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Trends in Preexposure Prophylaxis (PrEP) Use Among Sex Partners as Reported by Persons with HIV—United States, May 2015–June 2020

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Abstract

Objective: To estimate trends in the proportion of sexually active U.S. adults with HIV (PWH) reporting an HIV-discordant sexual partner taking pre-exposure prophylaxis (PrEP) and proportion of partners taking PrEP.

Design: The Medical Monitoring Project is a complex sample survey of U.S. adults with diagnosed HIV.

Methods: We used annual cross-sectional data collected during 6/2015–5/2020 to estimate the annual percentage change (EAPC), overall and by selected characteristics, in 1) reported partner PrEP use among PWH with HIV-discordant partners (N=8,707) and 2) reported PrEP use among these partners (N=15,844).

Results: The proportion of PWH reporting PrEP use by 1 HIV-discordant sex partner rose 19.5% annually (11.3% to 24.4%). The prevalence rose from 6.0% to 17.4% (EAPC, 25.8%) among Black PWH, 10.1% to 26.0% (EAPC, 19.5%) among Hispanic/Latino PWH, and 20.8% to 34.6% (EAPC, 16.3%) among White PWH. Among MSM with HIV, the prevalence increased from 9.6% to 32.6% (EAPC, 28.2%) among Black MSM, 16.6% to 36.0% (EAPC, 15.6%) among Hispanic/Latino MSM, and 24.9% to 44.1% (EAPC, 17.9%) among White MSM. Among HIV-discordant sex partners, the proportion reported to be taking PrEP increased 21.1% annually (7.8% to 18.8%). Reported PrEP use rose from 4.9% to 14.2% (EAPC, 29.9%) among Black partners, 6.5% to 16.8% (EAPC, 20.3%) among Hispanic/Latino partners, and 12.7% to 26.1% (EAPC, 17.0%) among White partners.

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Conflicts of interest: The authors declare no conflicts of interest.

Conclusions: One in five HIV-discordant sexual partners of PWH were reported to be taking PrEP. PrEP use rose among all examined populations, although the increases did not eliminate disparities in PrEP use.

Keywords

human immunodeficiency virus; HIV; pre-exposure prophylaxis; PrEP; men who have sex with men

Background

Pre-exposure prophylaxis (PrEP) is highly effective at preventing HIV acquisition (1) and increasing access to and use of PrEP is a core component of the Ending the HIV Epidemic (EHE) in the United States initiative and the National HIV/AIDS Strategy (NHAS) (2, 3). However, federal monitoring data indicate that only 23% of people estimated to need it were prescribed PrEP in 2020 (4) and documented racial/ethnic and sex (at birth) disparities in PrEP use have continued (5–10). While studies have found increases in PrEP use in the United States in the years following U.S. Food and Drug Administration approval of emtricitabine/tenofovir disoproxil fumarate (Truvada[®]) for use as PrEP in 2012 (7, 11–14), none of these studies were focused on HIV-discordant sex partners of people with HIV (PWH), a key group that may need PrEP initiation if the PWH has not experienced sustained undetectable viral suppression, as viral suppression prevents HIV transmission to sexual partners (15). Evaluating trends in reported PrEP use among the HIV-discordant partners of PWH—and determining whether existing trends are sufficient to reduce existing gender and racial/ethnic disparities—will allow us to monitor progress and provide information to inform a tailored response for this population to achieve the EHE goal of increasing PrEP use among all who need it.

To address this gap, we analyzed reported PrEP use among HIV-discordant sexual partners of PWH in the United States using a national probability sample of PWH collected from May 2015 to June 2020. We assessed trends in reported partner PrEP use, overall and by characteristics of the person with HIV and their partners.

Methods

Medical Monitoring Project (MMP) methods have been previously described in detail (16, 17). In brief, MMP first sampled 23 jurisdictions from all U.S. states, the District of Columbia, and Puerto Rico. Second, simple random samples of adults with diagnosed HIV were drawn annually for each participating state/territory from the National HIV Surveillance System (NHSS), a census of U.S. persons with diagnosed HIV. For this analysis, we used data from the 2015–2019 MMP data collection cycles spanning June 2015 through May 2020; data were collected via phone or face-to-face interviews and medical record abstractions during June through the following May of each cycle year. State/territory response rates were 100% and ranged annually from 40–46% at the person level. Data were weighted based on probabilities of selection and adjusted for non-response (18) and then post-stratified to NHSS population totals by sex, race/ethnicity, and age. MMP is an ongoing public health surveillance activity and thus Institutional Review Board approval was not

obtained, although two participating jurisdictions choose to obtain local approvals. Informed consent was given by all participants.

MMP participants self-reported their sex partnerships over the past 12 months, including information about partners' age, gender and race/ethnicity and use of PrEP within HIV-discordant partnerships. PrEP use was assessed among the most recent 5 partners without HIV. Partners with an unknown HIV status were categorized as not taking PrEP. Among sexually active persons with HIV who had at least one HIV negative or unknown HIV status (HIV-discordant partner (N=8,707)), we estimated the weighted prevalence and associated 95% confidence interval (CI) of reporting at least one HIV-discordant partner taking PrEP, overall and by selected characteristics of the person with HIV. Among the HIV-discordant partnerships reported by these persons (N=15,844), we calculated the prevalence of partners reported to be taking PrEP, overall and by selected characteristics. Based on weighted frequencies, we used Poisson regression models to calculate relative estimated annual percent changes (EAPC)—a measure of relative annual percent change across all 5 cycle years—with accompanying confidence intervals and *p*-values (significance defined as *p* < 0.05). To assess whether limiting the analysis to persons with known HIV status biased our findings, we repeated the analysis excluding persons with partners whose HIV status was unknown. All analyses accounted for MMP's complex sample design and weights, and were conducted using SAS survey procedures.

Results

Trends in the prevalence of reporting 1 partner using PrEP among sexually active persons with HIV with HIV-discordant partners

Among all sexually active PWH with HIV-discordant partners, the prevalence of reporting 1 partner taking PrEP rose from 11.3% in the 2015 cycle to 24.4% in 2019 cycle, with an EAPC of 19.5% (Table 1). Among cisgender men with HIV, the prevalence rose from 13.5% to 29.0% (EAPC 18.9%). The prevalence of reported partner PrEP use rose from 18.1% to 37.0% (EAPC 18.4%) among men who had sex with men (MSM) and 4.1% to 9.0% (EAPC 17.2%) among men who only had sex with women (MSW). Small numbers prevented us from assessing trends in reported partner PrEP use among cisgender women and transgender persons. Reported partner PrEP use among persons with HIV aged 18–29 years rose from 17.4% to 36.7% (EAPC 19.4%), among persons aged 30–49 from 11.8% to 26.7% (EAPC 19.9%), and among persons aged 50 or more from 8.4% to 18.0% (EAPC 22.3%).

The prevalence of reporting a partner taking PrEP rose from 6.0% to 17.4% (EAPC 25.8%) among Black PWH, 10.1% to 26.0% (EAPC 19.5%) among Hispanic/Latino PWH, and 20.8% to 34.6% (EAPC 16.3%) among White PWH. Among MSM with HIV, the prevalence increased from 9.6% to 32.6% (EAPC 28.2%) among Black MSM, 16.6% to 36.0% (EAPC 15.6%) among Hispanic/Latino MSM, and 24.9% to 44.1% among White MSM (EAPC 17.9%).

Reported partner PrEP use rose from 7.9% to 16.5% (EAPC 20.2%) among PWH living in households <100% of the federal poverty guideline and 20.6% to 38.7% (EAPC 15.2%) among PWH living in households ≥400% of the federal poverty guideline. Reported PrEP

use did not differ substantially among PWH who were virally suppressed compared with those who were not virally suppressed and increased similarly (EAPCs 20.0% and 18.8%, respectively). Prevalence rose from 11.7% to 26.8% (EAPC 20.3%) among those living in MMP jurisdictions that expanded Medicaid and 10.6% to 20.4% (EAPC 17.9%) among those living in MMP jurisdictions that did not expand Medicaid.

The prevalence of reporting a partner taking PrEP rose from 5.0% to 14.3% (EAPC 26.4%) among PWH who had 1 sex partner over the past 12 months and from 17.4% to 34.8% (EAPC 17.6%) among PWH with more than 1 sex partner. Limiting the analysis to only persons with known HIV status partners resulted in no substantive changes with one exception, reported PrEP use was no longer significantly lower among Hispanic partners compared with white partners.

Trends in the prevalence of PrEP use among HIV-discordant sex partners reported by persons with HIV

Among HIV-discordant sexual partners reported by PWH, the prevalence of reported PrEP use increased from 7.8% to 18.8% (EAPC 21.1%; Table 2). The prevalence of PrEP use rose from 9.2% to 21.5% among cisgender male partners (EAPC 20.3%) and 2.9% to 7.4% among cisgender female partners (EAPC 23.1%). The prevalence of reported PrEP use among transgender partners was too small to report. Among partners 29 years of age, PrEP use rose from 6.9% to 21.9% (EAPC 24.2%), among those aged 30–49 from 9.6% to 19.9% (EAPC 18.9%), and among partners aged 50 or older from 4.0% to 13.2% (EAPC 30.0%). By race/ethnicity, reported PrEP use rose from 4.9% to 14.2% (EAPC 29.9%) among Black partners, 6.5% to 16.8% (EAPC 20.3%) among Hispanic/Latino partners, and 12.7% to 26.1% (EAPC 17.0%) among White partners.

PrEP use did not differ substantially among partners reported by PWH who were virally suppressed compared with those who were not virally suppressed and increased similarly (EAPCs 21.8% and 20.1%, respectively). PrEP use rose from 8.0% to 20.5% (EAPC 21.9%) among reported partners living in states that expanded Medicaid and from 7.3% to 15.8% (EAPC 19.0%) among those living in states that did not expand Medicaid.

Discussion

Using nationally representative estimates derived from a large, geographically diverse sample of U.S. PWH, we found a 19.5% estimated annual relative increase in the proportion of sexually active PWH reporting PrEP use by at least one HIV discordant sex partner from the 2015 MMP cycle to the 2019 cycle (11.3% to 24.4%). In addition, among the HIV-discordant sex partners of these PWH, the proportion reported to be taking PrEP also increased 21.1% annually (7.8% to 18.8%). This is consistent with other studies that have shown increasing PrEP use in the United States in recent years (11–14). What is added by this study is its finding that PrEP use is increasing among a priority population for whom PrEP uptake may be particularly important, the HIV-discordant sex partners of PWH. Although the risk of HIV transmission in these partnerships is negligible when the PWH is virally suppressed (15), viral suppression status can be dynamic and people may experience viral rebound (19), so monitoring PrEP use among this population is still valuable. This

analysis also adds to the literature by documenting increases in reported PrEP use among the partners of a probability sample of PWH that is national in scope, reflective of the characteristics of U.S. PWH, and geographically and demographically diverse.

Encouragingly, reported HIV-negative partner PrEP use rose among all examined populations of PWH and their partners. However, important gender and racial/ethnic disparities remained. While reported partner PrEP use rose at similar rates among MSM and MSW, the percentage of MSW with partners taking PrEP remained much lower than among MSM. Also, the numbers of cisgender women and transgender persons reporting partners taking PrEP was too low to produce reliable estimates. Further, the HIV-discordant partnerships reported by PWH also indicate that PrEP use among cisgender female partners remained far lower than among cisgender male partners, although they increased at similar rates. The numbers of transgender partners reported to be taking PrEP was also too low to produce reliable estimates, which may indicate substantial room for improvement in increasing PrEP use among this group. Unfortunately, our ability to explore trends in PrEP use among women by race/ethnicity was limited by small numbers of non-Black women; such analyses would be useful considering that more White than Black women receive PrEP (7) despite an inverse relationship to HIV incidence (4). National data indicate that only 9% of cisgender women with a need for PrEP were taking it (4). However, PrEP interventions designed specifically for women, as well as those for MSW, are lacking (20). PrEP screening based on individual behaviors may miss some women at risk for acquiring HIV due to increased levels of network or community risk (21). Even when indications are present (e.g., bacterial STIs), women are often not provided PrEP (22, 23). Using a shared decision-making model in which patients and clinicians collaboratively identify multilevel factors to determine HIV risk and eligibility for PrEP may be helpful, since risk-based screening may miss women at risk of acquiring HIV due to structural factors (24). One evaluation found that integrating PrEP into a family planning clinic increased screening among women, although uptake was low (25). Because barriers to PrEP use among women are multidimensional and present at all steps of the PrEP continuum (26), multi-level interventions tailored for women are needed.

Because transgender persons are disproportionately affected by HIV (27), increasing PrEP use among transgender persons is a priority of the NHAS (3). Unfortunately, the proportion of transgender persons in HIV discordant partnerships is not documented in the literature. In this analysis, the number of transgender partners reported to be using PrEP was too small for this analysis to assess trends. Surveillance focused on transgender women in 7 US cities highly affected by HIV found that 32% of transgender women reported PrEP use over the past 12 months (28), while among a national probability sample only 3% of sexually active transgender persons reported taking PrEP (29). Increasing PrEP use among transgender persons will contribute to achieving NHAS goals, but barriers exist at multiple levels (26). TRIUMPH, a community-led PrEP demonstration project focused on transgender persons used a multilevel strategy that incorporated peer health education, community mobilization, and clinical integration of PrEP and hormone therapy that was successful in promoting PrEP use among transgender persons in two US cities (30).

Despite progress in increasing PrEP use among the HIV-discordant partners of Black and Hispanic/Latino PWH—including among the partners of Black and Hispanic/Latino MSM—we documented persisting racial/ethnic disparities. Although the prevalence of reporting a partner taking PrEP increased at a higher rate among Black PWH compared with White PWH, this increasing trend was not enough to close the racial gap in the prevalence of partner PrEP use. Similarly, despite more rapidly increasing prevalence of partner PrEP use among Black MSM compared with White MSM, this increase was not enough to close the racial gap by 2019/2020, with 32.6% of Black MSM reporting a partner taking PrEP compared with 44.1% of White MSM. Among HIV discordant partners reported by PWH we found similar disparities, with increases in PrEP use among Black and Hispanic/Latino partners that were not sufficient to achieve racial equity by the 2019 MMP cycle. Promoting PrEP use among underserved racial and ethnic groups is needed to promote health and decrease HIV incidence (31). A scoping review of PrEP use among Black MSM found that barriers included financial barriers, stigma, and concern about side effects, while key facilitators were discussions about PrEP among their social and sexual networks (5). PrEP navigation models designed by clinics and community-based organizations that combine professional and peer navigation have been found to be highly effective in linking MSM of color to PrEP (32). However, even among programs implementing intensive multi-level activities to increase PrEP use, racial and ethnic disparities persisted (33). Although we found that reported PrEP use among Black partners rose an estimated annual 29.9% from the 2015 to 2019 MMP cycle, the percentage point difference in PrEP use was higher in 2019 compared to 2015 (–11.9 percentage points versus –7.8 percentage points). Increasing PrEP use among Black and Hispanic/Latino populations remains of paramount importance to achieve health equity and reduce HIV incidence (34, 35).

Our findings provide evidence that Medicaid expansion through the Affordable Care Act may have been effective at facilitating PrEP use among the partners of PWH, as has been found for PrEP use in general (36, 37). While reported partner PrEP use was similar during the 2015 cycle, it increased at higher rates among PWH living in jurisdictions that expanded Medicaid than among those living in jurisdictions that did not, and by the 2019 cycle the prevalence was higher among those in Medicaid expansion states (26.8% vs 20.4%). We found comparable results among the partners reported by PWH, where the prevalence of partners taking PrEP was similar during the 2015 cycle but grew more quickly among partners of PWH living in Medicaid expansion states compared to those who did not (EAPCs 21.9 vs. 19.0), resulting in higher PrEP use among partners of those living in Medicaid expansion states by the 2019 cycle. This finding suggests that Medicaid expansion may be a structural intervention that can increase PrEP coverage, as cost and coverage issues remain significant barriers to PrEP use (5, 38). Recent guidance issued by the US Departments of Health and Human Services, Labor, and the Treasury clarified that PrEP, including PrEP-related ancillary and support services, must be provided without cost-sharing by most private insurers and several public insurance programs, which may further increase PrEP use among the insured (39).

Finally, reported PrEP use was not substantively different between partners of PWH who were and were not virally suppressed. Partners of PWH who are not virally suppressed would benefit from taking PrEP, so efforts to accelerate PrEP use are needed among

this group. Effort to increase viral suppression among PWH and PrEP use among sexual partners of PWH who are not virally suppressed are complementary strategies to reduce HIV transmission and improve health. Providers of HIV medical care can be important partners in these efforts by encouraging their patients with HIV to discuss PrEP with their HIV negative partners and encourage them to speak to a medical professional about initiating PrEP. In addition, integrating PrEP education and use of Data to Care (40) and other HIV care engagement outreach activities tailored to persons who are not virally suppressed or have disengaged from HIV care may be helpful.

Limitations of this analysis include that the small numbers of transgender persons and persons of race/ethnicity other than Black, Hispanic/Latino, or White precluded the assessment of trends among these groups. Also, PrEP use and characteristics of partners were reported by the person with HIV and subject to measurement error; because this bias likely is constant over time, it should not affect our findings regarding trends. PrEP use was only assessed among the most recent 5 partners. However, only 16% of persons reported more than 5 partners and, among these, almost 37% reported PrEP use among one of their most recent 5 partners. In addition, partners with unknown HIV status and those with unknown PrEP use were assumed to not be taking PrEP, which is a more conservative and less biased approach as compared with either assuming they were all taking PrEP or excluding those with unknown characteristics. Assuming all were taking PrEP would be an overestimate and removing them would bias the results by excluding more casual partnerships. The sensitivity analysis found that limiting the analysis to only persons with known HIV status partners resulted in no substantive changes with one exception, reported PrEP use was no longer significantly lower among Hispanic partners compared with White partners. Therefore, our finding that PrEP use was lower among Hispanic partners should be interpreted with caution. Considering these limitations, our estimates of PrEP use can be considered a lower bound, although our findings regarding trends may not be affected, assuming reporting biases are consistent over the time frame examined. In addition, Virginia expanded Medicaid in January 2019 but was categorized as a non-Medicaid expansion state because this was their status for most of the period studied and presumably the effects of Medicaid expansion on increasing PrEP use would take some time to obtain. Removing Virginia from the analysis did not substantively affect our findings. Finally, although a multivariable examination of factors associated with PrEP use among the partners of PWH was beyond the scope of this analysis, this would be a promising area for future analyses of MMP data.

We found a 19.5% estimated annual relative increase in the proportion of sexually active PWH with HIV-discordant partners reporting PrEP use among at least one sex partner during June 2015 to May 2020. In addition, among the sex partners reported by PWH the proportion reported to be taking PrEP also increased 21.1% annually. Encouragingly, reported partner PrEP use rose among all examined populations of PWH and their partners, including those that have consistently been less likely to use PrEP. However, important racial/ethnic and gender disparities remained, which must be addressed to effectively provide PrEP to all of those in need and end the HIV epidemic in the United States.

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Table 1. Trends in the prevalence of reporting 1 partner using PrEP among sexually active persons with HIV with HIV-discordant partners, overall and by selected characteristics of the person with HIV—United States, Medical Monitoring Project 2015 cycle to 2019 cycle (data collected June 2015 to May 2020)

Characteristics	At least one HIV-discordant partner taking PrEP												P-value
	2015		2016		2017		2018		2019		EAPC (95% CI)		
	n	Row % (95% CI)	n	Row % (95% CI)	n	Row % (95% CI)	n	Row % (95% CI)	n	Row % (95% CI)			
Total	185	11.3 (8.2–14.5)	295	16.8 (14.6–19.0)	391	19.4 (16.6–22.2)	439	24.9 (21.5–28.2)	426	24.4 (21.5–27.2)	19.5 (19.2–19.7)	<.001	
Gender													
Cisgender male	171	13.5 (9.6–17.5)	278	20.6 (18.1–23.1)	370	23.5 (20.2–26.8)	399	29.7 (25.6–33.8)	389	29.0 (25.8–32.2)	18.9 (18.6–19.2)	<.001	
Cisgender men who have sex with men	156	18.1 (12.8–23.3)	238	25.0 (21.8–28.2)	341	30.4 (26.2–34.6)	353	36.9 (32.3–41.5)	352	37.0 (33.3–40.7)	18.4 (18.1–18.7)	<.001	
Cisgender men who only have sex with women	15	4.1 (2.0–6.2)	38	8.5 (5.5–11.5)	29	6.6 (4.0–9.1)	44	10.3 (7.1–13.4)	36	9.0 (6.1–12.0)	17.2 (16.4–18.1)	<.001	
Cisgender female	-	*	17	4.5 (2.0–6.9)	16	4.0 (1.8–6.1)	32	7.0 (4.5–9.5)	27	6.5 (4.5–8.5)	NA		
Transgender	-	*	0		-	*	8	20.6 (8.8–32.3)	-	*	NA		
Age (years)													
18–29	33	17.4 (8.5–26.3)	58	24.2 (17.9–30.5)	83	33.3 (26.7–39.8)	92	37.2 (30.1–44.3)	82	36.7 (30.6–42.9)	19.4 (18.8–19.9)	<.001	
30–49	99	11.8 (8.0–15.6)	156	19.2 (16.0–22.4)	225	22.3 (18.3–26.3)	237	27.8 (22.9–32.8)	204	26.7 (23.7–29.8)	19.9 (19.5–20.3)	<.001	
50+	53	8.4 (5.2–11.5)	81	10.5 (8.5–12.6)	83	10.8 (7.8–13.7)	110	16.8 (12.3–21.4)	140	18.0 (12.9–23.1)	22.3 (21.8–22.8)	<.001	
Race/Ethnicity¹													
American Indian/Alaska Native	-	*	-	*	-	*	-	*	-	*	NA		
Asian	-	*	-	*	-	*	-	*	-	*	NA		
Black	43	6.0 (4.1–7.8)	81	11.2 (8.1–14.4)	95	11.7 (9.8–13.7)	127	16.3 (12.8–19.9)	111	17.4 (14.5–20.2)	25.8 (25.3–26.3)	<.001	
Hispanic/Latino	35	10.1 (4.3–15.9)	72	18.7 (12.6–24.8)	116	23.1 (17.6–28.7)	100	22.8 (18.1–27.6)	119	26.0 (20.4–31.5)	19.5 (19.0–20.0)	<.001	

Characteristics	At least one HIV-discordant partner taking PrEP												P-value
	2015		2016		2017		2018		2019		EAPC (95% CI)		
	n	Row % (95% CI)	n	Row % (95% CI)	n	Row % (95% CI)	n	Row % (95% CI)	n	Row % (95% CI)			
Native Hawaiian/other Pacific Islander	-	*	-	*	-	*	-	*	-	*	NA	NA	<.001
White	93	20.8 (15.1–26.5)	121	22.3 (17.2–27.4)	150	26.9 (22.4–31.4)	174	37.1 (32.2–42.0)	170	34.6 (28.9–40.3)	16.3 (15.9–16.7)	NA	<.001
Multiracial	-	*	17	15.4 (8.3–22.4)	-	*	26	28.0 (19.1–37.0)	17	19.7 (11.5–28.0)	NA	NA	
MSM by race/ethnicity ¹													
Black, non-Hispanic MSM	25	9.6 (4.4–14.9)	50	19.9 (14.3–25.5)	74	23.4 (18.8–28.0)	80	29.0 (22.0–35.9)	75	32.6 (25.8–39.5)	28.2 (27.5–28.8)	NA	<.001
Hispanic/Latino MSM	30	16.6 (7.8–25.5)	62	27.2 (19.7–34.7)	100	33.4 (25.5–41.2)	88	32.5 (26.3–38.6)	100	36.0 (29.8–42.2)	15.6 (15.1–16.2)	NA	<.001
White, non-Hispanic MSM	87	24.9 (17.6–32.3)	106	26.2 (20.1–32.3)	143	33.8 (28.8–38.8)	153	44.1 (37.2–51.1)	156	44.1 (38.1–50.1)	17.9 (17.5–18.3)	NA	<.001
Length of time since HIV diagnosis													
<5 years	50	14.9 (8.9–20.9)	92	26.0 (20.2–31.8)	108	32.3 (25.5–39.2)	111	33.4 (26.8–39.9)	111	37.2 (31.3–43.2)	20.3 (19.8–20.7)	NA	<.001
5–9 years	64	14.6 (9.9–19.2)	88	21.9 (17.4–26.5)	125	22.8 (18.0–27.5)	110	30.0 (23.5–36.6)	113	28.0 (23.7–32.4)	16.1 (15.6–16.6)	NA	<.001
10+ years	70	8.5 (5.1–12.0)	114	10.7 (8.8–12.6)	157	13.7 (10.7–16.6)	217	20.1 (16.1–24.0)	201	19.0 (15.1–23.0)	23.7 (23.3–24.1)	NA	<.001
Household poverty level ²													
<100% of poverty guideline	55	7.9 (5.2–10.5)	72	10.8 (8.3–13.3)	86	11.0 (7.9–14.2)	107	15.9 (13.3–18.4)	93	16.5 (12.1–20.9)	20.2 (19.7–20.7)	NA	<.001
100%–<139% of poverty guideline	10	8.6 (3.7–13.5)	-	*	27	17.8 (11.3–24.3)	38	22.0 (11.4–32.7)	32	20.7 (13.2–28.2)	NA	NA	
139%–<400% of poverty guideline	69	13.1 (9.1–17.1)	117	20.1 (15.1–25.0)	145	21.8 (18.2–25.3)	168	29.2 (24.1–34.4)	173	27.8 (24.1–31.6)	18.4 (18.0–18.8)	NA	<.001
>=400% of poverty guideline	45	20.6 (11.4–29.9)	83	28.9 (20.8–37.1)	114	35.6 (28.2–43.0)	91	39.5 (29.3–49.7)	98	38.7 (32.1–45.3)	15.2 (14.7–15.7)	NA	<.001
Sustained viral suppression													
Yes	125	10.9 (8.1–13.8)	215	17.7 (14.5–20.8)	270	20.4 (16.4–24.3)	292	24.5 (20.7–28.2)	290	25.4 (22.0–28.8)	20.0 (19.7–20.3)	NA	<.001

Characteristics	At least one HIV-discordant partner taking PrEP												P-value
	2015		2016		2017		2018		2019		EAPC (95% CI)		
	n	Row % (95% CI)	n	Row % (95% CI)	n	Row % (95% CI)	n	Row % (95% CI)	n	Row % (95% CI)			
No	60	11.9 (7.3–16.6)	80	15.0 (11.2–18.8)	121	17.7 (14.4–21.0)	147	25.6 (21.0–30.1)	136	22.8 (18.3–27.3)	18.8 (18.4–19.3)	<.001	
Living in a Medicaid-expansion state participating in MMP ³													
Yes	133	11.7 (7.7–15.8)	223	18.8 (15.3–22.4)	291	21.1 (17.4–24.8)	321	27.6 (23.3–31.9)	304	26.8 (23.0–30.6)	20.3 (20.0–20.6)	<.001	
No	52	10.6 (6.5–14.7)	72	13.5 (10.1–16.9)	100	16.4 (11.6–21.3)	118	20.4 (16.5–24.3)	122	20.4 (17.5–23.4)	17.9 (17.4–18.3)	<.001	
Number of sex partners, past 12 months													
1	34	5.0 (3.0–7.0)	86	9.6 (7.2–12.1)	91	9.5 (7.5–11.5)	141	16.5 (12.9–20.1)	117	14.3 (11.2–17.5)	26.4 (25.8–26.9)	<.001	
>1	151	17.4 (12.4–22.4)	209	23.5 (19.8–27.3)	300	28.3 (24.1–32.6)	298	32.7 (28.8–36.6)	309	34.8 (30.6–39.1)	17.6 (17.3–17.9)	<.001	

Notes: PrEP, pre-exposure prophylaxis; CI, confidence interval; EAPC, estimated annual percent change; MSM, men who have sex with men. N's by cycle year were 2015 = 1,611, 2016 = 1,726, 2017 = 1,807, 2018 = 1,776, and 2019 = 1,787.

¹ Hispanic/Latino persons may be of any race.

² Participants were asked about their combined monthly or yearly household income (in U.S.\$) from all sources during the 12 months before interview. The number of persons meeting the current federal poverty threshold was determined by using the U.S. Department of Health and Human Services poverty guidelines that corresponded to the calendar year for which income was asked.

³ Texas, Mississippi, Georgia, North Carolina, Florida, and Virginia were classified as non-Medicaid expansion states; California, Oregon, Washington, Illinois, Indiana, New York, New Jersey, Pennsylvania, Delaware, Michigan, and Puerto Rico were classified as Medicaid expansion states.

Table 2. Trends in the prevalence of PrEP use among HIV-negative or HIV-unknown status sex partners reported by persons with HIV, overall and by selected characteristics of the sex partner—United States, Medical Monitoring Project 2015 cycle to 2019 cycle (data collected June 2015 to May 2020)

Characteristics	Partner reported to be taking PrEP												P-value
	2015		2016		2017		2018		2019		EAPC (95% CI)		
	n	Row % (95% CI)	n	Row % (95% CI)	n	Row % (95% CI)	n	Row % (95% CI)	n	Row % (95% CI)			
Total	226	7.8 (5.2–10.3)	386	12.4 (10.4–14.3)	587	16.1 (13.4–18.7)	609	18.4 (16.1–20.7)	629	18.8 (16.4–21.1)	21.1 (20.9–21.4)	<.001	
Partner gender													
Cisgender male	206	9.2 (6.0–12.3)	340	14.1 (11.8–16.4)	545	18.8 (15.9–21.8)	541	20.7 (18.2–23.2)	573	21.5 (18.9–24.1)	20.3 (20.1–20.5)	<.001	
Cisgender female	19	2.9 (1.6–4.3)	42	5.4 (3.5–7.3)	37	5.1 (3.2–7.1)	59	7.9 (5.3–10.6)	47	7.4 (5.0–9.8)	23.1 (22.3–23.9)	<.001	
Transgender	-	*	-	*	-	*	-	*	-	*	NA		
Partner age (years)													
<=29	60	6.9 (4.2–9.7)	119	14.0 (10.7–17.4)	210	20.1 (15.9–24.3)	192	20.0 (16.6–23.3)	196	21.9 (18.5–25.3)	24.2 (23.8–24.6)	<.001	
30–49	144	9.6 (5.9–13.3)	229	13.7 (11.0–16.3)	323	16.7 (13.6–19.9)	345	21.0 (17.6–24.4)	360	19.9 (17.2–22.6)	18.9 (18.6–19.2)	<.001	
50+	21	4.0 (2.2–5.7)	37	7.3 (4.8–9.8)	52	7.9 (4.7–11.1)	70	10.8 (7.9–13.8)	71	13.2 (8.9–17.6)	30.0 (29.3–30.8)	<.001	
Partner race/ethnicity /													
American Indian/Alaska Native	-	*	-	*	-	*	-	*	-	*	NA		
Asian	-	*	-	*	-	*	-	*	-	*	NA		
Black, non-Hispanic	56	4.9 (3.3–6.5)	107	7.8 (5.7–9.8)	114	7.8 (6.4–9.3)	177	13.9 (10.6–17.3)	171	14.2 (11.6–16.9)	29.9 (29.4–30.3)	<.001	
Hispanic/Latino	42	6.5 (3.3–9.7)	77	10.9 (6.8–14.9)	181	17.6 (13.5–21.6)	136	15.9 (12.6–19.2)	152	16.8 (13.1–20.6)	20.3 (19.9–20.8)	<.001	
Native Hawaiian/other Pacific Islander	-	*	-	*	-	*	-	*	-	*	NA		
White, non-Hispanic	106	12.7 (7.4–18.0)	174	18.8 (15.1–22.4)	252	25.5 (20.3–30.7)	252	26.1 (22.4–29.9)	253	26.1 (21.3–30.8)	17.0 (16.6–17.3)	<.001	
Multiracial	-	*	8	23.6 (12.1–35.0)	17	25.0 (10.8–39.2)	-	*	12	28.9 (14.5–43.4)	NA		

Characteristics	Partner reported to be taking PrEP												P-value
	2015		2016		2017		2018		2019		EAPC (95% CI)		
	n	Row % (95% CI)	n	Row % (95% CI)	n	Row % (95% CI)	n	Row % (95% CI)	n	Row % (95% CI)			
Sustained viral suppression among the partner with HIV													
Yes	154	7.3 (5.0–9.7)	287	13.2 (10.6–15.8)	414	16.8 (13.3–20.2)	414	18.3 (15.4–21.1)	426	19.6 (16.7–22.4)	21.8 (21.5–22.1)	<.001	
No	72	8.5 (4.9–12.1)	99	10.9 (7.1–14.7)	173	14.8 (11.4–18.3)	195	18.7 (15.5–21.9)	203	17.6 (13.6–21.6)	20.1 (19.8–20.5)	<.001	
Living in a Medicaid-expansion state participating in MMP ²													
Yes	165	8.0 (4.7–11.3)	292	13.5 (10.8–16.3)	447	17.5 (14.2–20.9)	454	20.4 (17.3–23.5)	463	20.5 (17.6–23.3)	21.9 (21.6–22.2)	<.001	
No	61	7.3 (3.6–11.0)	94	10.5 (6.9–14.1)	140	13.4 (8.7–18.1)	155	15.0 (12.1–17.9)	166	15.8 (13.1–18.4)	19.0 (18.6–19.4)	<.001	

Notes: PreP, pre-exposure prophylaxis; CI, confidence interval; EAPC, estimated annual percent change; MSM, men who have sex with men. N's by cycle year were 2015 = 2,798, 2016 = 3,092, 2017 = 3,338, 2018 = 3,288, and 2019 = 3,328.

¹ Hispanic/Latino persons may be of any race.

² Texas, Mississippi, Georgia, North Carolina, Florida, and Virginia were classified as non-Medicaid expansion states; California, Oregon, Washington, Illinois, Indiana, New York, New Jersey, Pennsylvania, Delaware, Michigan, and Puerto Rico were classified as Medicaid expansion states.