

Comparing Methods to Evaluate Risk of Prolonged Postoperative Opioid Use in Patients with Serious Mental Illness

Elizabeth Nilsen BSN RN, Paul Scott PhD, Susan Sereika PhD, Hayley Germack PhD MHS RN

Background

- Opioid prescribing is a major contributor to the opioid epidemic¹
- Prolonged use → misuse, overdose, addiction, major trauma^{2,3}
- A systematic review identified depression, anxiety, mood disorder and PTSD as risk factors for prolonged postoperative opioid use (PPOU)⁴
- Our preliminary analysis found individuals with serious mental illness (SMI) were 40% more likely to develop PPOU⁵
- To make causal inference, we applied 2 methods to estimate risk:
 - Propensity Score Methods (PSM)** – account for confounding based on **observed** characteristics⁶
 - Endogenous Treatment Effect Models (ETEM)** – account for **unobserved** confounding from endogeneity⁷

Results

Sample Description

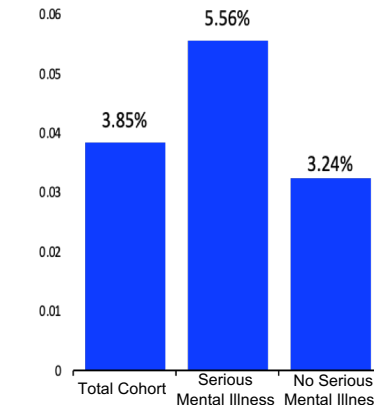
Characteristic	No. (%)		p value	
	Overall	No Prolonged Opioid Use (n=7,085)		Prolonged Opioid Use (n=284)
Serious Mental Illness*	1944 (26.4)	1836 (25.9)	108 (38.0)	<0.0001
Sex				
Female	4294 (58.3)	4111 (58.0)	183 (64.4)	0.0316
Age (years)	71.3 (10.9)	71.3 (10.9)	70.7 (11.9)	0.4095
Race/Ethnicity**				
White	6116 (83.0)	5884 (83.1)	232 (81.7)	
Black	605 (8.2)	582 (8.2)	23 (8.1)	0.6906
Other	648 (8.8)	619 (8.7)	29 (10.2)	
Low-Income Subsidy	1726 (23.4)	1631 (23.0)	95 (33.5)	<0.0001
Length of Stay (days)	2.6 (3.9)	2.5 (3.8)	3.3 (5.2)	0.0004
Outpatient Visits (#)	2.3 (5.3)	3.2 (5.3)	3.9 (5.6)	0.0340
Comorbidities (#)	5.7 (3.7)	5.7 (3.6)	6.8 (4.0)	<0.0001
Obesity	2389 (32.4)	2268 (32.0)	121 (42.6)	0.0002
COPD	1450 (19.7)	1366 (19.3)	84 (29.6)	<0.0001
Alcohol Use Disorder	264 (3.6)	248 (3.5)	16 (5.6)	0.0578

For comparisons, we used χ^2 tests for categorical variables and ANOVAs for continuous variables. Mean and SD are reported for continuous variables.

*Major Depressive Disorder, Bipolar Disorder, Schizophrenia, other psychotic disorders

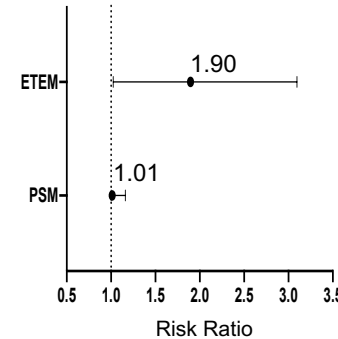
**non-hispanic; "Other" includes the following categories: Asian, Hispanic, North American Native, Unknown, Other

Incidence of PPOU



5.6% of individuals with SMI develop PPOU

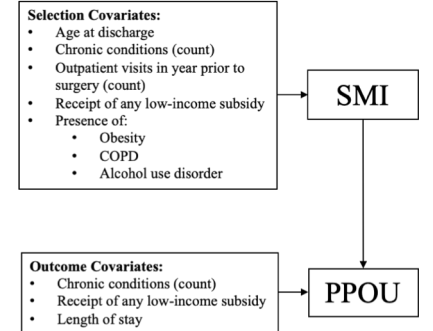
Risk of PPOU in SMI



Individuals with SMI are nearly **twice** as likely to develop PPOU

Statistical Methods

- Covariates selected through Best-subsets
- Propensity score methods (PSM) with inverse probability-weight adjusted Poisson regression
- Endogenous treatment effect models (ETEM) with Poisson Regression and Robust Standard Errors⁸



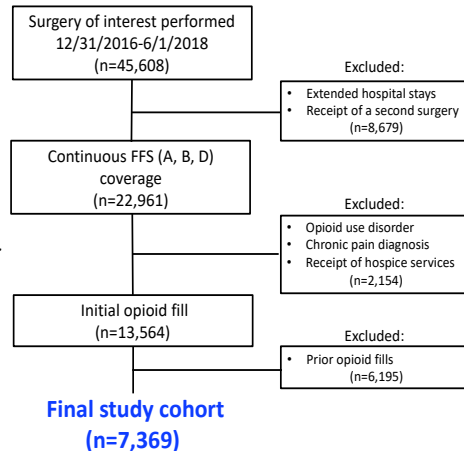
Methods

Design: Retrospective cohort study

Data source: 5% sample Medicare claims, 2016-2018

Surgeries of interest: 13 common major and minor procedures

Primary outcome: PPOU (prescription opioid fills > 90 days following discharge)



Discussion

Conclusions:

- After surgery, approximately 6% of opioid-naïve patients with SMI will develop PPOU.
- Based on ETEM, **patients with SMI are nearly twice as likely to develop PPOU** than patients without SMI, while PSM indicate no notable effect
- Statistical methods accounting for endogeneity (ETEM) may do better at estimating risk⁸**

Limitations:

- Prescription opioid fill ≠ actual opioid use
- Medicare sample may not be representative of SMI population
- This dataset does not include claims from beneficiaries with Medicare Advantage plans

Implications for Practice:

- Pre- and postoperative assessments/screenings should account for a patient's mental health, and pain management education should begin early.