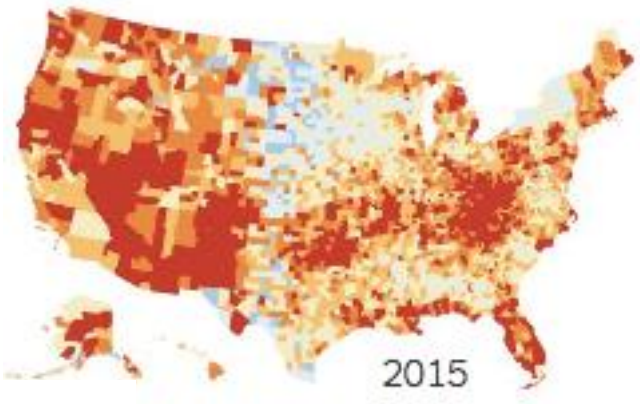
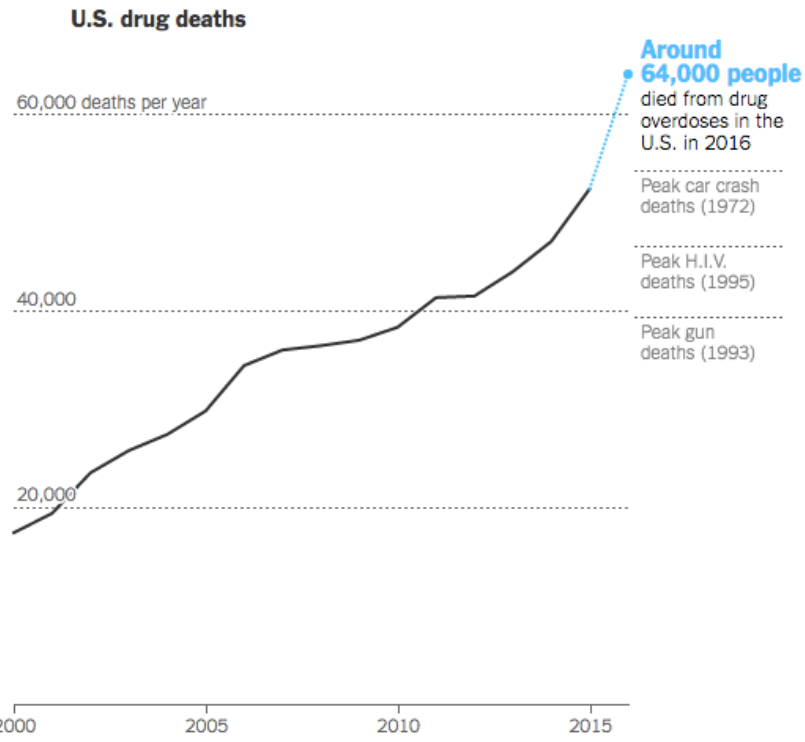
The Affordable Care Act in the Heart of the Opioid Epidemic: Evidence from West Virginia

Brendan Saloner
Johns Hopkins Bloomberg School of Public Health

Michael M. Davis Lecture
University of Chicago CHAS
November 7, 2017

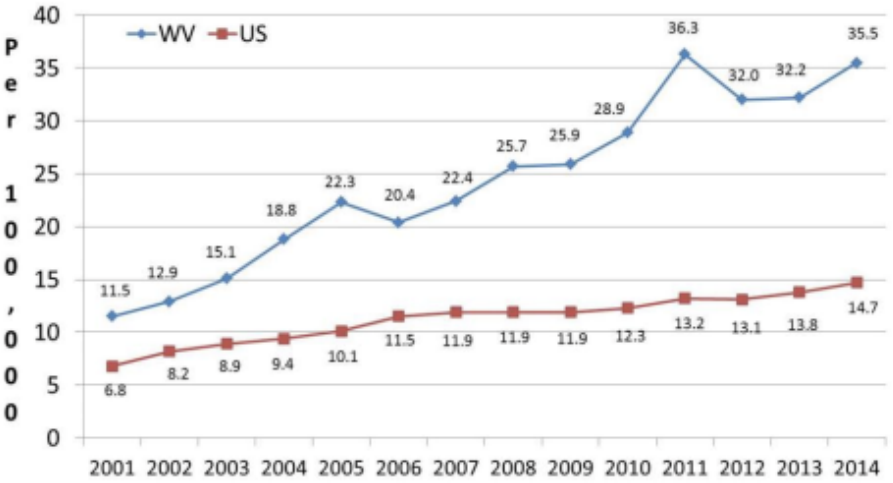
The National Epidemic



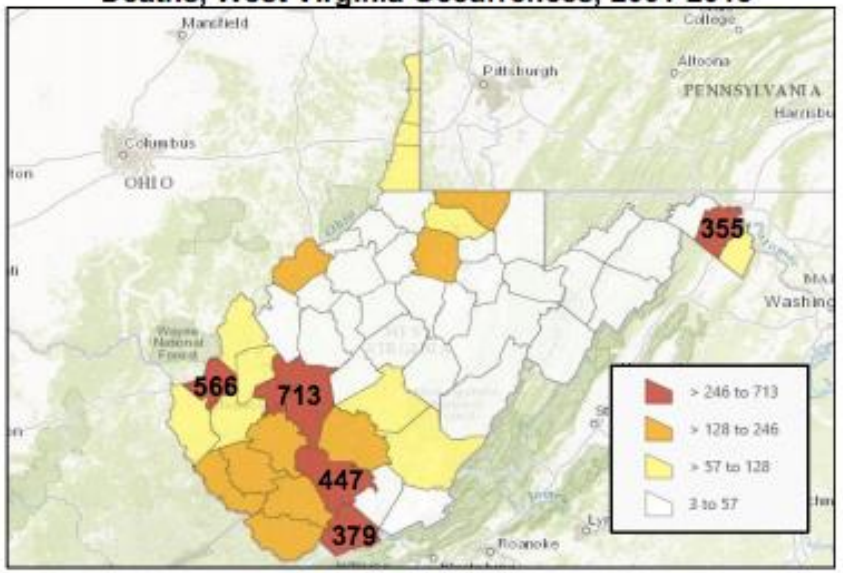


West Virginia is at the Heart of the National Opioid Epidemic

Age-Adjusted Resident Drug Overdose Mortality Rate
West Virginia and United States, 2001-2014

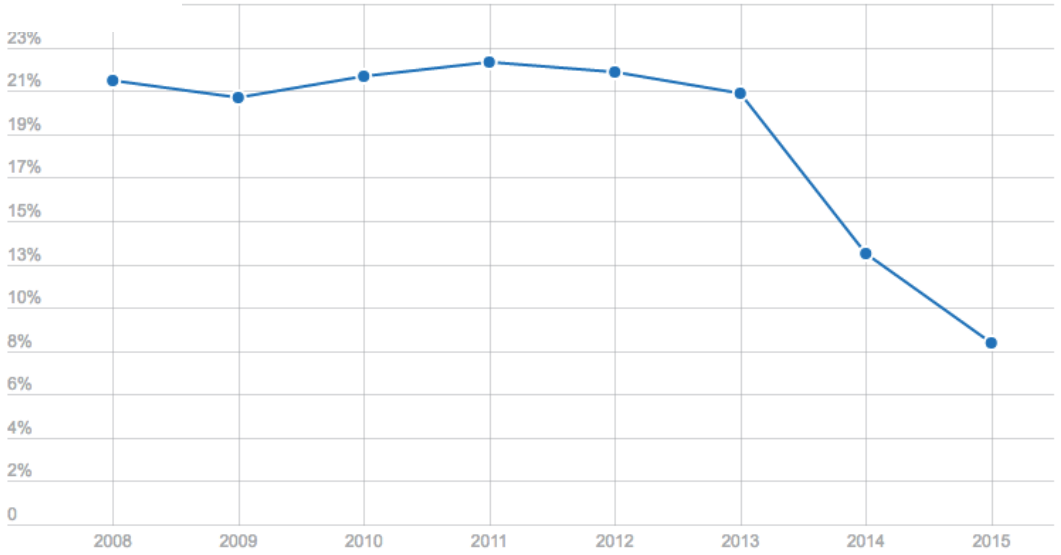


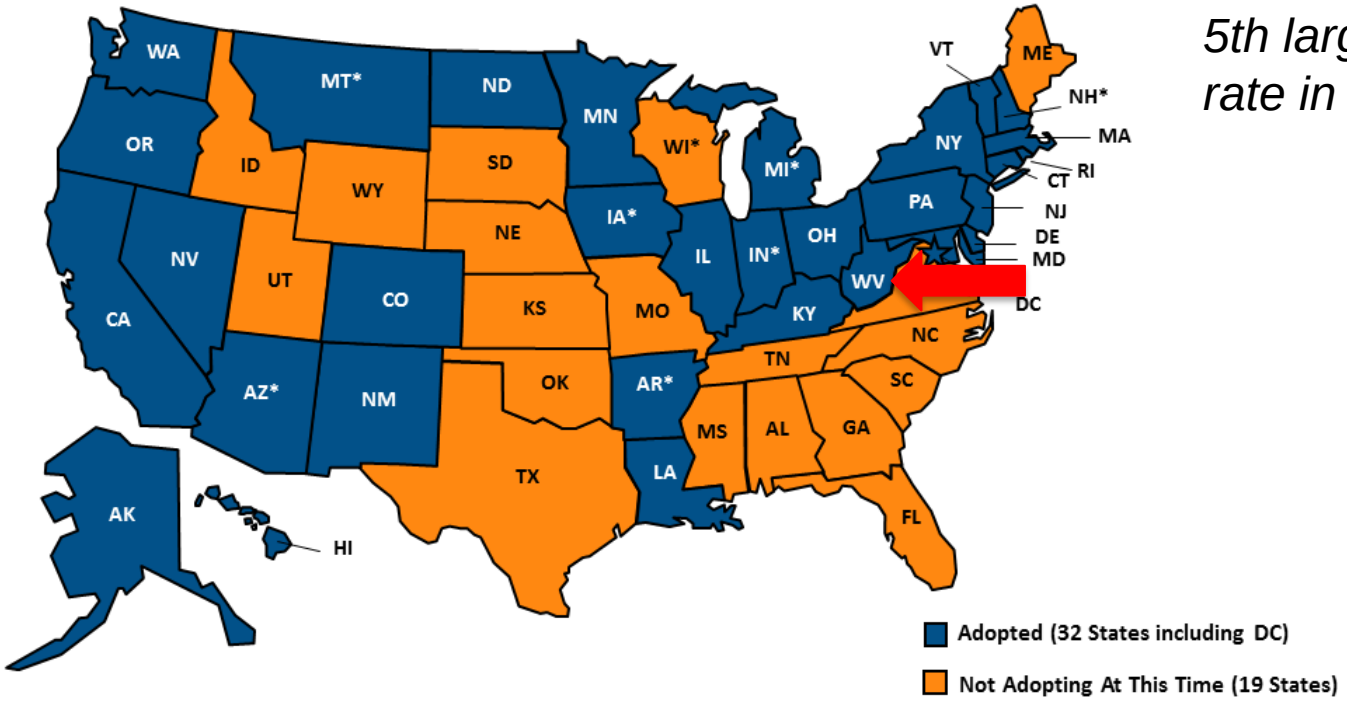
County-Level Distribution of Opioid-Related Overdose Deaths, West Virginia Occurrences, 2001-2015



Data Source: WV Health Statistics Center, Vital Statistics System 2015 Preliminary Data

…and is also the heart of Medicaid expansion





5th largest drop in uninsured rate in US 2013 → 2016[1]

[1]https://www.census.gov/library/publications/2017/demo/p60-260.html

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- Has Medicaid expansion changed the ability of low-income adults with opioid use disorder to access treatment?

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- What are the remaining barriers to receiving quality treatment?

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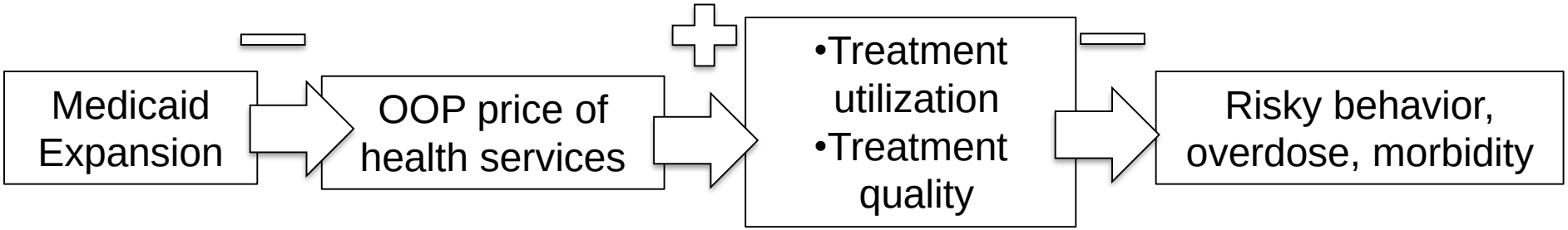
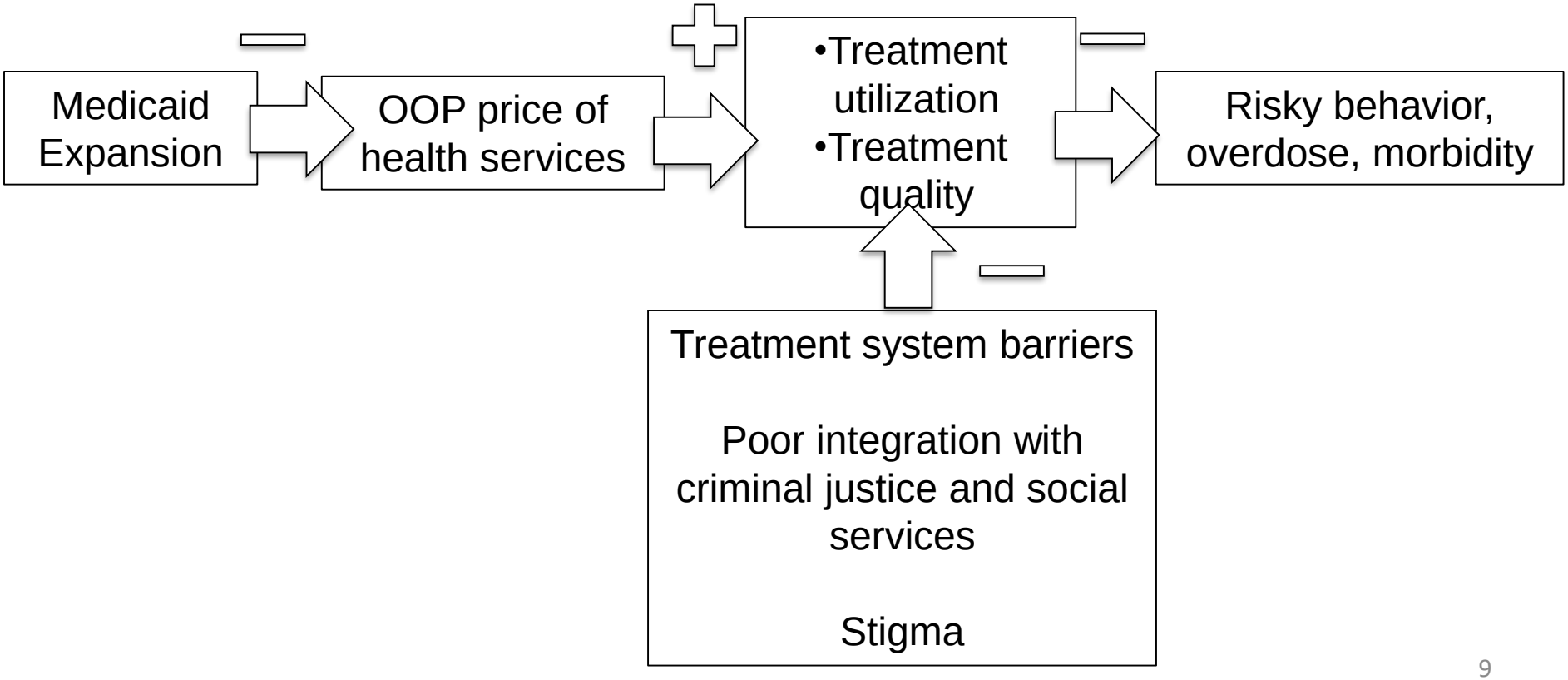
- What are the remaining barriers to receiving quality treatment?
- What are the implications of changing access to care for health status, criminal justice, and social services?

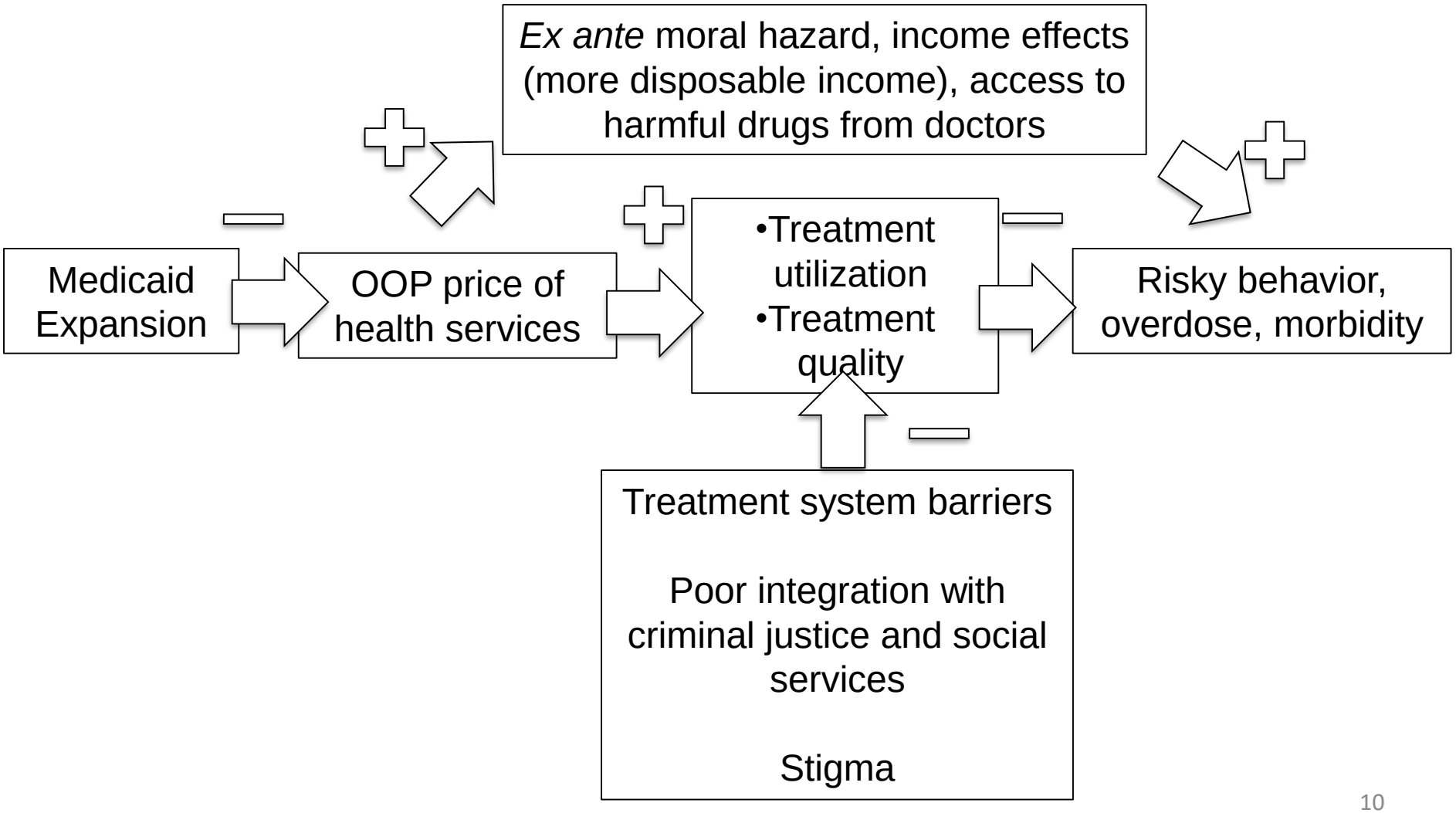
Conceptual Framework



Conceptual Framework



Conceptual Framework



As Trumpcare health bill languishes in politics, former opioid abusers cling to lifeline

"Coming to treatment, it made me find myself again – the me I was before I did drugs,"Dusti Hill said. "If it weren't for this place I wouldn't get my kids back. I wouldn't be happy."

…She hopes to regain custody of her twin girls in the coming weeks and eventually return to school, earn a degree in alcohol and drug dependency, and become a counselor.

***Hill benefited from the Affordable Care Act, dubbed Obamacare,** the healthcare law enabling states to expand Medicaid to adults earning up to 138 percent of the federal poverty level. The law requires insurers to cover 10 essential health benefits, including addiction treatment and mental health services.*

Rural communities would be hit hardest by repeal. In 2015, the 15 counties with the highest mortality from opioid-related overdose were all predominantly rural, and almost all were located in Kentucky and West Virginia — both states that have expanded Medicaid. ***Repeal would abruptly reverse the dramatic insurance expansions that have occurred in these and other states, revoking coverage for medication treatment for tens of thousands of rural Americans with opioid use disorders in the midst of an escalating epidemic.***

"If they have private insurance, I can hook them right up. If they're on Medicaid—and ninety-five per cent of the people I work with are—it's going to be a long wait for them. Weeks, months." He said, "The number of beds would have to increase by a factor of three or four to make any impact."….

The few with private insurance could get rehab anywhere in the country. But most people in town had Medicaid or no insurance at all, and such addicts had to receive treatment somewhere in the state. Currently, the detox facility closest to Martinsburg is about two hours away.

Today's Talk

Part 1: Effects of ACA Medicaid Expansion on Substance Use Disorder Treatment

Part 2: Evidence from West Virginia

Part 3: Predicting overdoses in Maryland using linked clinical and criminal justice data

Part 1:

Effects of ACA Medicaid Expansion on Substance Use Disorder Treatment

NBER Working Paper No. 23342 with Johanna Catherine Maclean.

Funding support: NIDA K01 DA042139

We take full responsibility for findings and views represented in paper.

Data and Methods

Treatment Episode Data Set (TEDS), 2010-2015

- All-payer dataset of admissions to all specialty SUD treatment programs that receive federal funding support
  - Contains ~2 million admissions per year
  - Broadly comparable to nationally representative population of individuals in treatment programs

- 50 states and DC report on admissions in virtually all years
  - 31 states further report insurance status of admissions, 26 report source of payment for admissions

- We restrict to age>18 and aggregate data to state-year observations

Data and Methods

Medicaid State Drug Utilization Data (SDUD), 2011-2015

- Reports from states on outpatient drugs covered under Medicaid drug rebate program
- We focus on number of Medicaid-reimbursed fills per 100,000 adults for FDA approved addiction medications: buprenorphine, naltrexone, acamprosate, disulfiram, and topiramate

National Vital Statistics Mortality Files, 2010-2015

- State aggregated death rate for causes related to drug overdose and alcohol poisoning per 100k adults age>18

Data and Methods

Medicaid expansion status

- We rely on Kaiser Family Foundation reports on timing of state ACA Medicaid expansions

Other covariates

- Annual state level socio-demographics
- Annual measures reflecting safety net generosity (mean TANF and SNAP payments for a family of four)

State	Expansion date
Early expanding states	
California	7/1/2011
Connecticut	4/1/2010
District of Columbia	7/1/2010
Minnesota	3/1/2011
New Jersey	4/14/2011
Washington	1/3/2011
States expending in 2014	
Arizona	1/1/2014
Arkansas	1/1/2014
Colorado	1/1/2014
Delaware	1/1/2014
Hawaii	1/1/2014
Illinois	1/1/2014
Iowa	1/1/2014
Kentucky	1/1/2014
Maryland	1/1/2014
Massachusetts	1/1/2014
Michigan	4/1/2014
Nevada	1/1/2014
New Hampshire	8/15/2014
New Mexico	1/1/2014
New York	1/1/2014
North Dakota	1/1/2014
Ohio	1/1/2014
Oregon	1/1/2014
Rhode Island	1/1/2014
Vermont	1/1/2014
West Virginia	1/1/2014
Late expanding states	
Alaska	9/1/2015
Indiana	2/1/2015
Montana	1/1/2016
Louisiana	7/1/2016
Pennsylvania	1/1/2015

Data and Methods

Main specification:

$$SUD_{st} = \alpha_0 + \alpha_1 Expand_{st} + \alpha_2' X_{st} + S_s + \tau_t + \varepsilon_{st}$$

SUD_{st} is an SUD treatment outcome in state *s* in time *t*

$Expand_{st}$ is an indicator for whether or not a state has expanded its Medicaid program

X_{st} is a vector of state level characteristics

S_s and τ_t are vectors of state and year fixed effects

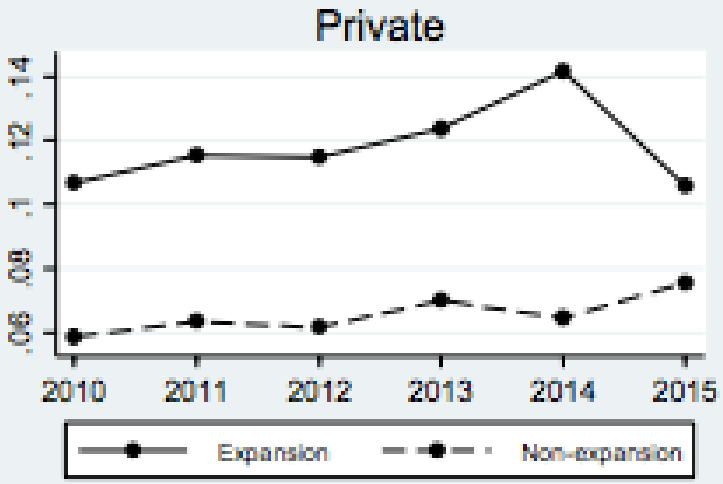
ε_{st} is the error term

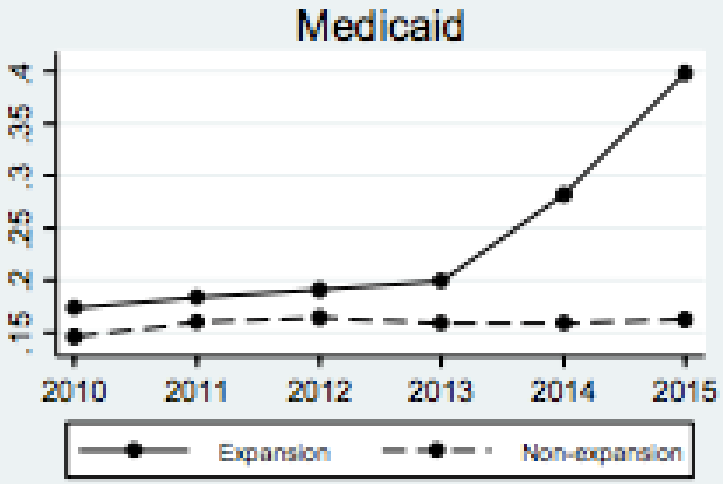
Data and Methods

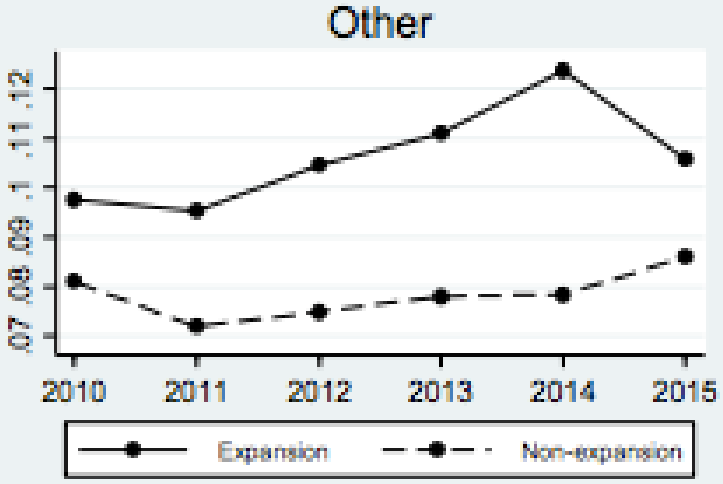
Robustness checks and extensions:

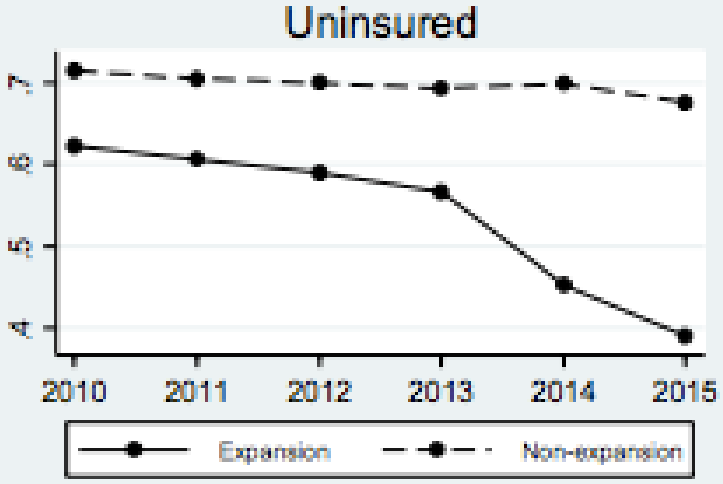
- Tests for parallel trends
- Event study analysis
- Adding state-specific linear time trends
- Weighting data by population size

Unadjusted Trends in Insurance Coverage

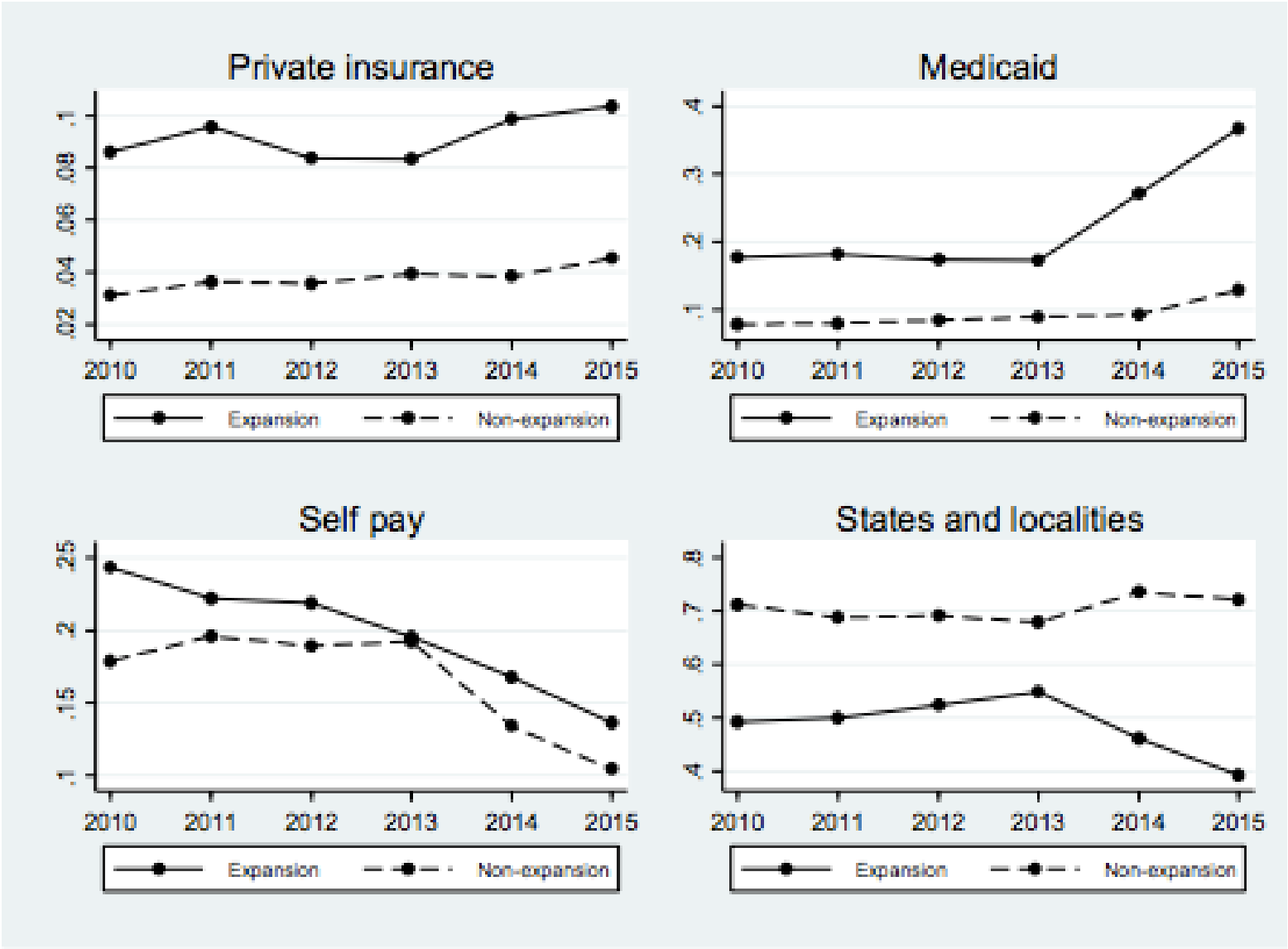








Unadjusted Trends in Payment Source



DD Estimates: Admissions

Outcome:	**Admissions**
Pre-expansion mean in the expansion state group	1062
DD	83.454
	(54.081)
N	299

Notes: All models estimated with OLS and control for state demographics, state fixed effects, and year fixed effects. Standard errors are clustered at the state level and are reported in parentheses.
***;**;*=statistically different from zero at the 1%;5%;10% level.

DD Estimates: Admissions

Outcome:	Admissions
Pre-expansion mean in the expansion state group	1062
2010*treat	-7.429
	(73.793)
2011*treat	-10.706
	(58.941)
2012*treat	-26.256
	(31.902)
2014*treat	55.039
	(51.539)
2015*treat	114.827
	(72.923)
F-test of joint significance of policy leads (*p*-value)	0.8578
N	263

Notes: All models estimated with OLS and control for state demographics, state fixed effects, and year fixed effects. Standard errors are clustered at the state level and are reported in parentheses. The omitted year is 2013. Early expanding states excluded from the sample.
***;**;*=statistically different from zero at the 1%;5%;10% level.

DD Estimates: Insurance Coverage

Outcome:	Private	Medicaid	Other insurance	Uninsured
Pre-expansion proportion in the expansion state group	0.114	0.186	0.109	0.591
DD	0.026	0.132**	0.009	-0.166***
	(0.016)	(0.048)	(0.013)	(0.034)
N	169	169	169	169

Notes: All models estimated with OLS and control for state demographics, state fixed effects, and year fixed effects. Insurance state sample includes the following states: AK, AL, AR, CO, DC, DE, HI, IA, IL, IN, KS, KY, MA, MD, ME, MO, MT, ND, NE, NH, NJ, NV, OR, PA, SC, SD, TN, TX, and UT. Standard errors are clustered at the state level and are reported in parentheses.

***;**;*=statistically different from zero at the 1%;5%;10% level.

DD Estimates: Payment Source

Outcome:	Private	Medicaid	Self-pay	States and localities
Pre-expansion proportion in the expansion state group	0.087	0.173	0.109	0.521
DD	0.015	0.129***	-0.029	-0.115**
	(0.012)	(0.036)	(0.025)	(0.045)
N	145	145	145	145

Notes: All models estimated with OLS and control for state demographics, state fixed effects, and year fixed effects. Payment source state sample includes the following states: AK, AR, CO, DC, HI, IA, ID, KS, KY, MO, MS, MT, ND, NE, NH, NJ, NV, OH, PA, RI, SC, SD, TX, UT, and VT. Standard errors are clustered at the state level and are reported in parentheses.

***;**;*=statistically different from zero at the 1%;5%;10% level.

DD Estimates: Prescriptions for SUD Medications

Coefficient estimate:	Parallel trends (Treat*time+)	DD
Pre-expansion mean in the expansion state group	806	806
DD	11.667**	355.984***
	(5.135)	(109.328)
N	536	1016

Notes: All models estimated with OLS and control for state demographics, state fixed effects, and period fixed effects. Standard errors are clustered at the state level and are reported in parentheses.
+Early expanding states dropped from the analysis sample.
***;**;*=statistically different from zero at the 1%;5%;10% level.

DD Estimates: Drug and Alcohol Fatalities

Coefficient estimate:	Parallel trends (treat*time+)	DD
Pre-expansion mean in the expansion state group	84	84
DD	0.037	-0.235
	(0.058)	(0.518)
N	720	1224

Notes: All models estimated with OLS and control for state demographics, state fixed effects, and period fixed effects. Standard errors are clustered at the state level and are reported in parentheses.
+Early expanding states dropped from the analysis sample.
***;**;*=statistically different from zero at the 1%;5%;10% level.

Discussion

- Medicaid expansion under the ACA did not change the rate of admission to specialty SUD treatment programs

- However, Medicaid rapidly increased as a source of insurance and payer in expansion states, conditional on receiving treatment

- This is important:
  - Impact on state budgets
  - Impact on out-of-pocket spending

- Findings consistent with other recent studies (Feder et al. 2017; McKenna 2017; Saloner et al. 2016)

Discussion

- SUD Medications financed by Medicaid increased by 42%
  - Does this represents new medication initiation or cost-shifting of existing medication treatment?
  - Demand response may be different for medications than specialty treatment

- No measurable changes in rate of fatal overdoses (yet)

Discussion

- SUD Medications financed by Medicaid increased by 42%
  - Does this represents new medication initiation or cost-shifting of existing medication treatment?
  - Demand response may be different for medications than specialty treatment

- No measurable changes in rate of fatal overdoses (yet)

- Bottom line: Some good news for treatment access, some reason to be concerned

Part 2:

Medicaid Expansion in West Virginia

Joint work with Rachel Landis, Colleen Barry, Bradley Stein

Data are provided by West Virginia Department of Health and Human Resources

Funding support: NIDA K01 DA042139

We take full responsibility for findings and views represented in paper.

Contribution of This Study

- To characterize trends in diagnosis and initiation in treatment with greater granularity over the first three years of Medicaid expansion and differences across substate areas

- To examine treatment indicators related to quality of care (e.g., counseling)

- *(Ongoing)* To examine association of entry into treatment with overall spending and service use

Methods

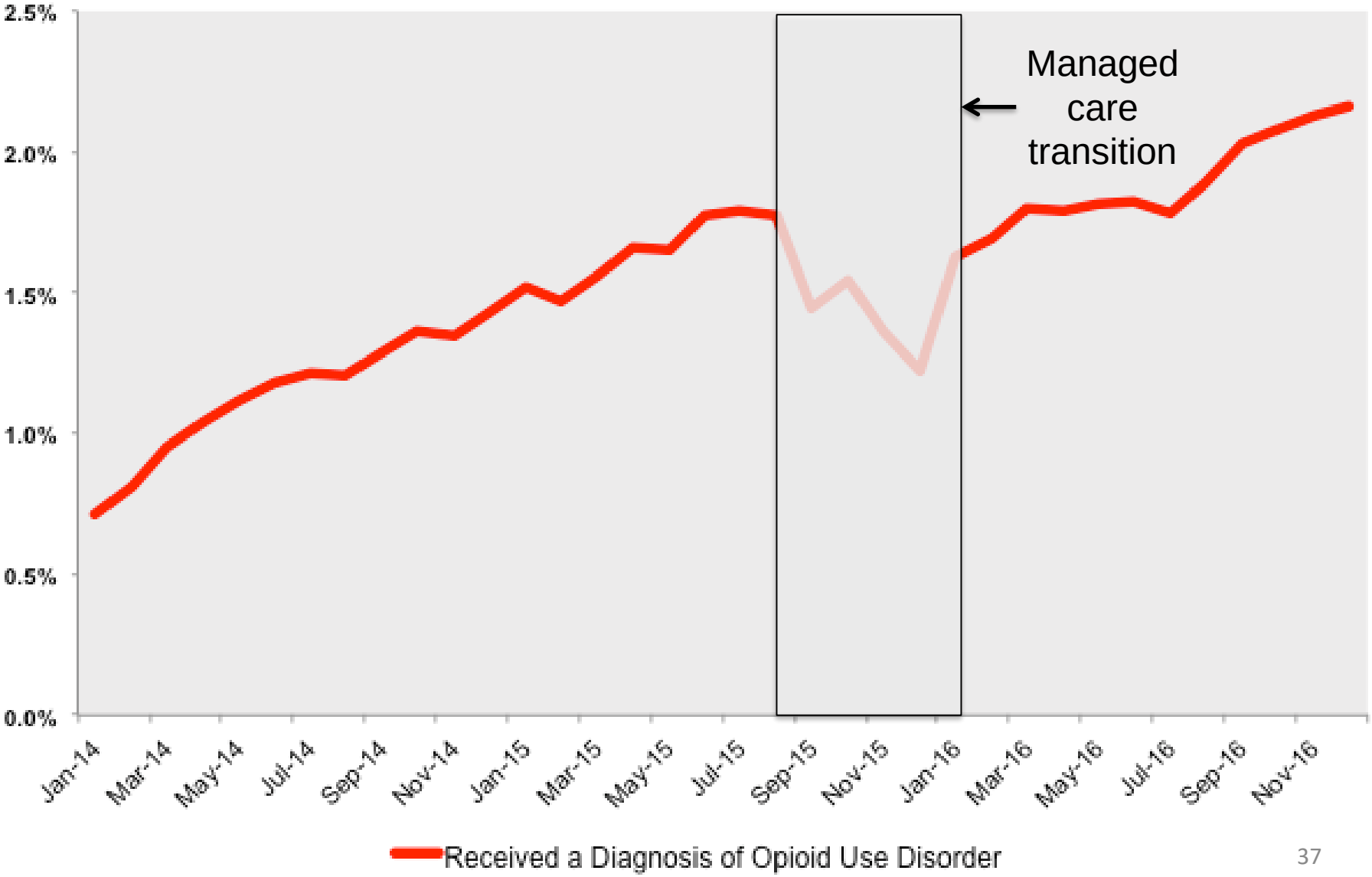
- Claims aggregated into person-year and person-months
- Diagnosis of OUD and overdoses identified using ICD-9/10 codes
- We classified procedure codes for OUD treatment: counseling, physician consultation, labs/testing, and other, and identified two major medications (buprenorphine and naltrexone)
  - No methadone maintenance coverage during study period
- We examine means and distributions of utilization overall, by OUD diagnosis status, and for individuals who use MAT

OUD diagnosed sample skews younger, more Hispanic, male than full sample

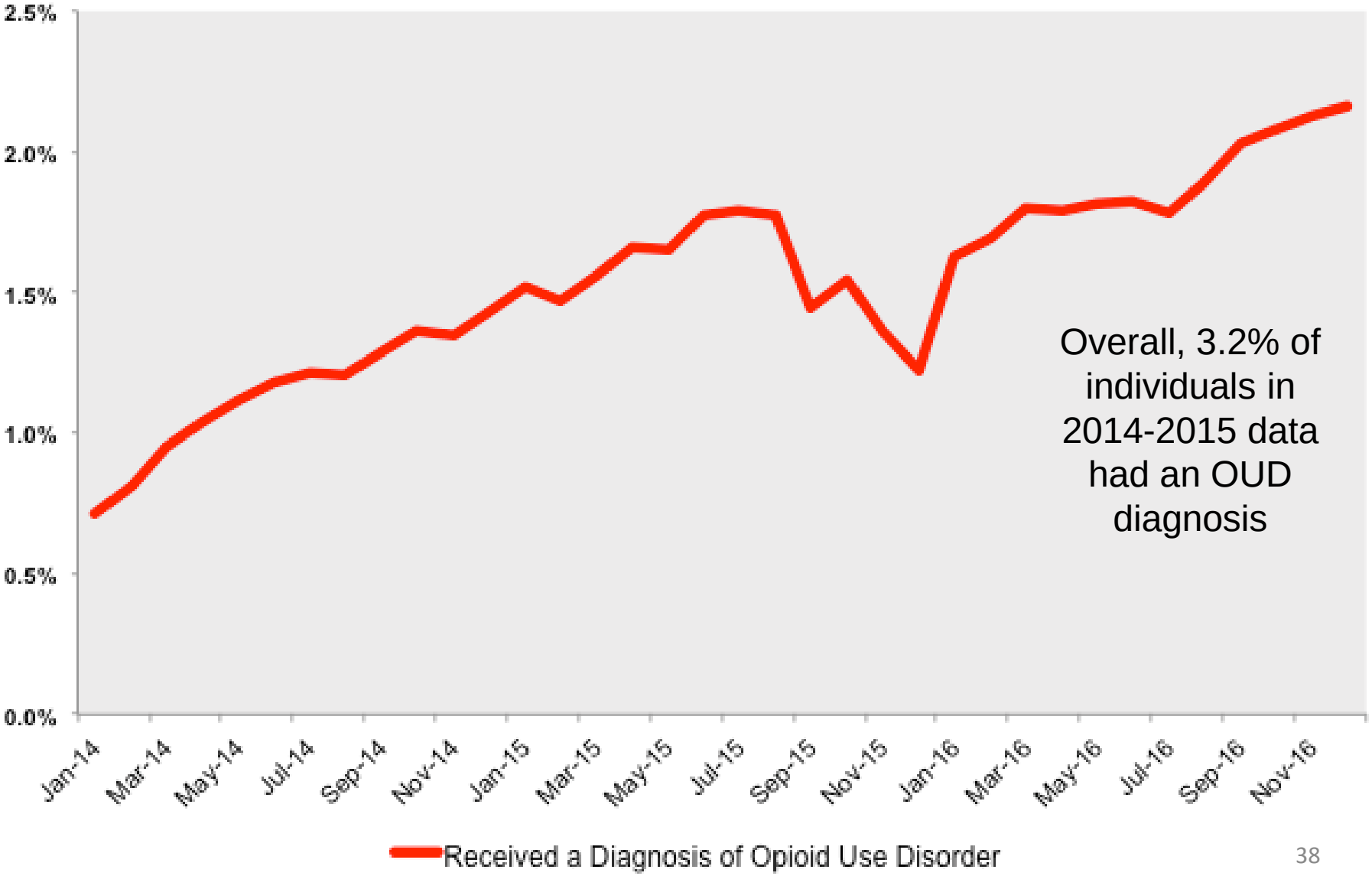
	Full Sample (N=441,022)	Treated for Opioid Use Disorder (N=14,179)
Mean Age in Years	37.2	**32.9**
Male	47.1%	**54.2%**
Female	52.9%	45.8%
Race/Ethnicity		
Non-Hispanic White	88.4%	89.7%
Non-Hispanic Black	4.4%	**1.4%**
Hispanic	1.0%	**4.0%**
Other Race	6.2%	4.8%
County overdose rate		
High OD county	24.60%	**30.72%**
Medium OD County	47.48%	45.65%
Low OD County	27.91%	23.63%
Rural-urban status		
In an MSA	57.9%	**63.5%**
Adjacent to an MSA	28.0%	25.9%
Rural, non-adjacent to MSA	14.1%	10.6%

Note: Unit of analysis is person years

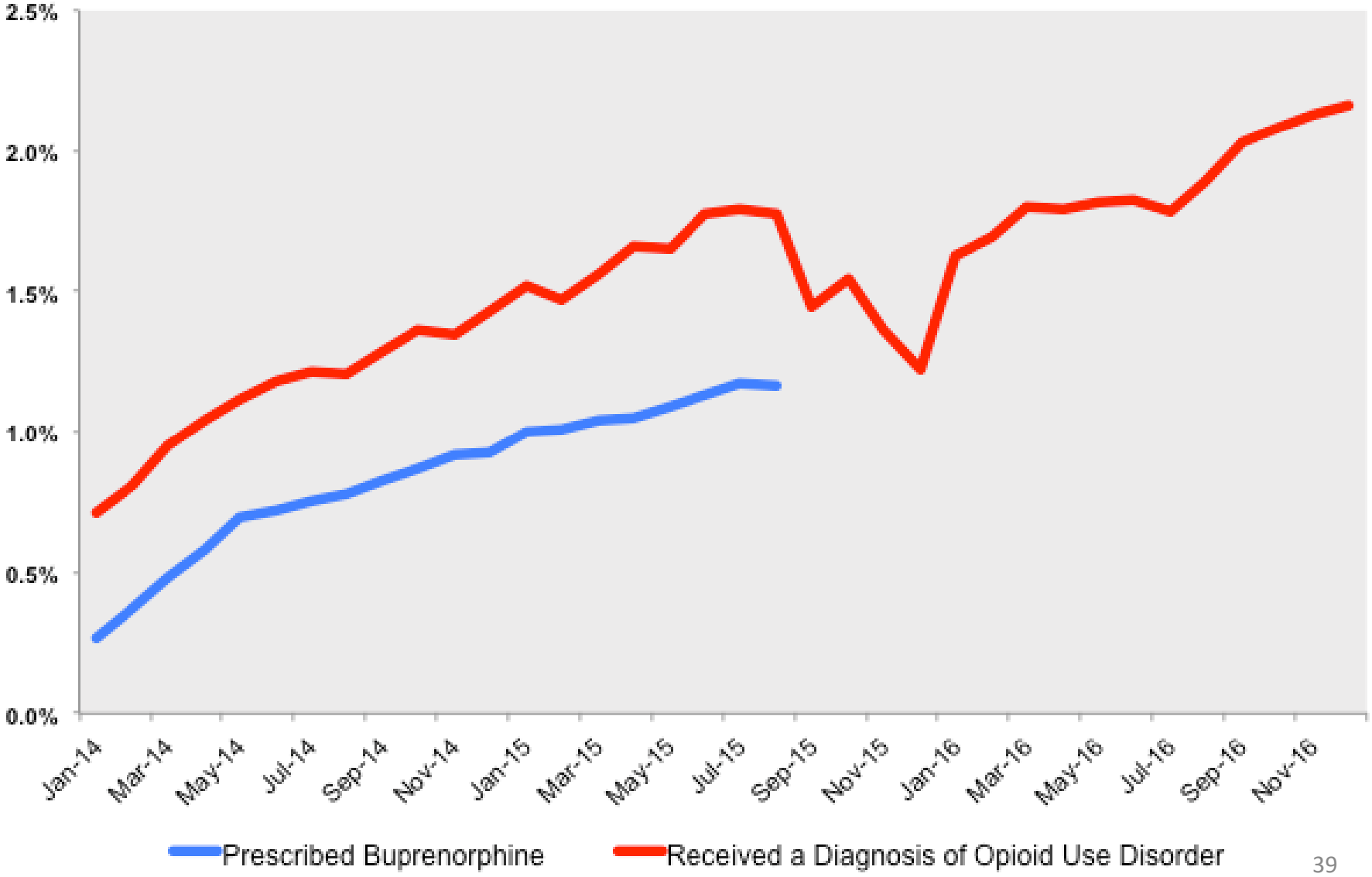
Steady Rise in Diagnosed OUD Prevalence



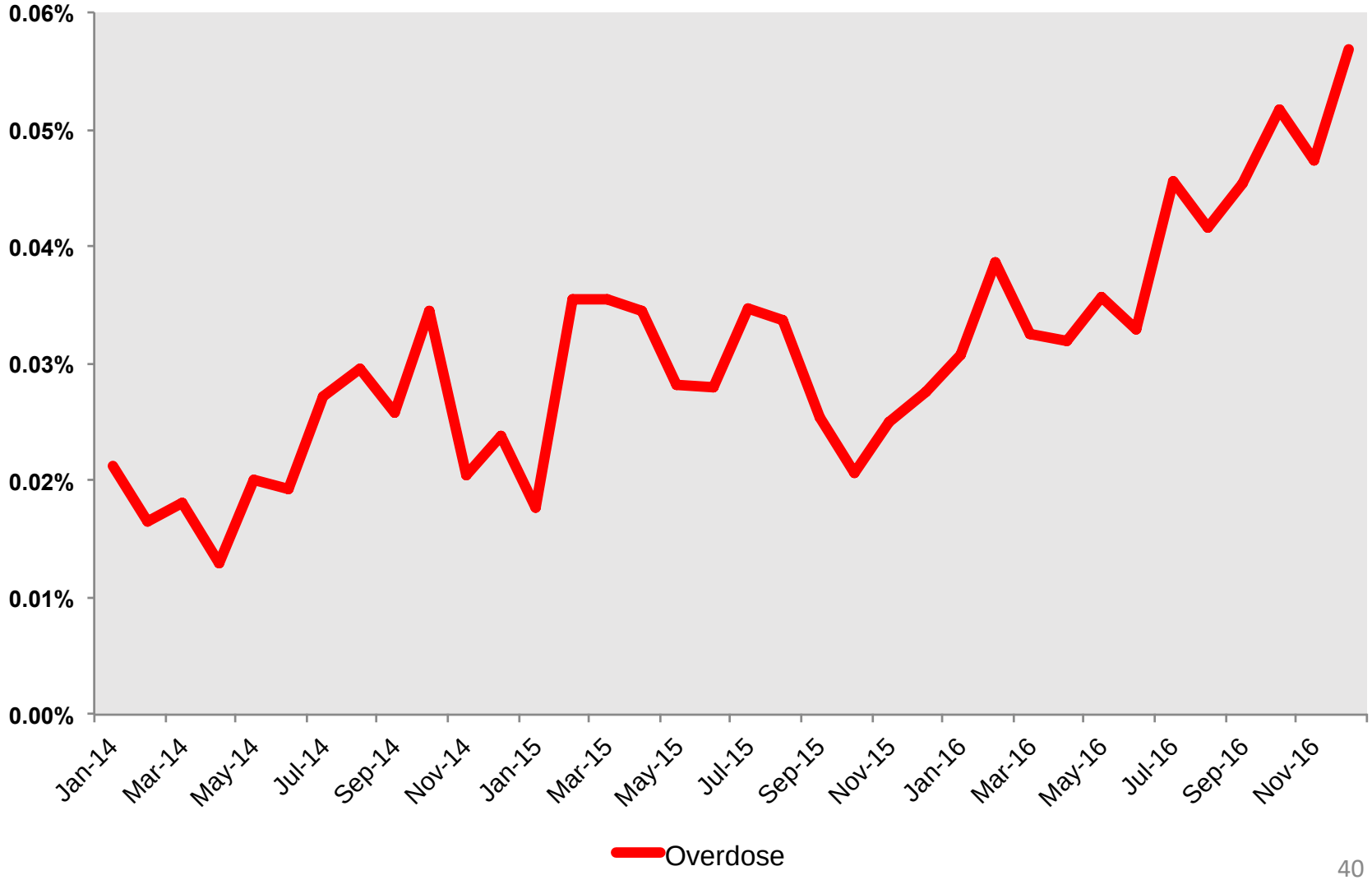
Steady Rise in Diagnosed OUD Prevalence



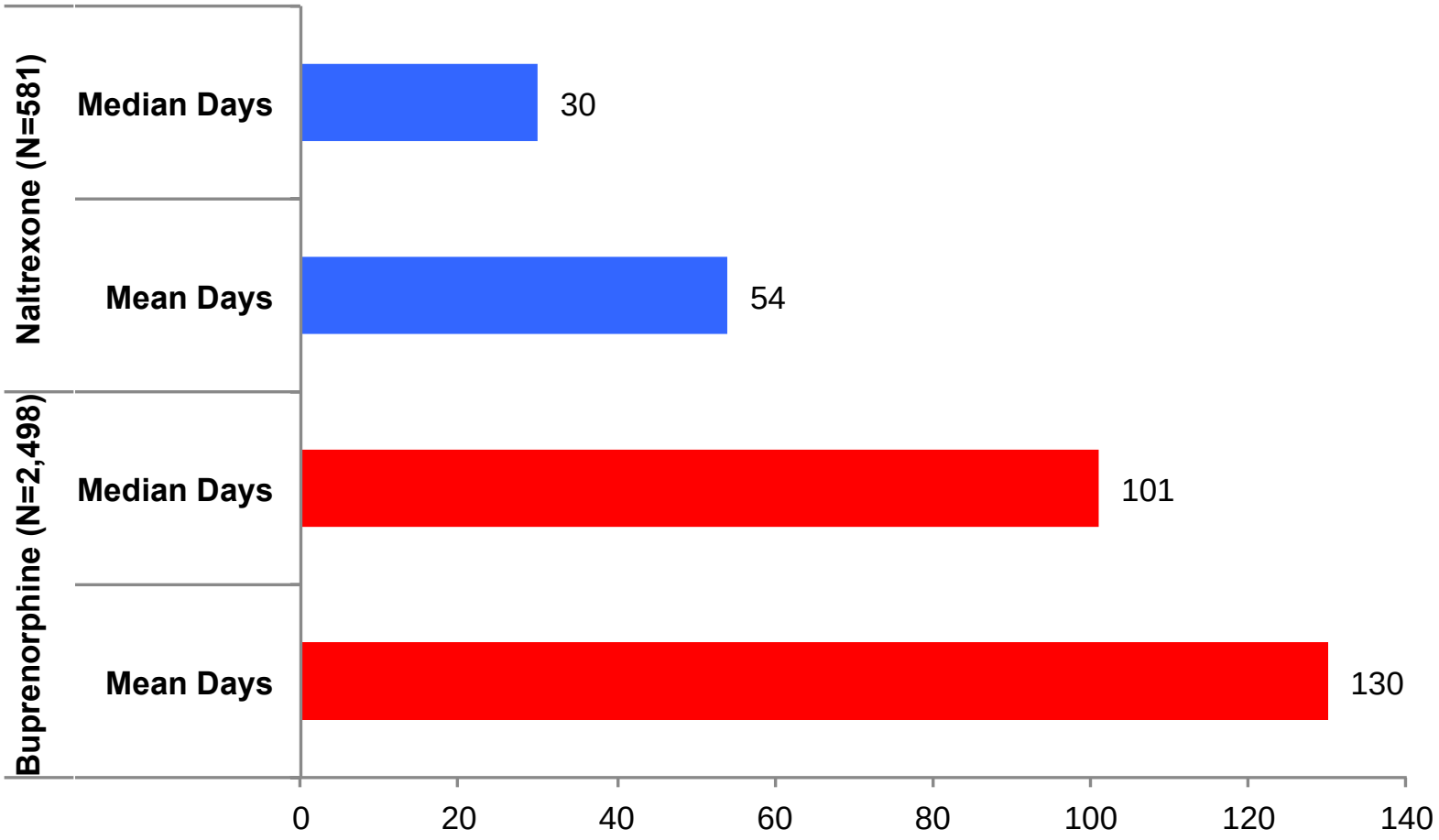
Rising Share of Individuals with OUD Received Buprenorphine (through Q3 2015)



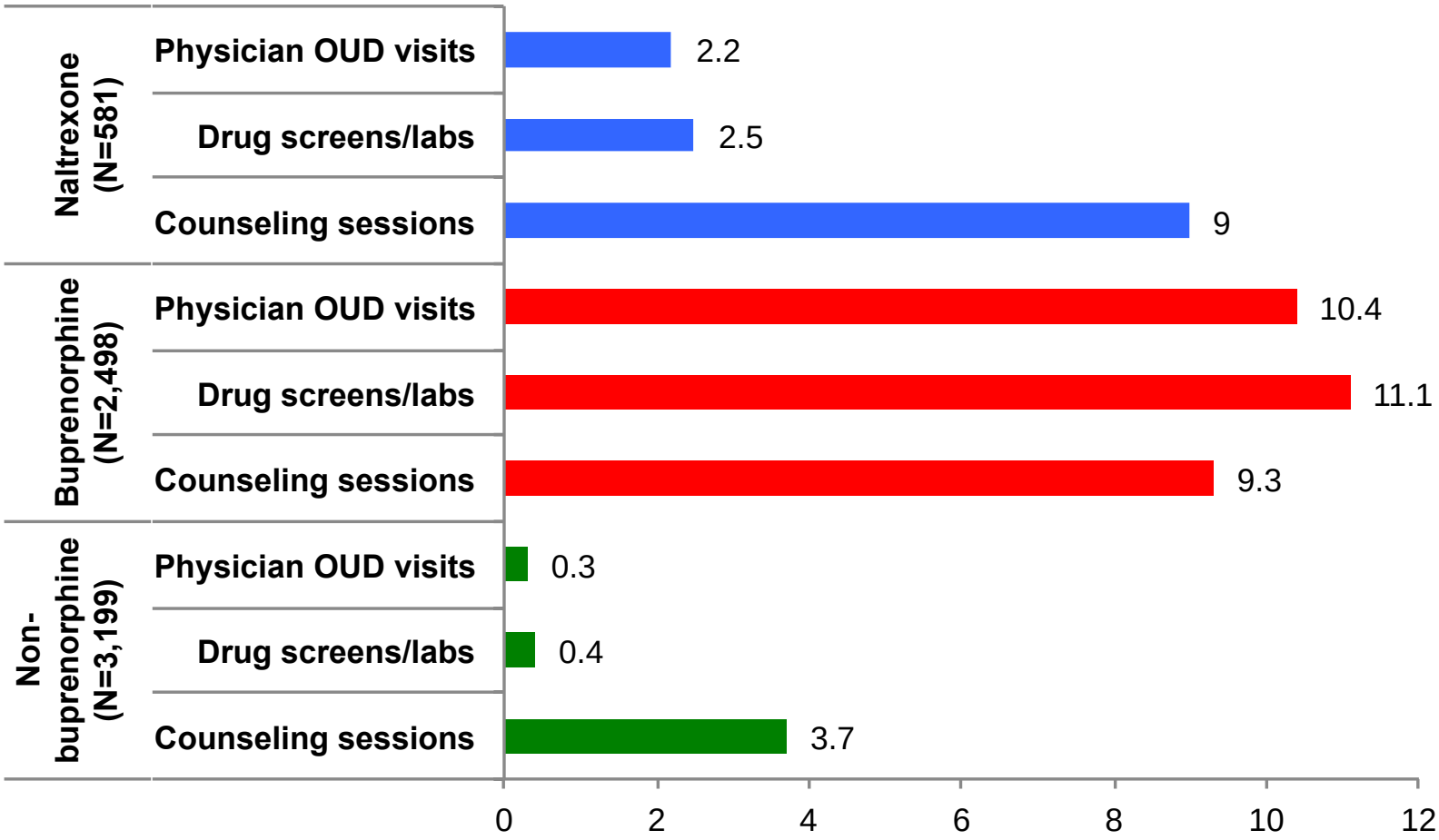
Sharp Rise in Nonfatal Overdoses – 6 per 10,000 members/month by late 2016



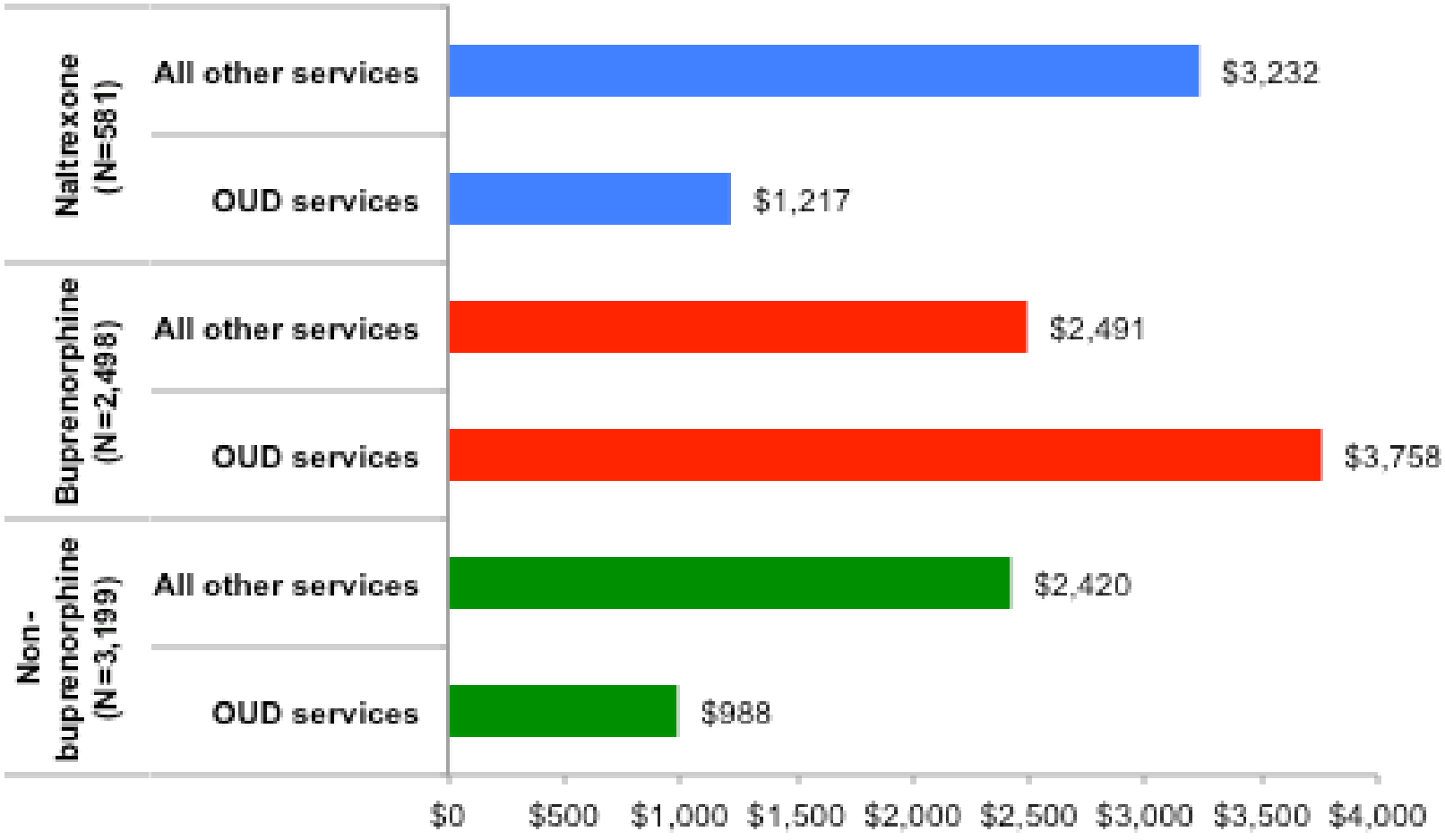
Much Shorter Duration of Treatment for Naltrexone than for Buprenorphine (2014 data)



Individuals Receiving Buprenorphine Had Greatest OUD Related Service Use



OUD Services Much Larger Portion of Spending for Individuals Receiving Bup



Discussion

- 2014-2016 is a period of ramping up of OUD treatment in West Virginia Medicaid expansion, but the need for services is likely also growing during this time
- Less than half of diagnosed (43%) receiving buprenorphine. Those without buprenorphine are retained for shorter periods of time
- Counseling and labs seem to be standard of care for individuals in buprenorphine treatment
  - Good if it results in better monitoring of treatment progress, but could also raise threshold for office-based providers and lead to less access

Comparison with Pennsylvania Study

- Overall, about 3.2% of enrollees in WV Medicaid expansion received an OUD diagnosis in 2 year period
  - Less than diagnosed prevalence previously reported in 2007-2012 Medicaid data from PA (4.5%)

- On the other hand, 43% of WV enrollees used buprenorphine, compared to at most 25% in PA, and higher use of lab tests and counseling in WV than PA

Gordon, A. J., Lo-Ciganic, W. H., Cochran, G., Gellad, W. F., Cathers, T., Kelley, D., & Donohue, J. M. (2015). Patterns and quality of buprenorphine opioid agonist treatment in a large Medicaid program. Journal of addiction medicine, 9(6), 470-477.

Next Steps

- **Within subject analyses:** measuring time to first diagnosis from program entry, spending on OUD and other services during treated and untreated periods
- **Geographic analysis:** our 2016 data has ZIP code identifiers, allowing for more detailed analysis of proximity to service providers
- **State policy change:** state just added OTP methadone services to benefit package
- **Comparisons with other states:** comparison with expansion in Maryland and other regional states

Part 3:

Predicting overdoses in Maryland using linked clinical and criminal justice data

Joint work with Johns Hopkins team (Weiner, Jarman, Schneider, Krawczyk, Lemke, Richards), Chesapeake Regional Information Systems for our Patients (Ferris) and Maryland Department of Health

Funder US Department of Justice Bureau of Justice Assistance Harold Rogers Funding to Support Interstate Data Sharing Activities

We take full responsibility for findings and views represented in paper.

Project motivation: Overdose is a preventable event

Our hypothesis is that we can develop a predictive risk model that can reliably identify individuals at high risk of an overdose

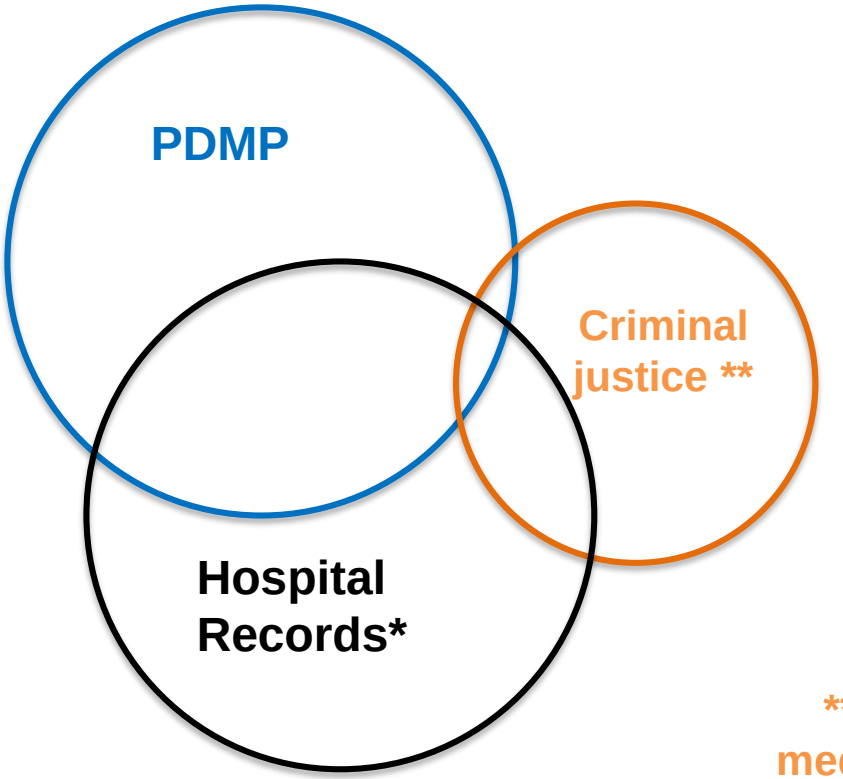
This model can be developed by:

- Proactive case detection within the PDMP
- Looking *beyond* the PDMP at other clinical and non-clinical person-level databases

Along the way, we hope to learn much more about factors (e.g., treatment) that protect against risk of adverse opioid events

Conceptual View of the Project's Three Phases

Phase 1: Link databases



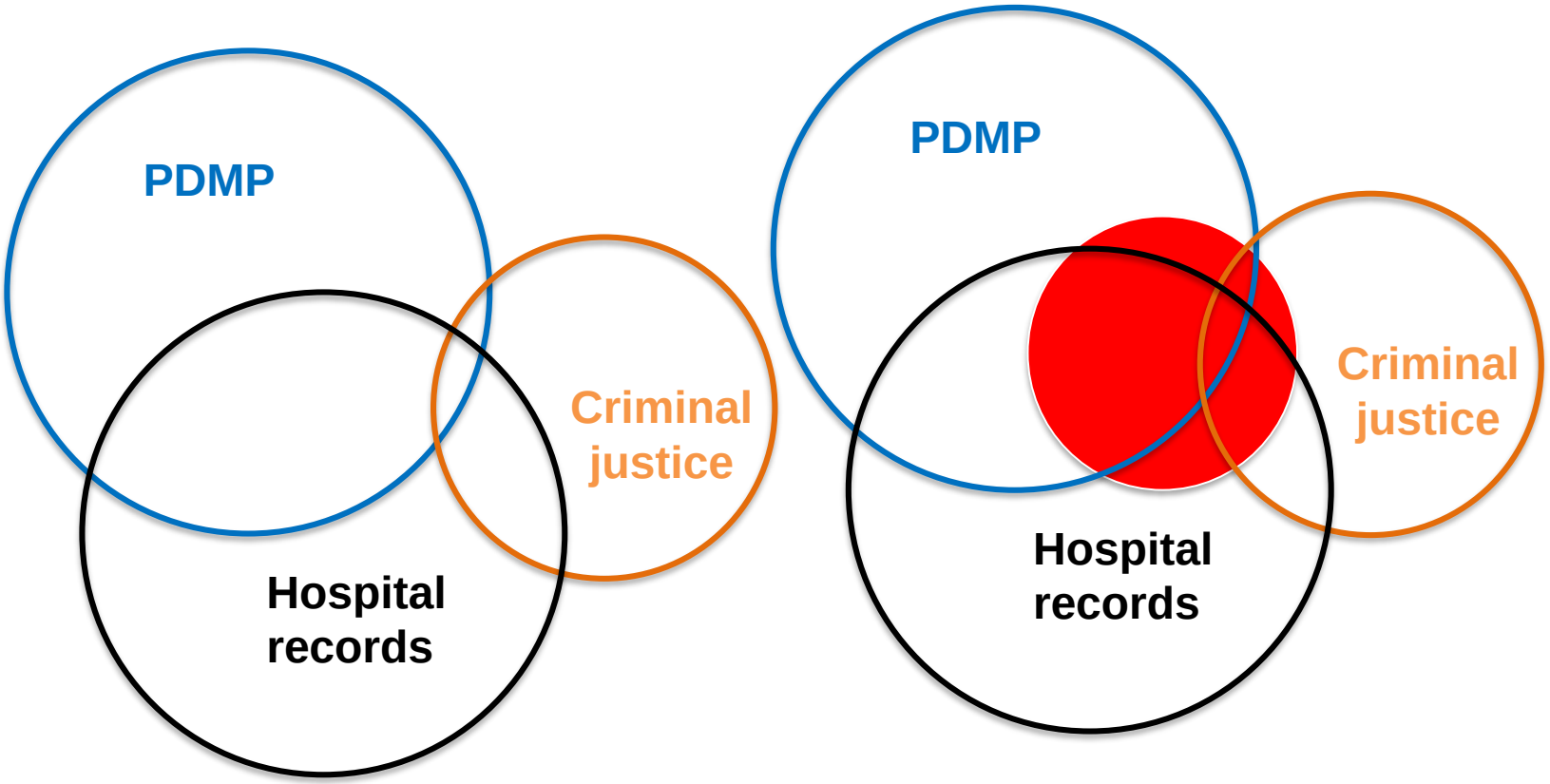
** And other non medical data such as juvenile services

* And other clinical data such as OCME and BEACON

Conceptual View of the Project's Three Phases

Phase 1: Link databases

Phase 2: Identify high risk cohort w/ predictive risk modeling

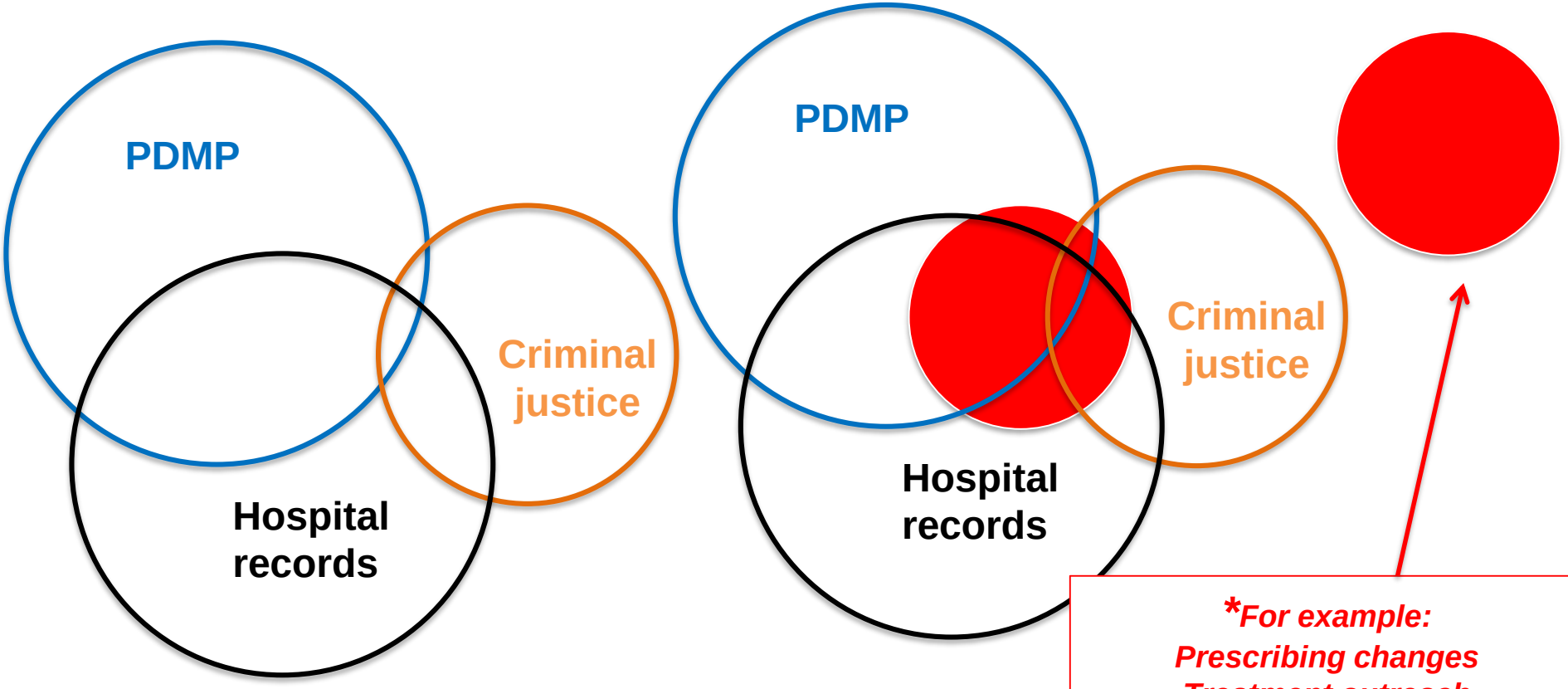


Conceptual View of the Project's Three Phases

Phase 1: Link databases

Phase 2: Identify high risk cohort w/ predictive risk modeling

Phase 3: Pilot interventions w/ high risk cohort*



**For example:*
Prescribing changes
Treatment outreach
Harm reduction
Community interventions

Targeting Areas for Study

- Descriptively: how many overdose decedents have a prescription history in the PDMP? Is there a predictable cascade of adverse events before a fatal overdose? How much is risk concentrated spatially and temporally?

- How well can overdose risk be detected solely using the PDMP? What about the PDMP + each database?

- How much does prediction improve with a greater look-back period (e.g., prior month versus prior year)?

Linking multiple databases

Maryland Prescription Drug Monitoring Program

Office of Chief Medical Examiner

Health Services Cost Review Commission

Statewide Maryland Automated Tracking System

Department of Public Safety and Correctional Services

Linking multiple databases

Maryland Prescription Drug Monitoring Program

Office of Chief Medical Examiner

Health Services Cost Review Commission

Statewide Maryland Automated Tracking System

Department of Public Safety and Correctional Services

- Universe of controlled substance prescriptions in Maryland 2013-present
- Opioid quantity, duration, type
- Dose escalation
- Doctor/pharmacy shopping
- Non-opioid controlled substance prescriptions

Linking multiple databases

Maryland Prescription Drug Monitoring Program

Office of Chief Medical Examiner

Health Services Cost Review Commission

Statewide Maryland Automated Tracking System

Department of Public Safety and Correctional Services

- All investigated deaths related to opioids
- Toxicology reports
- Manner of death
- Location
- Narrative (free text)

Linking multiple databases

Maryland Prescription Drug Monitoring Program

Office of Chief Medical Examiner

Health Services Cost Review Commission

- Universe of all hospital visits in Maryland
- Hospital visits for opioid poisoning
- Visits for all other causes (e.g., injuries, psychiatric)

Statewide Maryland Automated Tracking System

Department of Public Safety and Correctional Services

Linking multiple databases

Maryland Prescription Drug Monitoring Program

Office of Chief Medical Examiner

Health Services Cost Review Commission

Statewide Maryland Automated Tracking System

Department of Public Safety and Correctional Services

- Universe of admissions to substance abuse treatment programs
- Number of prior admissions
- Duration of treatment and use of medication-assisted treatment
- Self-reported frequency of illicit use

Linking multiple databases

Maryland Prescription Drug Monitoring Program

Office of Chief Medical Examiner

Health Services Cost Review Commission

Statewide Maryland Automated Tracking System

Department of Public Safety and Correctional Services

- Records of arrests, incarceration, and community supervision
- Detailed criminal violation codes

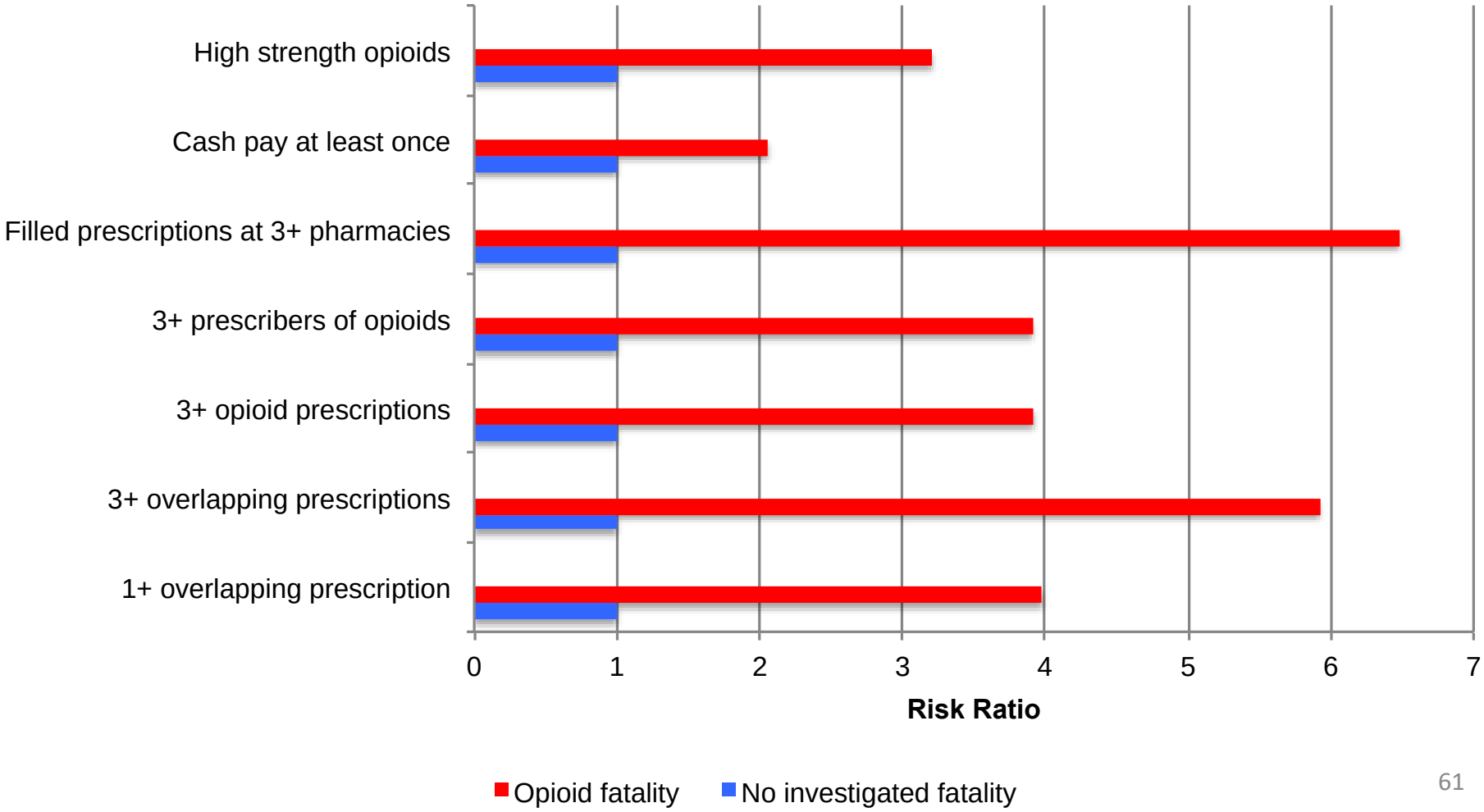
Summary of OCME Investigated Deaths

	Total	2014	2016	% change (2016 -2014)
Overdose Deaths, N	3,795	882	1,824	107%
Heroin	2,513	575	1,196	108%
Fentanyl	1,637	185	1,112	501%
Prescription Opioids	1,089	324	415	28%
Race, N				
Black	1,100	254	560	120%
White	2,574	600	1,203	101%
Hispanic	65	17	35	106%
Other	47	9	22	144%
Sex, N				
Male	2,742	632	1,323	109%
Female	1,051	250	500	100%
Age, N				
19 and Under	42	14	19	36%
20-39	1,651	365	811	122%
40-59	1,814	439	847	93%
60-69	259	58	135	133%
70 and Older	29	6	12	100%
Geography, % (N)				
Baltimore City	1,220	266	608	129%
Central	1,322	311	621	100%
Capital	543	136	142	4%
Western	243	46	80	74%
Eastern	279	73	77	5%
Southern	158	38	48	26%

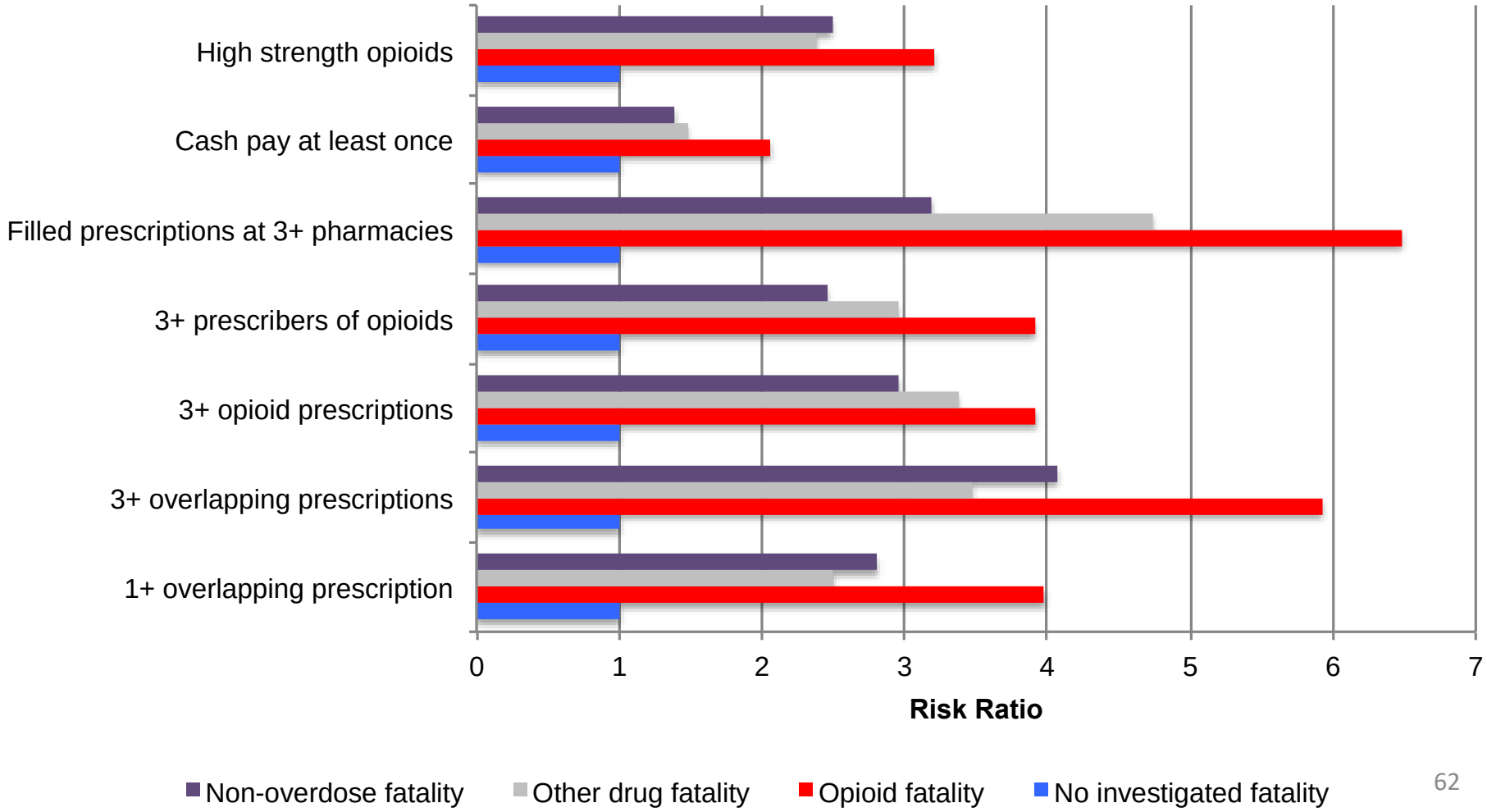
PDMP Population in 2016

Total Prescriptions (N)	7,298,913
Total Individuals with a Prescription (N)	1,625,705
Sex, %	
Male	41.42
Female	58.58
Age, % (N)	
<40	34.62
≥40	65.38
Type of prescriptions, %	
Opioids	53.1
Benzodiazepines	22.73
Days' supply, Mean	
Opioids	58.52
Benzodiazepines	101.23
Number of prescribers among opioid users, %	
1	69.54
2 to 4	27.49
≥5	2.97
Number of pharmacies among opioid users, %	
1	81.5
2 or 3	16.52
≥4	1.98

Linked analysis: predictors of opioid overdose fatality with PDMP



Linked analysis: adding in other non-opioid overdose fatalities



Summary of Findings to Date

- A miniscule proportion of people prescribed opioids fatally overdose, but the fatal overdose population bears a number of prescription-related risk factors
- These risk factors are also predictive of deaths from other overdose drugs and other fatalities (e.g., homicides, suicides, and injuries)
- Hospital and law enforcement records may be another key source of risk factors, as people who fatally overdose are much more likely to be in contact with these entities
- We have much work to learn about the overlap of populations across systems

A Way Forward?

- Medicaid is a lever for changing the substance use disorder treatment system, and improving health and social outcomes… but Medicaid has its limits

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- Viable paths forward requires a strategy coordinated across payers and service systems, including partnerships between criminal justice, specialty providers, and hospitals

Thank you!

Brendan Saloner

bsaloner@jhu.edu

Twitter: @BrendanSaloner