

## Supplementary Online Content

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**eTable 1.** Outcome Measures

**eTable 2.** Covariates Included in Propensity Score Calculation

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

<b>eTable 1. Outcome Measures</b>	
Inpatient Psychiatric admission	Inpatient admissions with a first listed mental disorder diagnosis (ICD-9:290-319).
Emergency Department visit for mental health reason	Emergency department visits in which the first listed diagnosis is a mental disorder (ICD-9-CM: 290-319).
Self-Injurious Behavior	Defined by an E-code of E950-E958, excluding late effects of deliberate self-harm (E959), on any inpatient, emergency department, or outpatient claim.
Mortality	Date of death defined by the MAX Date of Death File (MAX DOD) which is auxiliary to the CMS Medicaid Analytic Extract (MAX). The MAX DOD File was constructed from the Social Security Death Master File.
Admission for Cardiovascular disease	Defined by first listed diagnosis of acute myocardial infarction (AMI) (ICD-9-CM: 410) or stroke (430-438, except 435) on inpatient claims.
Diabetes	<p>Defined by the Mini-Sentinel Algorithm for Type 2 diabetes</p> <ul style="list-style-type: none"> <li>a. 1+ inpatient claims with primary or secondary ICD-9 codes 250.XX, 357.2, 362.01-362.07, 366.41, OR</li> <li>b. 2+ outpatient claims on separate dates with any listed ICD-9 codes 250.XX, 357.2, 362.01-362.07, 366.41, OR</li> <li>c. 2+ prescriptions for an antidiabetic medication (two dispensing of metformin or two dispensings of thiazolidinediones with no other indication of diabetes were not included)</li> </ul>

eTable 2. Covariates included in Propensity Score Calculation
1. Year of initiating treatment augmentation
2. Male
3. Female
4. Medicaid eligibility: Low income
5. Medicaid eligibility: Disability
6. Medicaid eligibility: Others
7. Age at index: 18-21
8. Age at index: 22-25
9. Age at index: 26-29
10. Age at index: 30-33
11. Age at index: 34-37
12. Age at index: 38-41
13. Age at index: 42-45
14. Age at index: 46-49
15. Age at index: 50-53
16. Age at index: 54-57
17. Age at index: 58-61
18. Age at index: 62-64
19. Race: White, non-Hispanic
20. Race: Black, non-Hispanic
21. Race: Hispanic or Latino
22. Race: Asian
23. Race: Hawaiian or Pacific Islander
24. Race: Native American or Alaskan Native
25. Race: More than one race
26. Race: Unknown
27. Prescriptions for ADHD medication filled during the baseline period
28. Prescriptions for for antibiotics filled during the baseline period
29. Prescriptions for antidepressants filled during the baseline period
30. Prescriptions for benzodiazepine filled during the baseline period
31. Prescriptions for cardiovascular disease filled during the baseline period
32. Prescriptions for antidiabetics filled during the baseline period
33. Prescriptions for GI disease filled during the baseline period
34. Prescriptions for hyperlipidemia filled during the baseline period
35. Prescriptions for metabolic medication filled during the baseline period
36. Prescriptions for mood stabilizer filled during the baseline period
37. Prescriptions for Neurologic/Musculoskeletal disease filled during the baseline period
38. Prescriptions for non-benzo anxiolytic/hypnotics filled during the baseline

39. Prescriptions for OBGYN disease filled during the baseline
40. Prescriptions for other psychiatric medications filled during the baseline
41. Prescriptions for any psychotropic medication filled during the baseline
42. Prescriptions for respiratory disease filled during the baseline period
43. Diagnosis of acute bronchitis received during the baseline period
44. Diagnosis of anemias received during the baseline period
45. Diagnosis of anxiety received during the baseline period
46. Diagnosis of appendicitis received during the baseline period
47. Diagnosis of asthma received during the baseline period
48. Diagnosis of bipolar received during the baseline period
49. Diagnosis of white blood cells disorder received during the baseline period
50. Diagnosis of cellulitis and abscess received during the baseline period
51. Diagnosis of cerebrovascular disease received during the baseline period
52. Diagnosis of cholelithiasis received during the baseline period
53. Diagnosis of chronic bronchitis received during the baseline period
54. Diagnosis of liver disease received during the baseline period
55. Diagnosis of depression received during the baseline period
56. Diagnosis of diabetes received during the baseline period
57. Diagnosis of intervertebral disc disorder received during the baseline period
58. Diagnosis of dysrhythmias received during the baseline period
59. Diagnosis of dyskinesia received during the baseline period
60. Diagnosis of emphysema received during the baseline period
61. Diagnosis of noninfectious enteritis and colitis received during the baseline period
62. Diagnosis of fracture of neck received during the baseline period
63. Diagnosis of fracture received during the baseline period
64. Diagnosis of heart failure received during the baseline period
65. Diagnosis of HIV received during the baseline period
66. Diagnosis of hyperlipidemia received during the baseline period
67. Diagnosis of hypertension received during the baseline period
68. Diagnosis of injury received during the baseline period
69. Diagnosis of diverticula of intestine received during the baseline period
70. Diagnosis of intestinal obstruction received during the baseline period
71. Diagnosis of ischemic heart disease received during the baseline period
72. Diagnosis of acute kidney failure received during the baseline period
73. Diagnosis of chronic kidney failure received during the baseline period
74. Diagnosis of kidney infection received during the baseline period
75. Diagnosis of obesity infection received during the baseline period
76. Diagnosis of osteoarthritis received during the baseline period
77. Diagnosis of other neoplasms received during the baseline period
78. Diagnosis of pancreatitis received during the baseline period
79. Diagnosis of pneumonia received during the baseline period

80. Diagnosis of all poisonings received during the baseline period
81. Diagnosis of poisoning by psychotropic medication received during the baseline period
82. Diagnosis of pulmonary circulation received during the baseline period
83. Diagnosis of mental retardation received during the baseline period
84. Diagnosis of sever cardiovascular disease received during the baseline period
85. Diagnosis of suicide received during the baseline period
86. Diagnosis of substance disorder received during the baseline period
87. Diagnosis of schizoaffective disorder received during the baseline period
88. Diagnosis of schizophreniform disorder received during the baseline period
89. Number of hospitalizations for primary diagnosis of non-mental health disorders during the baseline period
90. Number of hospitalizations for primary diagnosis of mental health disorders during the baseline period
91. Number of outpatient visits for primary diagnosis of non-mental health disorders during the baseline period
92. Number of outpatient visits for primary diagnosis of mental disorders other than schizophrenia during the baseline period
93. Number of outpatient visits for primary diagnosis of schizophrenia during the baseline period
94. Number of outpatient ER visits for primary diagnosis of non-mental health disorders during the baseline period
95. Outpatient ER visits for primary diagnosis of mental disorder during the baseline period
96. Psychosocial Service contacts during the baseline period
97. Psychotherapy during the baseline period

<b>eTable 3. Treatment Medications and Deaths</b>				
<b>Generic</b>	<b>Total</b>	<b>Percent by class</b>	<b>Death in 365-day ITT</b>	<b>% death by drug</b>
<b>ANTIPSYCHOTICS</b>	<b>26,014</b>		<b>259</b>	<b>1.00%</b>
ARIPRAZOLE	6,194	23.81%	59	0.95%
ASENAPINE	92	0.35%	0	0.00%
ILOPERIDONE	64	0.25%	0	0.00%
OLANZAPINE	4,095	15.74%	45	1.10%
PALIPERIDONE	722	2.78%	6	0.83%
QUETIAPINE	5,814	22.35%	65	1.12%
RISPERIDONE	5,569	21.41%	57	1.02%
ZIPRASIDONE	3,464	13.32%	27	0.78%
TOTAL		100.00%		
<b>MOOD STABILIZERS</b>	<b>12,849</b>		<b>161</b>	<b>1.25%</b>
CARBAMAZEPINE	493	3.84%	4	0.81%
DIVALPROEX	6,486	50.48%	61	0.94%
GABAPENTIN	1,755	13.66%	45	2.56%
LAMOTRIGINE	700	5.45%	4	0.57%
LITHIUM	1,228	9.56%	13	1.06%
OXCARBAZEPINE	777	6.05%	10	1.29%
TOPIRAMATE	1,082	8.42%	17	1.57%
VALPROATE	159	1.24%	5	3.14%
VALPROIC	169	1.32%	2	1.18%
TOTAL		100.00%		
<b>ANTIDEPRESSANTS</b>	<b>31,117</b>		<b>327</b>	<b>1.05%</b>
AMITRIPTYLINE	792	2.55%	14	1.77%
AMOXAPINE	10	0.03%	1	10.00%
BUPROPION	3,300	10.61%	26	0.79%
CITALOPRAM	2,725	8.76%	24	0.88%
CLOMIPRAMINE	59	0.19%	0	0.00%
DESIPRAMINE	39	0.13%	0	0.00%
DESVENLAFAXINE	55	0.18%	0	0.00%
DOXEPIN	376	1.21%	1	0.27%
DULOXETINE	477	1.53%	7	1.47%
ESCITALOPRAM	3,569	11.47%	36	1.01%
FLUOXETINE	3,229	10.38%	29	0.90%
FLUVOXAMINE	193	0.62%	1	0.52%
IMIPRAMINE	128	0.41%	1	0.78%
MAPROTILINE	2	0.01%	0	0.00%

MIRTAZAPINE	1,553	4.99%	32	2.06%
NEFAZODONE	89	0.29%	1	1.12%
NORTRIPTYLINE	146	0.47%	0	0.00%
PAROXETINE	2,550	8.19%	27	1.06%
PROTRIPTYLINE	6	0.02%	0	0.00%
SERTRALINE	4,258	13.68%	40	0.94%
TRAZODONE	6,431	20.67%	74	1.15%
TRIMIPRAMINE	2	0.01%	0	0.00%
VENLAFAXINE	1,135	3.65%	13	1.15%
TOTAL		100.00%		
<b>BENZODIAZEPINES</b>	<b>11,941</b>		<b>204</b>	<b>1.71%</b>
ALPRAZOLAM	1,068	8.94%	22	2.06%
CHLORDIAZEPOXIDE	103	0.86%	4	3.88%
CLONAZEPAM	3,168	26.53%	46	1.45%
CLORAZEPATE	39	0.33%	0	0.00%
DIAZEPAM	855	7.16%	16	1.87%
ESTAZOLAM	11	0.09%	0	0.00%
FLURAZEPAM	179	1.50%	2	1.12%
LORAZEPAM	5,283	44.24%	95	1.80%
OXAZEPAM	36	0.30%	0	0.00%
QUAZEPAM	1	0.01%	0	0.00%
TEMAZEPAM	1,122	9.40%	17	1.52%
TRIAZOLAM	69	0.58%	2	2.90%
TOTAL		100.00%		
<b>TOTAL</b>	<b>81,921</b>		<b>951</b>	

eTable 4. Effectiveness and Mortality Outcomes (Episodes*) N = 103,858															
	Second Antipsychotic N=33,307			Antidepressant N=38,550				Benzodiazepine N=16,059				Mood Stabilizer N=15,942			
	N	%	Adjusted Hazard Ratio (Reference)	N	%	Adjusted Hazard Ratio	95% CI	N	%	Adjusted Hazard Ratio	95% CI	N	%	Adjusted Hazard Ratio	95% CI
Inpatient psychiatric admission	6,475	19.4	1.0	6,546	17.0	0.85	0.81-0.88	3,136	19.5	1.08	1.02-1.13	3,894	24.4	1.01	0.97-1.06
Emergency Department visit for mental health reason	7,275	21.8	1.0	8,182	21.2	0.92	0.89-0.95	3,947	24.6	1.12	1.07-1.17	4,357	27.3	1.00	0.96-1.05
Self-injurious behavior	106	0.3	1.0	159	0.4	0.97	0.73-1.28	61	0.4	1.01	(0.83-1.24)	70	0.4	1.03	(0.71-1.50)
Mortality	332	1.0	1.0	409	1.1	1.00	0.85-1.18	256	1.6	1.17	0.97-1.42	206	1.3	1.33	(1.09-1.63)
Admissions for cardiovascular disease	88	0.3	1.0	130	0.3	1.28	0.95-1.73	53	0.3	1.16	0.76-1.79	54	0.3	1.41	0.92-2.16
	Second Antipsychotic N=27,523**			Antidepressant N=31,953**				Benzodiazepine N=12,934**				Mood Stabilizer N=12,963**			
Diabetes	1,220	4.4	1.0	1,259	3.9	0.88	0.81-0.96	584	4.5	0.98	0.87-1.10	531	4.1	1.00	0.89-1.13

\*Individuals were allowed to have more than one treatment episode if qualifying new treatment initiations occurred >365 days apart.

\*\*Those with diagnosis of diabetes during the baseline period were excluded.