



# Buprenorphine Adherence Trajectories, Persistence, and Healthcare Expenditures Among Commercially Insured Patients with Opioid Use Disorder

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PCR149



## BACKGROUND

- Approximately 8 million people in the United States are affected by Opioid Use Disorder (OUD), involving prescription opioids, heroin, or both.
- The estimated societal cost of OUD in the U.S. is \$504 billion.
- Buprenorphine is the most commonly used medication for OUD and is proven to be effective and safe at recommended doses.
- Unfortunately, only about 40% of patients with OUD retain buprenorphine treatment, and only about 50% adhere to their treatment regimen.
- The persistence and adherence patterns with buprenorphine over time among commercially insured adults are unknown.
- This study aimed to identify patterns of buprenorphine utilization over time and estimate its economic implications on the U.S. healthcare system.

## OBJECTIVES

- To estimate the mean time from buprenorphine initiation to discontinuation
- To identify distinct trajectories of buprenorphine adherence in the first six months of treatment
- To examine the association between buprenorphine adherence trajectories and healthcare expenditures

## METHODS

### Study design & Data source

- Retrospective cohort study
- Merative™ MarketScan® Research Database –
  - Commercial Insurance (calendar years 2017 to 2019)

### Inclusion criteria

- OUD diagnosis
- Continuous enrolment in medical and pharmacy benefits
- Buprenorphine initiation for OUD
- Buprenorphine average daily dose of ≥4mg for at least 30 days

### Exclusion criteria

- <18 years of age
- Mental or substance abuse carveout

## METHODS CONT'D

### STUDY MEASURES

#### Exposure: Adherence

- Distinct buprenorphine adherence trajectories
- Adherence was measured using the proportion of days covered (PDC) measure in every month of treatment for six months
- $PDC = (No. \text{ of days in period covered} / No. \text{ of days in follow-up period}) \times 100$
- Adherence =  $PDC \geq 80\%$

#### Exposure: Persistence

- Time from buprenorphine initiation to discontinuation. Discontinuation = treatment gap of 30 days or more

#### Outcome: Cost

- Difference in healthcare spending among non-adherent trajectories versus adherent trajectory
  - By health services: outpatient, inpatient, medical (outpatient + inpatient), and outpatient pharmacy services

#### Covariates:

- Demographic: age, sex, region, insurance plan type, beneficiary status
- Clinical: comorbidities and history of hospitalization
- Treatment: pre-index medication use and buprenorphine treatment characteristics

### STATISTICAL ANALYSES

#### Descriptive Analysis

- Descriptive statistics reported as mean (standard deviation) and frequency (percentage) by adherence trajectory

#### Buprenorphine Adherence and Time to Discontinuation

- Restricted mean survival time test to estimate persistence to buprenorphine persistence (time from treatment initiation to discontinuation)
- Group-based trajectory modeling (GBTM) to identify distinct adherence trajectories

#### Healthcare Spending

- Zero-inflated adjusted (IPW) Generalized linear models (GLM)
- Gamma distribution with a log link to fit cost distribution
- Adjusted for baseline characteristics and average buprenorphine monthly dose

## RESULTS

Fig 1. Patient Adherence Trajectories

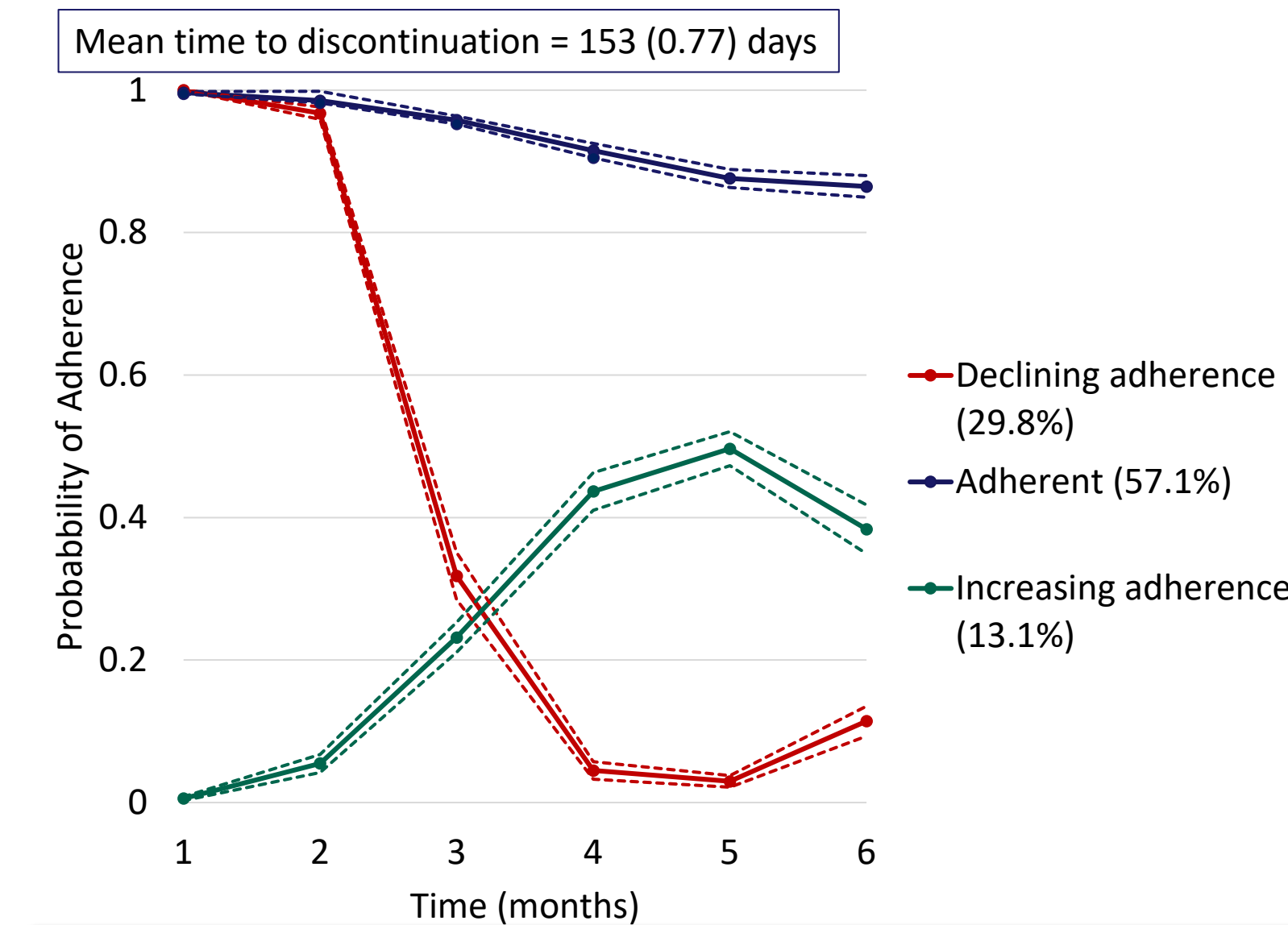


Fig 2. Unadjusted Mean Healthcare Expenditures

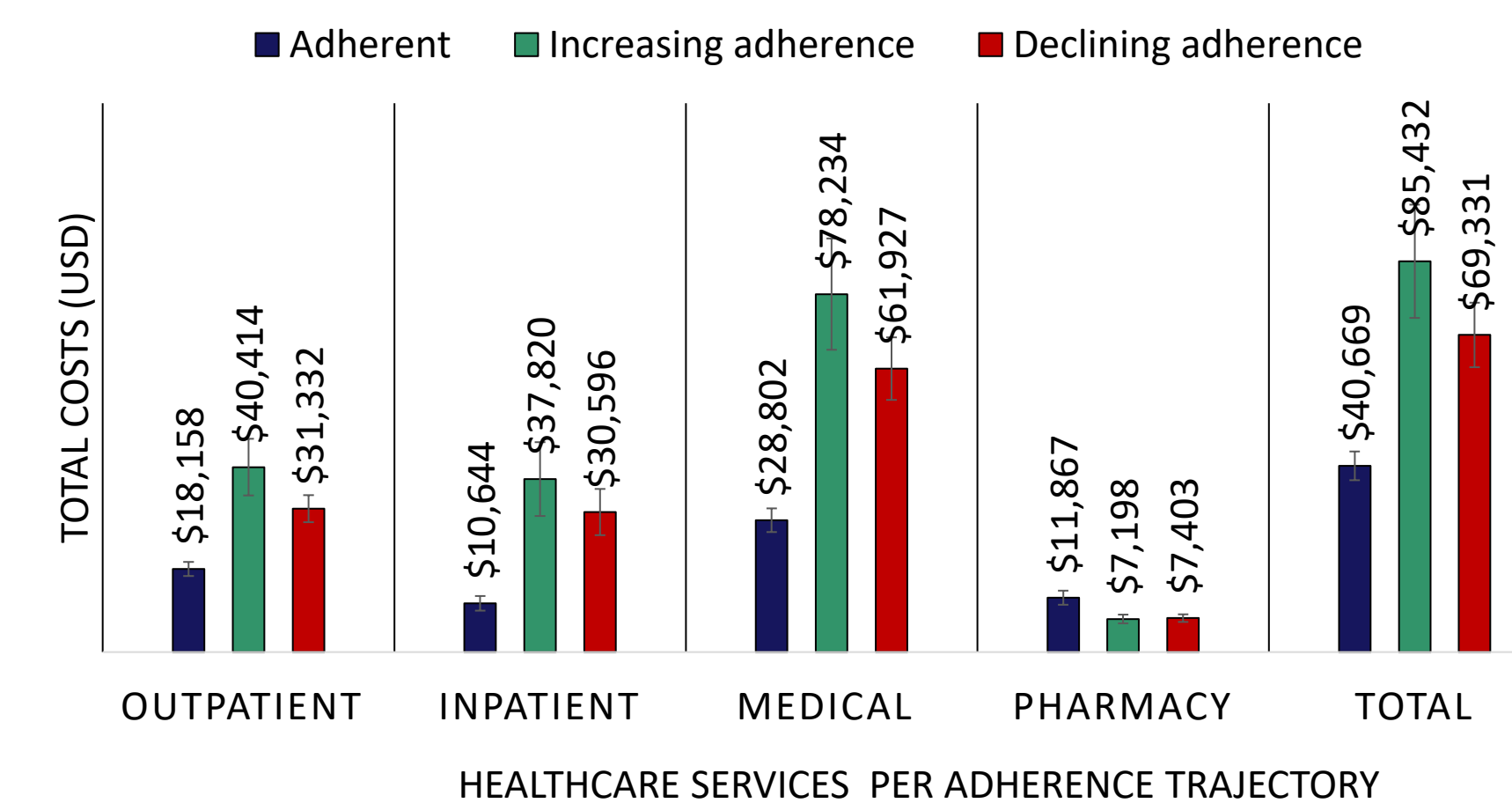


Table 1. Patient Baseline Characteristics by Adherence Trajectory

Characteristics (n = 5,263)	Adherent	Increasing Adherence	Declining adherence
n, %	3,090 (58.71%)	691 (13.13%)	1,482 (28.16%)
Demographic			
Age*	38 (29 – 48)	30 (24 – 43)	34 (24 – 47)
Male	1,153 (37.31)	227 (40.09)	554 (37.38)
Clinical*			
Comorbidities	1037 (33.56)	281 (40.66)	859 (57.96)
Alcohol use disorder	157 (5.08)	73 (10.56)	124 (8.37)
Tobacco use disorder	253 (8.19)	47 (6.80)	156 (10.53)
Pre-index treatment*			
Benzodiazepines	827 (26.76)	199 (28.80)	483 (32.59)
Antidepressants	1429 (46.25)	369 (53.40)	787 (53.10)
Statins	686 (22.20)	207 (29.96)	396 (26.72)
Index Buprenorphine*			
Product type at index (BUP/NAL)	2710 (87.70)	570 (82.49)	1283 (86.57)
Dose (>24 mg)	451 (14.60)	164 (23.73)	195 (13.16)

\* Statistically significant at alpha = 0.05

Table 2. Adjusted Differences in Healthcare Spending

Health care services	Marginal Difference In Total Healthcare Expenditures (USD)			
	Declining Adherence vs. Adherent		Increasing Adherence vs. Adherent	
	Mean difference	95% Confidence interval*	Mean difference	95% Confidence interval*
Outpatient	7,148.67	4,609.74 to 9,687.60	11,411.48	7,387.80 to 15,435.15
Inpatient	12,287.04	8,868.06 to 15,706.01	18,737.12	12,889.17 to 24,585.06
Medical costs	19,829.10	14,695.18 to 24,963.01	28,215.05	19,880.40 to 36,549.70
Pharmacy	-298.11	-343.86 to -252.36	-174.96	-240.32 to -109.59
Total	21,037.81	8,463.79 to 33,611.82	37,800.14	16,421.05 to 59,179.22

## CONCLUSIONS

- We identified three distinct trajectories of buprenorphine adherence in the first 180 days of treatment: steadily adherent, increasing adherence, and declining adherence.
- Individuals belonging to the increasing adherence and declining adherence groups incurred higher healthcare spending.
- Implementing strategies to improve adherence among patients with opioid use disorder can have significant economic benefits.

## REFERENCES



Scan to see references