

## Introduction

Doxycycline taken within 72 hours following sexual exposure (a.k.a. doxyPEP) has been shown to reduce the incidence of syphilis and chlamydia in three large randomised control trials (1,2,3). Data on doxyPEP effectiveness against gonorrhoea is not as robust, and there remains concerns around the microbiome and antimicrobial resistance.

Previous surveys have indicated that doxyPEP is already being used by service users (4)(5).

We designed a survey to investigate knowledge, attitudes and behaviours of our service users in relation to doxyPEP and to determine if this is already being used within our cohort. A second survey explored health care workers knowledge and attitudes on using doxyPEP for STI prevention.

## Methods

Ethics approval was received from the St James's Hospital Research Ethics Committee.

### Eligibility criteria (Service users):

- >18 years, attending HIV, PrEP and STI clinics at the GUIDe clinic and GMHS clinic in Dublin, Ireland
- GBMSM, heterosexual, trans and cis gender men and women and non-binary individuals

### Eligibility criteria (healthcare worker survey):

- Doctors, sexual health nurses, pharmacists and microbiologists working at the GUIDe clinic and GMHS
- Survey monkey used, available in Brazilian Portuguese and English, accessible via a QR code on posters and information flyers
- Survey opened on the 22/1/24 and closed on the 25/3/24
- Passive sampling, active recruitment and convenience sampling
- Characteristics of the study population according to doxyPEP use were compared with  $\chi^2$ , Fisher's exact, or Mann-Whitney *U* tests, as appropriate
- Data was exported into Excel<sup>®</sup> and analysed using the statistical software STATA<sup>®</sup> (version 16)

## Results

### Results of service users survey

378 responses were received with a 77% completion rate.

### Demographics and characteristics of respondents

Median age of respondents (years): 32 (IQR 26-39).

Gender of respondents: female 64/378 (16.9%), male 303/378 (80.1%), non-binary 8/378 (2.1%), transfemale 1/378 (0.3%), gender fluid 1/378 (0.3%), missing 1/378 (0.3%). 370/378 (97.8%) reported this was the same gender assigned at birth.

Figure 1 : Description of respondent's sexuality

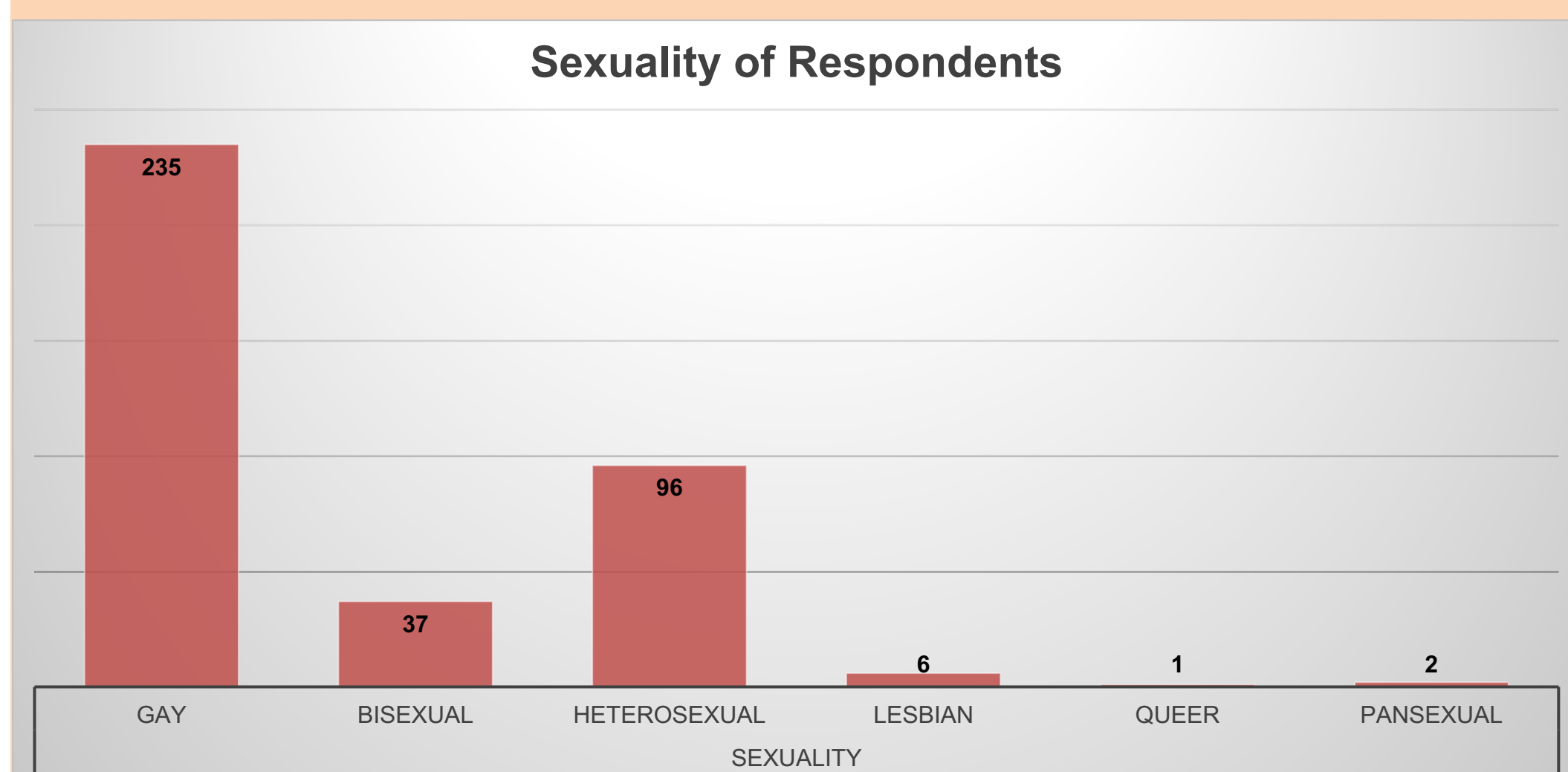


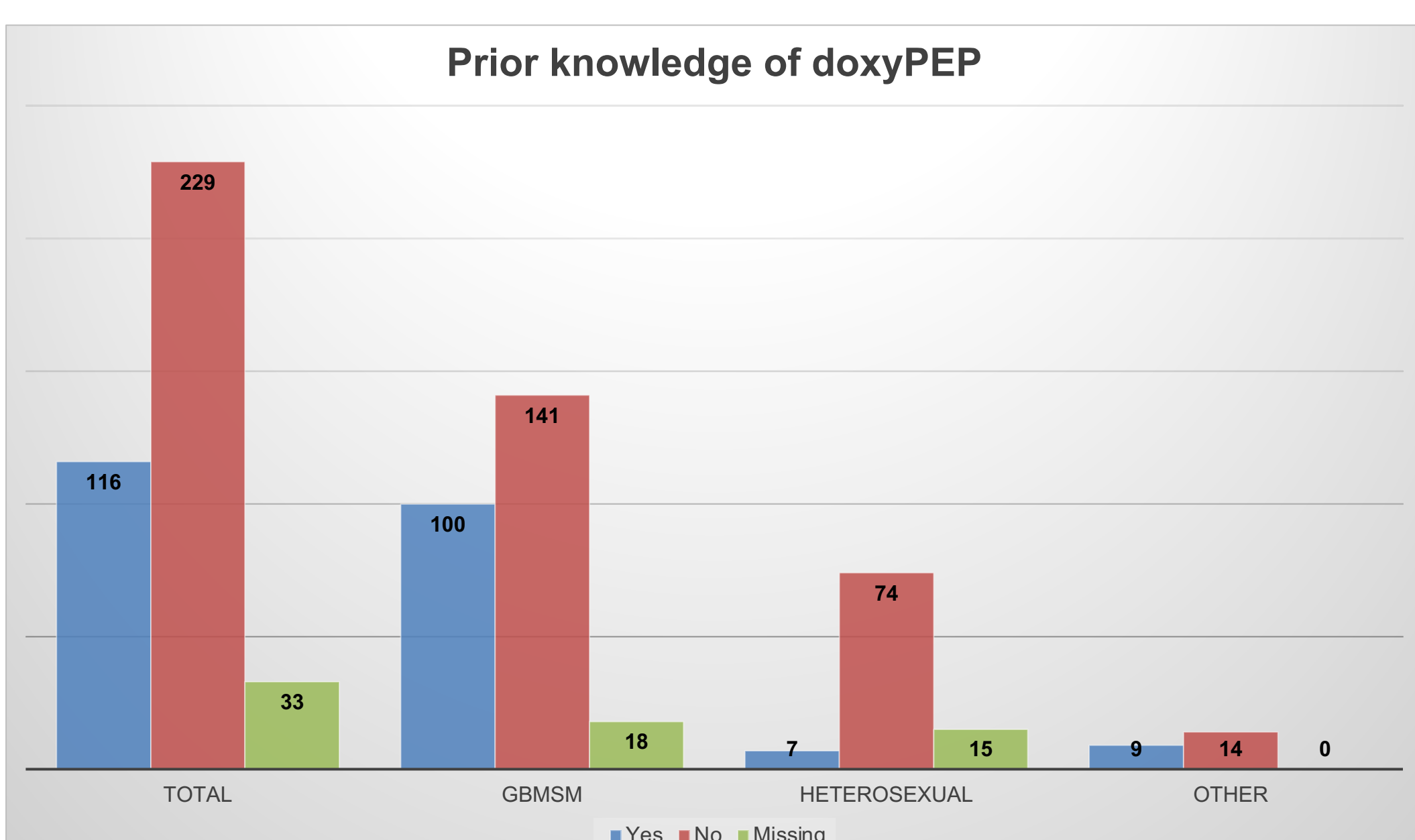
Table 1. STI's in the previous year (all respondents)

Variable	Total	gbMSM	Heterosexual	other
n (%)	378 (100)	259 (100)	96 (100)	23 (100)
STI in the previous year, n (%)	201 (53.2)	157 (60.6)	34 (35.4)	10 (43.5)
	No	177 (46.8)	102 (39.4)	13 (56.5)
Number of STI diagnoses in the previous year median (IQR) (n=193)	2 (1-2)	2 (1-2)	1 (1-1)	1 (1-2)
STI diagnosed in the previous year, n (%)				
Chlamydia	106 (28)	88 (34)	12 (12.5)	6 (26.1)
Gonorrhoea	117 (31)	105 (40.5)	7 (7.3)	5 (21.7)
Syphilis	42 (11.1)	37 (14.3)	4 (4.2)	1 (4.4)

### Knowledge, attitudes and behaviours of respondents (before being given information on doxyPEP)

Figure 2. Prior knowledge of doxyPEP

Yes: total 116/378 (30.7%), gbMSM 100/259 (38.6%), heterosexual 7/96 (7.3%), other 9/23 (39.1%)



## References

- Molina JM, Charreau I, Chidiac C, Pialoux G, Cua E, Delaunay C, et al. Post-exposure prophylaxis with doxycycline to prevent sexually transmitted infections in men who have sex with men: an open-label randomised substudy of the ANRS IPERGAY trial. *Lancet Infect Dis.* 2018;18(3):308-17.
- Luetkemeyer AF, Donnell D, Dombrowski JC, Cohen S, Grabow C, Brown CE, et al. Postexposure Doxycycline to Prevent Bacterial Sexually Transmitted Infections. *N Engl J Med.* 2023;388(14):1296-306.
- Molina JM, Bercot B, Assoumou L, Rubenstein E, Algarde-Genin M, Pialoux G, et al. Doxycycline prophylaxis and meningococcal group B vaccine to prevent bacterial sexually transmitted infections in France (ANRS 174 DOXYVAC): a multicentre, open-label, randomised trial with a 2 x 2 factorial design. *Lancet Infect Dis.* 2024.
- Carveth-Johnson T, Stingone C, Nwokolo N, Whitlock G. Doxycycline use in MSM taking PrEP. *Lancet HIV.* 2018;5(9):e482.
- Chow EPF, Fairley CK. Use of doxycycline prophylaxis among gay and bisexual men in Melbourne. *Lancet HIV.* 2019;6(9):e568-e9.

### Self-reported knowledge on doxyPEP (1=no knowledge, 10=full knowledge), median (IQR) (n=313) :

Total = 2.5 (1-6), gbMSM = 3 (1-6), heterosexual =1 (0-3), other 4 = (2-7)

Table 2. Awareness regarding antimicrobial resistance

Awareness regarding AMR, n (%)	Total	gbMSM	Heterosexual	Other
Yes	161 (42.6)	126 (48.7)	21 (21.9)	14 (60.9)
No	168 (44.4)	106 (40.9)	54 (56.3)	8 (34.8)
Missing	49 (13.0)	27 (10.4)	21 (21.9)	1 (4.4)

### Self-reported concerns on AMR and doxyPEP (1=no concerns; 10=high concerns), median (IQR) (n=326)

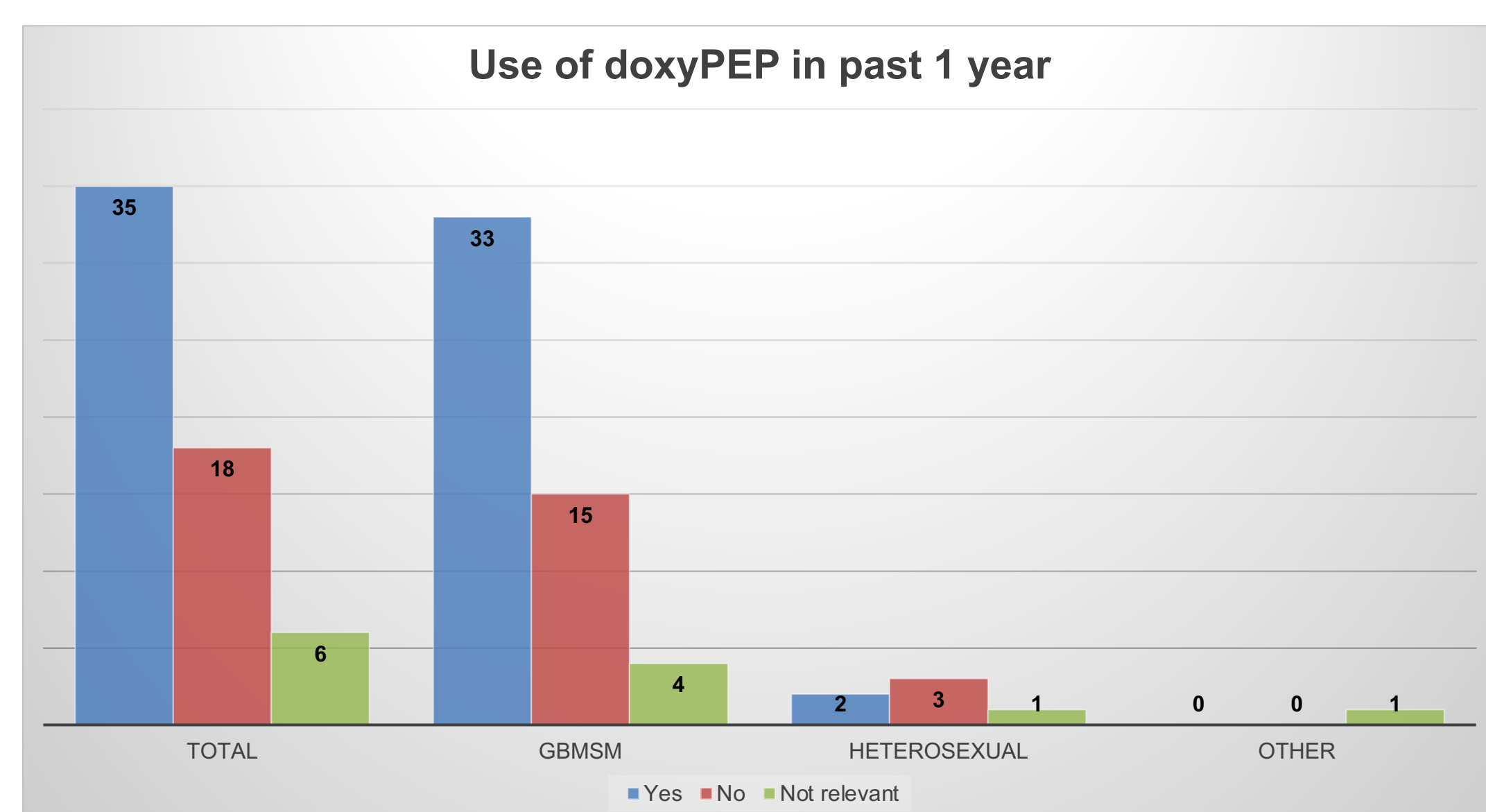
Total = 5.5 (3-8), gbMSM = 6 (4-9), Heterosexual = 3.5 (1-6), other 6.5 = (5-10)

Table 3. Number of respondents that would consider using doxyPEP in future

Consider using doxyPEP in the future, n (%)	Total	gbMSM	Heterosexual	Other
Yes	235 (62.1)	181 (69.9)	39 (40.6)	15 (65.2)
No	12 (3.2)	8 (3.1)	4 (4.2)	0 (0)
Don't know	82 (21.7)	43 (16.6)	32 (33.3)	7 (30.4)
Missing	49 (13)	27 (10.4)	21 (22.8)	1 (4.3)

### Use of antibiotic prophylaxis amongst respondents

Figure 3. Use of doxycycline to prevent an STI in previous year



60/378 (15.9%) reported the use of any antibiotics to prevent STIs in past 1 year, 35/378 (9.3%) reported specifically the use of doxycycline

Median (IQR) (n=35) number of times doxycycline was used to prevent an STI in the past year :

Total 2 (1-5), gbMSM 2 (1-5), Heterosexual 2 (1-3)

### DoxyPEP users vs non doxyPEP users

Table 4. Number of Sexual partners/STIs in doxyPEP vs non doxyPEP users

Variable	Total	dPEP user	No dPEP
n (%)	378 (100)	35 (100)	343 (100)
Number of sexual partners in the previous year, median (IQR)	6 (2-20)	30 (10-60)	6 (2-15)
STI in the previous year, n (%)			
	Yes	201 (53.2)	27 (77.1)
	No	177 (46.8)	8 (22.9)
Number of STI diagnoses in the previous year, median (IQR) (n=193)	2 (1-2)	2 (1-3)	1 (1-2)

Most doxyPEP users belong to gbMSM group (33/35 (94.3%); p=0.001), 2/35(5.7%) were heterosexual. 1/35(2.9%) female reported doxyPEP use.

Use of HIV PrEP and chems was more frequent in doxyPEP users (14/35 (40.0%) vs. 56/343 (16.3%), p <0.001 and 13/35 (37.1%) vs. 54/343 (15.7%, p=0.005)

### Interest/Concerns regarding doxyPEP post provision of information

Self reported interest in doxyPEP following provision of information on doxyPEP (1=not interested, 10=highly interested), median (IQR):

Total 67 (31-98), gbMSM 75 (50-100), heterosexual 31.5 (1-57.5), other 70 (10-100)

Concerns around doxyPEP usage ranked from most concerning to least concerning: risk of increased **resistance to gonorrhoea**, risk of resistance to other bacteria, changes in the microbiome, disengagement with sexual health services/reduction in STI screening, side effects of antibiotics, no concerns Information desired prior to using doxyPEP, from most desired to least desired: **longer term real-world data**, peer group support, healthcare worker opinion, national guidelines, international guidelines

### Healthcare workers knowledge, attitudes and behaviors regarding doxyPEP

52 responses were received with a 100% completion rate. 20/52(38%) doctors, 26/52(50%) nurses, 4/52(8%) pharmacists, 2/52(4%) microbiologists answered the survey. 45/52(87%) are aware of the outcomes of recent doxyPEP studies .

46/52(88%) have **concerns** about the use of doxyPEP, 20/52 (38%) would be happy to prescribe doxyPEP now with current evidence available.

Concerns around doxyPEP usage ranked from most concerning to least concerning: risk of increased **resistance to gonorrhoea**, risk of resistance to other bacteria, changes in the microbiome, disengagement with sexual health service/reduction in STI screening, side effects of antibiotics, increase in 'risky' sexual behaviour, difficulty in interpreting syphilis serology

## Conclusion

Almost 1/10 had taken doxycycline for STI prophylaxis. Those reporting recent doxyPEP use had higher partner number and STI diagnoses, suggesting appropriate self-selection. Forty percent of heterosexual respondents are interested in using doxyPEP. Whilst the majority of HCWs see a role for doxyPEP, high levels of concern remain and less than half would be happy to prescribe with current evidence.

Findings suggest need for continued data collection, inclusive of women and heterosexual populations.