

A Multivariate Analysis of Nationwide Changes in Opioid Prescriptions from 2012-2016



Leighton Ku, Drishti Pillai

ABSTRACT

Medicaid programs play a dual role in the opioid crisis, financing both prescription opioids for pain relief and treatment medications like buprenorphine. We examined state-level changes in the volume of pain reliever opioids and treatment opioids in Medicaid, as well as changes in opioid mortality rates between 2012 and 2016, for a non-elderly, adult population. The national average utilization of pain reliever opioids per adult enrollee fell sharply, by about one-quarter across the board in both expansion and non-expansion states alike, while the level of treatment opioids per enrollee rose by over 50% in expansion states, and 10% in non-expansion states.

Multivariate models indicate that Medicaid expansions had no significant effect on per enrollee utilization of pain reliever opioids or treatment opioids, nor on changes in opioid mortality rates, contrary to a recent report made by the Senate Committee on Homeland Security and Governmental Affairs¹.

The two main factors associated with changes in medication use per adult Medicaid enrollee were the 1) state levels of opioid use disorder, as measured by mortality rates, and 2) time.

OBJECTIVES

- To examine overall and per-capita changes in the levels of prescriptions for pain reliever and treatment opioids across all states from 2012 through 2016.
- To examine what factors are significantly associated with changes in the level of prescriptions for pain reliever and treatment opioids across states and over time.

DATA & METHODS

We combined multiple data sources to construct a state-level database for each year from 2012 to 2016. The variables of interest in our database are:

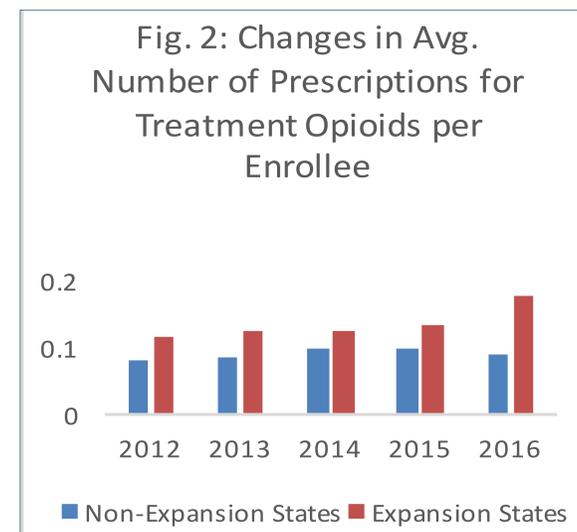
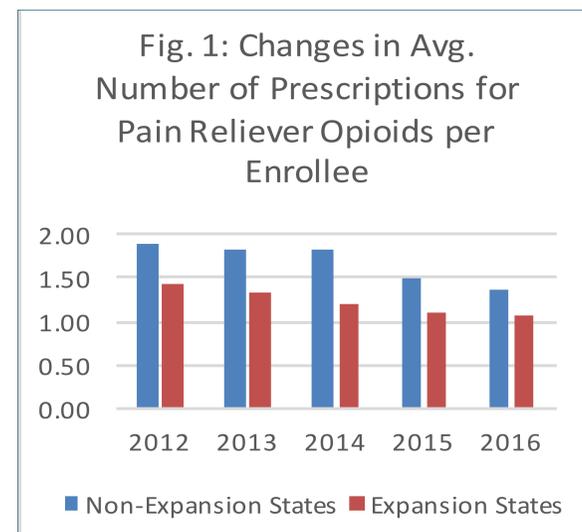
- The total volume of prescription refills for pain reliever and treatment opioids reimbursed by Medicaid.
- The number of non-elderly adult Medicaid enrollees.
- Opioid mortality rates.
- Unemployment rates.
- Expansion status.
- State capacity to provide drug abuse treatment for Medicaid enrollees.

We used multivariate, two-way fixed effects linear regression models, controlling for states, years, and time-invariant differences across states, to examine factors associated with changes in opioid prescriptions from 2012 through 2016. The use of year fixed effects controls for national level secular trends, such as changing professional recommendations about prescription opioid use or treatment approaches, entry of new medications and drug price changes.

RESULTS

Figures 1 & 2, respectively, present data on the changes in average per-enrollee Medicaid prescriptions for pain reliever and treatment opioids from 2012 to 2016 between expansion and non-expansion states (we exclude early and late Medicaid expansion states and look only at the 41 states that either expanded Medicaid in 2014 or states that had not expanded through 2016).

Prescriptions for pain reliever opioids fell by 28% and 24% in expansion and non-expansion states, respectively; prescriptions for treatment opioids rose by 56% and 10% in expansion and non-expansion states, respectively.



RESULTS (Contd.)

Table 1 presents results of a two-way fixed effects model. Changes in pain reliever opioid refills were significantly associated with opioid mortality rate, unemployment rate, and time; whereas changes in treatment opioid refills were statistically associated solely with opioid mortality rate.

Table 1. Results of Two-Way Fixed Effects Models on the Number of Prescription Opioid Fills per Adult Enrollee and the Number of Treatment Medication Fills per Adult Enrollee, 41 States, 2012-2016

	Prescription Opioids per Enrollee		Treatment Medications per Enrollee	
	Coeff	Std Err	Coeff	Std Err
Expanded Medicaid	0.008	0.090	0.008	0.010
Opioid Mortality Rate	-0.016	0.007 *	0.008	0.002 ***
Unemployment Rate	-0.041	0.018 *	0.003	0.002
Substance Treatment Ctrs Year (compared to 2012)	-0.339	0.382	0.070	0.060
2013	-0.111	0.042 *	0.007	0.004
2014	-0.229	0.086 *	-0.001	0.008
2015	-0.454	0.104 ***	-0.004	0.011
2016	-0.508	0.118 ***	0.005	0.015
Constant	2.223	0.187 ***	-0.022	0.044
R-squared within	0.545		0.432	
between	0.119		0.541	
overall	0.006		0.502	

* p < .05, *** p < .001

CONCLUSIONS

Our simple and multivariate analyses indicate that Medicaid expansion did not have a significant impact on opioid use across states or over time. Strong effects of time on pain reliever opioid prescription rates suggest that as awareness of the opioid epidemic grew, providers changed their prescribing patterns. Although increases in prescriptions for treatment opioids were unrelated to expansion, the expansion greatly increased the scope of treatment for drug abuse by providing states that were already hard-hit by the crisis with the funding they needed to expand treatment to cover a greater number of low-income and at-risk adults.

REFERENCES

Majority Staff of the Senate Committee on Homeland Security and Governmental Affairs. Drugs for Dollars: How Medicaid Helps Fuel the Opioid Epidemic. Jan. 18, 2018.