Short-Term Suicide Risk Following Psychiatric Hospital Discharge

Supplementary Material

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Appendix (Diagnostic Codes)

Supplemental Table 1: Cohort selection among inpatients who were 18 to 64 years of age		
Eligibility criterion	Any Mental Disorders Cohort (N)	Non-Mental Disorders Cohort (N)*
Initial sample	1,163,328	1,518,113
Eligible for Medicaid, 180 days prior to index admission	901,641	1,128,441
Inpatient length of stay, 1 to 30 days	890,451	1,128,192
Discharged home, not an institutional setting	770,643	1,090,551
Study cohorts	770,643	1,090,551
Results based on 45-state 2001-2007 Medicaid MAX files. *10% random sample of inpatients with principal discharges other than mental disorders (ICD-9: 290-319).		

Characteristic	Depressive Disorders (N=193,620) %	Bipolar Disorder (N=109,139) %	Schizophrenia (N=173,810) %	Substance Use Disorders (N=185,064) %	Other Mental Disorders (N=109,010) %	Non-Mental Disorders (N=1,090,551) %
Age, years						
18-34	39.7	41.0	30.8	26.9	44.8	64.9
35-44	28.7	29.6	30.0	35.2	24.6	12.5
45-64	31.6	29.4	39.2	37.8	30.6	22.5
Sex						
Male	30.0	33.2	55.6	57.8	41.5	14.6
Female	70.0	66.8	44.4	42.2	58.5	85.4
Race/Ethnicity						
White, non-Hispanic*	67.9	76.5	56.6	55.2	67.1	51.8
Black, non-Hispanic	22.0	17.4	36.2	33.7	24.8	27.6
Hispanic	10.0	6.1	7.3	11.1	8.1	20.6
Recent mental health treatment						
Outpatient mental health diagnosis						
Depression	44.4	28.1	16.2	17.9	24.3	4.6
Alcohol use disorder	11.9	11.7	8.8	30.9	9.3	2.2
Drug use disorder	6.4	6.4	4.2	25.7	4.9	1.0
Schizophrenia	5.3	12.4	55.8	4.5	9.6	0.9
Bipolar disorder	7.9	44.0	10.5	5.5	9.1	1.0
Anxiety disorder	16.7	13.4	5.9	9.7	14.7	2.2
Other mental disorder	19.7	22.8	22.0	10.9	31.5	3.3
Any deliberate self-harm	1.9	1.4	0.5	0.4	1.2	0.0
Emergency mental health diagnosis	20.6	24.0	22.4	18.4	19.9	1.1
Inpatient, length of stay, days						
1-4	40.3	29.4	18.8	47.7	49.9	77.0
5-8	39.1	40.0	36.0	36.4	30.5	16.9
9-30	20.6	30.6	45.3	15.8	19.6	5.4
No outpatient health care, past 180 days	8.8	8.6	11.1	12.3	10.3	6.7

Supplemental Table 2: Background characteristics of adult Medicaid inpatients with a principal diagnosis of depression, bipolar disorder, schizophrenia, substance use, or no mental disorder

*Includes White, American Indian/Alaskan Native, Asian, Native Hawaiian/Other Pacific Islander, and more than one race
**During 180 day period prior to inpatient admission

Supplemental Table 3: Suicide during the 90 days following hospital discharge of adult inpatients in the Medicaid program by presence of primary mental disorder diagnosis and age group

Group	Number of Discharges N	Person-years at risk Years	Suicides N	Suicide Rate (per 100,000 person-years)	Unadjusted Hazard Ratio of Suicide (95%CI)	Adjusted* Hazard Ratio of Suicide (95%CI)
Age, total						
Any mental disorder	770643	189573.7	338	178.3	15.43 (10.68, 22.28)	10.61 (7.27, 15.48)
Non-mental disorder	1090551	268214.9	31	11.6	1.00	1.00
Age, 18-34 years						
Any mental disorder	273726	67428.2	90	133.5	46.59 (18.93, 114.65)	21.44 (8.38, 54.83)
Non-mental disorder	708081	174540.6	5	2.9	1.00	1.00
Age, 35-44 years						
Any mental disorder	232176	57123.6	109	190.8	7.13 (3.61, 14.06)	5.71 (2.88, 11.34)
Non- mental disorder	136703	33605.1	9	26.8	1.00	1.00
Age, 45-64 years						
Any mental disorder	264741	65021.9	139	213.8	7.56 (4.57, 12.51)	6.86 (4.13, 11.39)
Non-mental disorder	245767	60069.2	17	28.3	1.00	1.00
*Adjusted for sex, race/ethnicity, and region.						

Characteristic	Total Adjusted HR (95% CI)	Males Adjusted HR (95% CI)	Females Adjusted HR (95% CI)	Interaction P-value
Supplemental Table 4: Short-term risk of suicide of adult inpatients in the Medicaid program with a first-listed mental disorder				
Age, year				
18-34	1.0	1.0	1.0	N/A
35-44	**1.58 (1.19, 2.10)**	1.25 (0.87, 1.81)	**2.28 (1.43, 3.62)**	0.05
45-64	**1.79 (1.36, 2.35)**	**1.59 (1.13, 2.23)**	**2.22 (1.40, 3.54)**	0.25
Sex				N/A
Male	**2.29 (1.82, 2.88)**	N/A	N/A	
Female	1.00	N/A	N/A	
Race/Ethnicity				
White, non-Hispanic*	**4.91 (3.22, 7.47)**	**4.43 (2.68, 7.32)**	**6.09 (2.83, 13.15)**	0.49
Hispanic	**2.23 (1.16, 4.27)**	1.86 (0.82, 4.19)	**3.16 (1.05, 9.50)**	0.49
Black, non-Hispanic	1.00	1.00	1.00	N/A
Primary discharge diagnosis				
Depressive disorders	**1.99 (1.41, 2.81)**	**2.14 (1.40, 3.30)**	1.72 (0.96, 3.08)	0.64
Bipolar	**1.65 (1.11, 2.45)**	**1.72 (1.04, 2.86)**	1.46 (0.76, 2.80)	0.79
Schizophrenia	1.37 (0.94, 2.00)	1.43 (0.91, 2.25)	1.19 (0.58, 2.42)	0.75
Substance use disorder	1.0	1.0	1.0	N/A
Other mental disorder	1.38 (0.91, 2.08)	1.35 (0.80, 2.28)	1.31 (0.66, 2.61)	0.98
Number of outpatient mental health disorder groups**				
0	1.0	1.0	1.0	N/A
1	1.15 (0.82, 1.60)	1.17 (0.76, 1.79)	1.09 (0.64, 1.87)	0.83
2	**1.48 (1.04, 2.10)**	1.39 (0.88, 2.20)	1.57 (0.91, 2.71)	0.76
3	1.39 (0.89, 2.18)	1.55 (0.88, 2.73)	1.16 (0.56, 2.41)	0.51
≥4	**1.92 (1.13, 3.25)**	1.64 (0.80, 3.36)	**2.31 (1.05, 5.09)**	0.54
Linear Trend Test: Chi-square (p-value)	3.59 (0.06)	1.12 (0.29)	2.74 (0.10)	
Inpatient, length of stay, days				
1-4	1.13 (0.84, 1.52)	1.05 (0.72, 1.54)	1.25 (0.79, 1.99)	0.49
5-8	0.99 (0.74, 1.33)	1.09 (0.76, 1.56)	0.85 (0.52, 1.38)	0.47
9-30	1.0	1.0	1.0	N/A
No outpatient health care, past 180 days	**1.67 (1.11, 2.52)**	1.53 (0.92, 2.56)	**2.02 (1.01, 4.03)**	0.56

HR denotes hazard ratios, CI denotes confidence interval.   Adjusted HRs are from a single model that also controls for geographic region.
*Includes White, American Indian/Alaskan Native, Asian, Native Hawaiian/Other Pacific Islander, and more than one race
**180 days prior to hospital admission

Group	Number of Discharges N	Person-years at risk Years	Suicides N	Suicide Rate (per 100,000 person-years)	Unadjusted Hazard Ratio of Suicide (95%CI)	Adjusted* Hazard Ratio of Suicide (95%CI)
Supplemental Table 5: Suicide rates of adult inpatients in the Medicaid program by number of outpatient health visits in the 180 days before hospital admission, during the first 90 days following hospital discharge						
Outpatient health care visits, past 180 days						
0	153211	37691.6	45	119.4	1.11 (0.76, 1.62)	1.40 (0.94, 2.07)
1-5	286531	70513.9	50	70.9	0.66 (0.46, 0.95)	0.88 (0.61, 1.29)
6-10	237982	58584.4	38	64.9	0.60 (0.41, 0.90)	0.85 (0.56, 1.27)
11-15	217741	53603.6	35	65.3	0.61 (0.40, 0.92)	0.92 (0.61, 1.40)
16-20	180409	44416.4	30	67.5	0.63 (0.41, 0.97)	0.93 (0.60, 1.45)
21-30	263174	64778.7	42	64.8	0.60 (0.41, 0.89)	0.86 (0.58, 1.28)
31-50	267833	65884.3	62	94.1	0.88 (0.62, 1.24)	1.17 (0.82, 1.67)
>50	254313	62315.7	67	107.5	1.00	1.00
Adjusted for age, sex, race/ethnicity, and region.						

Appendix: Diagnostic Groups and ICD-9-CM Codes	
Diagnostic Group and Conditions	*ICD-9-Codes*
Depressive disorders	296.2x, 296.3x, 296.82, 298.0, 300.4, 311
Alcohol use disorders	291, 303, 305
Drug use disorders	292, 304
Schizophrenia	295.00-295.99
Bipolar disorders	296.0x, 296.1x, 296.4x, 296.5x, 296.6x, 296.7x, 296.8x (other than 296.82)
Anxiety Disorders	300.0x, 300.2x, 300.3 308.3, 309.81
Other mental disorders	290-319 not included in other narrow diagnostic groups
Deliberate self-harm	E950-E959

Diagnostic groups define diagnostic categories used in Table 3 and Supplemental Table 2. Substance use disorders in all tables defined as combination of alcohol use disorders and drug use disorders.