Referral From Postexposure Prophylaxis to Preexposure Prophylaxis in the United States, 2016-2025: An Analysis of Real-World Claims Data

P004

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Conclusions

- Among 19,102 postexposure prophylaxis (PEP) episodes, 16% were followed by a preexposure prophylaxis (PrEP) claim within 30 days after completion of the PEP regimen
- PrEP initiation was most common following PEP episodes among males, individuals aged 25 to 44 years, individuals living in the Midwest region of the United States, and those with commercial insurance
  - PrEP initiation was least common among non-Hispanic Black individuals
- Most PrEP initiation claims were for an oral regimen rather than a long-acting injectable regimen
- During the 6 months following PEP completion, subsequent coded HIV risk events and repeat PEP use were more frequently observed among PrEP initiators than among PrEP noninitiators
  - Higher rates of coded risk events among PrEP initiators may reflect differences in underlying risk, health care utilisation, or opportunities for risk-event coding
- Among those who did not initiate PrEP, 31% had a subsequent coded risk event in the following 6 months, identifying an opportunity to improve PEP to PrEP linkage among individuals with ongoing HIV prevention needs

Plain Language Summary

- PrEP and PEP are medications that help prevent HIV in people who do not have HIV
  - PrEP is taken before a person may be exposed to HIV
  - PEP is taken after a possible exposure to HIV
- PrEP is recommended for people who have a higher chance of getting HIV
  - However, people who need or want PrEP do not always get it
- Researchers looked at health insurance records, and they found that:
  - Few people started PrEP after finishing PEP
  - People who started PrEP had more possible exposures to HIV after they finished PEP
- These findings may help researchers find ways to increase PrEP use among people who may still need protection from HIV following PEP

Introduction

- Effective strategies to prevent new HIV infections are needed to address the ongoing HIV epidemic in the United States[1]
- PrEP and PEP involve the use of antiretroviral therapy before or after a potential exposure to HIV to reduce the likelihood of HIV acquisition among individuals without HIV infection[2,3]
  - PEP involves a 28- to 30-day course of antiretroviral therapy initiated within <72 hours after a suspected HIV exposure, while PrEP entails the ongoing use of antiretrovirals for as long as the increased likelihood of HIV acquisition persists
- Current US guidelines recommend that PrEP should be offered to individuals engaging in behaviours associated with an increased likelihood of HIV acquisition or who repeatedly use PEP as preventative care[4]
  - However, barriers to PrEP uptake remain, including limited awareness, perceived HIV risk, health care access, and stigma[5,6]
- The initial PEP encounter represents a key opportunity for health care providers to assess the HIV prevention needs of an individual and to recommend PrEP linkage when appropriate[7,8]

Objective

- To characterise PrEP initiation following PEP, subsequent coded HIV risk events, and repeat PEP use via US claims data, with the goal of identifying opportunities to support PEP-to-PrEP linkage among those with unmet HIV prevention needs

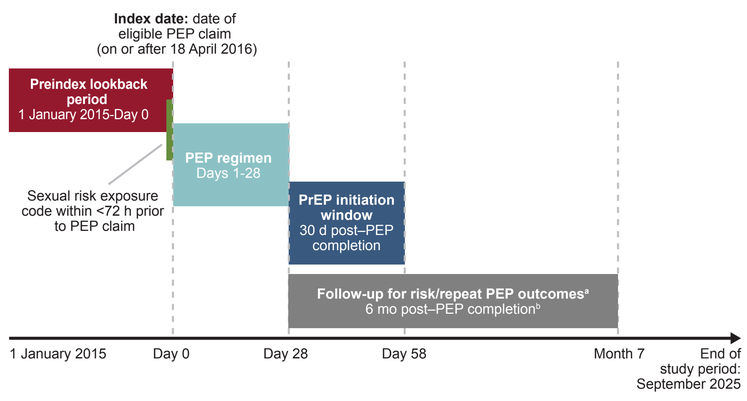
Methods

- A retrospective observational study was conducted from April 2016 through September 2025, using US closed administrative claims data from HealthVerity Marketplace from as early as January 2015 to allow for a preindex lookback period to capture historical claims (**Figure 1**)
  - The database comprised >200 million unique patients across private insurance, Medicaid, and Medicare and included linked pharmacy claims, medical claims, and laboratory test results
- The study included individuals with no known diagnosis of HIV who had a documented HIV or sexual risk exposure, or sexually transmitted infection testing, via medical claims who received PEP within <72 hours after the exposure
  - Eligible individuals were aged ≥12 years and had medical records with nonmissing sex and year of birth data and had an index date (date of first eligible PEP claim) on or after 18 April 2016
  - Occupational (ie, needle stick exposure) and sexual assault–related codes were excluded from this analysis

For additional exposure code details, please scan the QR code

- HIV risk exposures were identified using the *International Classification of Diseases, Tenth Revision, Clinical Modification* (ICD-10-CM), from which select diagnosis codes and laboratory test codes associated with HIV acquisition risk exposures were linked to pharmacy claims for PEP prescriptions
- PEP regimens were defined as a 28- or 30-day supply of raltegravir + emtricitabine/tenofovir disoproxil fumarate (RAL + F/TDF), dolutegravir + emtricitabine/tenofovir disoproxil fumarate (DTG + F/TDF), ritonavir-boosted darunavir + emtricitabine/tenofovir disoproxil fumarate (DRV/r + F/TDF), or bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF)[3]
- PrEP regimens were those commercially available at the time of the analysis and were defined as a 30- to 90-day supply of emtricitabine/tenofovir disoproxil fumarate (F/TDF) or emtricitabine/tenofovir alafenamide (F/TAF) or a prescription for cabotegravir extended-release injectable suspension[9]
- PrEP initiation following PEP completion was defined as ≥1 prescription for an eligible PrEP regimen within 30 days of the end of the PEP episode
- Patient demographic characteristics for PEP episodes were summarised by PrEP initiation status within 30 days of PEP completion
  - A 30-day window was selected to allow for delays in the post-PEP follow-up visit or other delays obtaining PrEP while still maintaining a temporal relationship between PEP completion and PrEP initiation
  - A 60-day window was also examined as a sensitivity analysis
- Incidence of risk events, as defined by ICD-10-CM diagnosis codes, and of repeated PEP episodes were reported among individuals identified as PrEP initiators or PrEP noninitiators during the 6-month period following PEP completion
- Data were summarised using descriptive statistics, including counts, mean (SD), and median (IQR); tests of statistical difference were conducted using the chi-square test
- PrEP initiation analyses were conducted at the PEP episode level; analyses of subsequent coded risk events and repeat PEP use were conducted at the individual level

Figure 1. Study Design



[a]Analyses of subsequent coded risk events and repeat PEP use were conducted at the individual level. All other analyses were conducted at the PEP episode level.
[b]The first identified PEP episode per individual was used.
PEP, postexposure prophylaxis; PrEP, preexposure prophylaxis.

Results

Characteristics of PEP Episodes

- Overall, 3036/19,102 (16%) PEP episodes were associated with PrEP initiation within 30 days of PEP completion (**Table 1**) and 3800 (20%) were associated with PrEP initiation within 60 days of PEP completion
  - PrEP initiation following PEP was more common among men than women and those with prior PrEP versus no prior PrEP, and was highest in the Midwest region of the United States compared with other regions; PrEP initiation following PEP was less common among those aged 12 to 17 years versus ≥18 years and among non-Hispanic Black individuals versus individuals of other races/ethnicities
  - PEP episodes among individuals with commercial insurance were more likely to be associated with PrEP initiation compared with PEP episodes among those with Medicaid, Medicare, or unknown insurance types
- The rate of PrEP uptake increased between the partial year of 2016 and 2021 and then declined slightly through the partial year of 2025

Table 1. Demographic Characteristics of PEP Episodes Among People Receiving Nonoccupational PEP, by PrEP Uptake Status[a]

Parameter, n	PrEP (n = 3036)	No PrEP (n = 16,066)	*P* Value[b]
Age group, y			
12-17	19	488	<0.001
18-24	618	3383	
25-44	2016	10,125	
45-64	373	2008	
≥65	10	62	
Sex			
Male	2605	10,829	<0.001
Female	431	5237	
Race/ethnicity			
Unknown	1537	7746	0.00109
Non-Hispanic White	580	2926	
Non-Hispanic Black	386	2586	
Hispanic	321	1743	
Other	116	575	
Asian	96	490	
US region			
Northeast	955	5042	<0.001
West	799	4246	
South	762	4487	
Midwest	520	2288	
Unknown	0	3	
Year of index date[c]			
2016	122	655	<0.001
2017	286	1300	
2018	357	1747	
2019	451	2079	
2020	277	1450	
2021	337	1590	
2022	366	1908	
2023	328	2111	
2024	330	2058	
2025	182	1168	
Year range[c]			
2016-2017	408	1955	<0.001
2018-2020	1085	5276	
2021-2024	1361	7667	
2025	182	1168	
Insurance type			
Commercial	1719	8293	<0.001
Medicaid	1186	6932	
Unknown	96	613	
Medicare/Medicare Advantage	35	228	
Prior PrEP status			
No	1966	13,005	<0.001
Yes	1070	3061	
Regimen			
DTG + F/TDF	1888	7862	<0.001
RAL + F/TDF	858	6580	
B/F/TAF	286	1611	
DRV/r + F/TDF	4	13	

[a]Data are at the PEP episode level (n = 19,102).
[b]*P* values compare the distributions between PrEP initiators and PrEP noninitiators using the chi-square test; *P* values are usually significant in analyses of large real-world datasets due to large sample sizes.
[c]Eligible PEP episodes were indexed from April to December in 2016 and from January to June in 2025.
B/F/TAF, bictegravir/emtricitabine/tenofovir alafenamide; DRV/r + F/TDF, ritonavir-boosted darunavir + emtricitabine/tenofovir disoproxil fumarate; DTG + F/TDF, dolutegravir + emtricitabine/tenofovir disoproxil fumarate; PEP, postexposure prophylaxis; PrEP, preexposure prophylaxis; RAL + F/TDF, raltegravir + emtricitabine/tenofovir disoproxil fumarate.

PEP-to-PrEP Linkage and Uptake Patterns

- Among all PEP episodes with PrEP initiation within 30 days of PEP completion, the median (IQR) time to PrEP initiation was 6 (2-16) days (**Table 2**)
  - Nearly three-quarters of PEP episodes were associated with PrEP initiation within 15 days of PEP completion
- Most PrEP initiation claims within 30 days after PEP completion were for oral PrEP rather than long-acting injectable PrEP

Table 2. PEP-to-PrEP Linkage and Uptake Patterns Within 30 Days After PEP Completion, by Regimen[a,b]

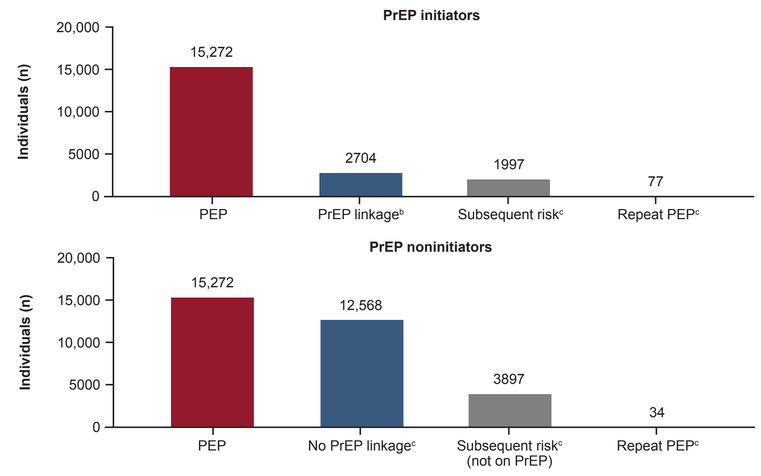
Parameter, n	Total[c] (n = 19,102)	DTG + F/TDF (n = 9750)	RAL + F/TDF (n = 7438)	B/F/TAF (n = 1897)
PrEP linkage				
No	16,066	7862	6580	1611
Yes	3036	1888	858	286
First PrEP modality				
Oral[d]	2992	1861	857	270
LAI[e]	44	27	1	16
PrEP modality within 30 d after PEP[f]				
Oral[d]	2983	1854	857	268
LAI[e]	53	34	1	18
PrEP history				
First PrEP use	1966	1215	591	159
PEP initiation ≤14 d since prior PrEP	81	54	18	9
PEP initiation 15-60 d since prior PrEP	264	168	69	26
PEP initiation >60 d since prior PrEP	725	451	180	92
PrEP delay[g] after PEP, d				
0-15	2246	1437	584	223
16-30	790	451	274	63
PrEP delay[g] after PEP, d, median (IQR)	6 (2-16)	6 (2-15)	8 (2-19)	7 (3-14)
PrEP delay[g] after PEP, d, mean (SD)	9.7 (9.1)	9.1 (8.9)	10.9 (9.5)	9.5 (8.5)

PrEP modality, history, and delay were calculated for eligible PEP episodes among individuals with PrEP claims within 30 days of PEP completion.
[a]Data are at the PEP episode level (n = 19,102).
[b]Data are descriptive only and not intended to represent a formal comparison.
[c]The 3 most common PEP regimens are shown; the total column includes PEP prescriptions for DRV/r + F/TDF (n = 17).
[d]F/TDF or F/TAF.
[e]Cabotegravir extended-release injectable suspension.
[f]Classified as LAI if any injectable PrEP use occurred within 30 days; otherwise classified as oral PrEP.
[g]PrEP delay was defined as the time from PEP completion to first PrEP initiation.
B/F/TAF, bictegravir/emtricitabine/tenofovir alafenamide; DRV/r + F/TDF, ritonavir-boosted darunavir + emtricitabine/tenofovir disoproxil fumarate; DTG + F/TDF, dolutegravir + emtricitabine/tenofovir disoproxil fumarate; F/TAF, emtricitabine/tenofovir alafenamide; F/TDF, emtricitabine/tenofovir disoproxil fumarate; LAI, long-acting injectable; PEP, postexposure prophylaxis; PrEP, preexposure prophylaxis; RAL + F/TDF, raltegravir + emtricitabine/tenofovir disoproxil fumarate.

Risk Incidence and Repeat PEP Use Among PrEP Initiators and PrEP Noninitiators

- Because multiple PEP episodes could occur within a single individual, analyses of subsequent risk events and repeat PEP use were conducted at the individual level (n = 15,272)
- Overall, 2704/15,272 (18%) individuals initiated PrEP within 30 days of PEP completion (**Figure 2**)
- The proportion of PrEP initiators with a subsequent coded HIV risk event during the 6 months following PEP completion was more than twice that of PrEP noninitiators (74% vs 31%)
- Repeat PEP use was 10-fold higher among PrEP initiators than among PrEP noninitiators (3% vs 0.3%)

Figure 2. Subsequent Risk Incidence and Repeat PEP Use Among PrEP Initiators and PrEP Noninitiators During 6 Months Following PEP Completion[a]



[a]All data are at the individual level (n = 15,272).
[b]Within 30 days of completion of indexing PEP episode.
[c]Within 6 months (183 days) of completion of indexing PEP episode.
PEP, postexposure prophylaxis; PrEP, preexposure prophylaxis.

Limitations

- This study is limited by its use of claims data, which do not capture individuals who access PEP or PrEP without insurance involvement and provide no information on the actual use of prescribed oral PrEP
- Given the large sample size, results should be interpreted with consideration of the magnitude of observed differences in addition to reported statistical significance
- The observed differences in risk event rates between PrEP initiators and PrEP noninitiators may partially reflect a higher number of follow-up visits and therefore opportunities to record risk events among individuals receiving PrEP compared with those not receiving PrEP
- Higher rates of documented risk events among PrEP initiators should not be interpreted as being caused by PrEP use, as some risk events may have preceded or coincided with PrEP initiation
- As the methods used to identify real-world PEP and PrEP claims inherently require a tradeoff between sensitivity and specificity, it is possible that true prescriptions were missed or that false positives were included
- Claims-based risk events reflect documented diagnoses or testing and may not capture all HIV exposures or distinguish differences in underlying risk versus differences in health care utilisation and coding

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