

# HIV Preexposure Prophylaxis as a Gateway to Primary Care

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**Objectives.** To determine whether HIV preexposure prophylaxis (PrEP) use is associated with use of non-HIV-related health care.

**Methods.** We conducted a cross-sectional study of potential PrEP candidates at a Boston, Massachusetts, community health clinic during 2012 to 2016, comparing the proportion of PrEP users and non-PrEP users receiving primary care.

**Results.** Of 5857 PrEP candidates, 2047 (35%) were prescribed PrEP. After adjustment for demographics and number of visits, more PrEP users received influenza vaccination (prevalence ratio [PR]=1.28; 95% confidence interval [CI]=1.20, 1.37), tobacco screening (PR=1.06; 95% CI=1.02, 1.09), and depression screening (PR=1.07; 95% CI=1.04, 1.11) compared with non-PrEP users. After additional adjustment for diabetes, hypertension, and overweight or obesity, more PrEP users received glucose testing (PR=1.64; 95% CI=1.56, 1.72) but fewer received hemoglobin A1c testing (PR=0.81; 95% CI=0.71, 0.93) compared with non-PrEP users.

**Conclusions.** PrEP use was associated with receipt of influenza vaccination, tobacco and depression screening, and glucose but not hemoglobin A1c testing. Among PrEP users receiving routine care, the benefits of PrEP may extend to behavioral health, mental health, and prevention and treatment of other infectious and chronic diseases. (*Am J Public Health.* 2018;108:1418–1420. doi:10.2105/AJPH.2018.304561)

Daily oral preexposure prophylaxis (PrEP) using emtricitabine and tenofovir is highly protective against HIV infection.<sup>1,2</sup> Clinical monitoring among PrEP users facilitates identification and treatment of other infections, including hepatitis C and bacterial sexually transmitted infections (STIs).<sup>3,4</sup> PrEP may also provide a gateway to other types of health care for men who have sex with men and other individuals at risk for HIV infection, just as family planning clinics provide a gateway to care for many women.<sup>5</sup> However, to our knowledge, no studies have evaluated whether PrEP use is associated with increased receipt of non-PrEP-related health care.

## METHODS

We conducted a cross-sectional study at Fenway Health, a community health center

in Boston, Massachusetts, specializing in care for sexual and gender minorities.<sup>6</sup> Fenway Health uses an electronic health record, which supports preventive care by prompting clinicians about recommended vaccinations and screenings. For each year during 2012 to 2016, we included HIV-uninfected patients tested for rectal STIs, indicating HIV risk and thus eligibility for PrEP. We assessed PrEP prescriptions and receipt of primary care during each calendar year.

We measured 4 primary care outcomes: (1) influenza vaccination, which is recommended

annually for almost everyone 6 months and older; (2–3) screening for tobacco use and depression, which are clinical performance measures for federally qualified health centers; and (4) hemoglobin A1c or glucose tests for diabetes screening or monitoring. Diabetes screening is recommended for overweight or obese adults older than 40 years and for younger adults with diabetes risk factors; these 2015 guidelines updated previous recommendations to screen adults with hypertension.

We used the  $\chi^2$  test and the *t* test to compare characteristics of PrEP users and nonusers. We used Poisson models to obtain prevalence ratios (PRs) comparing the proportions of PrEP users and nonusers who received each primary care outcome. Because patients could be included in the data set more than once if tested for rectal STIs in multiple years, we used generalized estimating equations to account for repeated measures. Adjusted models included age, gender, race/ethnicity, insurance type, year, and annual number of kept medical visits. Models for hemoglobin A1c or glucose testing additionally included diabetes and hypertension, as noted on the clinical problem list during the same year as the rectal STI test, and overweight or obesity, as noted on the problem list or on the basis of a recent body mass index of 25 kilograms per meters squared or greater.

We conducted analyses in SAS version 9.4 (SAS Institute, Cary, NC). Tests were 2 sided and the cutoff for statistical significance was  $P < .05$ .

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## RESULTS

We identified 5857 HIV-uninfected individuals tested for rectal STIs during 2012 to 2016, with 2107 tested during multiple years. Of the 5857 with 1 or more rectal STI test, 2047 (35%) were prescribed PrEP. Compared with nonusers, more PrEP users were cisgender men (97% vs 85%), whereas fewer were cisgender women (0.2% vs 6.0%) or transgender (2.7% vs 8.6%;  $P < .001$ ). There was no difference in mean age by PrEP use (33 years for both groups;  $P = .46$ ), but more PrEP users were Hispanic (14% vs 11%) and fewer were Asian (5.9% vs 7.5%) or Black (4.6% vs 5.9%;  $P < .001$ ). Compared with nonusers, fewer PrEP users were enrolled in Medicaid (7.4% vs 11%) or uninsured (0.9% vs 1.9%;  $P < .001$ ). Prevalence of diabetes did not differ between PrEP users and nonusers (6.7% vs 6.1%;  $P = .33$ ), but more PrEP users had hypertension (10% vs 7.9%;  $P = .006$ ) and overweight or obesity (61% vs 48%;  $P < .001$ ).

Of the 5857 study subjects, 2357 (40%) received influenza vaccination, 4352 (74%) tobacco screening, 4211 (72%) depression screening, 894 (15%) hemoglobin A1c testing, and 2984 (51%) glucose testing. In unadjusted analysis, a higher proportion of PrEP users received influenza vaccination, tobacco screening, depression screening, and glucose testing compared with nonusers (Table 1). After adjustment for demographic characteristics and number of visits, a higher

proportion of PrEP users received influenza vaccination (PR = 1.28; 95% confidence interval [CI] = 1.20, 1.37), tobacco screening (PR = 1.06; 95% CI = 1.02, 1.09), and depression screening (PR = 1.07; 95% CI = 1.04, 1.11) compared with nonusers. After additional adjustment for diabetes, hypertension, and overweight or obesity, a higher proportion of PrEP users received glucose testing (PR = 1.78; 95% CI = 1.69, 1.88) and a lower proportion received hemoglobin A1c testing (PR = 0.81; 95% CI = 0.71, 0.93) compared with nonusers.

## DISCUSSION

In this analysis of data from a large community health center, PrEP use was independently associated with increased receipt of primary care, including influenza vaccination, tobacco and depression screening, and glucose testing, but not hemoglobin A1c testing. There are at least 3 possible explanations for these observed associations. First, PrEP users may be more motivated to care for their health in other ways; this increased engagement in health care may be a reason for PrEP initiation or may result from the experience of using PrEP. Second, PrEP-associated monitoring may result in ancillary testing and treatment of unrelated conditions; for example, providers may order glucose tests as part of a panel that also includes creatinine,

which is routinely monitored during PrEP use, and may follow up with additional testing or treatment as needed. Indeed, ancillary glucose testing may negate the need for additional diabetes-related testing, potentially accounting for the lower prevalence of hemoglobin A1c testing among PrEP users. Finally, providers may be more likely to screen for certain conditions or behaviors among PrEP users, such as smoking or substance use, if perceived as a higher-risk population.

In addition to being candidates for PrEP, individuals at risk for HIV infection—like those who have acquired HIV infection—may be in greater need of non-HIV-related care compared with the general population. Although HIV infection directly increases the risk of aging-associated diseases, such as cardiovascular disease and cancer,<sup>7</sup> comorbidities among HIV patients are partly driven by a higher prevalence of behavioral risk factors, such as smoking and substance use.<sup>8,9</sup> HIV patients also have an excess risk of depression, which may be prevalent before HIV diagnosis.<sup>10</sup> Most PrEP users in the United States are men who have sex with men, a population in which discrimination contributes to mental health conditions, substance use, and smoking.<sup>11,12</sup> Thus, PrEP users could benefit from the increased opportunities for non-HIV-related screening and treatment that the PrEP care package may provide.

Our study has several strengths. First, patients at Fenway Health have access to health services regardless of insurance coverage or income, minimizing potential selection bias from differential access to care. Second, by restricting our sample to HIV-uninfected individuals tested for rectal STIs, we minimized confounding by unmeasured factors that may differ between PrEP users and nonusers. The primary limitation was the cross-sectional design, which precludes conclusions about temporality or causality. Future longitudinal and qualitative studies should further elucidate the relationship between PrEP and the use of non-HIV-related health care. Finally, because of the dedication of Fenway Health to providing primary care to sexual and gender minorities, the associations we observed between PrEP use and primary care may overestimate those at other community health centers that do not have the same mission.

**TABLE 1—Comparison of Receipt of Primary Care Between Preexposure Prophylaxis (PrEP) Users and Individuals Not Prescribed PrEP: Fenway Health, Boston, MA, 2012–2016**

Type of Primary Care Received	PrEP Users (n = 2047), No.	Non-PrEP Users (n = 3810), No.	Unadjusted PR = (95% CI)	Adjusted PR = (95% CI)
Influenza vaccination (yes vs no)	1109	1248	1.39 (1.31, 1.48)	1.28 (1.20, 1.37)
Tobacco screening (yes vs no)	1782	2570	1.15 (1.12, 1.19)	1.06 (1.02, 1.09)
Depression screening (yes vs no)	1847	2364	1.34 (1.30, 1.38)	1.07 (1.04, 1.11)
Hemoglobin A1c or glucose testing (yes vs no)	1603	1588	1.78 (1.70, 1.85)	1.64 (1.56, 1.72)
Hemoglobin A1c testing (yes vs no)	356	538	0.98 (0.87, 1.11)	0.81 (0.71, 0.93)
Glucose testing (yes vs no)	1570	1414	1.94 (1.85, 2.03)	1.78 (1.69, 1.88)

*Note.* CI = confidence interval; PR = prevalence ratio. Sample sizes represent individuals who ever used PrEP or each type of primary care during the study period. We obtained unadjusted and adjusted PRs from Poisson models with generalized estimating equations to account for clustering among patients tested for rectal sexually transmitted infections, and thus included in the data set, in multiple years. Adjusted models included age, gender, race/ethnicity, insurance type, year, and number of visits, with diabetes, hypertension, and overweight or obesity additionally included in models for hemoglobin A1c and glucose testing.

## PUBLIC HEALTH IMPLICATIONS

To our knowledge, this is the first study to identify an association between PrEP use and receipt of primary care. The benefits of PrEP may extend to behavioral health, mental health, and prevention and treatment of other infectious and chronic diseases. In addition to efforts to integrate PrEP prescribing into primary care, efforts may be warranted to ensure uptake of recommended primary care among PrEP users. [AJPH](#)

### CONTRIBUTORS

J. L. Marcus designed the study, conducted the analysis, and drafted the brief. K. Levine and C. Grasso collected the data. All authors contributed to data interpretation and critical revisions of the brief.

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**Note.** The content of this brief is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

### HUMAN PARTICIPANT PROTECTION

The Fenway Community Health institutional review board considered this study exempt from review and approved a waiver of written informed consent.

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