

## Supplementary Online Content

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**eTable 1.** National Drug Codes Used to Identify Pharmacy Claims for Medications

**eTable 2.** Sociodemographic Characteristics of 23 312 Youth With Opioid Use Disorder and Odds Ratios (OR) for Receipt of a Medication (Buprenorphine or Naltrexone) Within 3 Months of Diagnosis: Optum, January 1, 2001 to December 31, 2014

**eTable 3.** Sociodemographic Characteristics of 15 824 Youth With Opioid Use Disorder and Odds Ratios (OR) for Receipt of a Medication (Buprenorphine or Naltrexone) Within 12 Months of Diagnosis: Optum, January 1, 2001 to December 31, 2014

This supplementary material has been provided by the authors to give readers additional information about their work.

**eTable 1.** National Drug Codes Used to Identify Pharmacy Claims for Medications

Medication	National Drug Codes
Buprenorphine	149075701, 12496075701, 12496075705, 54569141600, 54569141601, 54017613, 93537856, 228315603, 378092393, 12496127802, 35356055530, 49999063830, 50383092493, 68308020230, 54017713, 93537956, 228315303, 378092493, 12496131002, 35356055630, 49999063930, 50383093093, 63874117303, 68308020830, 74201201, 74201232, 409201232, 21695051510, 38779088800, 38779088801, 38779088803, 38779088806, 38779088809, 49452129201, 49452129202, 49452129203, 49452825301, 49452825302, 49452825303, 51552076501, 51552076502, 51552076505, 51552076506, 51552076509, 51552076510, 51552076550, 51927101200, 62991158301, 62991158302, 62991158303, 62991158304, 62991158306, 62991158307, 62991158308, 63275992201, 63275992202, 63275992203, 63275992204, 63275992205, 63275992207, 63370090506, 63370090509, 63370090510, 63370090515, 54018813, 93572056, 228315403, 228315473, 406192303, 12496128302, 16590066630, 42291017430, 49999039507, 49999039515, 49999039530, 50383029493, 52959074930, 54569549600, 54868575000, 55700018430, 63629402801, 63874108503, 65162041603, 68071151003, 68258299903, 54018913, 93572156, 228315503, 228315573, 406192403, 12496130602, 35356000407, 35356000430, 42291017530, 43063018407, 43063018430, 50383028793, 52959030430, 54569573900, 54569573901, 54569573902, 54569640800, 54868570700, 54868570701, 54868570702, 54868570703, 54868570704, 55045378403, 63629403401, 63629403402, 63629403403, 63874108403, 65162041503, 66336001630, 68071138003, 40042001001, 42023017901, 42023017905, 55390010010, 35356060704, 59011075004, 35356060504, 54569632500, 59011075104, 35356060604, 54569632600, 59011075204, 12496120201, 12496120203, 12496120801, 12496120803, 54569639900, 55700014730, 12496120401, 12496120403, 12496121201, 12496121203, 54123091430, 54123095730, 59011075804, 59385001201, 59385001230, 59385001401, 59385001430, 59385001601, 59385001630, 59011075704, 54123098630, 54123011430, 54123092930, 63481016101, 63481016160, 63481020701, 63481020760, 63481034801, 63481034860, 63481051901, 63481051960, 63481068501, 63481068560, 63481082001, 63481082060, 63481095201, 63481095260

Naltrexone	56001122, 56001130, 56001170, 56007950, 56008050, 185003901, 185003930, 406009201, 406009203, 406117001, 406117003, 555090201, 555090202, 16729008101, 16729008110, 42291063230, 43063059115, 47335032683, 47335032688, 50436010501, 51224020630, 51224020650, 51285027501, 51285027502, 52152010502, 52152010504, 52152010530, 54868557400, 65694010003, 65694010010, 68084029111, 68084029121, 68094085362, 68115068030, 49452483501, 51927275300, 51927360200, 51927354800, 63459030042, 65757030001, 65757030202, 38779088703, 38779088704, 38779088705, 38779088706, 38779088708, 49452480801, 49452480802, 49452483502, 51552073701, 51552073702, 51552073704, 51927437700, 52372075101, 52372075102, 52372075103, 55812033301, 55812033302, 55812033303, 63370015810, 63370015815, 63370015825, 63370015835, 63370015845, 60966014404, 60966024403, 60966034402, 62991124301, 62991124302, 62991124303, 62991124304
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**eTable 2.** Sociodemographic Characteristics of 23 312 Youth With Opioid Use Disorder and Odds Ratios (OR) for Receipt of a Medication (Buprenorphine or Naltrexone) Within 3 Months of Diagnosis: Optum, January 1, 2001 to December 31, 2014.

<b>Characteristic<sup>a</sup></b>	<b>Received Medication (N=5,580) %</b>	<b>Unadjusted OR (95% CI)</b>	<b>Adjusted<sup>b</sup> Probability of Receiving Medication, % (95% CI)</b>	<b>Adjusted<sup>b</sup> OR (95% CI)</b>
Age of diagnosis				
21-25 years (N=12,577)	32.9	<i>Reference</i>	30.3 (29.4 – 31.2)	<i>Reference</i>
18-20 years (N=7,929)	24.1	0.65 (0.61 – 0.69)	22.0 (21.0 – 23.0)	0.65 (0.61 – 0.69)
16-17 years (N=2,093)	10.3	0.24 (0.20 – 0.27)	10.0 (8.7 – 11.3)	0.26 (0.22 – 0.30)
13-15 years (N=713)	1.7	0.03 (0.02 – 0.06)	1.6 (0.6 – 2.6)	0.04 (0.02 – 0.07)
Sex				
Male (N=15,325)	28.8	<i>Reference</i>	24.6 (23.8 – 25.4)	<i>Reference</i>
Female (N=7,987)	23.2	0.75 (0.70 – 0.80)	20.5 (19.5 – 21.5)	0.79 (0.74 – 0.84)
Race/ethnicity <sup>c</sup>				
White non-Hispanic (N=19,177)	27.2	<i>Reference</i>	23.3 (22.6 – 24.1)	<i>Reference</i>
Black non-Hispanic (N=117)	21.4	0.73 (0.47 – 1.13)	17.4 (10.5 – 24.3)	0.69 (0.43 – 1.12)
Hispanic (N=1,277)	23.5	0.82 (0.71 – 0.94)	20.1 (17.8 – 22.3)	0.84 (0.71 – 0.95)
Asian (N=249)	25.3	0.91 (0.68 – 1.21)	20.4 (15.5 – 25.2)	0.84 (0.62 – 1.14)
Mixed (N=2,453)	26.8	0.98 (0.89 – 1.08)	23.9 (22.0 – 25.7)	1.03 (0.93 – 1.15)
Metropolitan area				
Metropolitan (N=15,191)	26.5	<i>Reference</i>	23.0 (22.2 – 23.8)	<i>Reference</i>
Non-metropolitan (N=7,350)	27.6	1.05 (0.99 – 1.12)	23.3 (22.3 – 24.4)	1.02 (0.95 – 1.09)

Neighborhood educational level <sup>d</sup>				
High (N=15,581)	26.9	<i>Reference</i>	23.0 (22.2 – 23.9)	<i>Reference</i>
High-middle (N=4,709)	27.8	1.04 (0.97 – 1.12)	23.9 (22.6 – 25.3)	1.05 (0.97 – 1.14)
Low-middle (N=2,405)	25.5	0.93 (0.84 – 1.02)	22.6 (20.7 – 24.6)	0.98 (0.87 – 1.10)
Low (N=594)	26.9	0.89 (0.74 – 1.08)	21.6 (17.8 – 25.4)	0.92 (0.73 – 1.16)
Neighborhood poverty level <sup>e</sup>				
Low (N=12,464)	27.6	<i>Reference</i>	23.9 (22.9 – 24.8)	<i>Reference</i>
Low-middle (N=5,828)	25.9	0.92 (0.85 – 0.98)	22.1 (20.9 – 23.2)	0.90 (0.84 – 0.98)
High-middle (N=3,663)	25.7	0.91 (0.84 – 0.99)	22.1 (20.6 – 23.7)	0.91 (0.82 – 1.01)
High (N=1,334)	27.4	0.99 (0.87 – 1.12)	24.0 (21.1 – 26.8)	1.00 (0.85 – 1.19)
Census region				
South (N=9,673)	27.3	<i>Reference</i>	23.2 (22.2 – 24.1)	<i>Reference</i>
Midwest (N=6,145)	26.8	0.98 (0.91 – 1.05)	23.9 (22.7 – 25.1)	1.04 (0.97 – 1.13)
West (N=4,036)	27.0	0.99 (0.91 – 1.07)	22.8 (21.4 – 24.2)	0.98 (0.90 – 1.07)
Northeast (N=3,454)	25.9	0.94 (0.86 – 1.02)	22.1 (20.7 – 23.6)	0.94 (0.86 – 1.04)

a. Where counts do not add to total, data are missing

b. Adjusted for all other covariates listed in the table in addition to year that an individual was diagnosed with opioid use disorder (coded as an indicator variable)

c. Race/ethnicity data were derived from a combination of geocoded census block group-level race from the 2000 US Census and surname analysis to identify Asian and Hispanic individuals; mixed neighborhoods are those that did not meet a 75% threshold for white, black, or Hispanic ethnicity

- d. Neighborhood educational level was based on geocoded census block group-level data from the 2000 US Census; High education level denotes neighborhoods with less than 15% of individuals with less than high school education; high-middle, 15% to 24.9%; low-middle, 25% to 39.9%; and low, 40% or more of individuals<sup>33</sup>
- e. Neighborhood poverty was based on geocoded census block group-level data from the 2000 US Census; Low denotes neighborhoods with less than 5% of individuals living below the poverty level; low-middle, 5% to 9.9%; high-middle, 10% to 19.9%; and high, 20% or more

**eTable 3.** Sociodemographic Characteristics of 15 824 Youth With Opioid Use Disorder and Odds Ratios (OR) for Receipt of a Medication (Buprenorphine or Naltrexone) Within 12 Months of Diagnosis: Optum, January 1, 2001 to December 31, 2014.

Characteristic <sup>a</sup>	Received Medication (N=5,580), %	Unadjusted OR (95% CI)	Adjusted <sup>b</sup> Probability of Receiving Medication, % (95% CI)	Adjusted <sup>b</sup> OR (95% CI)
Age of diagnosis				
21-25 years (N=8,122)	32.8	<i>Reference</i>	30.0 (28.9 – 31.1)	<i>Reference</i>
18-20 years (N=5,622)	24.2	0.66 (0.61 – 0.71)	22.1 (21.0 – 23.3)	0.66 (0.61 – 0.72)
16-17 years (N=1,550)	10.5	0.24 (0.20 – 0.28)	10.3 (8.8 – 11.9)	0.27 (0.23 – 0.32)
13-15 years (N=530)	1.5	0.03 (0.02 – 0.06)	1.6 (0.4 – 2.7)	0.04 (0.02 – 0.08)
Sex				
Male (N=10,483)	28.5	<i>Reference</i>	24.2 (23.1 – 25.1)	<i>Reference</i>
Female (N=5,341)	22.6	0.73 (0.68 – 0.79)	19.8 (18.6 – 21.0)	0.78 (0.72 – 0.84)
Race/ethnicity <sup>c</sup>				
White non-Hispanic (N=13,005)	26.9	<i>Reference</i>	22.8 (21.9 – 23.7)	<i>Reference</i>
Black non-Hispanic (N=74)	17.5	0.58 (0.32 – 1.06)	13.5 (5.7 – 21.4)	0.53 (0.27 – 1.04)
Hispanic (N=909)	23.3	0.83 (0.71 – 0.97)	20.5 (17.8 – 23.3)	0.87 (0.74 – 1.04)
Asian (N=174)	23.0	0.81 (0.57 – 1.16)	18.9 (13.2 – 24.5)	0.79 (0.54 – 1.14)
Mixed (N=1,636)	26.3	0.97 (0.35 – 1.09)	23.3 (21.0 – 25.6)	1.03 (0.90 – 1.17)
Metropolitan area				
Metropolitan (N=10,494)	26.2	<i>Reference</i>	22.6 (21.6 – 23.6)	<i>Reference</i>
Non-metropolitan (N=4,788)	27.1	1.04 (0.97 – 1.13)	22.8 (21.4 – 24.1)	1.01 (0.93 – 1.10)

Neighborhood educational level <sup>d</sup>				
High (N=10,829)	26.5	<i>Reference</i>	22.3 (21.3 – 23.3)	<i>Reference</i>
High-middle (N=3,063)	27.8	1.07 (0.98 – 1.17)	24.1 (22.4 – 25.8)	1.11 (1.00 – 1.22)
Low-middle (N=1,551)	25.3	0.94 (0.83 – 1.06)	23.2 (20.7 – 25.7)	1.05 (0.91 – 1.22)
Low (N=367)	22.1	0.83 (0.61 – 1.01)	18.9 (14.4 – 23.5)	0.81 (0.60 – 1.10)
Neighborhood poverty level <sup>e</sup>				
Low (N=8,673)	27.5	<i>Reference</i>	23.7 (22.5 – 24.8)	<i>Reference</i>
Low-middle (N=3,934)	25.6	0.91 (0.83 – 0.99)	21.5 (20.1 – 22.9)	0.88 (0.80 – 0.97)
High-middle (N=2,363)	24.7	0.87 (0.78 – 0.96)	20.9 (19.0 – 22.7)	0.85 (0.75 – 0.97)
High (N=840)	26.2	0.94 (0.80 – 1.10)	22.8 (19.3 – 26.3)	0.95 (0.77 – 1.18)
Census region				
South (N=6,625)	26.8	<i>Reference</i>	22.5 (21.3 – 23.6)	<i>Reference</i>
Midwest (N=4,171)	26.4	0.98 (0.90 – 1.07)	23.5 (22.1 – 24.9)	1.06 (0.96 – 1.16)
West (N=2,756)	26.6	0.99 (0.90 – 1.10)	22.7 (21.0 – 24.4)	1.01 (0.91 – 1.13)
Northeast (N=2,270)	25.8	0.95 (0.85 – 1.06)	21.5 (19.7 – 23.3)	0.94 (0.84 – 1.06)

- a. Where counts do not add to total, data are missing
- b. Adjusted for all other covariates listed in the table in addition to year that an individual was diagnosed with opioid use disorder (coded as an indicator variable)
- c. Race/ethnicity data were derived from a combination of geocoded census block group-level race from the 2000 US Census and surname analysis to identify Asian and Hispanic individuals; mixed neighborhoods are those that did not meet a 75% threshold for white, black, or Hispanic ethnicity



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