

# Opioids and the Labor Market

EDA University Showcase

2020 Meetings

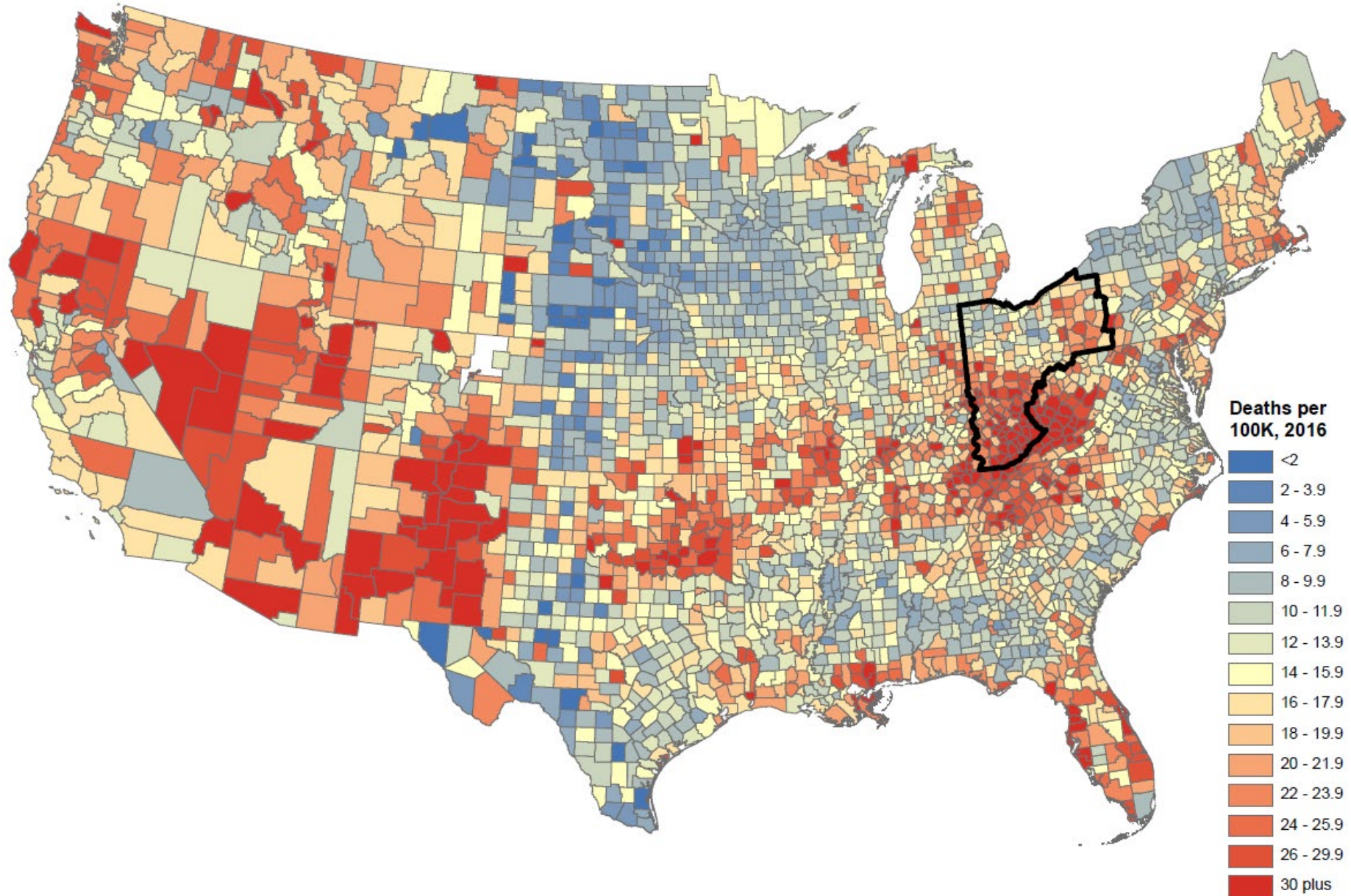
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# Disclaimer

These are my views and not necessarily those of the Federal Reserve Bank of Cleveland or the Federal Reserve System.

# Why is this a Cleveland Fed Issue?



Source: Center's for Disease Control



# Key Pieces of the Research Literature

**Case and Deaton**, 2015 show that poor labor market prospects of low education groups is associated with an increase in overdose deaths, suicides, and liver disease or “Deaths of Despair”

**Krueger**, 2018, shows that opioid availability helps to explain poor prime-age labor market participation rates in the 2000s

**Currie, Jin, and Schnell**, 2018, find a positive opioid effects on employment to population rates for prime age women (and to a lesser degree for men)

**Harris, Kessler, Murray, and Glenn**, 2019, used Prescription Drug Monitoring Program data show that opioid prescriptions cause labor force participation rates to be lower in 10 states

# Our Approach to this Issue

Examine the geographic relationship from 2006-2016 between

**Opioid  
Prescriptions**

and

**Employment/Population  
Participation Rate  
Unemployment**

There are a lot of other things that could matter:

Age, sex, and education levels of population

A really large recession and gradual recovery

Bad local labor markets

Economically challenged regions

# Key Data Sources

- Centers for Disease Control and Prevention (CDC)  
Rx Data

Annual data from 2006-2016

County-level identifier

Sample is 59,000 retail (non-hospital) pharmacies

- Covers 90 percent of counties
- Covers 90 percent of all retail Rx's in US
- Impute missing Rx data using PUMA-level average

# Key Data Sources

## American Community Survey (ACS)

- 1% sample of the 1-year ACS from 2006-2016
- Integrated Public Use Microdata Series (IPUMS-USA)
- N > 15 million
- Individual-level labor market outcomes and demographics

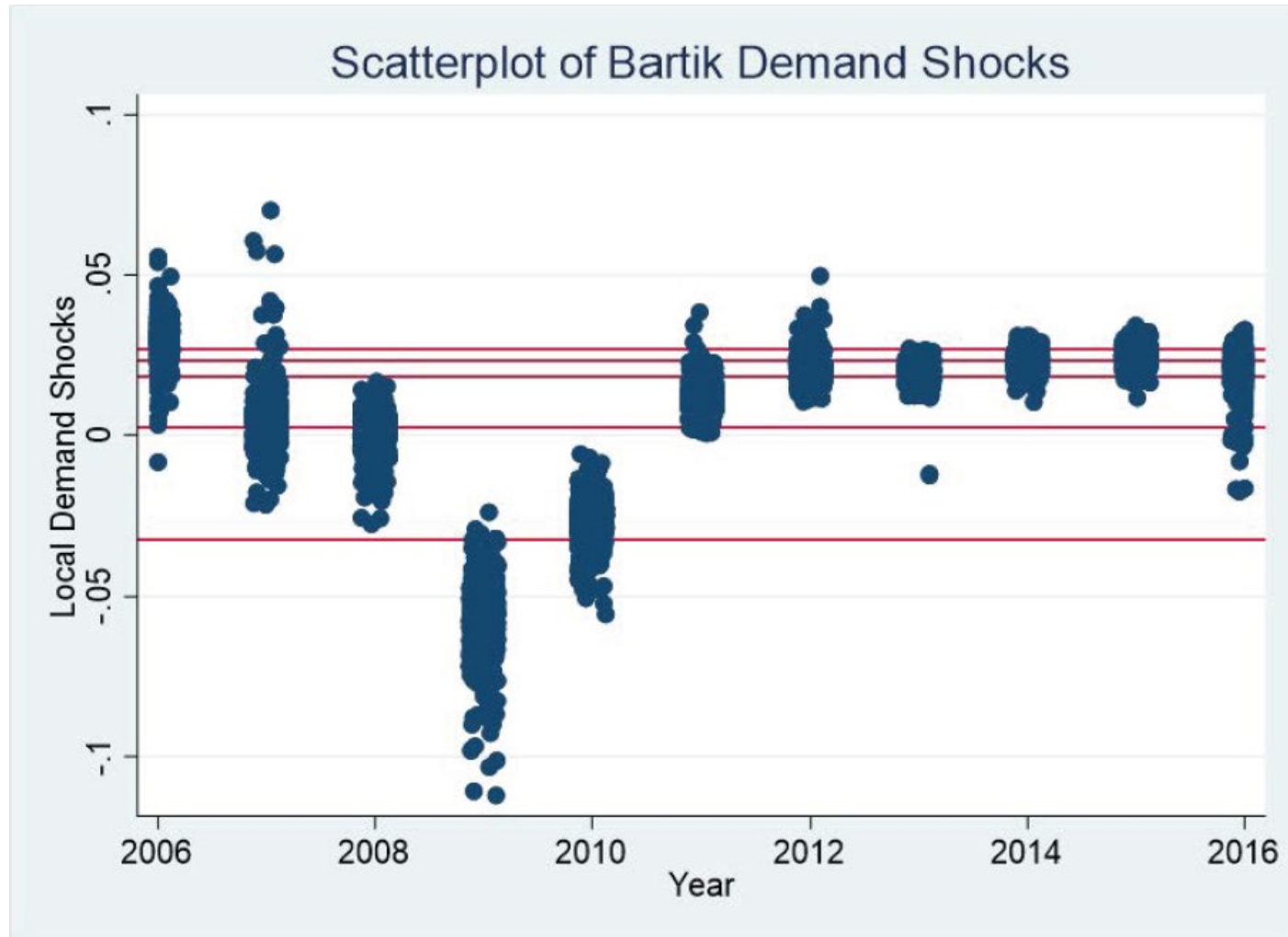
## COUMA geographic identifier

- County identifier if pop 100k
- PUMA identifier if county pop 100k

1/3 of US population in a non-identified county



# The Recession and Local Demand Matter





# Linear Probability Models

The equations we estimate are all a form of a linear probability model on an individual  $i$ 's labor force status in county  $j$  at time  $t$ ,  $Y_{ijt}$ , based on a combination of the natural log of the opioid prescription rate in the individual's county,  $P_{jt}$ , a function of the current local economic conditions (LECs) facing the individual,  $f(LEC_{jt})$ , individual characteristics observed at time  $t$ ,  $X_{it}$ , and a term to represent any unobserved factors,  $\epsilon_{it}$ :

$$Y_{ijt} = \alpha P_{jt} + f(LEC_{jt}) + \beta X_{it} + \epsilon_{it}. \quad (1)$$

# Controls for Local Economic Conditions

## 1 Difference-in-Differences

$$f(LEC_{jt}) = \gamma_j + \delta_t. \quad (2)$$

With both complete time ( $\delta_t$ ) and geographic ( $\gamma_j$ ) fixed effects.

## 2 Specific Controls

$$f(LEC_{jt}) = \eta D_{jt} + \theta \bar{Y}_{j,2000} + \gamma_k + \delta_t. \quad (3)$$

The cyclical control,  $D_{jt}$ , is a Bartik measure of local impacts of national economic changes that is observable in each location over time.  $\bar{Y}_{j,2000}$  are the average labor market outcomes in the location in 2000.

## 3 Comparison Groups

$$f(LEC_{jt}) = \eta D_{jt} + \theta \hat{Y}_{gt} + \gamma_k + \delta_t. \quad (4)$$

$\hat{Y}_{gt}$  is an evolving average level of labor market outcomes based on the location's decile of labor market outcomes by sex and whether it is an identified county in 2000 ( $g$ ).

# Vary the Level of the Location Fixed Effects

Table 3: Participation of Prime-Age Men and Women, Varying Fixed Effects

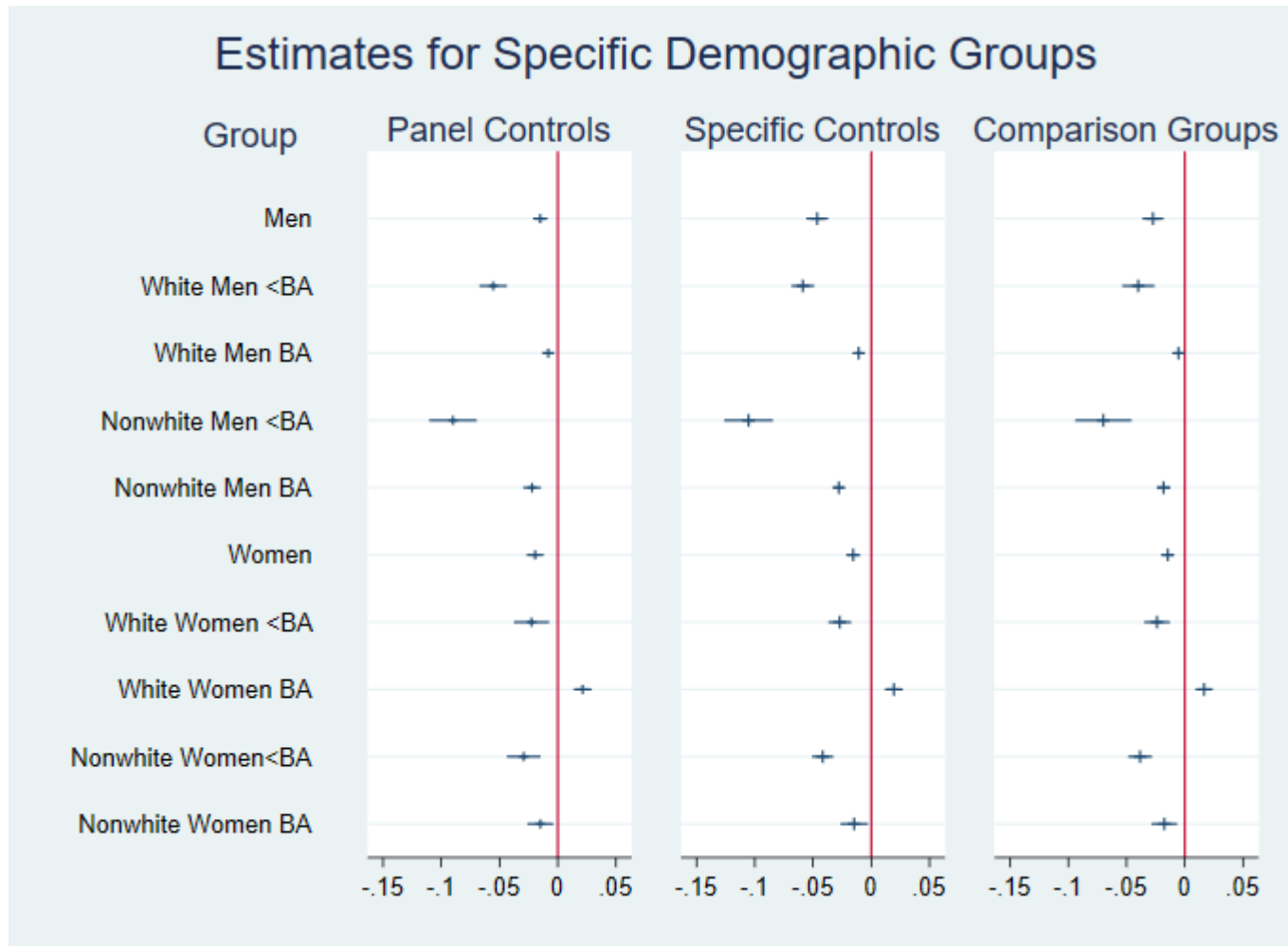
	Men			Women		
	Census Division	State	Couma	Census Division	State	Couma
Prescrip. Rate	-0.041*** (0.002)	-0.050*** (0.003)	-0.015*** (0.003)	-0.010*** (0.003)	-0.006** (0.002)	-0.019*** (0.004)
R-sqr	0.09	0.09	0.10	0.06	0.06	0.06
N	6440267	6440267	6440267	6655308	6655308	6655308

All regressions include demographic variables and year fixed effects.

Robust standard errors with clustering on couma x year.

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

# Demographic Differences are Large

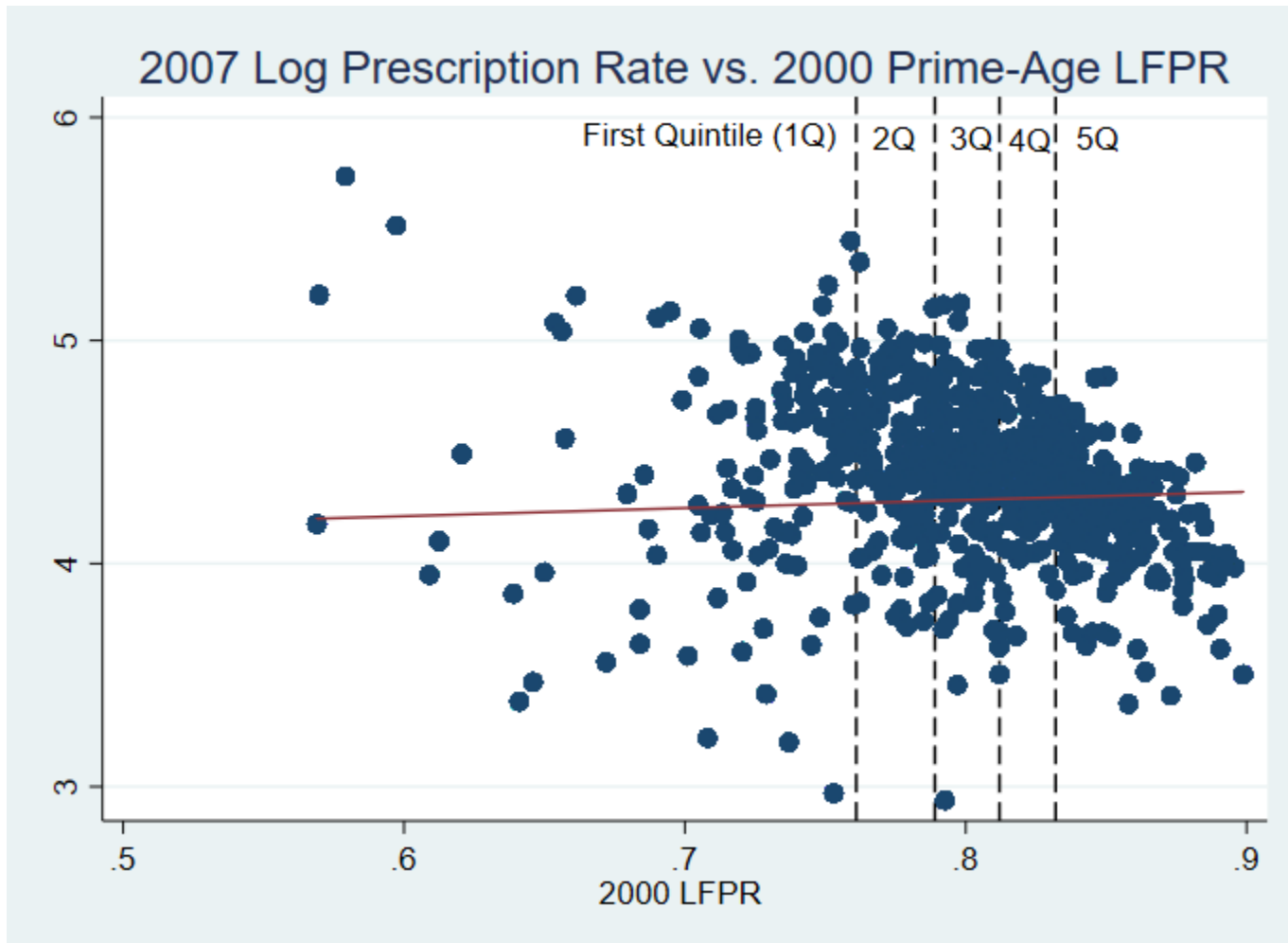


# Do Economic Conditions Increase Opioid Use?

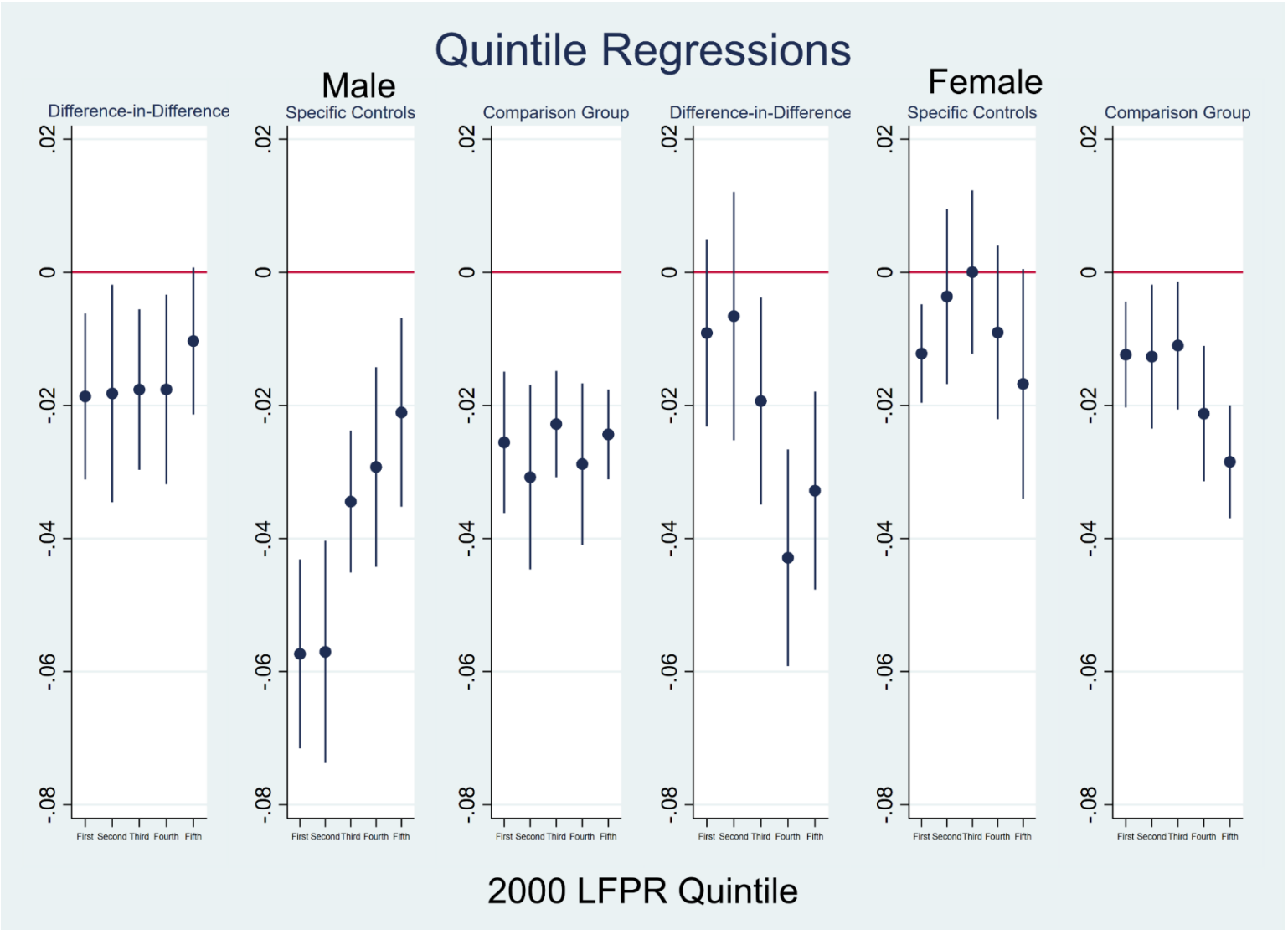
- What about the other direction – the labor market causing opioid use?
- The Great Recession was a major shock to the labor market. If the labor market drives opioid use, we should see an increase in use whose timing coincides with the Great Recession
- Maybe opioid use just occurs where labor markets are bad. Labor market weakness is persistent in many place, so if that determines it should be the case that more troubled places are more impacted

# Are Persistently Bad (Good) Labor Markets Driving our Results?

There are poor labor markets with both high and low prescriptions rates.



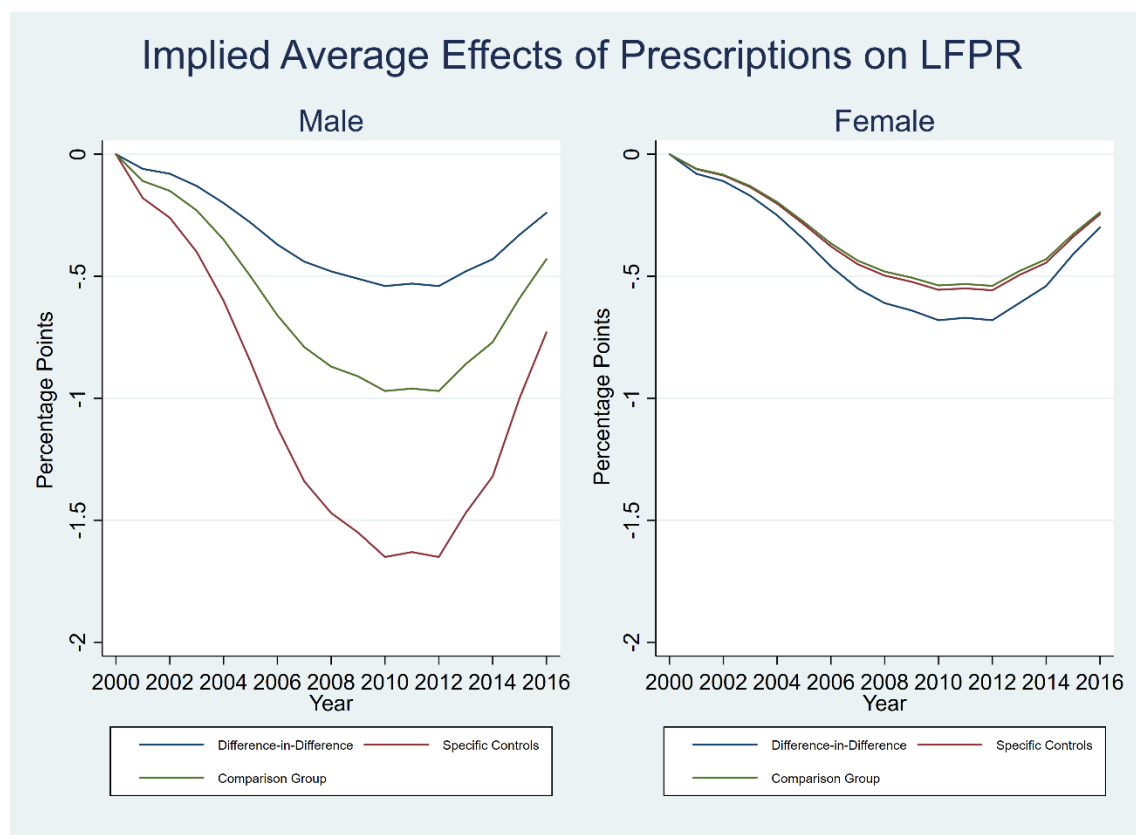
# Regression Coefficients by Quintile of 2000 LFPR





# Implied National Impacts are Really Large

Using our estimates and historical data on national numbers of prescriptions, we can estimate the national impact since 2001.



# Opioids and the Labor Market

- Opioid prescriptions are associated with lower employment and participation rates
- Effects are largest for men with high school or less educations: white and minority
- Effects are generally smaller for women
- The Great Recession does not appear to have boosted use
- Bad labor markets do not appear to be more susceptible to opioid prescriptions
- We estimate a large (model dependent) fraction of the realized decline in prime age labor force participation rate