

Dramatic increase in preexposure prophylaxis use among MSM in Washington state

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Objective: HIV preexposure prophylaxis (PrEP) is efficacious, but uptake has been slow. In Washington State, most insurance plans, including Medicaid, pay for PrEP, and the state supports a PrEP drug assistance program. We assessed trends in PrEP awareness and use among MSM in Washington.

Design and setting: Serial cross-sectional survey conducted annually at the Seattle Pride Parade between 2009 and 2015.

Methods: In a convenience sample of MSM who reside in Washington State and deny ever testing HIV positive ($n = 2168$), we evaluated the association between calendar year and self-report of PrEP uptake and awareness using descriptive statistics and multivariable relative risk and logistic regression. Regression models included HIV risk and demographic covariates.

Results: In 2015, 23% [95% confidence interval (CI): 16%, 31%] of high-risk MSM reported *currently* taking PrEP. The percentage of high-risk MSM who reported *ever* taking PrEP increased from 5% in 2012 to 31% in 2015. PrEP use among lower-risk MSM was low and stable, between 1 and 3% in 2012–2015. In multivariable analyses, PrEP use was associated with later calendar years (2015 vs. 2012: adjusted relative risk = 2.29, 95% CI: 1.16, 4.52) and elevated HIV risk (adjusted relative risk = 2.92, 95% CI: 2.00, 4.25). The percentage of high and lower-risk MSM who had heard of PrEP increased from 13 to 86% and from 29 to 58%, respectively.

Conclusion: PrEP awareness is high and the use has rapidly increased over the last year among MSM in Seattle, Washington, USA. These findings demonstrate that high levels of PrEP use can be achieved among MSM at high-risk for HIV infection.

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Introduction

The efficacy of preexposure prophylaxis (PrEP) in preventing HIV acquisition among MSM has been established in clinical trials [1–3], the US Food and Drug Administration approved tenofovir/emtricitabine for use as PrEP in 2012 [4], and the Centers for Disease Control and Prevention issued guidelines promoting PrEP use in 2014 [5]. Demonstration projects suggest that many MSM will take PrEP if the intervention is available [6–8]. More recently, the revised 2015 US National HIV/AIDS Strategy highlighted PrEP as a central component of the national plan to control HIV infection [9]. However, evidence to date suggests that PrEP uptake has been slow. National data collected from approximately 55% of US retail pharmacies suggest that only 3253 Americans had started PrEP as of 31 March 2014 [10].

Public Health – Seattle and King County (PHSKC) monitors HIV risks and the uptake of treatment and prevention interventions among MSM through annual surveys undertaken at Seattle Gay Pride events. We evaluated these data to assess trends in awareness and uptake of PrEP among MSM attending the Seattle Pride Parade between 2009 and 2015.

Methods

The Gay Pride survey collects data on respondents' demographic characteristics, access to healthcare, risk behaviors, HIV and sexually transmitted disease (STD) testing behaviors, and awareness of HIV prevention strategies and campaigns. Trained survey staff members are staggered along the parade route and administer the Pride Survey between 0800 and 1300 h on the Sunday of Pride weekend (the last weekend in June). Survey staff approach people at the parade, briefly describe the survey and its purpose, ascertain potential respondents' willingness to complete the survey, and evaluate eligibility using the screening question: 'Do you identify as a man who has sex with men?' The survey may be interviewer or self-administered in English or Spanish. PrEP was defined in the 2015 survey as 'a medication that can be taken by HIV-negative people on an ongoing basis to help prevent getting HIV'; the wording of the PrEP definition slightly differed in earlier surveys. Respondents who complete the survey receive a bag containing condoms, information about local services, and a \$5 Starbucks gift card.

We analyzed data about PrEP awareness and uptake from Pride Surveys undertaken between 2009 and 2015. This analysis is restricted to residents of Washington State who reported a negative or unknown HIV status. We used descriptive statistics to characterize trends over time, a multivariable relative risk regression model to evaluate

factors associated with PrEP awareness, and a multivariable logistic regression model to evaluate factors associated with PrEP uptake. Year of survey, age, race, educational attainment, income, King County residence, and HIV risk level were included in the models as independent variables. Respondents reporting any of the following in the past 12 months were considered 'high risk' for HIV infection: methamphetamine or amyl nitrate ('popper') use, a bacterial STD diagnosis (gonorrhea, chlamydia, or syphilis), at least 10 anal sex partners, or condomless anal sex with an HIV-positive man or man of unknown HIV status. We previously identified these factors as being associated with HIV acquisition among MSM STD clinic patients in King County and use this definition for HIV testing recommendations [11]. The Gay Pride survey is anonymous, and this analysis was undertaken as a public health surveillance activity. Therefore, it was not considered research and did not require review by an institutional review board.

Results

The number of surveys completed in a given year has increased since the Seattle Pride Survey was first conducted in 2009 (Table 1). Since 2009, the Pride Survey has been completed by 2595 respondents, of whom 2168 (85%) met the inclusion criteria for this analysis (e.g. HIV-negative/unknown MSM residing in Washington State attending the Seattle Pride Parade). The median age of respondents was 32. The majority of Pride Survey respondents resided in King County (70%), were white (71%), and had at least a 4-year college degree (54%) (Table 1). More than one-third of respondents reported an annual income exceeding \$50 000. The demographic composition of the Pride Survey sample is similar to the general population of men in King County [12]. About a quarter of respondents met PHSKC 'high-risk' criteria.

Prior to Food and Drug Administration approval of PrEP in 2012, only five men (<1% of 2009–2011 respondents) reported having ever used PrEP. Among high-risk respondents, the percentage reporting ever having taken PrEP increased from 5% in 2012 to 31% in 2015 (Fig. 1). In 2015, 23% of high-risk respondents (26 of 115 high-risk respondents) reported currently taking PrEP at the time of the survey; 72% of men who reported ever using PrEP were currently using the intervention ($n = 36$). Among lower-risk respondents, the percentage reporting ever using PrEP was stable between 2012 and 2015, ranging between 1 and 3%. In multivariable analyses, respondents in 2015 were more than twice as likely to have ever taken PrEP than respondents in 2012, and respondents classified as being at high risk for HIV acquisition were almost three times more likely to have ever taken PrEP than lower-risk men (Table 1).

Table 1. Characteristics of HIV-negative/unknown MSM who participated in the Seattle Pride Survey in 2009–2015 and factors associated with preexposure prophylaxis awareness and uptake.

	Sample description <i>n</i> (%)	Heard of PrEP		Ever taken PrEP	
		RR (95% CI)	Adjusted RR (95% CI)	OR (95% CI)	Adjusted OR (95% CI)
Age group					
<30	938 (43)	Ref.	Ref.	Ref.	Ref.
30–39	523 (24)	1.13 (0.95, 1.34)	1.04 (0.86, 1.26)	1.29 (0.81, 2.05)	1.16 (0.70, 1.93)
40–49	391 (18)	1.34 (1.12, 1.60)*	1.17 (0.95, 1.44)	1.19 (0.71, 2.01)	0.98 (0.55, 1.72)
≥50	316 (15)	1.23 (1.00, 1.49)†	1.02 (0.82, 1.28)	1.24 (0.71, 2.15)	0.96 (0.53, 1.75)
Race/ethnicity					
White	1503 (71)	Ref.	Ref.	Ref.	Ref.
Hispanic	249 (12)	0.85 (0.68, 1.06)	0.87 (0.69, 1.11)	0.76 (0.39, 1.46)	0.81 (0.42, 1.54)
Black	104 (5)	1.07 (0.79, 1.45)	1.20 (0.88, 1.64)	1.23 (0.56, 2.69)	1.29 (0.57, 2.96)
Asian	99 (5)	0.75 (0.52, 1.08)	0.74 (0.50, 1.09)	0.77 (0.28, 2.11)	0.82 (0.30, 2.22)
Have 4-year college degree	1119 (54)	1.37 (1.19, 1.58)‡	1.14 (0.97, 1.35)	1.20 (0.82, 1.76)	1.02 (0.66, 1.57)
Gross income					
Less than \$15 000	451 (21)	Ref.	Ref.	Ref.	Ref.
\$15 000–\$30 000	435 (20)	1.11 (0.88, 1.39)	1.08 (0.85, 1.38)	1.07 (0.58, 2.00)	1.07 (0.57, 2.00)
\$30 001–\$50 000	499 (24)	1.34 (1.08, 1.65)§	1.29 (1.02, 1.63)†	1.15 (0.63, 2.09)	1.12 (0.60, 2.09)
\$50 001–\$100 000	489 (23)	1.32 (1.07, 1.63)†	1.20 (0.94, 1.54)	1.36 (0.76, 2.42)	1.26 (0.66, 2.41)
More than \$100 000	251 (12)	1.63 (1.29, 2.07)‡	1.32 (1.00, 1.75)	1.89 (1.01, 3.55)†	1.69 (0.82, 3.51)
King County resident	1504 (70)	1.20 (1.02, 1.40)†	1.12 (0.94, 1.33)	1.44 (0.92, 2.25)	1.30 (0.81, 2.07)
Met high-risk criteria ^a	489 (23)	1.42 (1.23, 1.65)‡	1.38 (1.18, 1.60)‡	3.04 (2.10, 4.39)‡	2.92 (2.00, 4.25)‡
Survey year					
2009	133 (6)	0.94 (0.62, 1.42)	0.92 (0.59, 1.44)	0.84 (0.29, 2.48)	0.85 (0.28, 2.56)
2010	278 (13)	0.84 (0.59, 1.19)	0.81 (0.56, 1.17)	0.80 (0.33, 1.92)	0.84 (0.34, 2.05)
2011	270 (13)	0.94 (0.68, 1.32)	0.97 (0.68, 1.38)	0.89 (0.38, 2.09)	0.85 (0.36, 2.01)
2012	259 (12)	Ref.	Ref.	Ref.	Ref.
2013	301 (14)	1.24 (0.91, 1.69)	1.29 (0.94, 1.78)	1.40 (0.65, 3.00)	1.29 (0.59, 2.80)
2014	450 (21)	1.99 (1.52, 2.61)‡	2.06 (1.56, 2.73)‡	1.19 (0.58, 2.47)	1.15 (0.56, 2.39)
2015	477 (22)	2.35 (1.81, 3.06)‡	2.44 (1.85, 3.21)‡	2.40 (1.23, 4.66)§	2.29 (1.16, 4.52)†

CI, confidence interval; OR, odds ratio; PrEP, preexposure prophylaxis; RR, relative risk; STD, sexually transmitted disease.

†*p* < 0.05; §*p* < 0.01; **p* < 0.001; ‡*p* < 0.0001.

^aNote: High-risk criteria include methamphetamine or popper use, an STD diagnosis, at least 10 sex partners, or nonconcordant condomless anal sex in the last year [11].

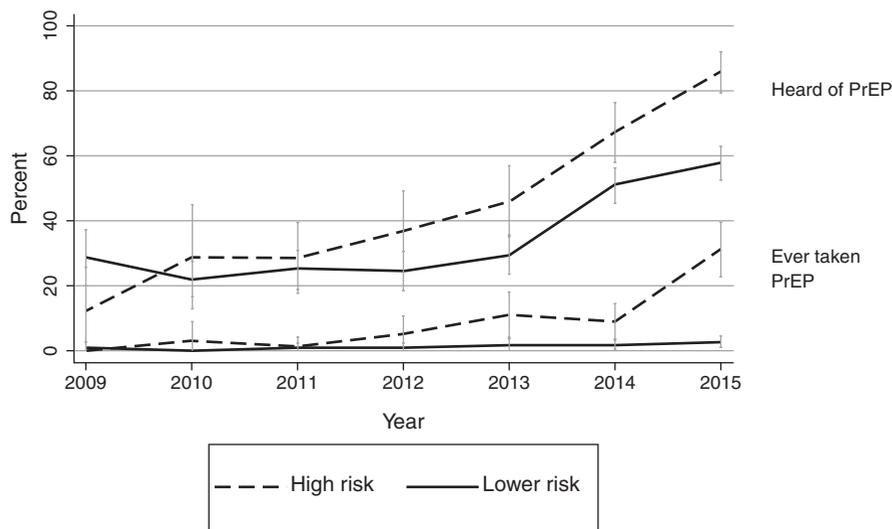


Fig. 1. Awareness and reported use of preexposure prophylaxis (PrEP) among HIV-negative/unknown MSM attending the Seattle Pride Parade in 2009–2015, stratified by HIV risk. Note: High-risk criteria include methamphetamine or inhaled nitrite use, a bacterial STD diagnosis, at least 10 anal sex partners, or nonconcordant condomless anal sex in the last year [11].

The percentage of respondents who had heard of PrEP was stable, ranging 20–30% from 2009 to 2012, and thereafter increased each year to 58% among lower-risk men and 86% among high-risk men in 2015. In multivariable analyses adjusting for year-to-year demographic differences between samples, awareness of PrEP was associated with latter calendar years, being classified as at high risk for HIV acquisition and higher income (Table 1).

Discussion

Although PrEP is known to be efficacious and appears to be effective [1,7,13], uptake of the intervention among MSM in the USA was minimal as recently as 2014. Our findings suggest that PrEP use rapidly increased among MSM in King County, Washington, USA, between 2014 and 2015, and that uptake of the intervention is highly concentrated among the men at highest risk for HIV acquisition. Almost one-third of high-risk MSM survey respondents had ever taken PrEP as of June 2015, and almost a quarter were currently using the intervention. Awareness of PrEP was high among MSM overall, and almost 90% of high-risk MSM had heard about PrEP. Of note, awareness and use of PrEP did not significantly differ by race or education, although we did observe a slight disparity by income.

Although the reasons for the relatively high level of PrEP use in King County are uncertain, a number of factors distinguish the area from much of the nation. The population is relatively educated and prosperous; the median family income in King County is 35% higher than the national median, and 47% of residents aged 25 or older are college graduates (vs. 29% nationally) [12]. Washington State has expanded Medicaid, which pays for PrEP without copayments. The state also has a PrEP drug assistance program that pays for PrEP for persons without health insurance and pays copayments for high-risk persons whose insurance does not cover the full costs of tenofovir/emtricitabine [14]. The State Department of Health has spearheaded a public health campaign to increase PrEP awareness among MSM [15], and a large number of medical providers, as well as the PHSKC STD Clinic, prescribe PrEP [16].

Although our findings demonstrate a dramatic increase in PrEP use among high-risk MSM, only 7% of all 2015 survey respondents indicated that they were currently taking PrEP. Achieving a population-level effect on HIV transmission may require substantially higher levels of use than we observed [17–20]. At the same time, modeling studies in the USA and Australia have suggested that given current drug costs, PrEP is only cost-effective if targeted to high-risk MSM [17–22]. Our findings suggest that such targeting is occurring in

King County, Washington, USA. However, some MSM categorized as being low risk in our analysis may be at significant risk for HIV acquisition. Future efforts should focus both on increasing PrEP uptake among high-risk MSM and developing better criteria to identify segments of the MSM population that would benefit most from PrEP.

Our findings have a number of limitations. Most importantly, the representativeness of survey respondents of MSM in the area is unknown, and it may be that men who attend Gay Pride events differ from MSM who do not. Self-reported measures of PrEP knowledge and use may be imperfect. The Pride Survey included a relatively small number of Black and Hispanic MSM, limiting our ability to estimate PrEP use in racial and ethnic minority MSM, a population that is disproportionately affected by HIV. Finally, the increase in PrEP use we observed, virtually all of which occurred between 2014 and 2015, could represent a statistical aberration. However, other local data, including administrative records showing 329 active King County PrEP drug assistance program enrollees and preliminary results from a survey completed by King County PrEP prescribers, support the finding that PrEP use has rapidly increased over the last year.

In summary, we found that PrEP knowledge among MSM in King County, Washington, USA, is high and that use of PrEP is rapidly increasing. PrEP is one of the four 'key areas of critical focus' highlighted in the updated 2015 US National HIV/AIDS Strategy [9]. Our findings demonstrate rapid local progress in increasing PrEP use among MSM in an area in which PrEP is widely available.

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Conflicts of interest

There are no conflicts of interest.

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