

Appendix A

Individual complaints	Mean
Felony Committed	0.088
Behavioral Issue	0.162
Negligence	0.670
Sexual Abuse	1.864
Policy Issue	0.024
Human Right Violation	0.118
Medicolegal Death ^a	4.174
Staffing Issues	0.157
Physical Abuse	0.822
Theft	0.000
Missing/Damaged Property	0.000
Attempted Suicide	1.483
Treatment Issue	0.056
Medication Issue	0.066
Verbal Abuse	0.107
AWA from Unit	0.000
Environmental	0.002
Privacy/HIPAA	0.024
Restraint/Seclusion ^b	1.275
Other	1.342

Notes

These categories of complaints are pre-determined by the Massachusetts Department of Mental Health. Each complaint had a tag (or sometimes multiple tags) indicating what type of complaint it was by using the above categories. We also tested a version of the composite using information from only 2017, rather than five-year averages, but the alpha of the composite was weaker ($\alpha = 0.63$) than the five-year average.

^aDeath is relatively high because it includes all known deaths that occur within 30-days of discharge, as facilities are required to report these deaths if they become aware of them. The majority of deaths are occurring post-discharge rather than while hospitalized according to the Department of Mental Health, although they could not disaggregate these numbers.

^bThese are complaints related to restraint and seclusion, which are separate from the episodes of restraint and seclusion that are also reported to the Massachusetts Department of Mental Health and the hours of restraint and seclusion that are reported to CMS' IPFQR program.

Appendix B

Distribution of hospital-acquired injury rates between low and high-safety facilities

With hospital-acquired injury	Low Safety (N = 7,612)	High Safety (N = 6,953)
N	194	113
%	2.6	1.6

Appendix C

Average scores on the components and overall composites between low and high-safety facilities

Standardized Measures ^a	Average reverse score					
	Low safety	[95% CI]		High safety	[95% CI]	
Rate of complaints not substantiated and not abuse-related	-1.23	[-1.26,	-1.20]	0.76	[0.76,	0.77]
Rate of substantiated complaints	-0.88	[-0.91,	-0.85]	0.50	[0.50,	0.50]
Rate of abuse-related complaints	-1.08	[-1.11,	-1.05]	0.65	[0.64,	0.66]
Rate of episodes of restraint	-0.99	[-1.00,	-0.97]	1.22	[1.22,	1.23]
Rate of episodes of seclusion	-0.45	[-0.46,	-0.43]	0.49	[0.49,	0.49]
Rate of hours of restraint	-0.62	[-0.65,	-0.60]	0.85	[0.85,	0.86]
Rate of hours of seclusion	-0.65	[-0.70,	-0.61]	0.32	[0.32,	0.32]
Composite	-0.84	[-0.85	-0.83]	0.69	[0.68	0.69]

Notes

^aFor substantiated complaints and abuse-related complaints, those would get a weight of two rather than one. For abuse-related complaints, those complaints that were substantiated would get a weight of three as opposed to two.

Appendix D

Characteristics among the middle 60% safety group (N = 24, 563)		
	n	%
Prior Emergency Department Visit	17,446	71.0
<i>Severity Score</i>		
Least Severe	7,925	32.3
Moderate Severe	13,481	54.9
Most Severe	3,157	12.9
Transferred	5,501	22.4
Prior 30-day Admission	4,194	16.4
Less than 100-day prior Admission	7,080	28.8
Had any substance use disorder	12,886	52.5
Opioid use disorder	4,300	17.5
Alcohol use disorder	9,435	38.4
Other substance use disorder	3,208	13.1
Bipolar Diagnosis	4,912	20.0
Schizophrenia Diagnosis	4,931	20.1
Homelessness	3,257	13.3
<i>Race</i>		
Non-Hispanic White	19,122	78.0
Non-Hispanic Black	1,928	7.9
Non-Hispanic Asian	335	1.4
Non-Hispanic "other" race	833	3.4
Hispanic/Latinx	2,290	9.3
<i>Age</i>		
18-24	2,557	10.5
25-34	4,947	20.4
35-45	4,761	19.6
46-64	8,422	34.7
64+	3,244	13.4
Female	10,948	44.6
<i>Payment</i>		
Private Insurance	7,470	30.4
Self-pay/uninsured	195	0.8
Medicaid	7,421	30.2
Medicare	8,772	35.7
Other	705	2.9
<i>Geography</i>		
Rural	956	4.0
Closest hospital is low safety	4,192	18.0
Closest hospital is high safety	2,806	12.1
Was admitted to closest hospital	3,308	14.2

Notes

^aPrior admission rates build.

^b196 (0.5% of adult discharges) had missingness on the race variable.

^c529 had missing age information (1.3% of total sample, including children).

^d1,069 (2.7% of adult discharges) had missing rurality information.

^e1,896 (4.9% of adult discharges) had missingness on the proximity variables.

Proportion is reported excluding missingness from the denominator.

Appendix E

Multinomial logistic regression models comparing predictors of risk of admission to a middle-safety versus high-safety (reference) facility

	Model 1		Model 2		Model 3	
	(N = 38,404)		(N = 38,393)		(N = 36,441)	
	RRR	<i>p</i>	RRR	<i>p</i>	RRR	<i>p</i>
<i>Severity (ref = least severe)</i>						
Moderate Severe	1.08	0.02	1.08	0.03	1.13	<0.01
Most Severe	1.13	0.01	1.12	0.02	1.23	<0.01
Transferred	1.18	<0.01	1.19	<0.01	2.18	<0.01
Prior 30-day Admission	1.12	0.05	1.11	0.06	1.15	0.04
Less than 100-day Admission	1.23	<0.01	1.22	<0.01	1.17	<0.01
Opioid use disorder	1.75	<0.01	1.73	<0.01	1.70	<0.01
Alcohol use disorder	1.10	<0.01	1.10	0.01	1.10	0.02
Other substance use disorder	1.23	<0.01	1.22	<0.01	1.30	<0.01
Bipolar Diagnosis	0.92	0.02	0.92	0.02	0.99	0.76
Schizophrenia Diagnosis	1.18	<0.01	1.18	<0.01	1.07	0.13
Homelessness	1.30	<0.01	1.28	<0.01	1.16	0.01
<i>Race (ref = White)</i>						
Non-Hispanic Black	1.85	<0.01	1.83	<0.01	1.59	<0.01
Non-Hispanic Asian	3.95	<0.01	3.98	<0.01	3.13	<0.01
Non-Hispanic "other" race	1.56	<0.01	1.56	<0.01	1.48	<0.01
Hispanic/Latinx	1.96	<0.01	1.93	<0.01	1.59	<0.01
<i>Age (ref = 18-24)</i>						
25-34	1.02	0.70	1.00	0.98	1.05	0.46
35-45	1.01	0.86	0.99	0.86	1.05	0.48
46-64	0.84	<0.01	0.83	<0.01	0.92	0.16
64+	0.59	<0.01	0.59	<0.01	0.63	<0.01
Female	0.97	0.29	0.97	0.31	1.00	0.92
Emergency Department	0.85	<0.01	0.85	<0.01	0.73	<0.01
Emergency Department X Transferred	5.65	<0.01	5.65	<0.01	4.32	<0.01
Payment and Geographical Characteristics						
<i>Payment</i>						
Self-pay/uninsured			0.82	0.20	0.86	0.44
Medicaid			1.15	<0.01	1.09	0.06
Medicare			1.06	0.13	0.99	0.89
<i>Geography</i>						
Rural					1.20	0.04
Closest hospital is low safety					0.36	<0.01
Closest hospital is high safety					0.05	<0.01
Rural X Closest hospital is low safety					0.22	<0.01
Constant	2.85	<0.01	2.77	0<0.01	8.92	<0.01
R2	3.05%		3.49%		19.39%	

Notes

The sample size for each model differs given missingness on predictors, notably geographical characteristics. In total, there was a missing rate of 1.9% for both models 1 and 2 and 6.9% for model 3. When using multiple imputation to address missingness, the results were qualitatively unchanged.

^aRRR = Relative Risk Ratio

Appendix F

Restricted sample sensitivity analysis: Multinomial logistic regression models comparing predictors of risk of admission to a low-safety versus high-safety (reference) facility

		Model 3	
		(N = 23,477)	
		RRR	<i>p</i>
Clinical and Demographic Characteristics			
<i>Severity (ref = least severe)</i>			
	Moderate Severe	1.22	<0.01
	Most Severe	1.03	<0.01
Transferred		3.38	<0.01
Prior 30-day Admission		1.21	0.10
Less than 100-day prior Admission		1.00	0.97
Opioid use disorder		1.39	<0.01
Alcohol use disorder		0.97	0.57
Other substance use disorder		1.36	<0.01
Bipolar Diagnosis		0.94	0.32
Schizophrenia Diagnosis		1.28	<0.01
Homelessness		1.20	0.03
<i>Race (ref = White)</i>			
	Non-Hispanic Black	1.57	<0.01
	Non-Hispanic Asian	5.25	<0.01
	Non-Hispanic "other" race	2.26	<0.01
	Hispanic/Latinx	1.22	0.05
<i>Age (ref = 18-24)</i>			
	25-34	0.93	0.49
	35-45	1.01	0.94
	46-64	0.95	0.58
	64+	0.56	<0.01
Female		0.96	0.45
Emergency Department		0.87	0.05
Emergency Department X Transferred		2.45	<0.01
Payment and Geographical Characteristics			
<i>Payment (ref = private insurance)</i>			
	Self-pay/uninsured	1.94	0.01
	Medicaid	1.53	<0.01
	Medicare	1.20	0.01
<i>Geography</i>			
	Rural	0.35	<0.01
	Closest hospital is low safety	2.27	<0.01
	Closest hospital is high safety	0.10	<0.01
	Rural X Closest hospital is low safety	0.18	0.02
	Constant	1.09	0.46
R2		20.14%	

Notes

This model is restricted to a random sample of only one discharge per individual to address potential confounding by multiple admissions of the same individual in the study period.

