

Supplementary Material

Article Title: HIV Diagnosis and Pre-Exposure Prophylaxis (PrEP) Prescription Among Commercially Insured Persons with Bipolar Disorder

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Supplementary Table 1: Diagnosis Codes

Diagnosis	ICD-9 Codes	ICD-10 Codes
Bipolar Disorder	Bipolar Disorder: 296.0x, 296.4x, 296.5x, 296.6x, 296.7, 296.80, 296.81, 296.89 Manic Episode: 296.1x	Bipolar Disorder: F31.x Manic Episode: F30.x
Opioid Use Disorder	304.0x, 304.7x, 305.5x	F11.x
Stimulant Use Disorder	304.2x, 304.4x, 305.6x, 305.7x	F14.x, F15.x
Alcohol Use Disorder	291.x, 303.0x, 303.9x, 305.0x	F10.x, O99.31
Cannabis Use Disorder	304.3x, 305.2x	F12.x
HIV	042, 043, 044, 079.53, 795.71, V08	B20.x-B23.x, B24, B97.35, O98.7x, Z21
Hepatitis B	070.2x, 070.3x, 070.42, 070.52, V02.61	B16.x, B17.0, B18.0, B18.1, B19.1x
High-Risk Sexual Behavior	V69.2	Z72.51, Z72.52, Z72.53
Gonorrhea	098.x, 647.1	A54.x, O98.2x
Chlamydia	078.88, 078.98, 099.5x, 099.41	A56.x
Syphilis	091.x-097.x	A50.x-A53.x, O98.1x
Other Venereal Diseases	099.0-099.4, 099.40, 099.49, 099.8, 099.9	A55, A57, A58, A60.x, A63.8, A64
Venereal Warts	078.11	A63.0
Trichomoniasis	131.x	A59.x
Bacterial Prostatitis	131.03	N41.x

Supplementary Table 2: Generic Names for Antiretrovirals

Generic Names
abacavir, adefovir, atazanavir, bictegravir, cabotegravir, cobicistat, darunavir, delavirdine, didanosine, dolutegravir, doravirine, efavirenz, elvitegravir, emtricitabine, enfuvirtide, entecavir, etravirine, fosamprenavir, fostemsavir, indinavir, lamivudine, lenacapavir, lopinavir, maraviroc, nelfinavir, nevirapine, raltegravir, rilpivirine, ritonavir, saquinavir, stavudine, tenofovir, tipranavir, zidovudine

Supplementary Table 3: National Drug Codes for Truvada and Descovy

Drug	National Drug Codes
Truvada (TDF/FTC)	00093760756, 00093770456, 00378193093, 00904717207, 16714053401, 31722056030, 33342010607, 35356007003, 35356007006, 35356007030, 42291043930, 42385095330, 42543071904, 50090087000, 50090087002, 50090087003, 50436070101, 51407011230, 52959096903, 54569558800, 54569558802, 54569558803, 54868514100, 55045348103, 60505420203, 61919066902, 61958070101, 65862035430, 66336003203, 68071211203, 68180028706, 68258198303, 69097020902, 69097074102, 69238209503, 70710136703, 72189015602, 72189031203, 76282067730
Descovy (TAF/FTC)	61958200201, 61958200202

Notes: Descovy is only approved for HIV prevention for people assigned male at birth.

Supplementary Table 4: Drug Names and Procedure Codes for Long-Acting Injective Antipsychotic and Anticraving Medications

Class	Medication	Generic or Brand Drug Name	Procedure Code
Antipsychotic	Paliperidone palmitate	[Invega Sustenna, Invega Trinza, Invega Hafyera]	J2426, J2427
	Aripiprazole monohydrate	Abilify Maintena, Abilify Asimtufii	J0401
	Aripiprazole lauroxil	[Aristada; Aristada Initio]	J1942, J1943, J1944
	Risperidone microspheres, suspension	Risperdal Consta, Perseris, Uzedly, Rykindo	J2794, J2798
	Haloperidol decanoate	haloperidol decanoate	J1631
	Fluphenazine decanoate	fluphenazine decanoate, fluphenazine enanthate	J2680
	Olanzapine pamoate	olanzapine pamoate [Zyprexa Relprevv]	J2358
Anticraving	Naltrexone	Vivitrol	J2315
	Buprenorphine	Brixadi, Sublocade	Q9991, Q9992

Supplementary Table 5: Insurance Plan Categorizations

Insurance Plan	Categorization
Basic/Major Medical Plan	Fee-for-Service
Comprehensive Plan	Fee-for-Service
Exclusive Provider Organization Plan	Fee-for-Service
Health Maintenance Organization Plan	Managed Care
Non-Capitated Point-of-Service Plan	Fee-for-Service
Preferred Provider Organization Plan	Fee-for-Service
Capitated or Partially Capitated Point-of-Service Plan	Managed Care
Consumer-Driven Health Plan	High-deductible Health Plan
High-Deductible Health Plan	High-deductible Health Plan

Supplementary Table 6.

	HIV	HIV Diagnosis	
Year of Cohort Entry (2010)	<i>n</i> (% ^b)	aOR (95%CI)	<i>p</i>
2010	37 (0.10)		
2011	61 (0.16)	1.74 (1.15,2.63)	.01
2012	42 (0.12)	1.34 (0.86,2.10)	.20
2013	45 (0.15)	1.58 (1.02,2.45)	.04
2014	46 (0.15)	1.56 (1.00,2.42)	.05
2015	29 (0.12)	1.19 (0.73,1.95)	.49
2016	23 (0.11)	1.10 (0.64,1.86)	.74
2017	42 (0.19)	1.98 (1.25,3.15)	<.001
2018	30 (0.13)	1.48 (0.90,2.45)	.12
2019	32 (0.15)	1.74 (1.06,2.87)	.03
2020	26 (0.14)	1.74 (1.02,2.95)	.04
2021	16 (0.11)	1.42 (0.76,2.64)	.27
2022	6 (0.05)	0.63 (0.26,1.54)	.31
Follow Up Duration (yrs)	-	1.13 (1.09,1.18)	<.001
Married			
Yes	352 (0.16)	<i>Ref.</i>	
No	83 (0.08)	0.39 (0.30,0.53)	<.001
Sex			
Female	334 (0.26)		
Male	101 (0.05)	5.30 (4.22,6.65)	<.001
Age			
14-24 yrs.	122 (0.12)		
25-34 yrs.	109 (0.15)	0.99 (0.63,1.56)	.96
35-44 yrs.	94 (0.14)	0.98 (0.61,1.57)	.92
45-54 yrs.	77 (0.14)	1.02 (0.62,1.66)	.94
55+ yrs.	33 (0.09)	0.80 (0.46,1.40)	.44
Relation to Policyholder (Self)			
Self	27 (0.07)		
Spouse	390 (0.14)	1.15 (0.84,1.58)	.38
Child/Other Dependent	18 (0.11)	0.50 (0.32,0.79)	<.001
Plan Type			
FFS	78 (0.15)		
HDHP	75 (0.10)	1.17 (0.90,1.53)	.24
MC	204 (0.14)	1.40 (1.07,1.82)	.01
Unknown	76 (0.12)	0.73 (0.37,1.44)	.37
Geography	2 (0.06)		
Urban			
Rural	281 (0.12)	0.52 (0.35,0.78)	<.001
Missing	73 (0.14)	0.93 (0.55,1.57)	.80
Region	72 (0.18)		
Northeast	9 (0.08)		
North Central		0.74 (0.54,1.02)	.07
West	260 (0.16)	1.09 (0.84,1.42)	.53
South	66 (0.08)	0.87 (0.63,1.20)	.41
Unknown	109 (0.12)	0.53 (0.12,2.37)	.41
STI Encounters			
0	397 (0.12)		
1	38 (0.54)	2.81 (1.53,5.17)	<.001
2		4.30 (2.44,7.55)	<.001
3	357 (0.11)	3.46 (1.69,7.08)	<.001

≥4	11 (0.37)	4.01 (2.87,5.62)	<.001
Follow-Up Encounters	13 (0.6)		
PCP only	8 (0.51)		
Psychiatry Only	46 (0.66)	1.58 (1.11,2.27)	.01
Psychiatry and Primary Care		0.85 (0.68,1.08)	.19
Other Providers	127 (0.11)	2.23 (1.64,3.03)	<.001
Psychiatric Hospitalizations	43 (0.17)		
0	195 (0.12)		
1	70 (0.20)	2.23 (1.46,3.39)	<.001
2		0.98 (0.52,1.86)	.95
3	339 (0.12)	1.13 (0.61,2.08)	.70
≥4	25 (0.33)	0.88 (0.64,1.22)	.45
High Risk Sexual Behavior	10 (0.15)	2.66 (1.85,3.83)	<.001
No	11 (0.17)		
Yes	50 (0.13)		
LAI Agent Use^a			
No	433 (0.13)		
Yes	2 (0.26)	1.71 (0.42,6.92)	.45
Stimulant Use Disorder			
No	380 (0.12)		
Yes	55 (0.44)	2.40 (1.71,3.39)	<.001
Opioid Use Disorder			
No	402 (0.13)		
Yes	33 (0.20)	0.75 (0.50,1.12)	.16
Cannabis Use Disorder			
No	364 (0.12)		
Yes	71 (0.22)	1.01 (0.74,1.37)	.96
Alcohol Use Disorder			
No	339 (0.12)		
Yes	96 (0.24)	1.19 (0.92,1.55)	.18

Results of HIV analyses including effects of year of cohort entry and duration of time in cohort.

Supplementary Table 7.

	Any PrEP			Sustained (3-mo) PrEP		
Year of Cohort Entry (2010)	<i>n</i> (% ^b)	aOR (95%CI)	<i>p</i>	<i>n</i> (% ^b)	aOR (95%CI)	<i>p</i>
2010	58 (0.16)			30 (0.08)		
2011	57 (0.15)	1.15 (0.78,1.68)	.48	33 (0.09)	1.49 (0.88,2.53)	.14
2012	53 (0.15)	1.24 (0.84,1.82)	.29	30 (0.08)	1.63 (0.95,2.79)	.08
2013	84 (0.27)	2.05 (1.44,2.92)	<.001	53 (0.17)	3.09 (1.90,5.02)	<.001
2014	99 (0.31)	2.39 (1.69,3.38)	<.001	55 (0.17)	3.04 (1.87,4.95)	<.001
2015	113 (0.47)	3.31 (2.36,4.66)	<.001	83 (0.34)	5.98 (3.76,9.52)	<.001
2016	124 (0.58)	4.62 (3.29,6.49)	<.001	85 (0.40)	7.80 (4.87,12.5)	<.001
2017	150 (0.66)	5.79 (4.14,8.11)	<.001	96 (0.42)	9.05 (5.64,14.5)	<.001
2018	168 (0.72)	7.74 (5.52,10.8)	<.001	127 (0.54)	16.1 (10.0,25.7)	<.001
2019	147 (0.68)	8.19 (5.78,11.6)	<.001	116 (0.53)	17.6 (10.9,28.6)	<.001
2020	130 (0.68)	10.2 (7.11,14.6)	<.001	103 (0.54)	23.2 (14.1,38.2)	<.001
2021	99 (0.65)	13.0 (8.86,19.0)	<.001	70 (0.46)	27.5 (16.2,46.6)	<.001
2022	55 (0.45)	12.2 (7.92,18.7)	<.001	28 (0.23)	19.1 (10.3,35.2)	<.001
Follow Up Duration (yrs)		1.18 (1.15,1.21)	<.001		1.23 (1.19,1.28)	<.001
Married						
Yes	1,150 (0.51)					
No	187 (0.17)	0.45 (0.37,0.55)	<.001		0.40 (0.32,0.50)	<.001
Sex						
Female	217 (0.11)			47 (0.02)		
Male	1,120 (0.88)	11.6 (10.0,13.5)	<.001	862 (0.68)	44.5 (33.0,60.1)	<.001
Age						
14-24 yrs.	507 (0.51)			285 (0.29)		
25-34 yrs.	397 (0.53)	0.80 (0.62,1.02)	.07	287 (0.39)	0.76 (0.56,1.02)	.07
35-44 yrs.	259 (0.38)	0.66 (0.51,0.86)	<.001	199 (0.29)	0.68 (0.49,0.93)	.02
45-54 yrs.	144 (0.26)	0.50 (0.37,0.66)	<.001	113 (0.20)	0.53 (0.37,0.74)	<.001
55+ yrs.	30 (0.08)	0.19 (0.13,0.30)	<.001	25 (0.07)	0.23 (0.14,0.38)	<.001
Relation to Policyholder						
Self	788 (0.48)			601 (0.37)		
Spouse	110 (0.14)	0.82 (0.65,1.04)	.10	76 (0.10)	0.85 (0.64,1.13)	.26
Child/Other Dependent	439 (0.47)	0.47 (0.37,0.60)	<.001	232 (0.25)	0.34 (0.25,0.46)	<.001
Plan Type						
FFS	883 (0.38)			604 (0.26)		
HDHP	250 (0.48)	0.94 (0.81,1.09)	.43	169 (0.32)	0.92 (0.76,1.11)	.39
MC	182 (0.46)	1.31 (1.11,1.56)	<.001	123 (0.31)	1.34 (1.09,1.66)	.01
Unknown	22 (0.19)	0.78 (0.50,1.22)	.28	13 (0.11)	0.69 (0.38,1.25)	.22
Geography						
Urban	1,205 (0.43)			820 (0.30)		
Rural	63 (0.16)	0.46 (0.36,0.60)	<.001	40 (0.10)	0.44 (0.32,0.62)	<.001
Missing	69 (0.44)	0.71 (0.54,0.93)	.01	49 (0.31)	0.71 (0.51,0.98)	.04
Region						
Northeast	286 (0.54)			185 (0.35)		
North Central	213 (0.29)	0.50 (0.41,0.60)	<.001	131 (0.18)	0.46 (0.36,0.59)	<.001
West	546 (0.38)	0.65 (0.56,0.76)	<.001	387 (0.27)	0.70 (0.58,0.85)	<.001
South	287 (0.46)	0.97 (0.82,1.16)	.74	203 (0.33)	1.07 (0.86,1.33)	.54
Unknown	5 (0.16)	1.03 (0.40,2.62)	.96	3 (0.10)	1.30 (0.39,4.32)	.67
STI Encounters						
0	964 (0.3)			625 (0.2)		
1	49 (1.64)	3.13 (2.28,4.29)	<.001	36 (1.21)	3.50 (2.39,5.13)	<.001
2	35 (1.62)	2.61 (1.79,3.79)	<.001	24 (1.11)	2.45 (1.53,3.92)	<.001
3	43 (2.74)	3.96 (2.79,5.61)	<.001	34 (2.17)	4.57 (3.02,6.90)	<.001
≥4	246 (3.53)	4.69 (3.95,5.56)	<.001	190 (2.73)	5.13 (4.18,6.30)	<.001

Follow-Up Encounters						
PCP only	393 (0.34)			273 (0.24)		
Psychiatry Only	62 (0.25)	0.74 (0.56,0.98)	.03	39 (0.16)	0.74 (0.52,1.05)	.10
Psychiatry and Primary Care	811 (0.51)	1.38 (1.21,1.57)	<.001	555 (0.35)	1.46 (1.24,1.72)	<.001
Other Providers	71 (0.20)	0.68 (0.52,0.88)	<.001	42 (0.12)	0.63 (0.45,0.89)	.01
Psychiatric Hospitalizations						
0	1,072 (0.39)			766 (0.28)		
1	38 (0.51)	1.00 (0.70,1.41)	.98	27 (0.36)	1.08 (0.71,1.65)	.71
2	34 (0.51)	1.02 (0.70,1.48)	.93	23 (0.34)	1.03 (0.65,1.65)	.89
3	26 (0.39)	0.80 (0.53,1.21)	.30	15 (0.23)	0.71 (0.41,1.22)	.22
≥4	167 (0.44)	0.93 (0.77,1.12)	.44	78 (0.21)	0.68 (0.52,0.89)	<.001
High Risk Sexual Behavior						
No	872 (0.27)			538 (0.16)		
Yes	465 (6.66)	16.9 (14.7,19.4)	<.001	371 (5.31)	24.4 (20.6,28.7)	<.001
LAI Agent Use^a						
No	1,334 (0.4)			908 (0.27)		
Yes	3 (0.4)	0.56 (0.18,1.81)	.33	1 (0.13)	0.30 (0.04,2.25)	.24
Stimulant Use Disorder						
No	1,198 (0.37)			824 (0.26)		
Yes	139 (1.10)	1.49 (1.19,1.87)	<.001	85 (0.67)	1.57 (1.18,2.10)	<.001
Opioid Use Disorder						
No	1,250 (0.39)			866 (0.27)		
Yes	87 (0.53)	0.67 (0.52,0.87)	<.001	43 (0.26)	0.51 (0.36,0.74)	<.001
Cannabis Use Disorder						
No	1,119 (0.37)			791 (0.26)		
Yes	218 (0.68)	0.69 (0.57,0.83)	<.001	118 (0.37)	0.57 (0.45,0.73)	<.001
Alcohol Use Disorder						
No	1,045 (0.36)			724 (0.35)		
Yes	292 (0.73)	1.16 (0.99,1.36)	.07	185 (0.46)	1.08 (0.88,1.31)	.47

Results of PrEP analyses including effects of year of cohort entry and duration of time in cohort.