

Supplementary Material

Title

Investigating heterogeneous effects of an expanded methadone access policy with opioid treatment program retention: A Rhode Island population-based retrospective cohort study

Authors

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Table S1. Unadjusted estimates for six-month retention in methadone treatment following first admission: Rhode Island, March 18-June 30, 2019 (control) versus March 18-June 30, 2020 (treatment)

	N	OR (95% CI)	RR (95% CI)
Overall			
Admissions			
All OTP admissions	1,248	1.19 (0.94, 1.51)	1.10 (0.97, 1.26)
Stratified			
Gender			
Female	415	1.03 (0.68, 1.57)	1.02 (0.81, 1.29)
Male	833	1.27 (0.95, 1.71)	1.14 (0.98, 1.34)
Age			
18-34 years	584	1.04 (0.73, 1.48)	1.02 (0.84, 1.25)
35-54 years	582	1.39 (0.98, 1.97)	1.20 (0.99, 1.46)
55+ years	82	1.10 (0.41, 2.92)	1.03 (0.71, 1.51)
Race/ethnicity			
Non-Hispanic white	1,002	1.25 (0.96, 1.63)	1.13 (0.98, 1.30)
Non-Hispanic Black	58	0.41 (0.11, 1.47)	0.51 (0.20, 1.34)
Hispanic/Latino	160	0.91 (0.44, 1.85)	0.94 (0.62, 1.45)
Educational attainment			
Below high school	323	2.07 (1.25, 3.42)	1.48 (1.15, 1.90)
Completed high school	510	1.46 (0.99, 2.15)	1.22 (1.00, 1.48)
Beyond high school	342	1.22 (0.78, 1.92)	1.11 (0.88, 1.40)
Arrest within 30 days of admission			
No	887	0.90 (0.68, 1.18)	0.95 (0.83, 1.09)
Yes	278	2.84 (1.39, 5.83)	2.22 (1.33, 3.69)
Primary drug at admission			
Heroin	728	1.41 (1.01, 1.97)	1.20 (1.01, 1.43)
Fentanyl	253	1.19 (0.72, 1.95)	1.10 (0.84, 1.43)

Notes: Unadjusted coefficients; additional categories not reported for race/ethnicity and primary drug at admission; OR, odds ratio; RR, risk ratio

Source: Rhode Island Department of Behavioral Healthcare, Developmental Disabilities, and Hospitals

Table S2. Sensitivity range analysis to assess missingness in arrest within 30 days of admission: Estimates for six-month retention in methadone treatment following first admission: Rhode Island, March 18-June 30, 2019 (control) versus March 18-June 30, 2020 (treatment)

		Assuming all post-intervention missingness is arrested and all pre-intervention missingness is not arrested (A)		Assuming all post-intervention missingness is not arrested and all pre-intervention missingness is arrested (B)	
	N	OR (95% CI)	RR (95% CI)	OR (95% CI)	RR (95% CI)
Overall					
Admissions					
All OTP admissions	1,128	1.11 (0.83, 1.47)	1.04 (0.92, 1.19)	1.03 (0.77, 1.38)	1.01 (0.89, 1.15)
Stratified					
Gender					
Female	380	0.66 (0.38, 1.15)	0.86 (0.69, 1.07)	0.64 (0.37, 1.11)	0.84 (0.67, 1.05)
Male	748	1.33 (0.94, 1.90)	1.13 (0.97, 1.32)	1.23 (0.87, 1.75)	1.09 (0.93, 1.28)
Age					
18-34 years	532	0.86 (0.56, 1.33)	0.93 (0.76, 1.13)	0.83 (0.53, 1.28)	0.91 (0.74, 1.12)
35-54 years	521	1.36 (0.90, 2.08)	1.15 (0.96, 1.40)	1.26 (0.83, 1.92)	1.11 (0.92, 1.35)
55+ years	75	0.65 (0.11, 3.84)	0.82 (0.51, 1.32)	0.57 (0.09, 3.47)	0.76 (0.45, 1.26)
Race/ethnicity					
Non-Hispanic white	921	1.15 (0.84, 1.59)	1.06 (0.93, 1.22)	1.06 (0.78, 1.47)	1.02 (0.89, 1.18)
Non-Hispanic Black	49	0.33 (0.03, 3.10)	0.57 (0.24, 1.39)	0.21 (0.01, 2.55)	0.51 (0.21, 1.24)
Hispanic/Latino	140	0.70 (0.28, 1.77)	0.84 (0.50, 1.39)	0.73 (0.29, 1.82)	0.86 (0.52, 1.40)
Educational attainment					
Below high school	306	1.42 (0.78, 2.60)	1.15 (0.89, 1.49)	1.47 (0.80, 2.72)	1.17 (0.90, 1.51)
Completed high school	492	1.06 (0.68, 1.66)	1.03 (0.85, 1.25)	0.96 (0.61, 1.50)	0.98 (0.81, 1.19)
Beyond high school	330	1.02 (0.59, 1.77)	0.99 (0.79, 1.25)	0.96 (0.55, 1.67)	0.97 (0.77, 1.22)
Arrest within 30 days of admission					
No	861 (A) 852 (B)	0.97 (0.71, 1.32)	0.98 (0.86, 1.12)	0.92 (0.68, 1.25)	0.96 (0.85, 1.10)
Yes	267 (A) 276 (B)	3.14 (1.31, 7.52)	2.17 (1.17, 4.03)	4.21 (1.41, 12.60)	2.06 (1.09, 3.88)
Primary drug at admission					
Heroin	664	1.29 (0.86, 1.94)	1.12 (0.93, 1.34)	1.20 (0.79, 1.80)	1.08 (0.90, 1.29)
Fentanyl	240	1.02 (0.57, 1.83)	1.01 (0.78, 1.32)	1.03 (0.57, 1.86)	1.02 (0.78, 1.33)

Notes: Models adjusted for age group, gender, race/ethnicity, educational attainment, housing status, employment status, veteran status, referral source, past-month arrest, payment source, and primary drug, holding out stratification variable per category; additional categories not reported for race/ethnicity and primary drug at admission; OR, odds ratio; RR, risk ratio

Source: Rhode Island Department of Behavioral Healthcare, Developmental Disabilities, and Hospitals

Table S3. Adjusted estimates for six-month retention in methadone treatment following first admission with missingness corrected using multiple imputation: Rhode Island, March 18-June 30, 2019 (control) versus March 18-June 30, 2020 (treatment)

	Adjusted OR (95% CI)	Adjusted RR (95% CI)
Overall		
Admissions		
All OTP admissions	0.95 (0.72, 1.24)	0.97 (0.86, 1.10)
Stratified		
Gender		
Female	0.64 (0.38, 1.08)	0.83 (0.68, 1.03)
Male	1.08 (0.80, 1.49)	1.03 (0.88, 1.20)
Age		
18-34 years	0.74 (0.49, 1.12)	0.87 (0.71, 1.06)
35-54 years	1.14 (0.77, 1.69)	1.06 (0.88, 1.27)
55+ years	0.77 (0.18, 3.32)	0.93 (0.59, 1.46)
Race/ethnicity		
Non-Hispanic white	0.96 (0.71, 1.30)	0.98 (0.86, 1.13)
Non-Hispanic Black	0.24 (0.19, 3.14)	0.39 (0.13, 1.24)
Hispanic/Latino	0.90 (0.39, 2.09)	0.94 (0.60, 1.48)
Educational attainment		
Below high school	1.37 (0.77, 2.43)	1.13 (0.88, 1.44)
Completed high school	0.81 (0.53, 1.24)	0.92 (0.76, 1.12)
Beyond high school	0.89 (0.52, 1.52)	0.93 (0.74, 1.18)
Arrest within 30 days of admission		
No	0.86 (0.64, 1.14)	0.93 (0.82, 1.06)
Yes	2.03 (0.89, 4.62)	1.88 (1.09, 3.23)
Primary drug at admission		
Heroin	1.14 (0.78, 1.66)	1.07 (0.90, 1.27)
Fentanyl	1.04 (0.59, 1.83)	1.00 (0.77, 1.29)

Notes: Missing data estimated using multiple imputation with chained equations; additional categories not reported for race/ethnicity and primary drug at admission; all models adjusted for age group, gender, race/ethnicity, educational attainment, housing status, employment status, veteran status, referral source, past-month arrest, payment source, and primary drug, holding out stratification variable per category; OR, odds ratio; RR, risk ratio
Source: Rhode Island Department of Behavioral Healthcare, Developmental Disabilities, and Hospitals

Table S4. Heterogenous treatment effect scan sensitivity analysis estimates for patient six-month retention following first opioid treatment program admission: Rhode Island, March 18-June 30, 2019 (control) versus March 18-June 30, 2020 (treatment) using penalty scores of 0.25 and 1.00

Six-Month Retention After First OTP Admission in Excess of Overall Retention					
Penalty = 0.25					
Cluster Features	Treatment Cluster Size	Observed Treatment Proportion Retained	Control Cluster Size	Observed Control Proportion Retained	P-value
Education below high school; primary drug of heroin or fentanyl; history of past-month arrest	6	1.00	55	0.15	0.005
Education below high school or beyond high school; history of past month arrest	12	0.75	120	0.15	0.008
Male; non-Hispanic white or Hispanic/Latino; primary drug of heroin or fentanyl; history of past-month arrest	22	0.59	111	0.17	0.044
Penalty = 1.00					
Cluster Features	Treatment Cluster Size	Observed Treatment Proportion Retained	Control Cluster Size	Observed Control Proportion Retained	P-value
Education below high school; history of past-month arrest	8	0.88	68	0.13	0.006

Notes: Treatment cluster indicates patients admitted from March 18-June 30, 2020; control cluster indicates patients admitted from March 18-June 30, 2019

Source: Rhode Island Department of Behavioral Healthcare, Developmental Disabilities, and Hospitals