PRIFYSGOL BANGOR / BANGOR UNIVERSITY

PRIFYSGOL
BANGOR
UNIVERSITY

# Experiences of men who have sex with men when initiating, implementing, and persisting with HIV pre-exposure prophylaxis

Gillespie, David; Wood, Fiona; Williams, Adam; Ma, Richard; de Bruin, Marijn; Hughes, Dyfrig; Jones, Adam T.; Couzens, Zoë; Hood, Kerenza

**Health Expectations**

Accepted/In press: 12/01/2022

Peer reviewed version

Cyswllt i'r cyhoeddiad / Link to publication

*Dyfyniad o'r fersiwn a gyhoeddwyd / Citation for published version (APA):*
Gillespie, D., Wood, F., Williams, A., Ma, R., de Bruin, M., Hughes, D., Jones, A. T., Couzens, Z., & Hood, K. (Accepted/In press). Experiences of men who have sex with men when initiating, implementing, and persisting with HIV pre-exposure prophylaxis. *Health Expectations*.

**Hawliau Cyffredinol / General rights**
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

• Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
• You may not further distribute the material or use it for any profit-making activity or commercial gain
• You may freely distribute the URL identifying the publication in the public portal ?

**Take down policy**
If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

23. Feb. 2022

**Full title:** Experiences of men who have sex with men when initiating, implementing, and persisting with HIV pre-exposure prophylaxis

**Running head:** Experiences of taking HIV PrEP in MSM

***Authors:*** *David Gillespie[1*], Fiona Wood[2], Adam Williams[1], Richard Ma[3], Marijn de Bruin[4], Dyfrig A Hughes[5], Adam T Jones[6], Zoë Couzens[7], Kerenza Hood[1]*

***Affiliations:*** *1 – Centre for Trials Research, College of Biomedical & Life Sciences, School of Medicine, Cardiff University, Cardiff, Wales, UK. 2 – PRIME Centre Wales and Division of Population Medicine, College of Biomedical & Life Sciences, School of Medicine, Cardiff University, Cardiff, Wales, UK. 3 – Department of Primary Care and Public Health, Imperial College London, London, England, UK. 4 – Radboud University Medical Center, Nijmegen, Netherlands. 5 – Centre for Health Economics and Medicines Evaluation, Bangor University, Bangor, Wales, UK. 6 – Policy, Research and International Development, Public Health Wales, Cardiff, Wales, UK. 7 – Public Health Wales NHS Trust, Cardiff, Wales, UK.*

**Corresponding author:** David Gillespie, Centre for Trials Research, College of Biomedical & Life Sciences, School of Medicine, Cardiff University, Cardiff, Wales, UK. E-mail: gillespied1@cardiff.ac.uk. Telephone: +44 2920 687610

**Data availability statement**

Data (thematic coding matrices for all developed themes) are available on request from the authors. Due to privacy/ethical restrictions, other data (e.g. full transcripts) are not available.

**Acknowledgements**

The DO-PrEP study was funded by the Welsh Government through Health and Care Research Wales (project ref HF-17-1411). The funder had no role in study design; in the collection, analysis, and interpretation of data; in the writing of the report; nor in the decision to submit

the paper for publication. The corresponding author confirms that they had full access to all the data in the study and had final responsibility for the decision to submit for publication.

We would like to acknowledge the participants recruited as part of the DO-PrEP study, without whom this work would not be possible.

We would like to acknowledge members of the DO-PrEP stakeholder group (Lisa Power, Nicholas Hobbs, George Barker, Carys Knapper, Karen Cameron, and Marion Lyons), staff involved with work in the sexual health clinics from which participants were recruited (Irene Parker, Amy Harris, Amanda Blackler, Rachel Drayton, Kim Mitchell, Leasa Green, Karla Blee, Olwen Williams, and Helen Sarah Bradshaw), and individuals involved in the set-up and conduct of the study (Sam Clarkstone, Rebecca Milton, Rebecca Cavanagh, and Kerry Nyland).

We would like to acknowledge the ongoing work of Fast Track Cardiff & Vale (https://fasttrackcardiff.wales/), to which this project is partnered.

The Centre for Trials Research is funded by Health & Care Research Wales and Cancer Research UK.

**Authors' Contribution**

DG led the design, collected data, conducted analysis, and drafted the manuscript. FW commented on early drafts of the manuscript. FW and AW double coded a subset of transcripts and assisted in finalising the initial coding framework. All authors reviewed the initial thematic matrices, comments on drafts of the manuscript, and approved the final version for publication.

**Declaration of interests**

DG and KH report receiving funding from Health and Care Research Wales during the conduct of this work. KH also reports a leadership role for Cardiff University on the Fast Track Cardiff & Vale leadership group. This group is a local branch of the Fast Track Cities initiative aiming to

eradicate HIV by 2030. RM reports funding from National Institute for Health Research during the conduct of this study. All other authors report no potential conflicts of interest.

**Ethics**

The study was reviewed and approved by the Wales Research Ethics Committee 3 (reference number: 19/WA/0175).

**Abstract**

**Introduction:** HIV pre-exposure prophylaxis (PrEP) involves the use of antiretroviral medication in HIV-negative individuals considered to be at risk of acquiring HIV. It has been shown to prevent HIV and has been available in Wales since July 2017. Measuring and understanding adherence to PrEP is complex as it relies on the simultaneous understanding of both PrEP use and sexual activity. We aimed to understand the experiences of men who have sex with men (MSM) living in Wales initiating, implementing, and persisting with HIV PrEP.

**Methods:** We conducted semi-structured interviews with MSM PrEP users in Wales who participated in a cohort study of PrEP use and sexual behaviour. Following completion of the cohort study, participants were invited to take part in a semi-structured interview about their experiences of taking PrEP. We aimed to include both individuals who had persisted with and discontinued PrEP during the study. The interview topic guide was informed by the ABC taxonomy for medication adherence and the theory of planned behaviour. We analysed our data using reflexive thematic analysis.

**Results:** 21 participants were interviewed, five having discontinued PrEP during the cohort study. The developed themes focused on triggers for initiating PrEP, habitual behaviour, drivers for discontinuation, and engagement with sexual health services. Stigma surrounding both PrEP and HIV permeated most topics, acting as a driver for initiating PrEP, an opportunity to reduce discrimination against people living with HIV, but also a concern around the perception of PrEP users.

**Conclusion:** This is the first study to investigate PrEP taking experiences incorporating established medication adherence taxonomy. We highlight key experiences regarding the initiation, implementation, and persistence with PrEP and describe how taking PrEP may

promote positive engagement with sexual health services. These findings may be useful for informing PrEP rollout programmes and need exploring in other key populations.

**Patient and public contribution**

PrEP users, in addition to PrEP providers and representatives of HIV advocacy and policy were involved in developing the topic guide for this study.

**Key words:** HIV; pre-exposure prophylaxis; medication adherence; qualitative research; sexual behaviour; sexual and gender minorities

## Introduction

By the end of 2020, 37.6 million individuals were living with HIV globally and 690,000 people died from HIV-related causes.[1] In Wales, there are approximately 150 new cases of HIV diagnosed each year, with 75% of these in men.[2] While no cure currently exists, advances in treatment, access to testing and treatment services and prevention methods means that HIV is now a manageable chronic health condition with near normal life expectancy.[3,4] One of the more recent HIV prevention methods is pre-exposure prophylaxis (PrEP).

PrEP involves the use of antiretroviral (ARV) medication in HIV-negative individuals considered to be at risk of acquiring HIV (e.g. through high-risk sexual behaviour or injecting drug use).[5–7] In Wales, tenofovir/emtricitabine (TDF-FTC) has been licensed as HIV PrEP since July 2017 and can be accessed through National Health Service (NHS) sexual health clinics free of charge by individuals considered to be at risk of acquiring HIV (prior to this, it was only available through unregulated, online purchase). PrEP is typically prescribed in 90-day supplies, and both daily (one pill a day around the same time each day) and event-based (two pills as a single dose 2-24 hours prior to condomless sexual intercourse, followed by one pill a day thereafter until two sex-free days have passed) regimens are recommended by providers. PrEP users attending clinic to receive their prescription receive an STI screen, have their renal function checked, and are asked about the sexual history and PrEP taking behaviours since their previous visit.[8,9] The latter aspects of the consultation are pertinent, as ensuring high levels of adherence to PrEP, in the absence of other HIV prevention methods, is important for maintaining a seronegative HIV status.[9,10] However, measuring and understanding adherence to PrEP is complex as it relies on the simultaneous understanding of both PrEP use and sexual activity.[11]

Adherence to a pharmaceutical regimen refers to 'the process by which patients take their medication as prescribed', and is comprised of treatment initiation (when the patient takes their

first dose), implementation (the extent to which a patient's actual dosing corresponds to the prescribed dosing regimen), and persistence (the length of time between initiation and the last dose).[12] The determinants of sub-optimal adherence may differ across these three processes, and hence may be amenable to different forms of intervention. Furthermore, while evidence-based interventions exist for optimising ARV medication prescribed as treatment,[13] these may not translate directly to settings where ARVs are prescribed as prophylaxis – particularly when "optimal" adherence will depend on the extent to which an individual engages in risk behaviours and PrEP regimen followed, which itself may vary over time.

The aim of this work therefore was to gain an in-depth understanding of the experiences and contextual factors which act as barriers and facilitators for the initiation, implementation, and persistence with PrEP among individuals accessing it through the National Health Service (NHS) in Wales.

**Materials & methods**

*Study design and theoretical framework*

We conducted a qualitative semi-structured interview study of MSM PrEP users in Wales. An interpretivist theoretical perspective was adopted, with the aim to understand the subjective experiences of individuals through inductive reasoning.

*Participant selection*

Participants were individuals receiving TDF-FTC as HIV PrEP through the NHS in Wales (a comprehensive, publicly-funded health service)[14] and participating in an ecological momentary assessment (EMA) study investigating PrEP use and sexual behaviour over time.[15] Participants were approached consecutively upon completion of the EMA study. Those approached were sent study information via e-mail, with SMS text message reminders sent to those who did not

respond within two-weeks. As an acknowledgement for their time, participants were offered a £20 gift voucher (with participants aware of this at the point of study approach).

We aimed to include between 20 and 30 participants in total, with this sample size informed by the information power model and taking into consideration the relatively narrow aims of the research, the identification of well-defined strata (i.e. those who continued taking PrEP and those who discontinued), a theoretically-informed topic guide (see below), and the strong emphasis placed on building trust and rapport with participants.[16]

*Setting and data collection*

All participants took part in semi-structured interviews using the online video platform Zoom®. Participants were supplied with an individual meeting ID and password (available to only the researcher and participant), gave informed consent prior to conducting the interview, and consent was audio recorded. Consent procedures for the first four interviews were double checked by FW. Interviews were conducted on a 1-to-1 basis, with the aim for them to last 30 to 60 minutes. The ABC taxonomy for describing and defining adherence to medications[12] and components of the theory of planned behaviour[17] were used to inform the topic guide. Questions were also asked covering the relationship between PrEP use and sexual behaviour, in addition to levels of support around PrEP use, and the perceived impact that PrEP has had on the lives of interviewees. The topic guide was reviewed and developed collaboratively amongst the research team and also with a stakeholder group. Field notes were taken during and after interviews. Field notes taken during interviews were primarily used as prompts to probe responses given by participants. See supplementary material for the topic guide.

Interviews were audio recorded and data were transcribed verbatim by a professional transcription service.

*Data analysis*

All transcripts were checked against the recording for accuracy by <LEAD AUTHOR> and anonymised. We conducted reflexive thematic analysis, outlined by Braun and Clarke, to analyse our interview data.[18,19] Following familiarisation with the data, codes were developed by inspecting transcripts line-by-line, with an initial coding framework developed by DG. Double coding was supported by co-authors FW and AW for the first four interviews in order to agree the initial coding framework, accounting for alternative perspectives, and subsequently by FW for a further three interviews to assess coding consistency. The initial coding framework was refined in response to input from FW and AW, and a revised framework was shared amongst the research team and stakeholder group for further input. Themes were developed using the 'One Sheet of Paper' or 'OSOP' technique[20] and were reviewed, refined, and subsequently named. Direct participant quotes are presented with a Participant Identification number (PID) and these may include language that some readers may find triggering or offensive.

The analysis was supported by the qualitative data management software NVivo version 12.[21]

*Research team and reflexivity*

Interviews were conducted by lead author DG. DG is a post-doctoral research fellow and the Chief Investigator of the study. He has undertaken training in conducting and analysing qualitative interviews. DG is a 34-year-old white heterosexual cis-gender male, with no lived experience of taking PrEP. DG was involved in the recruitment or follow-up of all participants enrolled in the wider cohort.[15]

While similarly aged as the majority of interviewees, there is a risk that the differing sexual orientation of the interviewer and interviewees, in addition to the interviewer never haven taken PrEP, may have resulted in lower quality interview data through a lack of insight and shared experience. We attempted to minimise this through a team-based approach to data analysis that allowed a wider range of perspectives to influence both the topic guide and

analysis. Furthermore, by conducting follow-ups with interviewees during their participation in the larger EMA study, the interviewer was able to gain trust and build rapport with interviewees prior to the interviews taking place.

*Ethics*

The study was reviewed and approved by the Wales NHS Research Ethics Committee 3 (reference number: 19/WA/0175).

**Results**

*Participants*

Thirty-eight individuals were approached to take part in an interview. No response was received from 13, three declined participation, and one who agreed did not turn up to their interview. In total, 21 participants were interviewed between 13th May 2020 and 6th November 2020. Interviews lasted 25 to 63 minutes (median duration 39 minutes). Participants were all cis gender males who exclusively had sex with other men. The majority were White British, the median age was 34 years (IQR: 27 to 43 years), and all but one adopted a daily PrEP regimen (with one participant taking PrEP event-based). Table 1 highlights that participants interviewed were broadly representative of those included in the larger cohort study, with a slight underrepresentation of those in full-time employment at the time they entered the cohort study. Five interviewees had discontinued PrEP during the course of the cohort study.

Figure 1 summaries the themes developed as part of this study and Table 2 illustrates a thematic matrix for the first theme.

*Triggers for initiating PrEP*

The recognition and acceptance that they were at risk of acquiring HIV was a key trigger for individuals initiating PrEP. Furthermore, self-recognition of risk was not always the starting point

for individuals seeking out PrEP. Partners, friends, and clinicians highlighting risk behaviours, particularly after standout incidents (e.g. an STI diagnosis, a post-exposure prophylaxis (PEP) prescription), was a key feature highlighted during interviews.

> *I had an incident where I had to go on PEP* [post-exposure prophylaxis]*, and then after that I thought it was more something I needed to get on as, as a preventative measure, so I didn't have to do it again, because it wasn't very pleasant. [PID 25, 20-30 years, continued on PrEP]*

The uncertainty surrounding the risk of HIV transmission during a sexual encounter and associated anxiety motivated some individuals to initiate PrEP in order to reduce their risk and thus exert some control. While this control and ownership largely centred on their own risks, this also extended more widely to sexual partners and more generally to everyone considered to be at risk.

> *It is something I probably would have considered if I was single as well. Just being sexually active with more than one partner, it seems like the kind of risk that PrEP would mitigate a little. [PID 55, 20-30 years, discontinued PrEP]*

Moreover, concerns around acquiring HIV were not always about the physical effects of the disease, but also related to the concerns around the stigma associated with living with HIV and the impact this may have on their mental health.

> *Not for the illness itself, but just the way it affected his* [ex-partner who was living with HIV] *mental health. So I really wanted to be on PrEP because if I ever transmitted HIV, I would fear falling apart from stigma reasons. [PID 11, 31+ years, continued on PrEP]*

While some individuals had previously purchased PrEP online and others had heard about the availability of PrEP through other means (e.g. clinical trials in England), the availability of PrEP

through the NHS in Wales was viewed favourably due to its legitimacy, ease of access (it was available without a cap on numbers or without signing up to a clinical trial from the outset), and it being available free of charge.

> *Having access to the prescription and regular treatment, because I've got friends in London who's got to pay for this, and they haven't got the programme we've got in Wales… When I look at my friends now, they're taking it, stopping taking it, taking it, as and when they've got the money and stuff like that. So, it's affected them… For me though, personally it was a good thing 'cause I had access to the medication, I could see that I was getting that protection that I needed… [PID 7, 31+ years, continued on PrEP]*

*Habitual behaviour for achieving high levels of implementation*

The formulation of habits, or integration of PrEP use into existing habits, was perceived by participants to be a vital component of successful PrEP taking behaviour. This had been reinforced by clinic staff, who emphasised the importance of taking PrEP every day around the same time.

The preference to take PrEP daily instead of adopting an alternative regimen seemed motivated by a greater trust in the evidence around daily PrEP, as well as the ability to make PrEP an automatic action, separate from sex, and thus enabling greater spontaneity.

> *Do you know, I've never thought of event based dosing, because I think it* [PrEP taking and sex] *would be too much planning, too much preparation, when sometimes it* [sex] *can be quite spontaneous. For me, that kind of planning is probably a little bit too much, and I think I'd rather just take it every day. But I think again, I'd probably panic, thinking have I taken the right doses at the right times, have I done it enough days before, have I done it enough days after? Just it'd be a lot more to think about. [PID 15, 20-30 years, continued on PrEP]*

Establishing a routine from scratch involved a process of trial-and-error. Participants reported exploring different methods for remembering to take PrEP regularly, with clear demonstration of self-regulatory processes when methods were unsuccessful. Pre-programmed alarms were highlighted as a support tool participants used to assist their memory, with these particularly helpful at times where other routines were disrupted.

The integration of PrEP into an existing routine was viewed as the simplest way to maintain regular PrEP use, with this approach also requiring a process of trial-and-error. In those already taking a daily medicine or supplement (e.g. vitamins), PrEP was typically added as "just another tablet" to this routine.

> *I tried, putting the bottle by my bed, so that I would take it first thing in the morning, and then I realised that I didn't take a drink to bed with me, so I had nothing to take it with in the morning... and then what I settled on then, when I finally got it sorted was um I'd have it on my living room table, where I have my breakfast and um I have a cup of tea with my breakfast, so the last bit of my tea would be to take my PrEP. Yeah it was just building some sort of way for me to incorporate it into stuff that I already do, it wasn't something additional that I had to do. [PID 25, 20-30 years, continued on PrEP]*

Furthermore, disruption of a routine was cited as a key reason accounting for missed doses, with the consequences of missed doses considered within the context of the individual's recent sexual behaviour.

*Short- and long-term drivers for discontinuation*

Participants described situations where they entered relationships which they considered to be long-term and monogamous, general periods of reduced sexual activity, and side-effects outweighing benefits as key reasons supporting their decision to discontinue PrEP. There was a general weighing up of the risks and benefits of continuing to take PrEP. Risk of acquiring HIV

through sexual contact, and hence the need for PrEP, was viewed as transient by some participants and this led to some temporary pauses in PrEP use while HIV risk was perceived to be low.

> *I was with a long term partner, and a few months in, I saw it as a long term relationship, it wasn't an open relationship, so I stopped taking the PrEP then. [PID 8, 20 to 30 years, discontinued PrEP]*

For participants who had persisted with PrEP, situations in which they may consider discontinuing in the future aligned closely with the enacted reasons stated above. This may imply a general view of being a PrEP user as an impermanent state.

> *Probably one of the only things that would stop me would be if it started to affect me, my health basically. So if it was sort of having that negative affect rather than a positive effect, so if it did start to effect something like liver function or joints or something like that badly, then I'd probably say it's time to stop it. [PID 6, 31+years, continued on PrEP]*

However, some participants did not see there being a potential future whereby PrEP would be unnecessary for them.

> *I think if I ended up meeting somebody else … And, you know, sort of went into a relationship or anything I'd still stick with it anyway because it's not doing any sort of harm with me at the moment… If I completely stop meeting with people, stop any sort of intercourse at all then maybe but … no. [PID 4, 31+ years, continued on PrEP]*

*Engagement in services*

Monitoring carried at out sexual health clinics, both in respect to the impact PrEP was having clean their body as well as HIV testing, provided both initial and ongoing reassurance to participants that PrEP worked and was not causing them harm. Furthermore, the regular STI

screening was generally viewed as a positive, as any infections could be detected and treated thus minimising any onwards transmission.

> *You're clean*, 'cos you regularly get tested with a clinic. [PID 54, 20 to 30 years, continued on PrEP]*

*Direct participant quote using language that some readers may find triggering or offensive.

By attending their sexual health clinic for a PrEP consultation, which included discussing their sexual activity since their previous visit with a consultant, collecting a PrEP prescription and undergoing screening tests, the perception of sexual health clinic visits moved from a less negative and reactive setting to a more positive and proactive setting.

> *I feel like when I'm taking PrEP it makes me feel like I'm doing something that is taking care of myself. I'm making like a concerted effort to actually put my health first. [PID 40, 20 to 30 years, discontinued PrEP]*

**Discussion**

In this study, we found that the initiation of PrEP was triggered following a recognition of HIV risk and an ownership of the responsibility for reducing risk. High-quality implementation of PrEP was perceived to be facilitated by integrating PrEP within existing routines. Furthermore, PrEP was not typically viewed as a life-long intervention. Indeed, hypothesised and enacted discontinuation was driven by either changes in sexual behaviour or side-effects considered to outweigh the benefits of PrEP. Finally, PrEP altered the ways in which individuals engaged with sexual health services. Central to most themes was the role that stigma played on decision-making – be it an underlying trigger for initiating PrEP, PrEP being seen as an opportunity to reduce discrimination against people living with HIV, or concerns around the perception of other PrEP users and individuals own PrEP use.

This is the first study to qualitatively investigate PrEP taking experiences, fully incorporating established medication adherence taxonomy.[12] Participants in this study were exclusively white MSM, the majority of whom were following a daily PrEP regimen, and while this is largely representative of PrEP users in Wales (91% of PrEP in Wales is prescribed daily),[22] the experiences described in this paper may not reflect those of other key populations nor of PrEP users adopting other regimens (e.g. event-based dosing), particularly those focussing on habit formulation and integrating PrEP into an existing routine. Interviews were conducted remotely. This approach has been remarked upon as reducing geographical constraints with regards to data collection and reducing some barriers towards participation (e.g. commitments which may make travelling to a face-to-face interview challenging). However, it has also been suggested that remote online interviews may also exclude certain populations (e.g. those without access to digital technology) and limit the ability for the researcher to build trust and rapport with a participant.[23]

Themes incorporating initiating and discontinuing PrEP have been described in previous work exploring the barriers to PrEP use.[24–26] While habit formulation is an often-encouraged strategy to ensure high levels of medication adherence,[27] the automatic action developed by integrating PrEP into existing routines could be thought of individuals engaging in "System 1" thinking, whereby conscious deliberate motivational processes do not feature in decision-making.[28] In other settings, MSM in a Netherlands-based study indicated that the choice of daily over event-based PrEP was similarly driven by a preference for unplanned sex.[29] Moreover, the use of tools to assist with regular PrEP use was a strategy also highlighted by gay and bisexual men interviewed about PrEP use in Australia.[30]

Translating our themes into interventions to optimise adherence to PrEP, it is clear that each process of medication adherence may be amenable to different forms of intervention.

Education, motivation, and peer-based interventions may enhance PrEP initiation, particularly if they increase awareness of the availability of PrEP, highlight HIV and other sexual health risks and address stigma concerns. On the latter point, it is apparent from both the experiences described and language used within interviews that HIV and PrEP-associated stigma is pervasive in this population. Regular monitoring and feedback of PrEP use and sexual behaviour may facilitate habit formulation while normalising self-reflection on sexual risk behaviours and thus ongoing PrEP necessity. The most effective interventions would likely be multi-modal, such as those trialled and shown to be most effective in improving adherence and health outcomes in individuals taking other preventative medication.[31,32]

**Conclusion**

In conclusion, this study highlights key experiences regarding the initiation, implementation, and persistence with PrEP, in addition to describing how PrEP may enhance sexual wellbeing and promote more positive engagement with sexual health services. These findings may be useful for informing PrEP policy-making, expansion of current programmes, and need exploring in other key populations.

**References**


1. World Health Organization. HIV/AIDS: Pre-exposure prophylaxis. Accessed May 9, 2021. https://www.who.int/hiv/topics/prep/en/

2. Public Health England. HIV: annual data tables. Published 2020. Accessed August 3, 2021. https://www.gov.uk/government/statistics/hiv-annual-data-tables#history

3. Marcus JL, Leyden WA, Alexeeff SE, et al. Comparison of Overall and Comorbidity-Free Life Expectancy Between Insured Adults With and Without HIV Infection, 2000-2016. *JAMA Netw open*. 2020;3(6):e207954. doi:10.1001/jamanetworkopen.2020.7954

4. The Lancet HIV. Marking 40 years of the HIV/AIDS response. *Lancet HIV*. 2021;8(6):e311. doi:10.1016/S2352-3018(21)00104-1

5. Grant RM, Lama JR, Anderson PL, et al. Preexposure Chemoprophylaxis for HIV Prevention in Men Who Have Sex with Men. *N Engl J Med*. 2010;363(27):2587-2599. doi:10.1056/NEJMoa1011205

6. Choopanya K, Martin M, Suntharasamai P, et al. Antiretroviral prophylaxis for HIV infection in injecting drug users in Bangkok, Thailand (the Bangkok Tenofovir Study): A randomised, double-blind, placebo-controlled phase 3 trial. *Lancet*. 2013;381(9883):2083-2090. doi:10.1016/S0140-6736(13)61127-7

7. McCormack S, Dunn DT, Desai M, et al. Pre-exposure prophylaxis to prevent the acquisition of HIV-1 infection (PROUD): Effectiveness results from the pilot phase of a pragmatic open-label randomised trial. *Lancet*. 2016;387(10013):53-60. doi:10.1016/S0140-6736(15)00056-2

8. Knapper C, Birley H, Couzens Z, Jones AT, Parker I. How to do it: Setting up a PrEP service in an integrated sexual reproductive health service setting. *Sex Transm Infect*.

2018;94(5):327-330. doi:10.1136/sextrans-2018-053561

9. BHIVA/BASHH. BHIVA/BASHH guidelines on the use of HIV pre-exposure prophylaxis (PrEP) 2018. 2018. Accessed July 5, 2021. https://www.bhiva.org/PrEP-guidelines

10. Grant RM, Anderson PL, McMahan V, et al. Uptake of pre-exposure prophylaxis, sexual practices, and HIV incidence in men and transgender women who have sex with men: A cohort study. *Lancet Infect Dis*. 2014;14(9):820-829. doi:10.1016/S1473-3099(14)70847-3

11. Haberer JE. Current concepts for PrEP adherence in the PrEP revolution. *Curr Opin HIV AIDS*. 2016;11(1):10-17. doi:10.1097/coh.0000000000000220

12. Vrijens B, De Geest S, Hughes DA, et al. A new taxonomy for describing and defining adherence to medications. *Br J Clin Pharmacol*. 2012;73(5):691-705. doi:10.1111/j.1365-2125.2012.04167.x

13. Kanters S, Park JJH, Chan K, et al. Interventions to improve adherence to antiretroviral therapy: a systematic review and network meta-analysis. *Lancet HIV*. 2017;4(1):e31-e40. doi:10.1016/S2352-3018(16)30206-5

14. NHS Wales. Health in Wales. Accessed July 29, 2021. https://www.wales.nhs.uk/

15. Gillespie D. DO-PrEP webpage. Published 2018. Accessed February 4, 2021. https://www.cardiff.ac.uk/centre-for-trials-research/research/studies-and-trials/view/do-prep

16. Malterud K, Siersma VD, Guassora AD. Sample Size in Qualitative Interview Studies: Guided by Information Power. *Qual Health Res*. 2016;26(13):1753-1760. doi:10.1177/1049732315617444

17. Ajzen I. The theory of planned behavior. *Organ Behav Hum Decis Process*. 1991;50(2):179-211. doi:https://doi.org/10.1016/0749-5978(91)90020-T

18. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77-101. doi:10.1191/1478088706qp063oa

19. Braun V, Clarke V. Reflecting on reflexive thematic analysis. *Qual Res Sport Exerc Heal*. 2019;11(4):589-597. doi:10.1080/2159676X.2019.1628806

20. Ziebland S, McPherson A. Making sense of qualitative data analysis: An introduction with illustrations from DIPEx (personal experiences of health and illness). *Med Educ*. 2006;40(5):405-414. doi:10.1111/j.1365-2929.2006.02467.x

21. QSR International Pty Ltd. NVivo. Published online 2018. https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home

22. Communicable Disease Surveillance Centre (CDSC). *Pre-Exposure Prophylaxis for HIV Provision in Wales (Interim Report)*.; 2021.

23. Wood F. Doing qualitative health services research remotely : A rejoinder to ' Collecting qualitative data during a pandemic ' by David Silverman. Published online 2021.

24. O'Halloran C, Owen G, Croxford S, et al. Current experiences of accessing and using HIV pre-exposure prophylaxis (PrEP) in the United Kingdom: A cross-sectional online survey, May to July 2019. *Eurosurveillance*. 2019;24(48):1-7. doi:10.2807/1560-7917.ES.2019.24.48.1900693

25. Edeza A, Karina Santamaria E, Valente PK, Gomez A, Ogunbajo A, Biello K. Experienced barriers to adherence to pre-exposure prophylaxis for HIV prevention among MSM: a systematic review and meta-ethnography of qualitative studies. *AIDS Care - Psychol Socio-Medical Asp AIDS/HIV*. 2021;33(6):697-705. doi:10.1080/09540121.2020.1778628

26. Cochrane E, Knapper C. Audit of patient retention in pre-exposure prophylaxis (PrEP) services in an integrated sexual reproductive health service setting. *Int J STD AIDS*. 2019;30(14):1432-1435. doi:10.1177/0956462419879618

27. Stecher C, Linnemayr S. Promoting antiretroviral therapy adherence habits: a synthesis of economic and psychological theories of habit formation. *AIDS*. 2021;35(5):711-716. doi:10.1097/QAD.0000000000002792

28. Gardner B, Lally P, Wardle J. Making health habitual: The psychology of "habit-formation" and general practice. *Br J Gen Pract*. 2012;62(605):664-666. doi:10.3399/bjgp12X659466

29. Zimmermann HML, Eekman SW, Achterbergh RCA, et al. Motives for choosing, switching and stopping daily or event-driven pre-exposure prophylaxis – a qualitative analysis. *J Int AIDS Soc*. 2019;22(10). doi:10.1002/jia2.25389

30. Vaccher SJ, Kaldor JM, Callander D, Zablotska IB, Haire BG. Qualitative Insights Into Adherence to HIV Pre-Exposure Prophylaxis (PrEP) Among Australian Gay and Bisexual Men. *AIDS Patient Care STDS*. 2018;32(12):519-528. doi:10.1089/apc.2018.0106

31. Marcus JL, Buisker T, Horvath T, et al. Helping our patients take HIV pre-exposure prophylaxis (PrEP): A systematic review of adherence interventions. *HIV Med*. 2014;15(7):385-395. doi:10.1111/hiv.12132

32. Nieuwlaat R, Wilczynski N, Navarro T, et al. Interventions for enhancing medication adherence. *Cochrane Database Syst Rev*. 2014;2014(11). doi:10.1002/14651858.CD000011.pub4

**Tables and Figures**

**Table 1:** Characteristics of interviewed participants (at point of recruitment into the cohort)

| | Variable | Interviewed [N=21] | | Approached and not interviewed [N=17] | | Not approached [N=22] | | Overall [N=60] | |
|---|---|---|---|---|---|---|---|---|---|
| | | n | % | n | % | n | % | n | % |
| Sex | Male | 21 | 100.0 | 17 | 100.0 | 22 | 100.0 | 60 | 100.0 |
| Gender | Cis gender | 21 | 100.0 | 17 | 100.0 | 22 | 100.0 | 60 | 100.0 |
| Ethnicity | White British | 20 | 95.2 | 14 | 82.4 | 19 | 86.4 | 53 | 88.3 |
| | White European | 1 | 4.8 | 1 | 5.9 | 2 | 9.1 | 4 | 6.7 |
| | White | 0 | 0.0 | 1 | 5.9 | 0 | 0.0 | 1 | 1.7 |
| | African | 0 | 0.0 | 1 | 5.9 | 0 | 0.0 | 1 | 1.7 |
| | White and Black African | 0 | 0.0 | 0 | 0.0 | 1 | 4.5 | 1 | 1.7 |
| Employment status | Full-time employed | 11 | 52.4 | 16 | 94.1 | 15 | 68.2 | 42 | 70.0 |
| | Part-time employed | 3 | 14.3 | 0 | 0.0 | 3 | 13.6 | 6 | 10.0 |
| | Casual hours | 4 | 19.0 | 1 | 5.9 | 1 | 4.5 | 6 | 10.0 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Retired | 2 | 9.5 | 0 | 0.0 | 2 | 9.1 | 4 | 6.7 |
| | Full-time education | 1 | 4.8 | 0 | 0.0 | 0 | 0.0 | 1 | 1.7 |
| | Not working | 0 | 0.0 | 0 | 0.0 | 1 | 4.5 | 1 | 1.7 |
| Education level | Educated to degree level or equivalent | 11 | 52.4 | 10 | 58.8 | 8 | 36.4 | 29 | 48.3 |
| | Educated to A-levels or equivalent | 7 | 33.3 | 6 | 35.3 | 5 | 22.7 | 18 | 30.0 |
| | Educated to GCSE-level (A*-C grades) or equivalent | 3 | 14.3 | 1 | 5.9 | 9 | 40.9 | 13 | 21.7 |
| PrEP status at recruitment into the cohort | Starting PrEP for the first time (at recruitment) | 4 | 19.0 | 5 | 29.4 | 2 | 9.1 | 11 | 18.3 |
| | Previously used PrEP | 17 | 81.0 | 12 | 70.6 | 20 | 90.9 | 49 | 81.7 |
| PrEP regimen | Daily | 20 | 95.2 | 16 | 94.1 | 21 | 95.5 | 57 | 95.0 |
| | Event-based | 1 | 4.8 | 1 | 5.9 | 1 | 4.5 | 3 | 5.0 |
| Relationship status | Single | 17 | 81.0 | 12 | 70.6 | 17 | 77.3 | 46 | 76.7 |
| | In a relationship | 3 | 14.3 | 5 | 29.4 | 4 | 18.2 | 12 | 20.0 |
| | Married | 1 | 4.8 | 0 | 0.0 | 1 | 4.5 | 2 | 3.3 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Sexual orientation | Gay man | 20 | 95.2 | 15 | 88.2 | 21 | 95.5 | 56 | 93.3 |
| | Bisexual | 1 | 4.8 | 1 | 5.9 | 1 | 4.5 | 3 | 5.0 |
| | Pansexual | 0 | 0.0 | 1 | 5.9 | 0 | 0.0 | 1 | 1.7 |
| Sexual preferences | Has sex exclusively with men | 21 | 100.0 | 17 | 100.0 | 21 | 95.5 | 59 | 98.3 |
| | Has sex with both men and women | 0 | 0.0 | 0 | 0.0 | 1 | 4.5 | 1 | 1.7 |
| Chronic health condition/s* | At least one co-morbid health condition | 9 | 42.9 | 7 | 41.2 | 11 | 50.0 | 27 | 45.0 |
| | Asthma / respiratory condition* | 3 | 14.3 | 3 | 17.6 | 3 | 13.6 | 9 | 15.0 |
| | Mood disorder / mental health condition* | 4 | 19.0 | 0 | 0.0 | 2 | 9.1 | 6 | 10.0 |
| | Digestive tract condition* | 2 | 9.5 | 2 | 11.8 | 2 | 9.1 | 6 | 10.0 |
| | Other condition* | 3 | 14.3 | 4 | 23.5 | 8 | 36.4 | 15 | 25.0 |
| | | **Median** | **IQR** | **Median** | **IQR** | **Median** | **IQR** | **Median** | **IQR** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Age of participant | 34 | 27 to 43 | 35 | 28 to 43 | 37 | 31 to 51 | 36 | 28 to 46 |

*Participants may have more than one health condition.

**Table 2:** Example of thematic matrix underpinning qualitative analysis (Theme 1: Triggers for initiating PrEP)

| Initial coding | Sub-theme | Example of direct quote |
|---|---|---|
| HIV risk perceptions | A recognition that they were at risk of acquiring HIV was a key trigger for PrEP initiation. This was sometimes influenced by others or a standout incident (e.g. STI diagnosis or PEP use). It was also not necessarily the physical effects of having HIV but the stigma issues and impact that has on mental health. | PID 11: *Not for the, the illness itself, but the, just the way it affected his (ex-partner who was living with HIV) mental health. Um, so I really wanted to be on PrEP because if I ever um, transmitted HIV, I would, I would fear, falling apart from stigma reasons.* |
| Partner's influence | | |
| Advice from HCPs | | PID 31: *I'd just been to clinic… to get a check in relation to…some symptoms of STIs…, and as a result of a consultation with the consultant, she suggested that I took PrEP.* |
| Influence of friends and partners | | PID 2: *It was a friend of mine, … they got up to various things and, and they, he, he showed concern for stuff that I was doing and the places I was going, so he, he suggested it.* |
| STI or worrying sexual encounter key trigger | | PID 25: *Um I had a incident where I had to go on PEP, um and then after that then I thought it was more something I needed to get on as, as a preventative measure, so I didn't have to do it again, because it wasn't very pleasant* |
| Personal choice | A key factor underpinning the decision to start PrEP was the individual taking ownership of the responsibility for reducing their risk of acquiring HIV. By doing this, there was an | PID 10: *In the end, it's your decision, to go on PrEP or not. You know, it's your decision to stay safe or not, you know. Err if your friends are gonna say "Oh no, don't worry, you shouldn't take it, you're gonna be fine", err this is not gonna be a support you know, it's not gonna be supporting, err I don't think err they* |

| | | |
|---|---|---|
| | acknowledgement that they were also protecting others. | *shouldn't have an interest, I think the decision should be just yours.* |
| Protect self | Ownership of the responsibility for reducing their risk could also be framed as the individual exerting an element of control over the uncertain nature of HIV transmission. | PID 55: *It is something I probably would have considered if I was single as well, um, just being sexually active with more than one partner, it seems like the kind of risk that PrEP would mitigate a little.* |
| Protect others | | PID 8: *to protect myself and in protecting myself, protecting others, you know, as well. Erm, so it was just to investigate and I thought, yeah, that's, you know, a reasonable step I can take.* |
| Access to PrEP | While some individuals had heard about PrEP being available for online purchase (or available elsewhere), a driver for individuals initiating PrEP was its availability through the NHS in Wales, which was generally viewed as a more trustworthy source of both medication and advice, in addition to being free of charge. | PID 7: *Having access to the prescription and, er, and regular treatment, and regular, because I've got friends in London who's got to pay for this and they, they haven't got the programme we've got in Wales… when I look at my friends now, they're taking it, stopping taking it, taking it, as and when they've got the money and stuff like that, so, it's affected then… For me, though personally it was a good thing 'cause I had access to the medication, I could see that I was getting that protection that which I needed…* |
| Advice from the internet | | |
| Trust in information about PrEP | | |

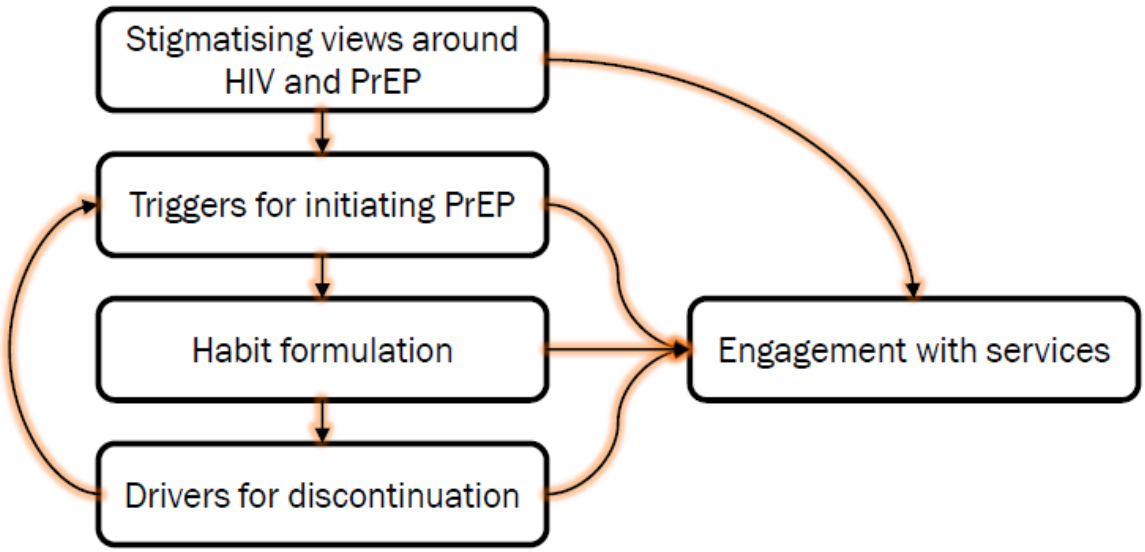


**Figure 1:** Thematic map underpinning key aspects of MSM PrEP users' experiences in Wales