



OPEN ACCESS

Short report

Early impact of COVID-19 social distancing measures on reported sexual behaviour of HIV pre-exposure prophylaxis users in Wales

David Gillespie ¹, Carys Knapper,² Dyfrig Hughes ³, Zoe Couzens,⁴ Fiona Wood ⁵, Marijn de Bruin,⁶ Richard Ma ⁷, Adam Thomas Jones ⁸, Adam Williams ¹, Kerenza Hood ¹

¹Centre for Trials Research, School of Medicine, College of Biomedical & Life Sciences, Cardiff University, Cardiff, Wales
²Aneurin Bevan University Health Board, Newport, Wales
³Centre for Health Economics and Medicines Evaluation, Bangor University, Bangor, Wales
⁴Public Health Wales NHS Trust, Cardiff, UK
⁵Division of Population Medicine, Cardiff University, Cardiff, UK
⁶Radboud University Medical Center, Nijmegen, Netherlands
⁷Imperial College London, London, UK
⁸Policy, Research and International Development, Public Health Wales, Cardiff, UK

Correspondence to

Dr David Gillespie, Centre for Trials Research, School of Medicine, College of Biomedical & Life Sciences, Cardiff University, Cardiff, Wales; gillespied1@cardiff.ac.uk

Received 15 May 2020

Revised 28 July 2020

Accepted 25 August 2020

Published Online First

23 September 2020



© Author(s) (or their employer(s)) 2021. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Gillespie D, Knapper C, Hughes D, et al. *Sex Transm Infect* 2021;**97**:85–87.

ABSTRACT

Objectives To describe the early impact of COVID-19 and associated control measures on the sexual behaviour of pre-exposure prophylaxis (PrEP) users in Wales.

Methods Data were obtained from an ecological momentary assessment study of PrEP use and sexual behaviour. Participants were individuals accessing PrEP through the National Health Service (NHS) sexual health clinics across four health boards in Wales. Weekly data documenting condomless sex in the preceding week were analysed between 03/02/2020 and 10/05/2020. The introduction of social distancing measures and changes to sexual health clinics in Wales occurred on the week starting 16/03/2020. Two-level logistic regression models were fitted to condomless sex (yes/no) over time, included an indicator for the week starting 16/03/2020, and were extended to explore differential associations by relationship status and sexual health clinic.

Results Data were available from 56 participants and included 697 person-weeks (89% of the maximum number that could have been obtained). On average, 42% of participants reported condomless sex in the period prior to the introduction of social distancing measures and 20% reported condomless sex after (OR=0.16, 95% CI 0.07 to 0.37, $p<0.001$). There was some evidence to suggest that this association was moderated by relationship status (OR for single participants=0.09, 95% CI 0.06 to 0.23; OR for not single participants=0.46, 95% CI 0.16 to 1.25).

Conclusions The introduction of social distancing measures and changes to PrEP services across Wales was associated with a marked reduction in reported instances of condomless sexual intercourse among respondents, with a larger reduction in those who were single compared with those who were not. The long-term impact of COVID-19 and associated control measures on this population's physical and mental health and well-being requires close examination.

INTRODUCTION

The international community has adopted various measures to control the spread of SARS-CoV-2, the respiratory virus that causes COVID-19. The UK government introduced social distancing measures from 16 March 2020, to restrict journeys outdoors and limit physical proximity, including contacts

with family and friends.^{1 2} Concurrently, necessity to redirect staff and resources to treat people hospitalised with COVID-19 has led to a suspension or alteration of other services across the National Health Service. In Wales, sexual healthcare has been impacted, limiting provision of HIV pre-exposure prophylaxis (PrEP).

PrEP is prescribed to HIV-negative individuals who are at risk of acquiring HIV through risk behaviours (eg, condomless sexual intercourse) and prevents HIV by preventing viral replication following an exposure.³ It has been available across Wales through sexual health clinics since July 2017, with the latest reports indicating that 1200 individuals have received a prescription for PrEP across six health boards.^{4 5} The extent to which PrEP services have been affected by COVID-19 varies according to the number and timing of cases in different Health Boards.⁶ One PrEP clinic, located in a UK COVID-19 hotspot with over 50% of the COVID-19 cases in Wales (on 23 March 2020), initially paused delivery of PrEP services, with the exception of people at highest risk, for five weeks during the first peak of COVID-19 and has now recommenced services. Other centres are now providing up to six months' supply of PrEP with or without HIV testing as available. All services are using remote consultations during the pandemic. Guidance on sexual contacts, in the context of social distancing and COVID-19, was issued by the British Association for Sexual Health and HIV on 26 March 2020 indicating that people should only have sexual contact with someone if they live within the same household.⁷

This article aims to describe the early impact that COVID-19 and associated control measures on the sexual behaviour of PrEP users in Wales.

METHODS

Data were obtained from an ongoing ecological momentary assessment study of individuals in receipt of HIV PrEP across four clinics in four of the six health boards in Wales offering PrEP and started recruitment in September 2019.^{8 9} The clinics and health boards were selected for inclusion in the study to capture a mixture of large and small clinics that were both geographically diverse and

served urban and rural populations. Potentially eligible participants were approached to take part consecutively during PrEP clinic attendance, and recruited participants completed questionnaires at four time-points (aligning to PrEP clinic appointments). These questionnaires covered self-reported PrEP use, questions about sex and relationships, health behaviours and beliefs, symptoms commonly attributed to PrEP use and healthcare contacts. Online surveys were sent weekly to participants asking them to report episodes of condomless sexual intercourse during the preceding week. The cohort closed to recruitment on 27/01/2020 ($n=60$), and data are reported from 03/02/2020 until 10/05/2020. Two-level logistic regression models were fitted to self-reports of condomless sexual intercourse (yes/no, with repeated observations within participants and an unstructured covariance) and included time (week of completion) as a linear effect and an indicator for the introduction of social distancing measures (16/03/2020). The model was extended to explore differential associations between the introduction of social distancing measures and condomless sexual intercourse by relationship status (single/not single—interpreted as no regular/regular partner) and sexual health clinic (the clinic where PrEP services were largely paused was compared with other clinics). Results are reported as OR, associated 95% CIs. As our primary question relates to overall reports of condomless sexual intercourse following the introduction of social distancing measures, p values are reported for this finding only.

RESULTS

Data were available from 56 participants (three participants provided no data and one withdrew prior to recruitment ending) covering a maximum of 784 person-weeks. Responses were obtained for 697 person-weeks (88.9%), with 358 person-weeks presocial distancing measures and 339 post. The number

of participants responding within a given week ranged from 45 (week 13) to 52 (weeks 1, 6, 7 and 8). The median number of responses in a given week was 51 (IQR: 48–52). All participants were cis-gender male, 55 were white (98.2%), their median age was 36 years (IQR: 28–47 years) and 55 had sex exclusively with other men (98.2%). At the beginning of the observed period, 42 of the 56 participants had their relationship status categorised as single (75.0%).

On average, 42.4% of participants reported condomless sexual intercourse in the period prior to the introduction of social distancing measures compared with 19.5% after (OR=0.16, 95% CI: 0.07 to 0.37, $p<0.001$). There was evidence to suggest that this association was moderated by relationship status (pre/postsocial distancing measure condomless sexual intercourse for those single: 42% to 13%; for those not single: 45% to 37%, OR single participant=0.09, 95% CI 0.06 to 0.23; OR for not single participant=0.46, 95% CI 0.16 to 1.25, [figure 1](#)). There was no evidence to suggest that changes in condomless sexual intercourse following social distancing measures were moderated by sexual health clinic (OR for interaction=0.70, 95% CI 0.29 to 1.70).

CONCLUSION

The introduction of social distancing measures and changes to PrEP services across Wales was associated with a marked reduction in reported instances of condomless sexual intercourse among respondents, with a larger reduction in those who were single (and therefore unlikely to have a regular partner) compared with those who were not.

The study uses an ecological momentary assessment approach, whereby within-person changes can be measured and modelled over time. Furthermore, the study was set up prior to the COVID-19 pandemic and introduction of social distancing

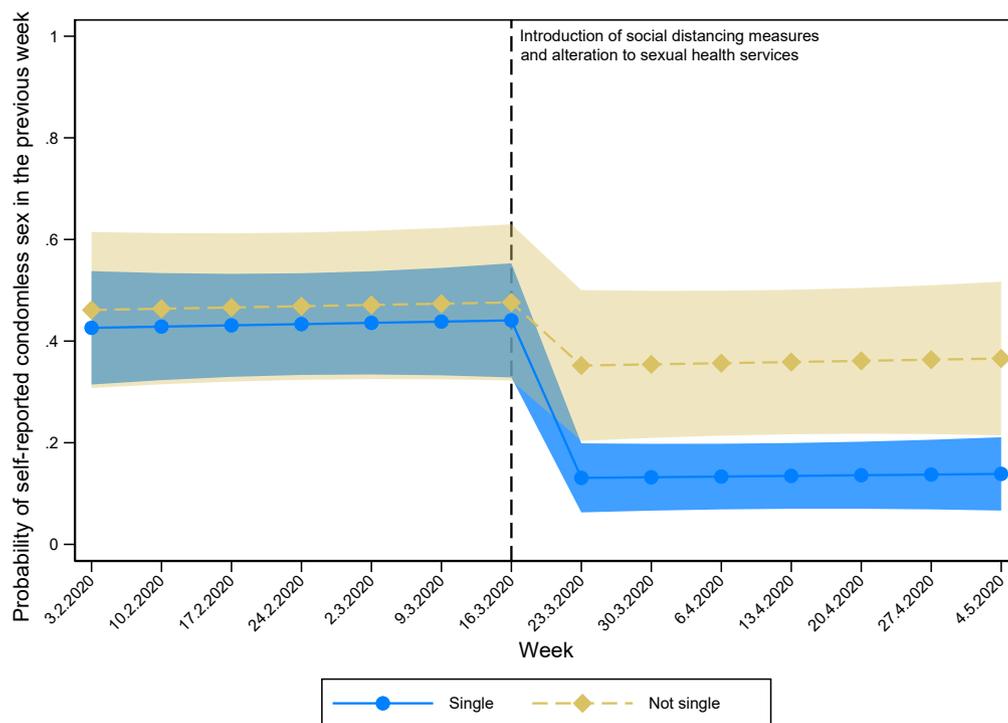


Figure 1 Predicted probabilities of condomless sexual intercourse (in the previous week) over time following the introduction of social distancing measures and the alteration of PrEP services in Wales. PrEP, pre-exposure prophylaxis.

measures. While self-report condom use may generally be subject to social desirability bias, the step change observed following the introduction of social distancing measures was unlikely to induce an immediate shift in reporting bias.

This cohort study included approximately 5% of all PrEP users in Wales and covered four of the six health boards in which PrEP is available via the NHS. Study participants were consecutively recruited from sexual health clinics and broadly representative of individuals accessing PrEP through the NHS in Wales (primarily white men who have sex with men (MSM)). While the median age of the cohort (36 years) was slightly higher than all NHS PrEP users in Wales (31), there was no evidence to suggest that age was associated with differential reports of condomless sexual intercourse preintroduction and postintroduction of social distancing measures.

However, the use of a binary reports of condomless sexual intercourse may mask changes in other sexual behaviours (eg, sex with a condom, changes in number of sexual partners). This requires further exploration. The study benefitted from high levels of complete data. However, some biases may have been induced if those not responding to the online sexual behaviour survey were more or less likely to report condomless sexual intercourse than those who did respond. The study included primarily white MSM, and while this is largely representative of individuals accessing PrEP through the NHS in Wales, caution is urged when extrapolation these findings to other key populations. Finally, while relationship status was treated as a time-varying variable, reported changes in relationship status were too few to decompose these effects with-individuals and between-individuals. Furthermore, relationship status was not reported as regularly as sexual behaviour, and unmeasured changes in relationship status may explain some reports of condomless sexual intercourse among participants categorised as single and vice versa.

This work provides added weight to calls from sexual health experts to use these control measures as an opportunity to mass test and treat at-risk populations for HIV and other STIs, in order to eliminate them from sexual networks.¹⁰ Furthermore, this analysis indicates a substantial shift in sexual behaviour since the introduction of social distancing measures, and the long-term impact of COVID-19 and associated control measures on this population's physical and mental health and well-being requires close examination.

Handling editor Tristan J Barber

Twitter David Gillespie DaveGuk87 @prep_do, Dyfrig Hughes @HughesDyfrig, Richard Ma Richard_GP @GP_SexualHealth, Adam Thomas Jones @adamthomasjones, Adam Williams @AdamDaleNewman1 and Kerenza Hood @kerryhood

Acknowledgements We would like to acknowledge the participants recruited as part of the DO-PrEP study, without whom these insights would not be possible. We would also like to acknowledge members of the DO-PrEP stakeholder group (Lisa Power, Nicholas Hobbs, George Barker, Karen Cameron and Marion Lyons), staff involved with work in the sexual health clinics from which participants were recruited (Rachel Drayton, Karla Blee, Helen Sarah Bradshaw, Irene Parker, Amy Harris, Amanda Blackler, Kim Mitchell, Leasa Green, Olwen Williams) and individuals involved in the setup and conduct of the study (Sam Clarkstone, Rebecca Milton, Rebecca Cavanagh and Kerry Nyland). The Centre for Trials Research is funded by Health & Care Research Wales and Cancer Research UK.

Contributors DG led the design, collected data, conducted statistical analysis and drafted the manuscript. CK contributed to the design and interpretation of the article and drafted the change to PrEP services in Wales. All other authors (DH, ZC, FW, MdB, RM, ATJ, AW and KH) contributed to the design and interpretation of the article and critically revised the manuscript.

Funding The DO-PrEP study was funded by the Welsh Government through Health and Care Research Wales (project ref HF-17-1411).

Disclaimer 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 he had full access to all the data in the study and had final responsibility for the decision to submit for publication.

Competing interests DG, KH and FW report receiving funding from Health and Care Research Wales during the conduct of this work. RM reports funding from National Institute for Health Research during the conduct of this study.

Patient consent for publication Not required.

Ethics approval Ethical approval to study sexual behaviour of PrEP users in Wales, how this changes over time and associated contextual effects was granted by the Wales Research Ethics Committee 3 (reference number 19/WA/0175).

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon request.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iDs

David Gillespie <http://orcid.org/0000-0002-6934-2928>
 Dyfrig Hughes <http://orcid.org/0000-0001-8247-7459>
 Fiona Wood <http://orcid.org/0000-0001-7397-4074>
 Richard Ma <http://orcid.org/0000-0001-6877-2785>
 Adam Thomas Jones <http://orcid.org/0000-0002-0681-8108>
 Adam Williams <http://orcid.org/0000-0002-4825-8997>
 Kerenza Hood <http://orcid.org/0000-0002-5268-8631>

REFERENCES

- 1 Gov.UK. Staying at home and away from others (social distancing). guidance, 2020. Available: <https://www.gov.uk/government/publications/full-guidance-on-staying-at-home-and-away-from-others/full-guidance-on-staying-at-home-and-away-from-others> [Accessed 18 Apr 2020].
- 2 Ferguson NM, Laydon D, Nedjati-Gilani G, *et al*. Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand. Available: <https://www.zehabesha.com/wp-content/uploads/Imperial-College-COVID19-NPI-modelling-16-03-2020.pdf>
- 3 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;363:2587–99.
- 4 Public Health Wales. PreP operational guide, 2017. Available: https://www.publichealthnetwork.cymru/files/6215/0946/3352/PreP_Operational_Guide_July_2017.pdf [Accessed 18 Apr 2020].
- 5 Knapper C, Birley H, Couzens Z, *et al*. How to do it: setting up a PreP service in an integrated sexual reproductive health service setting. *Sex Transm Infect* 2018;94:327–30.
- 6 Public Health Wales. Rapid COVID 19 confirmed case data per local health authority. Available: <https://public.tableau.com/profile/public.health.wales.health.protection#!/vizhome/RapidCOVID-19virology-Public/Headlinesummary> [Accessed 18 Apr 2020].
- 7 Sex, Social Distancing and COVID-19(Coronavirus). Available: <https://members.bashh.org/Documents/COVID-19/Sex%20Social%20Distancing%20%20COVID19%20-%20BASHH%20FAQs%20-%2020260320.pdf> [Accessed 18 Apr 2020].
- 8 Stone AA, Shiffman S. Ecological Momentary assessment (EMA) in behavioral medicine. *Ann Behav Med* 1994;16:199–202.
- 9 Cardiff University. DO-PrEP, 2020. Available: <https://www.cardiff.ac.uk/centre-for-trials-research/research/studies-and-trials/view/do-prep> [Accessed 20 Apr 2020].
- 10 Segalov M. Covid-19 crisis raises hopes of end to UK transmission of HIV. *guardian*, 2020. Available: <https://www.theguardian.com/society/2020/may/13/covid-19-crisis-raises-hopes-of-end-to-uk-transmission-of-hiv> [Accessed 15 May 2020].