

Supplementary Online Content

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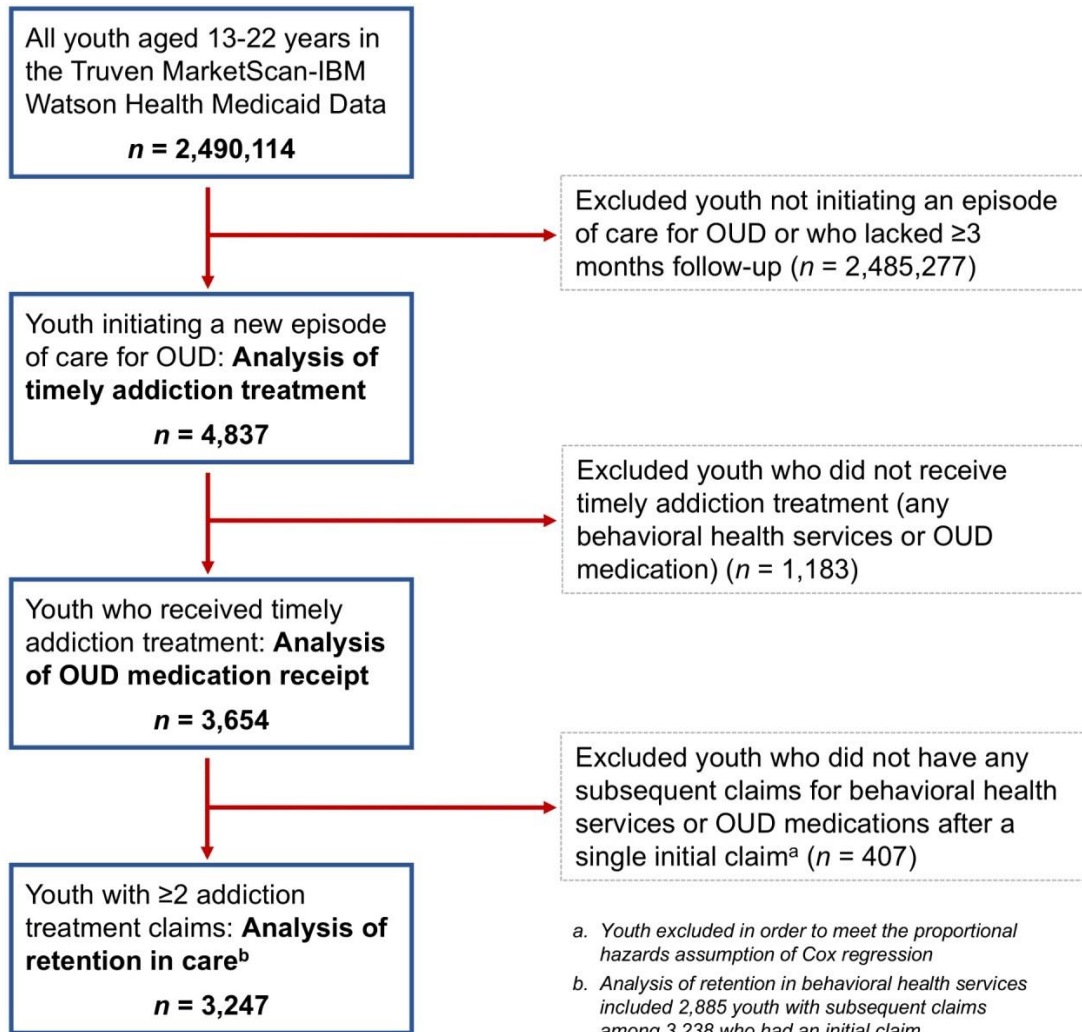
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This supplementary material has been provided by the authors to give readers additional information about their work.

eFigure. Flowchart for Development of Analytic Sample



eTable 1. Current Procedural Terminology (CPT) and Healthcare Common Procedure Coding System (HCPCS) Codes Used to Identify Utilization

Service	CPT and HCPCS codes
Behavioral health services (i.e., mental health or substance use disorder treatment) ^a	<p><i>Behavioral health services in any setting:</i> 90791-90792, 90832-90834, 90836-90840, 90853, 90863, 90875-90876, G0396, G0397, H0001, H0002, H0004, H0005, H0007-H0011, H0012, H0013, H0014, H0015, H0016, H0019, H0022, H0031, H0034-H0037, H0039, H0040, H0047, H2000, H2001, H2010-H2020, H2035, H2036, M0064, S0201, S9480, S9484, S9485, T1006, T1012</p> <p><i>Among above codes, those indicating detoxification services:</i> H0008-H0014</p> <p><i>Among above codes, those indicating intensive outpatient care:</i> H0015</p> <p><i>Among above codes, those indicating partial hospitalization:</i> H0035</p> <p><i>Among above codes, those indicating residential care:</i> H0012, H0013, H0017-H0019</p> <p><i>Among above codes, those indicating inpatient care:</i> H0008-H0011</p>
a. Adapted from Harris et al. ²⁶	

eTable 2. National Drug Codes Used to Identify Pharmacy Claims for OUD 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

eTable 3. International Classification of Diseases, 9th Revision (ICD-9) Diagnosis Codes for Medical and Psychiatric Comorbidity	
Diagnosis	ICD-9-CM diagnosis codes
Pregnancy ^a	Obtained using <i>Healthcare Cost and Utilization Project Clinical Classifications Software</i> groups 177-196
Depression ^b	296.2-296.39, 311, 300.4, 296.9-296.99
Anxiety disorder ^b	300-300.3, 300.5-300.9, 309.21, 309.81
ADHD ^b	314-314.9
Acute pain condition ^c	282.62, 338.11, 338.12, 338.18, 338.19, 522.5, 522.7, 574, 577, 592, 733.1, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 850, 851, 852, 853, 854, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 890, 891, 892, 893, 894, 895, 896, 897, 900, 901, 902, 903, 904, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959
Chronic pain condition ^c	338.21, 338.22, 338.28, 338.29, 338.4, 346.0, 346.1, 346.2, 346.3, 346.4, 346.5, 346.6, 346.7, 346.8, 346.9, 307.81, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729
Alcohol use ^d	<i>Alcohol withdrawal, intoxication, and abuse:</i> 291.0, 291.3, 291.4, 291.81, 303.0, 305.0 <i>Alcohol dependence:</i> 291.1, 291.2, 291.5, 291.8, 291.82, 291.89, 291.9, 303.9
Other drug use ^d	<i>Drug withdrawal, intoxication, and abuse:</i> 292.0, 292.1, 292.2, 292.81, 305.2-305.7 <i>Drug dependence:</i> 292.82-292.89, 292.9, 304.1-304.6
<p>a. Available from the Agency for Healthcare Research and Quality²⁹</p> <p>b. Adapted from Bardach et al.³⁰</p> <p>c. Adapted from the Centers for Disease Control and Prevention³¹</p> <p>d. Adapted from Pletcher et al.³²</p>	

eTable 4. Time to Receipt of Any Treatment (ie, Behavioral Health Services or OUD Medication) or of Any OUD Medication (Buprenorphine, Naltrexone, or Methadone) After Diagnosis: January 1, 2014, to September 30, 2015

Time After Diagnosis (Months)	Number in Sample^a, N	Received Any Treatment, N (%)	Received OUD Medication, N (%)
1	5,173	3,598 (69.6)	906 (17.5)
2	5,024	3,678 (73.2)	1,071 (21.3)
3	4,837	3,654 (75.5)	1,139 (23.5)
6	3,764	2,981 (79.2)	1,013 (26.9)
9	2,584	2,144 (83.0)	751 (29.1)
12	1,663	1,417 (85.2)	509 (30.6)

a. Sample limited to youth providing follow-up for all months listed (i.e., youth who were censored are not included)

eTable 5. Characteristics of 1139 Youth Who Received Timely OUD Medication According to Pharmaceutical Received^a

Characteristic	Buprenorphine (n = 936), N (%)	Naltrexone (n = 135), N (%)	Methadone (n = 68), N (%)	P Value
Age of diagnosis				<.001
21-22 years	549 (83.1)	61 (9.2)	51 (7.7)	
18-20 years	365 (82.2)	62 (14.0)	17 (3.8)	
16-17 years	22 (73.3)	8 (26.7)	0 (0.0)	
13-15 years	0 (0.0)	4 (100.0)	0 (0.0)	
Sex				.019
Male	332 (80.0)	63 (15.2)	20 (4.8)	
Female	604 (83.4)	72 (9.9)	48 (6.6)	
Race/ethnicity				.404
White non-Hispanic	763 (82.2)	111 (12.0)	54 (5.8)	
Black non-Hispanic	28 (77.8)	3 (8.3)	5 (13.9)	
Hispanic	9 (90.0)	0 (0.0)	1 (10.0)	
Other	136 (82.4)	21 (12.7)	8 (4.8)	
Medicaid-eligible due to disability				.812
No	18 (90.0)	1 (5.0)	1 (5.0)	
Yes	918 (82.0)	134 (12.0)	67 (6.0)	
Pregnancy ^b				<.001
No	717 (80.6)	124 (13.9)	49 (5.5)	
Yes	219 (88.0)	11 (4.4)	19 (7.6)	
Depression ^b				<.001
No	708 (83.0)	85 (10.0)	60 (7.0)	
Yes	228 (79.7)	50 (17.5)	8 (2.8)	
Anxiety disorder ^b				.005
No	725 (82.1)	96 (10.9)	62 (7.0)	
Yes	211 (82.4)	39 (15.2)	6 (2.3)	
Attention deficit hyperactivity disorder ^b				.013
No	874 (82.8)	117 (11.1)	65 (6.2)	
Yes	62 (74.7)	18 (21.7)	3 (3.6)	
Alcohol use disorder ^b				.168
No	876 (82.5)	121 (11.4)	65 (6.1)	
Yes	60 (77.9)	14 (18.2)	3 (3.9)	
Other substance use disorder ^b				.142
No	582 (83.7)	72 (10.4)	41 (5.9)	
Yes	354 (79.7)	63 (14.2)	27 (6.1)	

Acute pain condition ^b				.031
No	660 (80.5)	103 (12.6)	57 (7.0)	
Yes	276 (86.5)	32 (10.0)	11 (3.4)	
Chronic pain condition ^b				.023
No	644 (80.5)	99 (12.4)	57 (7.1)	
Yes	292 (86.1)	36 (10.6)	11 (3.2)	
<p>a. Youth who received multiple medications during the first 3 months following diagnosis are classified according to the first medication they received</p> <p>b. At or during the 90 days prior to receiving diagnosis of OUD</p>				