

## Predictors of Chronic Opioid Therapy in Medicaid Beneficiaries with HIV who Initiated Antiretroviral Therapy

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## Supplementary

Table 1S. Description of variables used in the study

Variables	ICD-9 codes
Cardiovascular disease <sup>1)</sup>	Myocardial infarction: 410.x, 412.x Congestive heart failure: 398.91, 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 425.4-425.9, 428.x Peripheral vascular disease: 093.0, 437.3, 440.x, 441.x, 443.1-443.9, 47.1, 557.1, 557.9, V43.4 Cerebrovascular disease: 362.34, 430.x-438.x
Hypertension <sup>1)</sup>	401.x, 402.x-405.x
Dementia <sup>1)</sup>	290.x, 294.1, 331.2
COPD <sup>1)</sup>	416.8, 416.9, 490.x-505.x, 506.4, 508.1, 508.8
Any liver disease <sup>1)</sup>	070.22, 070.23, 070.32, 070.33, 070.44, 070.54, 070.6, 070.9, 570.x, 571.x, 573.3, 573.4, 573.8, 573.9, V42.7, 456.0-456.2, 572.2-572.8
Diabetes <sup>1)</sup>	250.0-250.3, 250.8, 250.9, 250.4-250.7
Renal disease <sup>1)</sup>	403.01, 403.11, 403.91, 404.02, 404.03, 404.12, 404.13, 404.92, 404.93, 582.x, 583.0-583.7, 585.x, 586.x, 588.0, V42.0, V45.1, V56.x
Any malignancy <sup>1)</sup>	140.x-172.x, 174.x-195.8, 200.x-208.x, 238.6, including lymphoma and leukemia, except malignant neoplasm of skin
Metastatic solid tumor <sup>1)</sup>	196.x-199.x
Alcohol abuse <sup>1)</sup>	265.2, 291.1-291.3, 291.5-291.9, 303.0, 303.9, 305.0, 357.5, 425.5, 535.3, 571.0- 571.3, 980.x, V11.3
Substance use disorder <sup>1)</sup>	292.x, 304.x, 305.2- 305.9, V65.42
Hepatitis C infection <sup>2)</sup>	070.41, 070.44, 070.51, 070.54, V02.62
Depression <sup>1)</sup>	296.2, 296.3, 296.5, 300.4, 309.x, 311
Psychotic disease <sup>1)</sup>	293.8, 295.x, 296.04, 296.14, 296.44, 296.54, 297.x, 298.x
Back pain <sup>3)</sup>	721.3x- 721.9x, 722.2x, 722.30, 722.70, 722.80, 722.90, 722.32, 722.72, 722.82, 722.92, 722.33, 722.73, 722.83, 722.93, 724.xx, 737.1, 737.3, 738.4, 738.5, 739.2, 739.3, 739.4, 756.10, 756.11, 756.12, 756. 13, 756.19, 805.4, 805.8, 839.2, 839.42, 846, 846.0, 847.1, 847.3, 847.2, 847.9
Neck pain <sup>3)</sup>	721.0X, 721.1X, 722.0X, 722.31, 722.71, 722.81, 722.91, 723.XX, 839.0, 839.1, 847.0
Unclassified pain	Pelvic pain: 595.1, 625.8, 625.9 Abdominal pain: 564.1 General pain: 338.0, 338.21, 338.29, 338.4, 729.1, 780.96
Arthritis/joint pain <sup>3)</sup>	>=710 and <720 or >=725 and <740
Neuropathy pain	Postherpetic neuropathy: 053.10-053.14, 053.19 Diabetic Neuropathy: 250.60-250.63, 357.2 Neuropathy: 337.00, 337.09, 337.1, 355.1, 356.2, 356.3, 356.4, 356.8, 356.9, 357.1, 357.4, 357.5, 357.6, 357.7, 357.81, 357.89, 357.9, 724.3 Neuralgia: 350.1, 729.2 Surgically induced pain: 338.22, 338.28 Limb pain: 337.20, 337.21, 337.22, 337.29, 353.6, 354.4, 355.0, 355.2, 355.3, 355.4, 355.6, 355.71, 355.79, 355.8, 355.9, 729.5
Migraine/headache <sup>3)</sup>	>=346 and <347, or 307.81
Any fracture	800.xx-829.xx

Opportunistic infection <sup>4)</sup>	Salmonella septicemia: 003.1 Cryptosporidiosis: 007.2 Other specified protozoal intestinal diseases: 007.8 Tuberculosis (all sites): 010.0-018 Disease due to other mycobacteria: 031.x Actinomycotic infections: 039.x Progressive multifocal leukoencephalopathy: 046.3 Cytomegalovirus: 078.5 Candidiasis (various sites): 112.0-112 Coccidiomycosis (various sites): 114.x Histoplasmosis: 115.x Cryptococcosis: 117.5 Toxoplasmosis: 130.0-130 Pneumocystis Carinii pneumonia: 136.3 Cryptococcal meningitis: 321.0 Pneumonia in cytomegalic inclusion disease: 484.1
Surgery history <sup>5)</sup>	Total Knee Arthroplasty: 27447 Total Hip Arthroplasty: 27130 Laparoscopic Cholecystectomy: 47562, 47563, 47564 Open Cholecystectomy: 47600, 47605, 47610 Laparoscopic Appendectomy: 44970, 44979 Open Appendectomy: 44950, 44960 Cesarean Section: 59510, 59514, 59515 FESS: 31237, 31240, 31254, 31255, 31256, 31267, 31276, 31287, 31288 Cataract Surgery: 66982, 66983, 66984 TURP: 52601, 52612, 52614 Simple Mastectomy: 19301, 19302, 19303, 19180
Tobacco history	305.1
Any opioid use	GPI starting with 65
Benzodiazepine	Therapeutic class generic product identifier including Temazepam, Alprazolam, bromazepam, chlordiazepoxide, clobazam, clonazepam, Clorazepate, Diazepam, Estazolam, Flunitrazepam, Flurazepam, Halazepam, Ketazolam, Loprazolam, Lorazepam, Lormetazepam, Medazepam, Nitrazepam, Nordazepam, Oxazepam, Prazepam, Quazepam, Temazepam, Triazolam, Midazolam using Medispan
Gabapentinoid	GPI starting with '9654424400' '7260003000' '7299600230' '6254003000' '6256003020' (Gabapentin) and GPI starting with '7260005700' (pregabalin)
Non-opioid pain medication	Analgesics-anti-inflammatory: GPI starting with 66 Analgesics-nonnarcotic: GPI starting with 64
Antidepressant	GPI starting with 58
Antipsychotic	GPI starting with 59

ICD: International Classification of Disease, 9<sup>th</sup> Clinical Modification; GPI: Generic Product Identifiers; NDC: National drug codes

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Table 2S. Comparing predictors associated with chronic opioid use in Medicaid beneficiaries with HIV using different models

	Without clustering		State clustering		Full Model	Reduced Model using LASSO	Reduced Model using Elastic Net
	Full Model	Reduced Model	Full Model	Reduced Model			
Age	1.02 (1.01,1.03)	1.02 (1.02, 1.03)	1.02 (1.01 1.03)	1.02 (1.01, 1.03)	1.00 (1.00, 1.01)	1.02 (1.01, 1.03)	1.02 (1.01, 1.03)
Female	1.06 (0.92, 1.22)		1.06 (0.82, 1.37)		1.01 (0.99, 1.02)		1.08 (0.84, 1.38)
Race							
Black vs. white	0.74 (0.61, 0.90)	0.78 (0.66, 0.92)	0.76 (0.62, 0.93)	0.77 (0.65, 0.91)	0.98 (0.96, 0.99)	0.76 (0.63, 0.90)	0.76 (0.64, 0.90)
Other vs. white	0.68 (0.43, 1.08)	0.70 (0.44, 1.10)	0.67 (0.58, 0.79)	0.68 (0.59, 0.78)	0.96 (0.93, 1.00)	0.68 (0.60, 0.77)	0.68 (0.59, 0.79)
Unknown vs. white	0.82 (0.57, 1.20)	0.85 (0.59, 1.22)	0.82 (0.67, 1.01)	0.84 (0.67, 1.05)	0.98 (0.95, 1.01)	0.83 (0.67, 1.03)	0.84 (0.67, 1.04)
State							
KY vs. MD	0.83 (0.57, 1.19)						
NC vs. MD	0.83 (0.71, 0.98)						
WA vs. MD	0.91 (0.71, 1.17)						
Cardiovascular disease	0.78 (0.61, 0.98)	0.79 (0.63, 0.99)	0.78 (0.64, 0.96)	0.77 (0.68, 0.88)	0.97 (0.95, 1.00)		0.77 (0.67, 0.88)
Hypertension	1.12 (0.93, 1.34)		1.11 (0.95, 1.30)		1.01 (0.99, 1.03)		
Dementia	0.88 (0.54, 1.44)		0.89 (0.58, 1.36)		0.99 (0.94, 1.03)		
COPD	1.17 (0.97, 1.40)		1.16 (0.90, 1.50)	1.18 (0.92, 1.51)	1.02 (1.00, 1.03)	1.13 (0.87, 1.48)	1.15 (0.86, 1.55)
Any liver disease	0.94 (0.73, 1.21)		0.93 (0.74, 1.16)		0.99 (0.97, 1.02)		
Diabetes	0.91 (0.71, 1.18)		0.91 (0.78, 1.05)	0.92 (0.82, 1.02)	0.99 (0.97, 1.01)		
Renal disease	0.85 (0.63, 1.15)		0.85 (0.58, 1.25)		0.98 (0.95, 1.01)		
Any malignancy	1.25 (0.91, 1.73)		1.26 (1.18, 1.35)	1.28 (1.23, 1.33)	1.03 (0.99, 1.06)		1.29 (1.25, 1.33)
Metastatic solid tumor	1.11 (0.53, 2.30)		1.10 (0.67, 1.83)		1.03 (0.94, 1.11)		
Hepatitis C infection	1.60 (1.26, 2.02)	1.53 (1.28, 1.84)	1.62 (1.41, 1.87)	1.55 (1.47, 1.64)	1.06 (1.09, 1.04)	1.49 (1.41, 1.57)	1.55 (1.47, 1.64)
Depression	0.99 (0.82, 1.18)		0.98 (0.75, 1.30)		1.00 (0.98, 1.02)		
Psychotic disorder	0.71 (0.53, 0.96)	0.72 (0.55, 0.95)	0.71 (0.63, 0.80)	0.70 (0.62, 0.79)	0.97 (0.94, 0.99)		0.73 (0.65, 0.81)
Migraine/headache	0.88 (0.49, 1.57)		0.86 (0.61, 1.21)		0.98 (0.93, 1.03)		
Any fracture	0.70 (0.45, 1.10)		0.70 (0.57, 0.87)	0.70 (0.55, 0.89)	0.96 (0.92, 1.01)		0.70 (0.55, 0.89)
Surgery history	1.04 (0.56, 1.93)		1.04 (0.77, 1.39)		1.01 (0.95, 1.07)		
Opportunistic infection	1.06 (0.89, 1.26)		1.05 (0.98, 1.13)	1.04 (0.98, 1.11)	1.00 (0.99, 1.02)		
Alcohol abuse	0.85 (0.67, 1.09)		0.85 (0.69, 1.03)	0.84 (0.66, 1.05)	0.98 (0.96, 1.00)		0.83 (0.65, 1.05)
Substance use disorder	1.58 (1.33, 1.87)	1.59 (1.35, 1.86)	1.62 (1.22, 2.16)	1.62 (1.25, 2.12)	1.05 (1.03, 1.07)	1.50 (1.19, 1.90)	1.61 (1.26, 2.04)
Tobacco use disorder	0.87 (0.69, 1.10)		0.86 (0.74, 1.00)	0.86 (0.73, 1.02)	0.98 (0.96, 1.01)		

Back pain	1.45 (1.17, 1.79)	1.46 (1.19, 1.80)	1.44 (1.11, 1.88)	1.46 (1.10, 1.93)	1.05 (1.03, 1.07)	1.43 (1.07, 1.93)	1.45 (1.09, 1.92)
Neck pain	1.02 (0.72, 1.45)		1.02 (0.88, 1.17)		1.00 (0.97, 1.04)		
Arthritis	1.12 (0.93, 1.35)		1.11 (0.98, 1.26)	1.13 (1.01, 1.25)	1.01 (0.99, 1.03)	1.07 (0.97, 1.19)	1.12 (1.01, 1.24)
Neuropathy pain	1.19 (0.95, 1.49)	1.24 (1.01, 1.51)	1.18 (1.04, 1.33)	1.17 (1.05, 1.30)	1.02 (1.00, 1.04)	1.15 (1.03, 1.29)	1.16 (1.04, 1.30)
Unclassified pain	1.05 (0.77, 1.43)		1.04 (0.91, 1.20)		1.01 (0.98, 1.04)		
Number of medication (vs. none)							
1-4medications	1.35 (1.16, 1.57)	1.36 (1.17, 1.58)	1.35 (1.29, 1.41)	1.34 (1.29, 1.40)	1.02 (1.01, 1.04)	1.34 (1.29, 1.40)	1.35 (1.30, 1.41)
5+ medications	1.71 (1.37, 2.14)	1.74 (1.40, 2.16)	1.73 (1.44, 2.08)	1.71 (1.40, 2.09)	1.06 (1.03, 1.08)	1.66 (1.36, 2.03)	1.72 (1.42, 2.09)
Non-opioid pain medication	1.14 (0.98, 1.33)	1.18 (1.01, 1.37)	1.15 (0.94, 1.41)	1.16 (0.96, 1.40)	1.01 (1.00, 1.03)	1.16 (0.95, 1.42)	1.16 (0.95, 1.42)
Benzodiazepine	1.64 (1.35, 1.99)	1.62 (1.34, 1.96)	1.62 (1.49, 1.76)	1.62 (1.48, 1.77)	1.06 (1.04, 1.09)	1.60 (1.46, 1.76)	1.62 (1.49, 1.76)
Gabapentinoid	1.33 (1.05, 1.69)	1.33 (1.05, 1.68)	1.33 (1.21, 1.46)	1.33 (1.21, 1.45)	1.04 (1.01, 1.07)	1.33 (1.18, 1.49)	1.33 (1.19, 1.49)
Antidepressant	1.31 (1.11, 1.54)	1.35 (1.16, 1.56)	1.31 (1.06, 1.62)	1.31 (1.10, 1.56)	1.03 (1.01, 1.04)	1.32 (1.09, 1.60)	1.33 (1.11, 1.58)
Antipsychotic	1.08 (0.88, 1.33)		1.09 (0.96, 1.24)	1.09 (0.99, 1.21)	1.01 (0.99, 1.03)		
Any opioid use	1.87 (1.61, 2.17)	1.87 (1.62, 2.15)	1.85 (1.59, 2.15)	1.86 (1.61, 2.13)	1.06 (1.05, 1.08)	1.84 (1.61, 2.10)	1.84 (1.60, 2.11)

Table 3S. Comparing predictors associated with chronic opioid use in male Medicaid beneficiaries with HIV using different models

	Without clustering		State clustering		Full Model	Reduced Model using LASSO	Reduced Model using Elastic Net
	Full Model	Reduced Model	Full Model	Reduced Model			
Age	1.02 (1.01,1.03)	1.02 (1.01, 1.03)	1.02 (1.00 1.03)	1.02 (1.00, 1.03)	1.00 (1.00, 1.00)	1.02 (1.00, 1.03)	1.02 (1.01, 1.03)
Race							
Black vs. white	0.89 (0.68, 1.17)		0.76 (0.65, 0.90)	0.76 (0.68, 0.85)	0.98 (0.96, 1.00)		
Other vs. white	0.97 (0.55, 1.73)		0.93 (0.81, 1.06)	0.93 (0.81, 1.07)	0.99 (0.94, 1.04)		
Unknown vs. white	0.83 (0.51, 1.36)		0.74 (0.53, 1.03)	0.74 (0.53, 1.04)	0.97 (0.95, 1.00)		
State							
KY vs. MD	1.25 (0.79, 1.99)	1.31 (0.85, 2.04)					
NC vs. MD	0.95 (0.76, 1.19)	0.94 (0.76, 1.17)					
WA vs. MD	1.26 (0.92, 1.73)	1.34 (1.03, 1.76)					
Cardiovascular disease	0.77 (0.56, 1.06)		0.77 (0.64, 0.93)	0.78 (0.64, 0.94)	0.97 (0.95, 1.00)		
Hypertension	1.19(0.92, 1.54)		1.16 (0.91, 1.48)	1.16 (0.90, 1.48)	1.01 (0.99, 1.04)		
Dementia	0.90(0.48, 1.69)		0.92 (0.75, 1.14)	0.92 (0.72, 1.18)	0.99 (0.93, 1.05)		
COPD	1.07 (0.81, 1.43)		1.06 (0.75, 1.51)		1.01 (0.98, 1.04)		
Any liver disease	1.09 (0.78, 1.53)		1.07 (0.69, 1.67)		1.01 (0.98, 1.04)		
Diabetes	0.71 (0.49, 1.03)		0.69 (0.50, 0.94)	0.69 (0.50, 0.96)	0.97 (0.93, 1.00)		
Renal disease	0.90 (0.61, 1.32)		0.89 (0.68, 1.16)	0.90 (0.70, 1.14)	0.99 (0.95, 1.02)		
Any malignancy	1.00 (0.64, 1.58)		1.00 (0.95, 1.05)		1.00 (0.96, 1.04)		
Metastatic solid tumor	2.39 (0.93, 6.19)		2.37 (1.28, 4.39)	2.41 (1.29, 4.50)	1.14 (1.01, 1.27)		
Hepatitis C infection	1.48 (1.08, 2.03)	1.51(1.17, 1.94)	1.48 (1.21, 1.81)	1.54 (1.44, 1.64)	1.04 (1.01, 1.08)	1.44 (1.34, 1.55)	1.50 (1.41, 1.59)
Depression	1.01(0.77, 1.31)		0.98 (0.62, 1.55)		1.00 (0.97, 1.02)		
Psychotic disorder	0.64(0.42, 0.99)	0.62 (0.41, 0.92)	0.64 (0.51, 0.81)	0.63 (0.56, 0.71)	0.96 (0.93, 1.00)		
Migraine/headache	0.90 (0.37, 2.19)		0.85 (0.42, 1.75)		0.98 (0.90, 1.07)		
Any fracture	0.72 (0.41, 1.24)		0.71 (0.43, 1.15)	0.70 (0.43, 1.17)	0.97 (0.92, 1.02)		
Surgery history	1.46 (0.61, 3.46)		1.42 (0.96, 2.12)	1.44 (1.04, 1.99)	0.95 (1.04, 1.14)		
Opportunistic infection	1.03 (0.81, 1.31)		1.00 (0.86, 1.18)		1.00 (0.98, 1.02)		
Alcohol abuse	0.98 (0.72, 1.34)		0.96 (0.81, 1.14)		1.00 (0.97, 1.03)		
Substance use disorder	1.57 (1.23, 2.00)	1.54 (1.22, 1.93)	1.61 (1.34, 1.93)	1.59 (1.38, 1.84)	1.05 (1.02, 1.07)	1.43 (1.15, 1.77)	1.49 (1.18,1.87)
Tobacco use disorder	0.85 (0.62, 1.18)		0.84 (0.74, 0.97)	0.85 (0.74, 0.98)	0.98 (0.95, 1.01)		
Back pain	1.69 (1.27, 2.24)	1.80 (1.37, 2.37)	1.65 (1.06, 2.58)	1.65 (1.02, 2.66)	1.07 (1.03, 1.10)	1.73 (1.06, 2.83)	1.52 (1.10, 2.09)

Neck pain	1.29 (0.82, 2.04)		1.28 (0.95, 1.74)	1.29 (0.95, 1.74)	1.04 (0.99, 1.09)		
Arthritis	1.07 (0.83, 1.39)		1.04 (0.97, 1.13)	1.05 (0.97, 1.13)	1.01 (0.98, 1.03)	1.06 (0.96, 1.17)	
Neuropathy pain	1.61 (1.19, 2.18)	1.69 (1.30, 2.19)	1.61 (1.37, 1.90)	1.62 (1.38, 1.90)	1.06 (1.02, 1.09)	1.57 (1.34, 1.84)	1.25 (1.16, 1.34)
Unclassified pain	1.43 (0.87, 2.35)		1.45 (1.09, 1.94)	1.46 (1.08, 1.98)	1.05 (0.99, 1.11)		
Number of medication (vs. none)							
1-4medications	1.39 (1.13, 1.72)	1.40 (1.13, 1.73)	1.39 (1.26, 1.53)	1.39 (1.27, 1.52)	1.03 (1.01, 1.04)	1.38 (1.25, 1.53)	1.34 (1.28, 1.41)
5+ medications	1.71 (1.27, 2.32)	1.66 (1.24, 2.23)	1.75 (1.50, 2.05)	1.76 (1.52, 2.02)	1.05 (1.02, 1.08)	1.64 (1.40, 1.92)	1.69 (1.39, 2.06)
Non-opioid pain medication	1.09 (0.87, 1.36)		1.12 (0.86, 1.47)	1.12 (0.85, 1.47)	1.01 (0.99, 1.03)		
Benzodiazepine	1.68 (1.29, 2.19)	1.70 (1.31, 2.20)	1.67 (1.45, 1.93)	1.67 (1.45, 1.93)	1.06 (1.03, 1.10)	1.70 (1.48, 1.95)	1.71 (1.56, 1.87)
Gabapentinoid	1.23 (0.89, 1.70)		1.22 (1.02, 1.47)	1.22 (1.03, 1.44)	1.02 (0.99, 1.06)		
Antidepressant	1.27 (1.01, 1.59)	1.32 (1.08, 1.62)	1.30 (1.02, 1.65)	1.28 (1.06, 1.54)	1.03 (1.00, 1.05)	1.32 (1.16, 1.49)	1.41 (1.19, 1.67)
Antipsychotic	0.95 (0.70, 1.28)		0.97 (0.68, 1.38)		1.00 (0.97, 1.02)		
Any opioid use	1.76 (1.44, 2.16)	1.82 (1.49, 2.20)	1.79 (1.43, 2.25)	1.80 (1.42, 2.27)	1.06 (1.04, 1.08)	1.81 (1.51, 2.18)	1.93 (1.69, 2.20)



Table 4S. Comparing predictors associated with chronic opioid use in female Medicaid beneficiaries with HIV using different models

	Without clustering		State clustering		Full Model	Reduced Model using LASSO	Reduced Model using Elastic Net
	Full Model	Reduced Model	Full Model	Reduced Model			
Age	1.03 (1.02, 1.04)	1.03 (1.02, 1.04)	1.03(1.02, 1.03)	1.03 (1.02, 1.03)	1.00 (1.00, 1.00)	1.03 (1.02, 1.04)	1.03 (1.02, 1.03)
Race							
Black vs. white	0.62 (0.47, 0.82)	0.61 (0.46, 0.81)	0.68 (0.50, 0.93)	0.67 (0.49, 0.91)	0.97 (0.94, 0.99)	0.66 (0.50, 0.87)	
Other vs. white	0.47 (0.22, 1.01)	0.47 (0.22, 1.02)	0.46 (0.39, 0.54)	0.46 (0.39, 0.55)	0.93 (0.88, 0.99)	0.45 (0.40, 0.50)	
Unknown vs. white	0.87 (0.49, 1.55)	0.86 (0.49, 1.53)	0.90 (0.74, 1.11)	0.90 (0.73, 1.11)	0.99 (0.93, 1.04)	0.89 (0.75, 1.06)	
State							
KY vs. MD	0.48 (0.25, 0.90)	0.49 (0.26, 0.92)					
NC vs. MD	0.74 (0.59, 0.92)	0.71 (0.57, 0.89)					
WA vs. MD	0.56 (0.34, 0.91)	0.58 (0.36, 0.94)					
Cardiovascular disease	0.77 (0.54, 1.11)		0.79 (0.64, 0.97)	0.79 (0.62, 1.00)	0.98 (0.95, 1.01)		
Hypertension	1.06 (0.82, 1.38)		1.06 (0.97, 1.15)	1.08 (1.04, 1.12)	1.01 (0.98, 1.03)		
Dementia	0.84 (0.36, 1.95)		0.84 (0.33, 2.10)		0.97 (0.90, 1.06)		
COPD	1.25 (0.97, 1.60)		1.26 (0.97, 1.63)	1.25 (0.94, 1.66)	1.02 (1.00, 1.05)	1.21 (0.88, 1.67)	
Any liver disease	0.78 (0.53, 1.15)		0.77 (0.63, 0.94)	0.75 (0.62, 0.90)	0.97 (0.93, 1.01)		
Diabetes	1.19 (0.84, 1.69)		1.17 (0.77, 1.80)		1.02 (0.98, 1.05)		
Renal disease	0.77 (0.47, 1.25)		0.76 (0.45, 1.30)	0.77 (0.46, 1.26)	0.97 (0.92, 1.01)		
Any malignancy	1.63 (1.01, 2.62)		1.62 (1.24, 2.11)	1.61 (1.25, 2.07)	1.06 (1.01, 1.12)		
Metastatic solid tumor	0.46 (0.14, 1.59)		0.49 (0.29, 0.82)	0.48 (0.30, 0.76)	0.93 (0.82, 1.04)		
Hepatitis C infection	1.78 (1.25, 2.54)	1.53 (1.16, 2.02)	1.86 (1.61, 2.15)	1.86 (1.60, 2.16)	1.08 (1.04, 1.13)	1.52 (1.30, 1.78)	1.57 (1.32, 1.86)
Depression	0.97 (0.75, 1.26)		0.98 (0.83, 1.16)		1.00 (0.97, 1.02)		
Psychotic disorder	0.75 (0.50, 1.13)		0.76 (0.60, 0.96)	0.74 (0.60, 0.92)	0.97 (0.93, 1.01)		
Migraine/headache	0.93 (0.43, 2.01)		0.91 (0.72, 1.16)		0.98 (0.92, 1.05)		
Any fracture	0.67 (0.31, 1.48)		0.66 (0.39, 1.13)	0.62 (0.39, 0.99)	0.95 (0.89, 1.02)		
Surgery history	0.85 (0.34, 2.10)		0.83 (0.62, 1.12)	0.82 (0.60, 1.12)	0.98 (0.91, 1.06)		
Opportunistic infection	1.08 (0.85, 1.39)		1.08 (0.88, 1.32)		1.01 (0.98, 1.03)		
Alcohol abuse	0.70 (0.47, 1.03)	0.67 (0.46, 0.98)	0.68 (0.32, 1.48)		0.96 (0.99, 0.92)		
Substance use disorder	1.61 (1.26, 2.04)	1.57 (1.24, 1.98)	1.67 (1.08, 2.60)	1.58 (1.12, 2.22)	1.06 (1.03, 1.08)	1.50 (1.10, 2.03)	1.49 (1.09, 2.04)
Tobacco use disorder	0.85 (0.59, 1.22)		0.83 (0.65, 1.06)	0.81 (0.57, 1.15)	0.98 (0.95, 1.01)		
Back pain	1.22 (0.88, 1.69)		1.22 (1.07, 1.39)	1.21 (1.06, 1.38)	1.03 (0.99, 1.06)		

Neck pain	0.70 (0.39, 1.24)		0.70 (0.36, 1.36)	0.70 (0.36, 1.37)	0.96 (0.91, 1.01)		
Arthritis	1.20 (0.91, 1.58)		1.18 (0.95, 1.47)	1.09 (0.91, 1.32)	1.02 (0.99, 1.05)		
Neuropathy pain	0.80 (0.56, 1.14)		0.80 (0.57, 1.12)		0.98 (0.94, 1.01)		
Unclassified pain	0.89 (0.59, 1.32)		0.89 (0.72, 1.10)	0.87 (0.70, 1.10)	0.99 (0.95, 1.03)		
Number of medication (vs. none)							
1-4medications	1.30 (1.04, 1.63)	1.30 (1.04, 1.62)	1.32 (1.30, 1.33)	1.33 (1.32, 1.33)	1.02 (1.00, 1.04)	1.31 (1.30, 1.32)	1.29 (1.28, 1.30)
5+ medications	1.74 (1.24, 2.43)	1.75 (1.27, 2.43)	1.78 (1.25, 2.54)	1.82 (1.29, 2.58)	1.07 (1.03, 1.10)	1.77 (1.24, 2.51)	1.73 (1.22, 2.45)
Non-opioid pain medication	1.20 (0.96, 1.49)		1.20 (1.01, 1.42)	1.20 (1.00, 1.45)	1.02 (1.00, 1.04)	1.23 (1.01, 1.48)	1.21 (0.99, 1.46)
Benzodiazepine	1.66 (1.24, 2.22)	1.61 (1.21, 2.14)	1.64 (1.59, 1.69)	1.63 (1.60, 1.66)	1.07 (1.03, 1.10)	1.59 (1.58, 1.59)	1.70 (1.61, 1.78)
Gabapentinoid	1.47 (1.03, 2.10)	1.49 (1.06, 2.10)	1.47 (0.98, 2.20)	1.41 (0.97, 2.05)	1.06 (1.02, 1.11)	1.44 (1.01, 2.06)	1.44 (0.99, 2.09)
Antidepressant	1.35 (1.07, 1.72)	1.41 (1.14, 1.75)	1.34 (1.06, 1.70)	1.33 (1.10, 1.60)	1.03 (1.01, 1.05)	1.37 (1.15, 1.63)	1.42 (1.20, 1.67)
Antipsychotic	1.19 (0.89, 1.60)		1.20 (1.06, 1.36)	1.19 (1.06, 1.35)	1.02 (0.99, 1.05)		
Any opioid use	2.02 (1.63, 2.50)	2.09 (1.70, 2.56)	2.00 (1.83, 2.19)	2.01 (1.82, 2.21)	1.07 (1.05, 1.09)	1.96 (1.73, 2.21)	1.97 (1.75, 2.22)