were using PrEP at the time of the survey (up from 40% in 2021). While the growth in PrEP use slowed between the 2019 and 2021 surveys (coincident with COVID-19), there have since been larger increases in lifetime and current PrEP use that appear to reflect a resumption of social and sexual practices after the easing of COVID-19 restrictions that has occurred since 2021. PrEPARE has historically attracted a greater proportion of PrEP users than other studies, but in 2023, the levels of recent PrEP use reported by participants were similar to those found in routine behavioural surveillance studies. For example, in other studies conducted in early 2023, recent PrEP use was reported by 46% of gay and bisexual men in New South Wales and 50% of men in Victoria (Broady et al., 2023; MacGibbon, Broady, et al., 2023). The convergence in levels of PrEP use observed in the PrEPARE Project and routine behavioural surveillance suggests this is close to the actual level of use by GBQ+ people in Australia's most populous jurisdictions.

In 2023 we observed a continued decline in the use of daily pills as the main PrEP dosing strategy by PrEP users, which has accelerated since COVID-19 emerged in Australia (from 93% of PrEP users taking daily pills in 2019, to 76% in 2021 and 65% in 2023). In turn, there has been an increase in on-demand or event-based dosing (from 20% in 2021 to 31% in 2023). The level of event-based dosing is similar to that reported in behavioural surveillance data collected in 2023 in New South Wales and Victoria (Broady et al., 2023; MacGibbon, Broady, et al., 2023). These trends suggest a growing preference for flexible PrEP dosing options. It is possible that some men and non-binary people prefer on-demand PrEP because this strategy more adequately aligns with their patterns of sexual behaviour and risk. On-demand PrEP may also reduce users' overall pill burden, the cost

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associated with PrEP, and the frequency of clinical visits required for HIV and STI screening and prescriptions, although further research is needed to understand the relationship between dosing preferences and PrEP affordability and accessibility. It is likely that on-demand PrEP saves PrEP users time and money accessing healthcare, noting that a sizeable minority of PrEP users (44%) indicated PrEP was not affordable, and nearly one in five (17%) struggled to find a doctor to prescribe the medication. Cost of living is a current and pressing issue, particularly for young people in Australia. As a result, there have been reports of delays to people seeking healthcare and filling prescriptions (Productivity Commission, 2023). Government interventions may be required to ensure that cost-of-living pressures do not affect access to HIV prevention services, particularly among gay, bisexual and queer men and non-binary people on lower incomes and those who cannot access free public sexual health clinics.

The shift away from daily pill dosing highlights the continued importance of PrEP education about different dosing strategies and their effective use. Specifically, health education campaigns that promote on-demand PrEP could help to increase overall PrEP uptake given that this dosing strategy was the most preferred among non-PrEP-users in the sample. Longer-acting forms of PrEP were also popular among all participant subgroups, particularly monthly pills, which are not currently available in Australia or proven. For current PrEP users, long-acting injections were almost as popular as monthly pills, which holds promise as long-acting injections of cabotegravir (CAB-LA) becomes available in Australia (particularly for PrEP users who struggle with adherence to oral pills), while daily pills were the least popular dosing strategy for this group. Similarly, daily pills remained the least preferred dosing strategy among HIV-negative and untested participants not taking PrEP, and also among non-PrEP-users who were deemed suitable to take PrEP based on our approximation of Australian prescribing guidelines (ASHM, 2019).

Willingness to use PrEP remained stable at 32% during 2019–23 among HIV-negative and untested participants who had never used PrEP, and willingness decreased among non-users who were deemed suitable to take PrEP based on reported risk behaviour, from 39% in 2021 to 33% in 2023 (ASHM, 2019). Concern about using PrEP (e.g., side effects) has decreased significantly since 2013, and was reported by 37% of non-users in 2023 (no significant change since 2021). Willingness to have sex with gay and bisexual men using PrEP has remained stable since 2019, at more than 80% of participants living with HIV and HIV-negative and untested participants. These findings suggest a need for targeted education campaigns that acknowledge and address concerns and barriers to PrEP use among those who may benefit from its use.

In 2023 we revised our legacy measure of community attitudes to HIV treatment as prevention and we retained survey items introduced in 2021 about the Undetectable=Untransmittable or U=U campaign. Belief in TasP was highest among participants living with HIV (83%) and PrEP users (70%), followed by HIV-negative (43%) and untested participants (23%). A similar pattern was observed among participants in relation to familiarity with U=U and perceived accuracy of the U=U message. Most (83%) participants had heard of the U=U message and 66% of those who had heard of it believed it was accurate, and as with the legacy measure, familiarity and belief in U=U were highest among participants living with HIV and PrEP users. These findings have remained consistent with our detailed reporting on U=U from the 2021 survey, which documented greater U=U familiarity and perceived accuracy among those most engaged in HIV prevention and sexual health services (MacGibbon, Bavinton, et al., 2023).

In 2022, a new form of long-acting HIV treatment (a combination of cabotegravir and rilpivirine) received public subsidy following its earlier approval for use in Australia. Within the context of a variety of other long-acting treatments being trialled, such as removable implants and weekly pills, we asked participants living with HIV about their preferences for taking HIV treatment. As we found in the 2021 survey, there was a high level of interest in long-acting treatment options. Removable implants were the most popular option (33%; not currently available or proven), followed by long-acting injections (23%). Daily pills were the least preferred treatment option (21%).

We have previously documented changing attitudes to condoms as the use of biomedical HIV prevention has increased in Australia (Kolstee et al., 2022). From 2011–2021, the proportion of participants reporting a positive experience using condoms remained low and decreased over time, with fewer than 5% of participants reporting a positive experience of condoms in 2021 (MacGibbon et al., 2022). In 2023, we removed the condom experience scale from the survey due to consistently low scores on the measure among participants. Instead, we focused on confidence discussing condoms with partners. Confidence discussing condoms has declined between 2011 and 2023, however in 2023 there were important changes. While confidence discussing condoms has stabilised at lower levels among people living with HIV and PrEP users, confidence rebounded among both HIV-negative and untested/unknown status participants who were not taking PrEP. These findings suggest that participants who are not using a biomedical prevention strategy – and therefore who are most invested in initiating and sustaining condom use – are the most confident in doing so. These observations are supported by the lower levels of condomless casual sex reported by HIV-negative and untested participants compared to PrEP users and participants living with HIV.

As levels of condomless casual sex have increased, particularly among PrEP users and participants living with HIV, we have examined attitudes toward novel methods to prevent or manage STIs, in addition to barrier methods like condoms. Recent trials of antibiotics for STI prevention in men who have sex with men, transgender women, people living with HIV, and HIV PrEP users have found beneficial results, with a single dose of doxycycline (200mg) taken within 72 hours of sex ('doxy-PEP') reducing the incidence of syphilis, chlamydia, and gonorrhoea (Luetkemeyer et al., 2023; Molina et al., 2023). There is less evidence in support of daily doxycycline use as pre-exposure prophylaxis (doxy-PrEP), and heightened concern that this strategy would lead to greater antibiotic consumption (ASHM, 2023). Given the emerging evidence, we asked survey participants about their interest in and existing use of antibiotics for STI prevention. We found significant increases in participants' interest in the use of antibiotics for STI prevention since the 2021 survey, and in 2023, majorities of participants expressed interest in regular low-dose antibiotics (54%, e.g., doxy-PrEP) and antibiotics after sex (76%; e.g., doxy-PEP). By contrast, less than half of the sample (45%) endorsed condoms for the prevention of STIs. A minority of the participants (8%) had already used antibiotics to prevent STIs, suggesting that some gay, bisexual and queer men and non-binary people were already familiar with the concept of using antibiotics to prevent STIs, and emerging evidence about its efficacy. For approximately half the participants who had used antibiotics to prevent STIs, clinicians had reportedly provided off-label prescriptions for the drugs in the absence of formal prescribing guidelines. There are, however, concerns about antibiotic resistance that may be generated by strategies like doxy-PEP (e.g., Grant et al., 2020), and these concerns have framed calls for the limited and targeted use of antibiotics for those at highest risk of acquiring bacterial STIs (ASHM, 2023; Traeger

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et al., 2023). Related to this point, over a third of the sample (38%) knew nothing about antimicrobial resistance (AMR). Among those who had heard of AMR, most (76%) were concerned or very concerned about it, and greater knowledge about AMR was associated with greater concern about it. It remains unknown, however, to what extent doxy-PEP will lead to AMR on an individual and community level and whether concern about AMR might limit demand for antibiotic prophylaxis. In any event, we acknowledge the negative experiences that many gay, bisexual and queer men and non-binary people report in relation to condom use, and the desire to reduce the negative experience of having or being diagnosed with a STI (Holt et al., 2010; Kolstee et al., 2022). The strong interest in doxy-PEP likely reflects a desire to reduce STI incidence, but we found inconsistent knowledge about AMR among survey participants. Discussing the risks and benefits of doxy-PEP with the community will be necessary to encourage safe and limited use to prevent STIs in those most affected by them, but also to reduce the risk of AMR from excessive antibiotic use.

The PrEPARE Project continues to highlight evolving attitudes to HIV and STI prevention in Australia. In the most recent round, there has been a noticeable shift toward the use of more flexible PrEP dosing strategies, such as on-demand PrEP, and a growing interest in long-acting PrEP (and HIV treatment) options. Our findings highlight diverse sexual health needs among gay, bisexual and queer men and non-binary people, underscoring the continued importance of programs that support equitable, affordable access to HIV prevention, treatment and sexual health services in Australia.

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Appendix A. Statistical analyses

Aggregated national data are presented for all the findings. We have included statistical comparisons between NSW and other jurisdictions for most findings. Statistically significant differences between the states and territories on survey measures are noted in text, with reference to the relevant table that contains the comparative data for that measure. Data for New South Wales, Victoria and Queensland are shown in Appendix C. Data from other states and territories were grouped together due to the smaller number of participants from these jurisdictions.

Chi-squared tests were used to examine differences between categorical independent and dependent variables. Other non-parametric tests (such as the Wilcoxon rank-sum and the Kruskal-Wallis test) were used to examine differences between categorical independent variables and ordinal dependent variables (Likert scales), as well as to examine differences between categorical independent variables and continuous dependent variables, due to the non-normal distribution of scores on the continuous variables. Trends in behavioural characteristics over time were assessed with multivariate logistic regression, with the outcome of interest as dependent variable. The independent variables were the survey year and relevant demographic variables to control for variations in sampling. These included age, sexuality, employment status, state, and whether participants were born overseas. Statistical significance was set at $p < .05$. All analyses were conducted using Stata version 16.1 (StataCorp, College Station, TX).

Appendix B. Study measures

Table B-1. Scale summary statistics

	No. items	Population	<i>n</i>	Mean	SD	α
<i>Willingness to use PrEP</i>	7	HIV-negative and untested/unknown status participants who have never taken PrEP	724	3.6	0.7	.77
<i>Concern about using PrEP</i>	2	As above	724	3.3	0.9	.75
<i>Reduced HIV concern from PrEP</i>	3	As above	723	3.4	0.9	.74
<i>Willingness to have sex with men taking PrEP</i>	2*	All participants who had not taken PrEP in the last 6 months	1,019	4.3	0.8	.71
<i>HIV treatment prevents transmission</i>	2*	All participants	2,045	3.7	1.1	.75
<i>Sexual confidence and reduced HIV concern from PrEP</i>	4	Participants taking PrEP at the time of the survey (or within the last 6 months, except those who stopped PrEP permanently)	1,007	4.2	0.7	.76
<i>Confidence in discussing condoms with partners</i>	2	All participants	2,046	3.7	0.9	.72

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Appendix C. Reporting

Table C-1. Participant characteristics

	All N=2,046	NSW n=663	Vic. n=568	Qld n=380	Other states/ territories n=435	p value
Median age (interquartile range)	35.0 (27.0-46.0)	36.0 (29.0-47.0)	34.0 (26.0-45.0)	36.5 (28.0-46.0)	34.0 (26.0-46.0)	.042
Gender identity^a						.209
Male	1989 (97.2)	638 (96.2)	551 (97.0)	376 (98.9)	424 (97.5)	
Non-binary	47 (2.3)	21 (3.2)	13 (2.3)	3 (0.8)	10 (2.3)	
Different identity	10 (0.5)	4 (0.6)	4 (0.7)	1 (0.3)	1 (0.2)	
Sexual identity						.022
Gay	1672 (81.7)	546 (82.4)	484 (85.2)	301 (79.2)	341 (78.4)	
Bisexual/Queer/Another term	374 (18.3)	117 (17.6)	84 (14.8)	79 (20.8)	94 (21.6)	
Country of birth						<.001
Australia	1430 (69.9)	423 (63.8)	408 (71.8)	277 (72.9)	322 (74.0)	
Elsewhere	616 (30.1)	240 (36.2)	160 (28.2)	103 (27.1)	113 (26.0)	
Geographical region^b						<.001
Inner metro	989 (48.3)	361 (54.4)	300 (52.8)	140 (36.8)	188 (43.2)	
Outer metro	590 (28.8)	165 (24.9)	177 (31.2)	61 (16.1)	187 (43.0)	
Regional and remote	415 (20.3)	121 (18.3)	75 (13.2)	169 (44.5)	50 (11.5)	
Aboriginal and/or Torres Strait Islander	45 (2.2)	26 (3.9)	4 (0.7)	5 (1.3)	10 (2.3)	<.001
Highest level of education						.003
High school	399 (19.5)	119 (17.9)	101 (17.8)	82 (21.6)	97 (22.3)	
Trade certificate	338 (16.5)	94 (14.2)	83 (14.6)	78 (20.5)	83 (19.1)	
University degree	1309 (64.0)	450 (67.9)	384 (67.6)	220 (57.9)	255 (58.6)	
Employment status						.086
Employed full-time	1391 (68.0)	453 (68.3)	375 (66.0)	275 (72.4)	288 (66.2)	
Employed part-time	369 (18.0)	118 (17.8)	116 (20.4)	64 (16.8)	71 (16.3)	
Student/unemployed/other	286 (14.0)	92 (13.9)	77 (13.6)	41 (10.8)	76 (17.5)	
Annual income (AUD)						.002
Less than \$40,000	343 (16.8)	106 (16.0)	106 (18.7)	59 (15.5)	72 (16.6)	
\$40,000-\$79,999	509 (24.9)	154 (23.2)	127 (22.4)	111 (29.2)	117 (26.9)	
\$80,000-\$120,000	545 (26.6)	170 (25.6)	136 (23.9)	121 (31.8)	118 (27.1)	
More than \$120,000	520 (25.4)	189 (28.5)	150 (26.4)	77 (20.3)	104 (23.9)	
Prefer not to say	129 (6.3)	44 (6.6)	49 (8.6)	12 (3.2)	24 (5.5)	
Medicare coverage	1854 (90.6)	591 (89.1)	513 (90.3)	343 (90.3)	407 (93.6)	.1

^a Fisher's exact test.

^b 52 (2.5%) participants did not provide their postcode.

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Table C-2. HIV testing and status

	All N=2,046	NSW n=663	Vic. n=568	Qld n=380	Other states/ territories n=435	p value
Time since last HIV test						.075
≤12 months	1476 (72.1)	492 (74.2)	420 (73.9)	263 (69.2)	301 (69.2)	
>12 months	379 (18.5)	109 (16.4)	109 (19.2)	79 (20.8)	82 (18.9)	
Never tested for HIV	191 (9.3)	62 (9.4)	39 (6.9)	38 (10.0)	52 (12.0)	
HIV status						.080
Untested/unknown	208 (10.2)	71 (10.7)	39 (6.9)	42 (11.1)	56 (12.9)	
HIV-negative	1699 (83.0)	545 (82.2)	492 (86.6)	311 (81.8)	351 (80.7)	
HIV-positive*	139 (6.8)	47 (7.1)	37 (6.5)	27 (7.1)	28 (6.4)	

* Of participants who were living with HIV, 132 (95%) reported taking antiretroviral treatment at the time of survey and 131 (94.2%) reported having an undetectable viral load. Differences between states/territories are not reported due to small cell counts.

Table C-3. STI testing and diagnoses

	All N=2,046	NSW n=663	Vic. n=568	Qld n=380	Other states/ territories n=435	p value
Time since last test for STIs						.057
≤12 months	1444 (70.6)	468 (70.6)	426 (75.0)	262 (68.9)	288 (66.2)	
>12 months	317 (15.5)	104 (15.7)	81 (14.3)	56 (14.7)	76 (17.5)	
Never tested for STIs	285 (13.9)	91 (13.7)	61 (10.7)	62 (16.3)	71 (16.3)	
Participants who had been tested for STIs in past 12 months	(n=1,444)	(n=468)	(n=426)	(n=262)	(n=288)	
STI diagnosis in last 12 months	532 (36.8)	182 (38.9)	176 (41.3)	90 (34.4)	84 (29.2)	.006
Chlamydia diagnosis (last 12 months)	347 (24.0)	125 (26.7)	108 (25.4)	55 (21.0)	59 (20.5)	.268
Gonorrhoea diagnosis (last 12 months)	277 (19.2)	91 (19.4)	93 (21.8)	45 (17.2)	48 (16.7)	.731
Syphilis diagnosis (last 12 months)	89 (6.2)	24 (5.1)	34 (8.0)	20 (7.6)	11 (3.8)	.161
Another STI diagnosis (last 12 months)	63 (4.4)	19 (4.1)	21 (4.9)	11 (4.2)	12 (4.2)	.085

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Table C-4. Relationship agreements

	All N=2,046	NSW n=663	Vic. n=568	Qld n=380	Other states/ territories n=435	p value
Relationship type						.15
Monogamous	334 (34.4)	103 (32.6)	79 (30.5)	72 (37.3)	80 (39.6)	
Non-monogamous	636 (65.6)	213 (67.4)	180 (69.5)	121 (62.7)	122 (60.4)	
Relationship agreement^a						.72
Discussed rules	587 (60.5)	191 (60.4)	163 (62.9)	113 (58.5)	120 (59.4)	
Rules are unspoken/assumed	189 (19.5)	66 (20.9)	51 (19.7)	35 (18.1)	37 (18.3)	
No rules or agreement	192 (19.8)	59 (18.7)	44 (17.0)	45 (23.3)	44 (21.8)	

^a Two participants chose not to respond to this item.

Table C-5. Partner HIV status and sex in the last six months

	All N=2,046	NSW n=663	Vic. n=568	Qld n=380	Other states/ territories n=435	p value
Regular male partner's HIV status (boyfriend, partner, husband)^a						.48
No regular male partner(s)	1,076 (54.1)	347 (54.5)	309 (55.8)	187 (50.5)	233 (54.4)	
HIV-negative	458 (23.0)	147 (23.1)	115 (20.8)	88 (23.8)	108 (25.2)	
HIV-negative, taking PrEP	288 (14.5)	96 (15.1)	82 (14.8)	55 (14.9)	55 (12.9)	
Partner living with HIV	73 (3.7)	23 (3.6)	24 (4.3)	16 (4.3)	10 (2.3)	
Unknown/untested	94 (4.7)	24 (3.8)	24 (4.3)	24 (6.5)	22 (5.1)	
Any sex with male (cis or trans) partners (last 6 months)	1,840 (89.9)	596 (89.9)	524 (92.3)	339 (89.2)	381 (87.6)	.10
Any sex with female (cis or trans) partners (last 6 months)	137 (6.7)	36 (5.4)	40 (7.0)	30 (7.9)	31 (7.1)	.42
Any sex with non-binary partners (last 6 months)	149 (7.3)	43 (6.5)	48 (8.5)	24 (6.3)	34 (7.8)	.48
No. of male partners in last 6 months						.077
None	231 (11.3)	78 (11.8)	50 (8.8)	44 (11.6)	59 (13.6)	
1-5	961 (47.0)	302 (45.6)	255 (44.9)	190 (50.0)	214 (49.2)	
6-10	365 (17.8)	117 (17.6)	109 (19.2)	61 (16.1)	78 (17.9)	
>10	489 (23.9)	166 (25.0)	154 (27.1)	85 (22.4)	84 (19.3)	
No. of female partners in last 6 months^b						.862
None	1,918 (93.7)	629 (94.9)	531 (93.5)	353 (92.9)	405 (93.1)	
1-5	119 (5.8)	31 (4.7)	35 (6.2)	25 (6.6)	28 (6.4)	
6-10	6 (0.3)	2 (0.3)	2 (0.4)	1 (0.3)	1 (0.2)	
>10	3 (0.1)	1 (0.2)	0 (0.0)	1 (0.3)	1 (0.2)	
No. of non-binary partners in last 6 months^b						.589
None	1,910 (93.4)	623 (94.0)	522 (91.9)	359 (94.5)	406 (93.3)	
1-5	129 (6.3)	39 (5.9)	41 (7.2)	21 (5.5)	28 (6.4)	
6-10	5 (0.2)	1 (0.2)	3 (0.5)	0 (0.0)	1 (0.2)	
>10	2 (0.1)	0 (0.0)	2 (0.4)	0 (0.0)	0 (0.0)	
Sex with regular male partners						.18
No regular male partner(s) or no anal sex	696 (34.0)	238 (35.9)	173 (30.5)	125 (32.9)	160 (36.8)	
Consistent condom use	117 (5.7)	37 (5.6)	40 (7.0)	16 (4.2)	24 (5.5)	
Any condomless sex	1,233 (60.3)	388 (58.5)	355 (62.5)	239 (62.9)	251 (57.7)	
Sex with casual male partners						.089
No casual male partner(s) or no anal sex	669 (32.7)	203 (30.6)	172 (30.3)	132 (34.7)	162 (37.2)	
Consistent condom use	197 (9.6)	69 (10.4)	64 (11.3)	28 (7.4)	36 (8.3)	
Any condomless sex	1,180 (57.7)	391 (59.0)	332 (58.5)	220 (57.9)	237 (54.5)	

^a Excludes participants with multiple regular partners

^b Fisher's exact test

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Table C-6. Use of pre- and post-exposure prophylaxis (PEP and PrEP)

	All	NSW	Vic.	Qld	Other states/ territories	p value
All participants	N=2,046	n=663	n=568	n=380	n=435	
Ever taken PEP	495 (24.2)	187 (28.2)	140 (24.6)	67 (17.6)	101 (23.2)	.002
Ever taken PrEP	1,194 (58.4)	395 (59.6)	349 (61.4)	206 (54.2)	244 (56.1)	.10
HIV-negative and untested/unknown status participants	(n=1,907)	(n=616)	(n=531)	(n=353)	(n=407)	
PEP in the last year	164 (34.3)	55 (30.7)	47 (34.3)	21 (32.3)	41 (42.3)	.28
Current PrEP use	947 (49.7)	313 (50.8)	288 (54.2)	158 (44.8)	188 (46.2)	.018
Current PrEP users	(n=947)	(n=313)	(n=288)	(n=158)	(n=188)	
PrEP modality^a						.137
Daily pills	612 (64.6)	194 (62.0)	191 (66.3)	113 (71.5)	114 (60.6)	
Event-based dosing (2-1-1)	297 (31.4)	103 (32.9)	88 (30.6)	38 (24.1)	68 (36.2)	
Periodic dosing	33 (3.5)	16 (5.1)	7 (2.4)	5 (3.2)	5 (2.7)	
Another way	5 (0.5)	0 (0.0)	2 (0.7)	2 (1.3)	1 (0.5)	
Time since first taking PrEP						.77
Less than 1 year	228 (24.1)	73 (23.3)	69 (24.0)	36 (22.8)	50 (26.6)	
1-2 years	195 (20.6)	60 (19.2)	63 (21.9)	35 (22.2)	37 (19.7)	
2-4 years	263 (27.8)	86 (27.5)	73 (25.3)	51 (32.3)	53 (28.2)	
More than 4 years	261 (27.6)	94 (30.0)	83 (28.8)	36 (22.8)	48 (25.5)	
Source of PrEP^b						
Australian pharmacy	890 (94.0)	294 (93.9)	279 (96.9)	142 (89.9)	175 (93.1)	.026
Online from overseas	63 (6.7)	23 (7.3)	10 (3.5)	20 (12.7)	10 (5.3)	.002

^a Fisher's exact test.

^b Other response categories included 'got PrEP from someone else' (n=1) and 'other' (n=1).

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Table C-7. Awareness of PrEP among HIV-negative and untested/unknown participants who have never taken PrEP

	All n=724	NSW n=228	Vic. n=184	Qld n=148	Other states/ territories n=164	p value
Never heard of PrEP	33 (4.6)	10 (4.4)	5 (2.7)	6 (4.1)	12 (7.3)	.22
Know at least one person who is taking PrEP	440 (60.8)	141 (61.8)	117 (63.6)	88 (59.5)	94 (57.3)	.65
Have discussed PrEP with a doctor	174 (24.0)	56 (24.6)	47 (25.5)	31 (20.9)	40 (24.4)	.79

Table C-8. Attitudes towards PrEP among HIV-negative and untested/unknown participants who have never taken PrEP

	All n=724	NSW n=228	Vic. n=184	Qld n=148	Other states/ territories n=164	p value
Willing to use PrEP	228 (31.5)	73 (32.0)	61 (33.2)	44 (29.7)	50 (30.5)	.91
Concerned about using PrEP	271 (37.4)	87 (38.2)	63 (34.2)	60 (40.5)	61 (37.2)	.69
Reduced HIV concern from PrEP	240 (33.2)	74 (32.5)	68 (37.0)	45 (30.4)	53 (32.5)	.62

Table C-9. Attitudes towards gay and bisexual men taking PrEP among men who have never used PrEP

	All n=724	NSW n=228	Vic. n=184	Qld n=148	Other states/ territories n=164	p value
HIV-negative and untested/unknown status participants						
Willing to have sex with partners taking PrEP	582 (80.4)	177 (77.6)	159 (86.4)	119 (80.4)	127 (77.4)	.10
Participants living with HIV						
Willing to have sex with partners taking PrEP	112 (87.5)	34 (85.0)	32 (91.4)	24 (92.3)	22 (81.5)	.54

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Table C-10. Attitudes towards HIV treatment as prevention

	All	NSW	Vic.	Qld	Other states/ territories	p value
HIV-negative and untested/unknown status participants	n=1,907	n=616	n=531	n=353	n=407	
HIV treatment prevents transmission	1,038 (54.5)	348 (56.5)	312 (58.8)	171 (48.4)	207 (51.0)	0.007
Familiar with the Undetectable = Untransmittable (U=U) message	1,563 (82.0)	516 (83.8)	451 (84.9)	279 (79.0)	317 (77.9)	.011
Believe the U=U message is accurate (among those familiar with the message)	1,000 (64.0)	343 (66.5)	307 (68.1)	155 (55.6)	195 (61.5)	.003
Willingness to rely on U=Ua	687 (36.0)	230 (37.3)	212 (39.9)	118 (33.4)	127 (31.2)	.028
Participants living with HIV	n=139	n=47	n=37	n=27	n=28	
HIV treatment prevents transmission	115 (82.7)	40 (85.1)	33 (89.2)	21 (77.8)	21 (75.0)	.41
Familiar with the U=U message	133 (95.7)	44 (93.6)	37 (100.0)	26 (96.3)	26 (92.9)	.44
Believe the U=U message is accurate (among those familiar with the message)	123 (92.5)	41 (93.2)	37 (100.0)	23 (88.5)	22 (84.6)	.11
Willingness to rely on U=U ^a	119 (85.6)	43 (91.5)	34 (91.9)	20 (74.1)	22 (78.6)	.088

^a Willingness to rely on U=U was operationalised as willingness to have condomless anal intercourse with a partner living with HIV who had an undetectable viral load.

Table C-11. Attitudes towards condoms

	All	NSW	Vic.	Qld	Other states/ territories	p value
HIV-negative and untested/unknown status participants	n=1,907	n=616	n=531	n=353	n=407	
Confident discussing condoms with partners	687 (36.0)	230 (37.3)	212 (39.9)	118 (33.4)	127 (31.2)	.028
Participants living with HIV*	n=139	n=47	n=37	n=27	n=28	
Confident discussing condoms with partners	52 (37.4)	18 (38.3)	12 (32.4)	13 (48.1)	9 (32.1)	.56

*Differences by state/territory are not reported due to small cell counts.

Table C-12. Use of drugs other than alcohol in the previous six months

	All	NSW	Vic.	Qld	Other states/ territories	p value
	N=2046	n=482	n=318	n=209	n=271	
Any illicit drug use	663 (32.4)	230 (34.7)	209 (36.8)	113 (29.7)	111 (25.5)	<.001
Any drug use for the purpose of sex	329 (16.1)	113 (17.0)	110 (19.4)	52 (13.7)	54 (12.4)	.012