2025 PUBLIC HEALTH LAW CONFERENCE

Connection. Collaboration. Community.

Advancing Policy for Public Health: Using Legal Epidemiology to Advance Harm Reduction Policies to Improve Outcomes Related to HIV and Viral Hepatitis

Introduction

Scott Burris, Temple University

The Network for Public Health Law

Plan for the Session

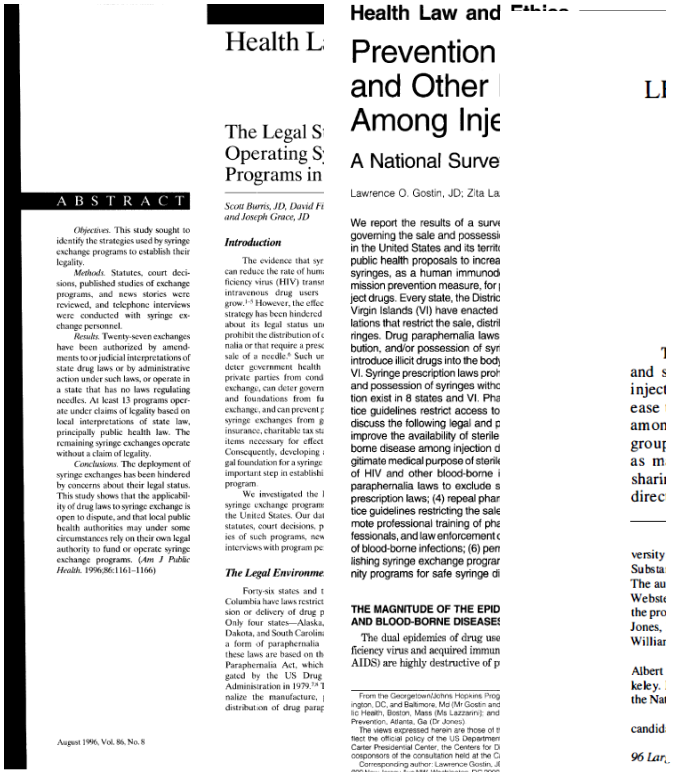
Temple University Beasley School of Law | Center for Public Health Law Research

- Scott Burris (CPHLR): Introduction – Legal Epidemiology and Harm Reduction
- Darian Diepholz (CDC): Overview of this collaborative legal epidemiology project and its origin
- Katie Moran-McCabe (CPHLR): A new Syringe Access Laws dataset
- Tamara Rushovich (Drexel University): Analysis of the impact of SSP laws on infectious endocarditis, hepatitis C, and HIV
- Klaus Mueller (Stony Brook University): A new policy dashboard
- Q&A with attendees

Policy Surveillance

Temple University
Beasley School of Law

Center for Public Health Law Research



ABSTRACT

Objectives. This study sought to identify the strategies used by syringe exchange programs to establish their legality.

Methods. Statutes, court decisions, published studies of exchange programs, and news stories were reviewed, and telephone interviews were conducted with syringe exchange personnel.

Results. Twenty-seven exchanges have been authorized by amendments to or judicial interpretations of state drug laws or by administrative action under such laws, or operate in a state that has no laws regulating needles. At least 13 programs operate under claims of legality based on local interpretations of state law, principally public health law. The remaining syringe exchanges operate without a claim of legality.

Conclusions. The deployment of syringe exchanges has been hindered by concerns about their legal status. This study shows that the applicability of drug laws to syringe exchange is open to dispute, and that local public health authorities may under some circumstances rely on their own legal authority to fund or operate syringe exchange programs. (*Am J Public Health.* 1996;86:1161–1166)

August 1996, Vol. 86, No. 8

Health L

The Legal S
Operating S
Programs in

Scott Burris, JD, David Fi and Joseph Grace, JD

Introduction

The evidence that syr can reduce the rate of hum ficiency virus (HIV) transm intravenous drug users grow.[1-3] However, the effec strategy has been hindered about its legal status un prohibit the distribution of nalia or that require a pres sale of a needle.[6] Such ur deter government health private parties from cond exchange, can deter govern and foundations from fu exchange, and can prevent p syringe exchanges from g insurance, charitable tax st items necessary for effect Consequently, developing gal foundation for a syringe important step in establishi program.

We investigated the l syringe exchange program the United States. Our dat statutes, court decisions, p ies of such programs, new interviews with program pe

The Legal Environme

Forty-six states and t Columbia have laws restrict sion or delivery of drug p Only four states—Alaska, Dakota, and South Carolin a form of paraphernalia these laws are based on th Paraphernalia Act, which gated by the US Drug Administration in 1979.[7,8] T nalize the manufacture, distribution of drug parap

Reproduced with permission of the copyright owner. Further reproductio

Health Law and Ethics

Prevention
and Other
Among Inje

A National Surve

Lawrence O. Gostin, JD; Zita La

We report the results of a surv governing the sale and possessi in the United States and its territ public health proposals to increa syringes, as a human immunod mission prevention measure, for ject drugs. Every state, the Distric Virgin Islands (VI) have enacted lations that restrict the sale, distril ringes. Drug paraphernalia laws bution, and/or possession of syr introduce illicit drugs into the body VI. Syringe prescription laws proh and possession of syringes witho tion exist in 8 states and VI. Pha tice guidelines restrict access to discuss the following legal and p improve the availability of sterile borne disease among injection d gitimate medical purpose of sterile of HIV and other blood-borne i paraphernalia laws to exclude s prescription laws; (4) repeal phar tice guidelines restricting the sale mote professional training of pha fessionals, and law enforcement of of blood-borne infections; (6) pern lishing syringe exchange prograr nity programs for safe syringe di

THE MAGNITUDE OF THE EPID AND BLOOD-BORNE DISEASES

The dual epidemics of drug use ficiency virus and acquired immun AIDS) are highly destructive of p

From the Georgetown/Johns Hopkins Prog ington, DC, and Baltimore, Md (Mr Gostin and ic Health, Boston, Mass (Ms Lazzarini); and Prevention, Atlanta, Ga (Dr Jones).

The views expressed herein are those of t flect the official policy of the US Departmen Carter Presidential Center, the Centers for D cosponsors of the consultation held at the C

Requests for reprints: Lawrence Gostin, JD, 600 New Jersey Ave NW, Washington, DC 2000

Downloaded From: http://jama.jamanetwo

LI

and s
inject
ease
amon
group
as m
sharii
direc

versity
Substa
The au
Websi
the pro
Jones,
Williar

Albert
keley.
the Na

candid

96 Lar

Articles

**Lethal Injections: The Law
Politics of Syringe Access
Drug Users***

ENS
stop
comp
bacte
terms
inge
both
quate
socia

I. I

(SEP
decr

of the
here a

Associ
Hopki

Healt

Johns

Comp
availa

Home / Syringe Serv

Syringe Serv

Across the country, a rise from using contaminated (HCV), hepatitis B virus (drugs may share needles and transmitting diseases legal sales, and exchang

Syringe Service Program drugs. SSPs are safe, eff of improperly discarded s incomplete and uneven. perception that SSPs are

This is a longitudinal data The map identifies the m by referral, drug paraphe

5

Check for updates

Research

PUBLIC HEALTH REPORTS

State Laws Governing Syringe Services Programs and Participant Syringe Possession, 2014-2019

Public Health Reports
2020, Vol. 135(Supplement 1) 128S-137S

DOI: 10.1177/0033354920921817
journals.sagepub.com/home/phr

SAGE

Marcelo H. Fernández-Viña, JD, MPH[1]; Nadya E. Prood, MPH[1]; Adam Herpolsheimer, JD[1]; Joshua Waimberg, JD[1]; and Scott Burris, JD[1]

Abstract

Objective: Law is an important factor in the diffusion of syringe services programs (SSPs). This study measures the current status of, and 5-year change in, state laws governing SSP operations and possession of syringes by participants.

Methods: Legal researchers developed a cross-sectional data set measuring key features of state laws and regulations governing the possession and distribution of syringes across the 50 US states and the District of Columbia in effect on August 1, 2019. We compared these data with previously collected data on laws as of August 1, 2014.

Results: Thirty-nine states (including the District of Columbia) had laws in effect on August 1, 2019, that removed legal impediments to, explicitly authorized, and/or regulated SSPs. Thirty-three states had 1 or more laws consistent with legal possession of syringes by SSP participants under at least some circumstances. Changes from 2014 to 2019 included an increase of 14 states explicitly authorizing SSPs by law and an increase of 12 states with at least 1 provision reducing legal barriers to SSPs. Since 2014, the number of states explicitly authorizing SSPs nearly doubled, and the new states included many rural, southern, or midwestern states that had been identified as having poor access to SSPs, as well as states at high risk for HIV and hepatitis C virus outbreaks. Substantial legal barriers to SSP operation and participant syringe possession remained in >20% of US states.

Conclusion: Legal barriers to effective operation of SSPs have declined but continue to hinder the prevention and reduction of drug-related harm.

Keywords

syringe services programs, legal epidemiology, legal mapping, policy surveillance

Prevention of HIV and viral hepatitis attributable to injection drug use is a public health priority.[1] The long-term decline in rates of new HIV infections among persons who inject drugs (PWID) has stalled, as rates of infections have been rising in "hotspots" where high levels of nonmedical prescription opioid use coincide with economic vulnerability, changes in drug markets, and lack of access to medication for treating opioid use disorder.[2-4] The number of new hepatitis B virus (HBV) cases has been stable. But the number of new hepatitis C virus (HCV) cases, largely attributable to injection drug use, increased 3.5-fold, from 850 in 2010 to 2967 in 2016.[5] Syringe services programs (SSPs), which provide PWID with sterile injection equipment and syringe disposal services, can directly provide or link PWID to services including vaccination, substance use disorder treatment, infectious disease screening, and overdose prevention. SSPs are safe, effective, and cost effective in reducing HIV and HCV transmission.[6,7] Studies indicate that SSPs do not increase crime rates or stimulate increased drug use, and they do not encourage new or young drug users.[8-10] SSPs can significantly decrease the number of improperly discarded syringes.[11] SSPs can also play an important role in overdose prevention

[1] Center for Public Health Law Research, Temple University Beasley School of Law, Philadelphia, PA, USA

Corresponding Author:
Scott Burris, JD, Temple University Beasley School of Law, Center for Public Health Law Research, 1719 N Broad St, Philadelphia, PA 19122, USA.
Email: scott.burris@temple.edu

g
tem

Evaluation has been another story

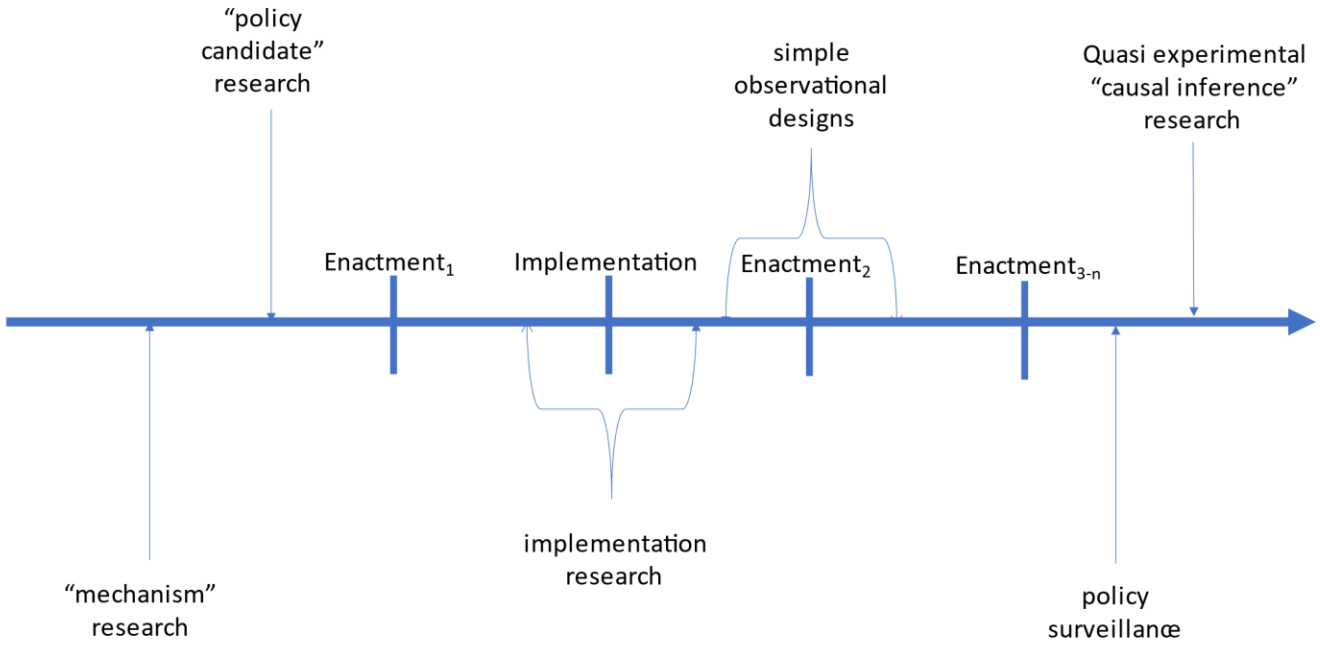
Temple University Beasley School of Law | Center for Public Health Law Research

- As Tamara will discuss, it is not easy to assess the impact of harm reduction legislation on health outcomes
  - Law ≠ receipt of services; services happen without law
  - Limited data on the drug using population and their health
  - The result has been not much research and much of the research coming to dubious conclusions about harm reduction making outcomes worse.

But also a profound institutional/cultural failure to take law seriously.

An Ideal Sequence of Policy and Research

Temple University Beasley School of Law | Center for Public Health Law Research



Missed Opportunities for Impact: The timing of legal epidemiology of naloxone laws

Year	Any State NAL	Any Prescriber immunity		Third-party prescribing		Any Dispenser immunity		Standing order-type mechanism		Pharmacist prescriptive authority/direct dispensing		Any immunity for lay administration		Permits possession without prescription	
		States with law	Studies	States with law	Studies	States with law	Studies	States with law	Studies	States with law	Studies	States with law	Studies	States with law	Studies
2001-02	1	1		0		1		0		0		1		0	
2003-05	2	2		0		2		0		0		1		0	
2006	3	2		0		2		0		0		2		1	
2007	3	2		1		2						2		1	
2008-09	4	3		1		3		0		0		2		1	
2010	6	3		3		3		1		0		4		1	
2011	6	3		3		3		1		0		5		1	
2012	8	3		4		3		1		0		6		2	
2013	18	7		12		6		6		0		14		4	
2014	28	16		23		13		18		1		24		7	
2015	43	33		39		29		34		3		39		11	
2016	48	38		45		36		43		5		45		16	
2017	51	42		48		40		48		9		48		16	
2018	51	43	[44, 45, 47]	48	[43-47]	42	[44, 47]	48	[42-47]	9	[44, 45, 47]	48		16	[44, 47]
2019	51	43	[50, 51]	48	[48, 50, 51]	42	[50]	48	[48-51]	9	[49]	48	[50]	16	[50, 51]

*Translated and updated from Smart 2021

And now on with the show…

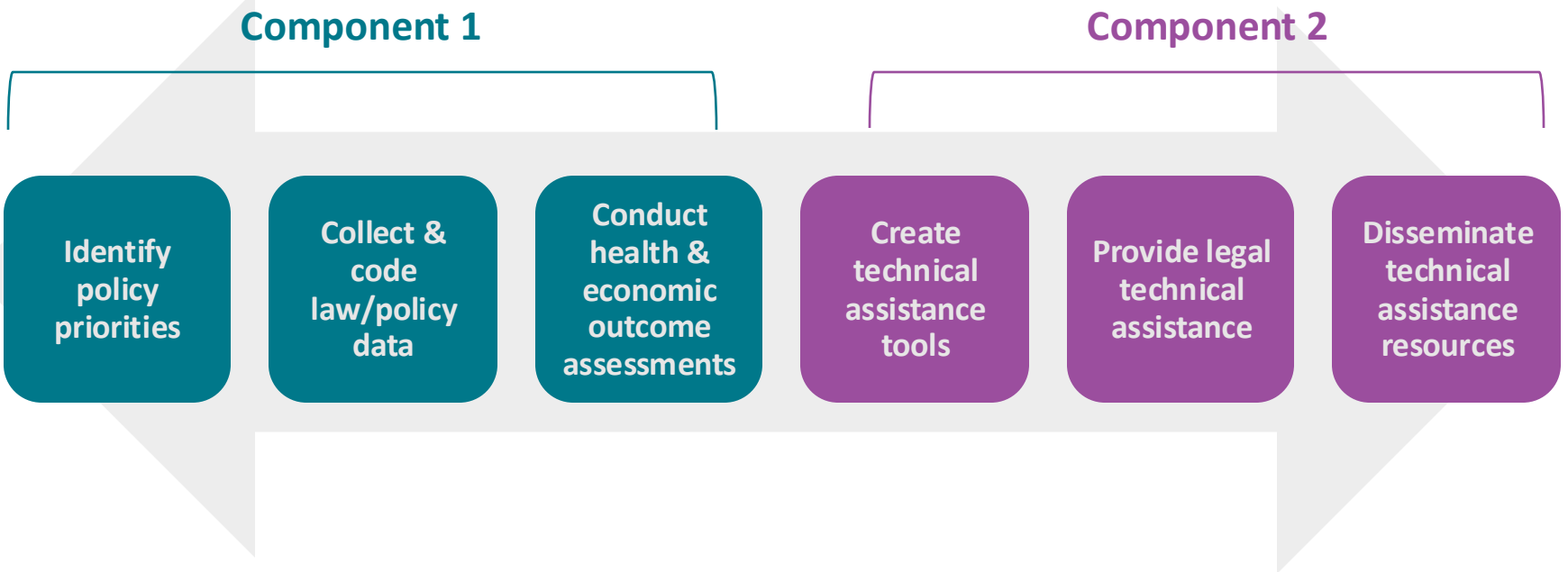
Using Legal Epidemiology to Advance Harm Reduction Policies to Improve Outcomes Related to HIV and Viral Hepatitis

Overview of the Project

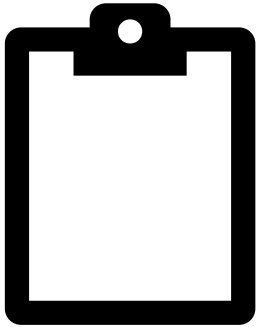
Darian Diepholz, JD MPH
Public Health Analyst, Centers for Disease Control and Prevention

- **Funded by PS23-0009:** Advancing **Policy as a Public Health Intervention** to Reduce Morbidity, Mortality and Disparities in HIV, Viral Hepatitis, STDs, and Tuberculosis
- **Purpose:** Strengthen the ability of leaders who make decisions in public health to identify and implement evidence-based policy interventions that will save lives, save money, and protect people from HIV, viral hepatitis, STDs, and TB
  - (Comp. 1) Grow breadth and depth of NCHHSTP-disease related longitudinal law and policy surveillance data sets and conduct comprehensive health and economic outcome assessments to inform public health practice.
  - (Comp. 2) Conduct and facilitate legal and policy-related technical assistance among leaders who make decisions impacting NCHHSTP-related health outcomes, including developing proactive technical assistance tools.

PPHI Work Happens on a Continuum



Project Origin



Mini-Delphi Study

19 participants	19 legal actions reviewed and rated

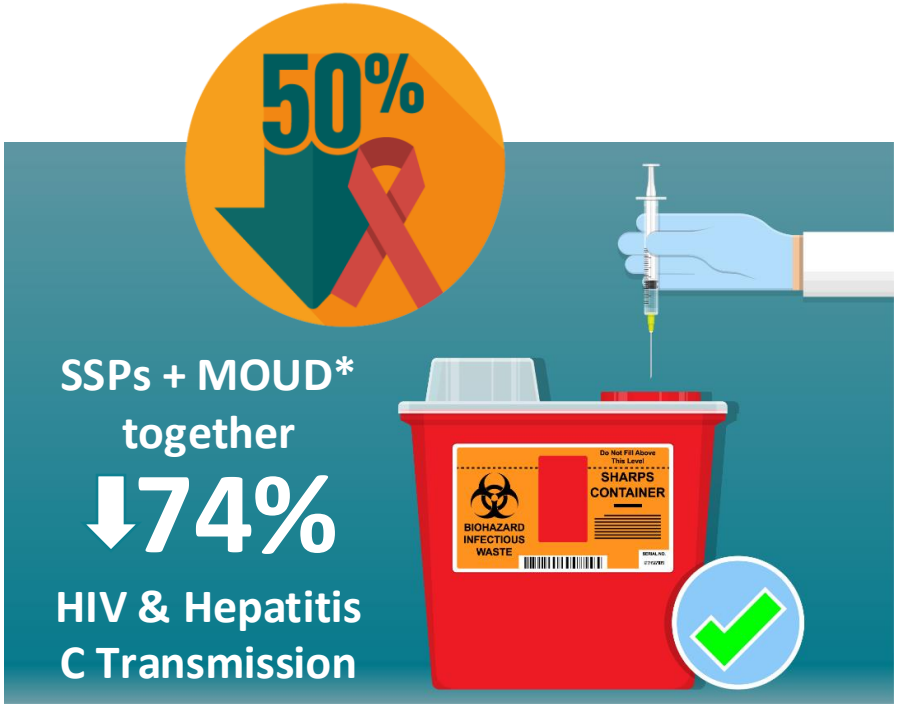
Syringe services programs (SSPs) were identified as a priority topic based on study results

Goal: Expanding existing data to understand state laws that address the infectious disease consequences of the opioid epidemic, including laws authorizing SSPs

Syringe Services Programs (SSPs)

- **SSPs are proven and effective community-based prevention programs that can provide a range of services**
  - Access to clean syringes and injection equipment
  - Disposal of used syringes
  - Vaccination, testing, and linkage to infectious disease care
  - Linkage to substance use disorder treatment and other supportive services (e.g., housing, job programs, food banks)

Over 30 Years of Research Demonstrate that SSPs are Safe and Effective



Medications for Opioid Use Disorder

- SSPs…
  - **Do not increase crime or illegal drug use**
  - Keep **communities clean and first responders safe** by providing safe needle disposal
- People who use SSPs are..
  - **5 times as likely to enter treatment** for a substance use disorder
  - **3 times as likely to reduce or stop injecting** than those who don't use the programs

Source: https://www.cdc.gov/syringe-services-programs/php/index.html

Policy Strategies for Preventing Injection Drug Use Associated Infections

- The passage, implementation, and evaluation of laws and policies can be used to achieve public health goals.
- State and local laws can facilitate access to services for people who inject drugs to prevent overdoses and stop the spread of infectious diseases.
- Public health practitioners, elected officials, healthcare administrators, law enforcement officials, and people who use drugs can work together to implement cost-effective policies to save lives and keep communities safe.

Overview of Project

Research Questions

What is the effect of state laws supporting access to clean syringes, including SSP authorization and associated drug laws on HIV and hepatitis C prevalence and incidence?

What is the effect of state laws supporting access to clean syringes, including SSP authorization and associated drug laws on infectious endocarditis hospitalizations and cost?

3-Part Assessment

- Longitudinal Legal Assessment
- Evaluation on Impact of Laws
- Machine Learning

2025 PUBLIC HEALTH LAW CONFERENCE

Connection. Collaboration. Community.

Using policy surveillance to track state laws regulating access to syringes: A foundation for advancing policies to improve health outcomes

Katie Moran-McCabe, JD
Adam Herpolsheimer, JD
Lauren Langan, JD
Sabrina Ruchelli, JD
Alex Willhouse, JD, LLM
Scott Burris, JD

Temple University Beasley School of Law, Center for Public Health Law Research

The Network for Public Health Law

SEPTEMBER 17, 2025

Acknowledgments: This project is supported by the Centers for Disease Control and Prevention of the U.S. Department of Health and Human Services (HHS) as part of a financial assistance award with 100 percent funded by CDC/HHS. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by CDC/HHS, or the U.S. Government.

The speaker does not have any conflicts of interest to disclose.

Methods

Legal epidemiology

The scientific study of law as a factor in the cause, distribution, and prevention of disease and injury in a population.

Identification of Priority Research Needs – Landscape Assessment

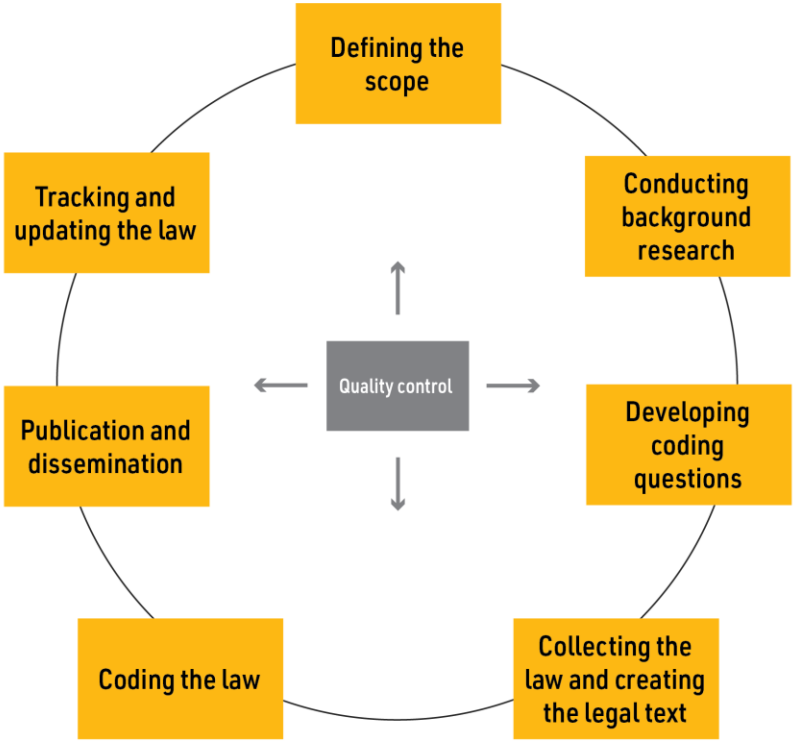
Temple University Beasley School of Law | Center for Public Health Law Research

- Mini-Delphi process
- Rapid legal scans
- Topics selected based on:
  - Initial areas of interest, and
  - Causal inferences regarding how laws may affect health outcomes related to the infections of interest
- Purpose:
  - What research already exists on the health effects of the laws?
  - What is the quality of that research?

Policy Surveillance

Temple University
Beasley School of Law
Center for Public Health Law Research

The systematic collection, analysis, and dissemination of laws and policies across jurisdictions or institutions, and over time.



Supportive legal environment for accessing clean syringes

Temple University Beasley School of Law | Center for Public Health Law Research

Approval of Syringe Exchange Programs in California: Results From a Local Approach to HIV Prevention

Ricky N. Bluthenthal, PhD, Keith G. Heinzerling, MD, MPH, Rachel Anderson, BA, Neil M. Flynn, MD, MPH, and Alex H. Kral, PhD

Syringe Sharing and HIV Incidence Among Injection Drug Users and Increased Access to Sterile Syringes

Thomas Kerr, PhD, Will Small, PhD, Chris Buchner, MSc, Ruth Zhang, MSc, Kathy Li, PhD, Julio Montaner, MD, and Evan Wood, MD, PhD

Cities throughout the world are increasingly experiencing HIV epidemics among injection drug users (IDU) as a result of sharing contaminated injecting equipment.[1] In response, various initiatives such as syringe exchange programs (SEPs) have been established.[2]

Despite the growing implementation of SEPs, IDU-driven HIV epidemics have persisted in some settings.[3] This has been true of Vancouver, British Columbia, Canada, which experienced one of North America's highest HIV rates although the city has been home to one of the continent's largest SEPs.[4] Preliminary reports have suggested that many local IDU have historically experienced difficulty accessing sterile syringes as a result of policy and programmatic factors such as limited hours of SEP operation and a rigid one-for-one syringe exchange policy (i.e., only 1 sterile syringe is distributed for every used syringe returned).[5,6] Indeed, studies

Objectives. We assessed the effects of syringe exchange program (SEP) policy on rates of HIV risk behavior and HIV incidence among injection drug users.

Methods. Using a multivariate generalized estimating equation and Cox regression methods, we examined syringe borrowing, syringe lending, and HIV incidence among a prospective cohort of 1228 injection drug users in Vancouver, British Columbia.

Results. We observed substantial declines in rates of syringe borrowing (from 20.1% in 1998 to 9.2% in 2003) and syringe lending (from 19.1% in 1998 to 6.8% in 2003) following SEP policy change. These declines coincided with a statistically significant increase in the proportion of participants accessing sterile syringes from nontraditional SEP sources ($P<.001$). In multivariate analyses, the period following the change in SEP policy was independently associated with a greater than 40% reduction in syringe borrowing (adjusted odds ratio [AOR]=0.57; 95% confidence interval [CI]=0.49, 0.65) and lending (AOR=0.52; 95% CI=0.45, 0.60), as well as declining HIV incidence (adjusted hazard ratio=0.13; 95% CI=0.06, 0.31).

Conclusions. Widespread syringe distribution appears to be a more effective SEP policy than do more restrictive SEP policies that limit syringe access. Efforts should be made to ensure that SEP policies and program design serve to maximize rather than hinder syringe access. (*Am J Public Health.* 2010;100:1449–1453. doi:10.2105/AJPH.2009.178467)

Carrie A. Lawrence
calawren@indiana.edu

Laura Miller
lemiller@yahoo.com

mendations for improvement are of

Keywords Health commons · HIV hepatitis C · Local government

Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology
18(Suppl 1):S37–S44 © 1998 Lippincott-Raven Publishers, Philadelphia

Syringe Use and Reuse: Effects of Syringe Exchange Programs in Four Cities

ssMark

*Robert Heimer, †Kaveh Khoshnood, ‡Dan Bigg, §Joseph Guydish, and ‖Benjamin Junge

Contents lists available at ScienceDirect

Drug and Alcohol Dependence

journal homepage: www.elsevier.com/locate/drugalcdep

Prevalence and predictors of transitions to and away from syringe exchange use over time in 3 US cities with varied syringe dispensing policies

Traci C. Green[a,b,*], Ricky N. Bluthenthal[c], Merrill Singer[d], Leo Beletsky[b], Lauretta E. Grau[a,b], Patricia Marshall[e], Robert Heimer[a,b]

[a] School of Public Health, Yale University, New Haven, CT 06520, USA
[b] Center for Interdisciplinary Research on AIDS, Yale University, New Haven, CT 06520, USA
[c] RAND Corporation and Department of Sociology, California State University, Dominguez Hills, Carson, CA 90747, USA
[d] Department of Anthropology and the Center for Health, Intervention and Prevention, University of Connecticut, Storrs, CT 06269, USA
[e] Department of Bioethics, Case Western Reserve University, Cleveland, OH 44106, USA

ARTICLE INFO

Article history:
Received 5 October 2009
Received in revised form 23 March 2010
Accepted 26 March 2010
Available online 26 May 2010

Keywords:
Syringe exchange
Injecting drug use
HIV/AIDS
Longitudinal study
Latent transition analysis

ABSTRACT

Syringe exchange programs (SEPs) can reduce HIV risk among injecting drug users (IDUs) but their use may depend heavily on contextual factors such as local syringe policies. The frequency and predictors of transitioning over time to and from direct, indirect, and non-use of SEPs are unknown. We sought, over one year, to: (1) quantify and characterize transition probabilities of SEP attendance typologies; (2) identify factors associated with (a) change in typology, and (b) becoming and maintaining Direct SEP use; and (3) quantify and characterize transition probabilities of SEP attendance before and after changes in policy designed to increase access. Using data collected from 583 IDUs participating in a three-city cohort study of SEPs, we conducted a latent transition analysis and multinomial regressions. Three typologies were detected: Direct SEP users, Indirect SEP users and Isolated IDUs. Transitions to Direct SEP use were most prevalent. Factors associated with becoming or maintaining Direct SEP use were female sex, Latino ethnicity, fewer injections per syringe, homelessness, recruitment city, injecting speedballs (cocaine and heroin), and police contact involving drug paraphernalia possession. Similar factors influenced transitions in the syringe policy change analysis. Policy change cities experienced an increase in Indirect SEP users (43–51%) with little increased direct use (29–31%). We found that, over time, IDUs tended to become Direct SEP users. Policies improving syringe availability influenced SEP use by increasing secondary syringe exchange. Interactions with police around drug paraphernalia may encourage SEP use for some IDUs and may provide opportunities for other health interventions.

Select Legal Variables

Temple University Beasley School of Law | Center for Public Health Law Research

1. Does state law allow for the operation of syringe services programs (SSPs)?

- Yes
- No

1.1. How does the state allow for the distribution of syringes from SSPs?

2. Does state law explicitly authorize SSPs?

- Yes
- No

2.1. On what date did the law explicitly authorizing SSPs become effective?

2.2. Is local government approval required prior to operation?

- Yes
- No

2.4. Does the law require used syringes to be returned in order to receive new syringes?

- Yes, the law requires one-for-one exchange
- Yes, the law requires exchange but not one-for-one exchange
- No, the law is silent on whether an exchange of used syringes for new syringes is required

2.5. What is the maximum number of syringes a participant can obtain in one visit to an SSP?

2.6. Does the law prohibit secondary exchange of syringes?

- Yes
- No, the law does not address secondary exchange
- No, the law explicitly allows secondary exchange

2.7. What additional services are SSPs required to provide?

3. Does the state have a drug paraphernalia law?

- Yes
- No

3.1. Is possessing drug paraphernalia a prohibited act?

- Yes
- No

3.1.1. Does this apply to the possession of syringes?

- Yes
- Yes, but syringe services program participants are exempt
- Yes, but syringe services program participants are exempt while located at the SSP
- Yes, but employees of a syringe services program are exempt

Quantitative Legal Data

Temple University Beasley School of Law | Center for Public Health Law Research

	Jurisdictions	Effective Date	Valid Through Date	ssp_does state allow	ssp_how remove barriers_Syringe exchange is explicitly authorized by state law
2	Alabama	8/1/2019	8/1/2021	0	.
3	Alaska	8/1/2019	8/1/2021	1	0
4	Arizona	8/1/2019	4/13/2021	0	.
5	Arizona	4/14/2021	8/1/2021	0	.
6	Arkansas	8/1/2019	7/27/2021	1	0
7	Arkansas	7/28/2021	8/1/2021	1	0
8	California	8/1/2019	12/31/2019	1	1
9	California	1/1/2020	12/31/2020	1	1
10	California	1/1/2021	7/26/2021	1	1
11	California	7/27/2021	8/1/2021	1	1
12	Colorado	8/1/2019	9/30/2019	1	1
13	Colorado	10/1/2019	2/29/2020	1	1
14	Colorado	3/1/2020	9/13/2020	1	1
15	Colorado	9/14/2020	8/1/2021	1	1
16	Connecticut	8/1/2019	9/30/2019	1	1
17	Connecticut	10/1/2019	10/1/2020	1	1
18	Connecticut	10/2/2020	12/31/2020	1	1
19	Connecticut	1/1/2021	6/30/2021	1	1
20	Connecticut	7/1/2021	7/12/2021	1	1

RESEARCH PROTOCOL
June 2024

State Syringe Access Laws

I. Date of Protocol: Last updated on May 29, 2025.

II. Scope:

This longitudinal dataset captures changes in the law from January 1, 2010, through June 1, 2024, and includes questions regarding syringe services programs (SSP) authorization and operation, prohibitions on the possession of drug paraphernalia, and prohibitions on the distribution of drug paraphernalia. This dataset includes state statutes and regulations for the 50 U.S. states and the District of Columbia.

This dataset was created in collaboration with CDC's National Center for HIV, Viral Hepatitis, STD, and Tuberculosis Prevention (NCHHSTP).

III. Primary Data Collection

a. **Project Dates:** July 2024 – January 2025

b. **Dates Covered in the Dataset:** This dataset captures state statutes and regulations in effect on January 1, 2010, or any date thereafter through June 1, 2024. This dataset does not purport to measure the law as it existed prior to the dataset start date (in this case, January 1, 2010).

Results

State Syringe Access Laws dataset

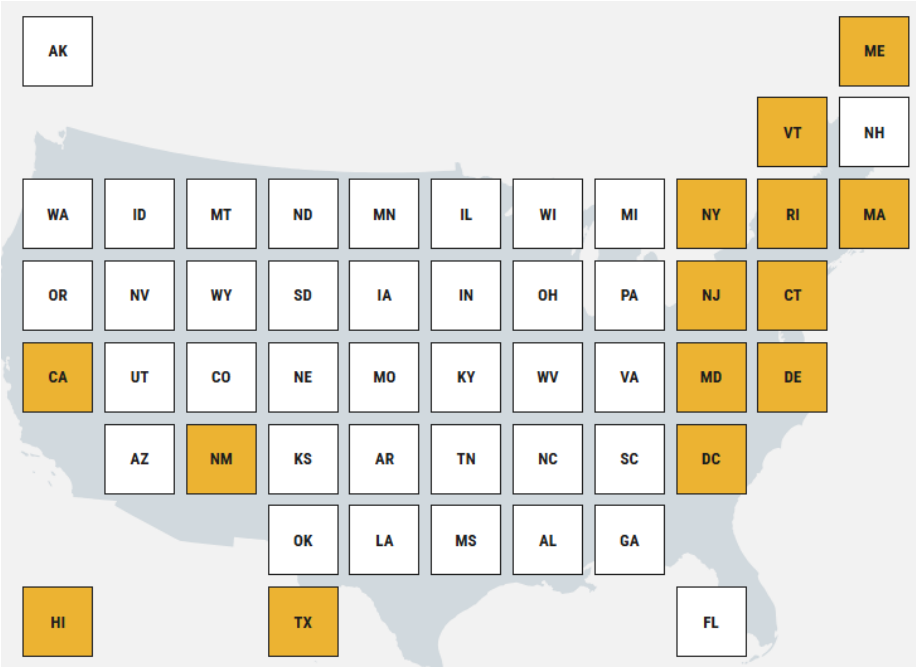
Temple University Beasley School of Law | Center for Public Health Law Research

- Key features of state statutes and regulations governing syringe services programs (SSPs) and drug paraphernalia distribution and possession
- Covers all 50 U.S. states and the District of Columbia
- Dataset dates: January 1, 2010 through June 1, 2024

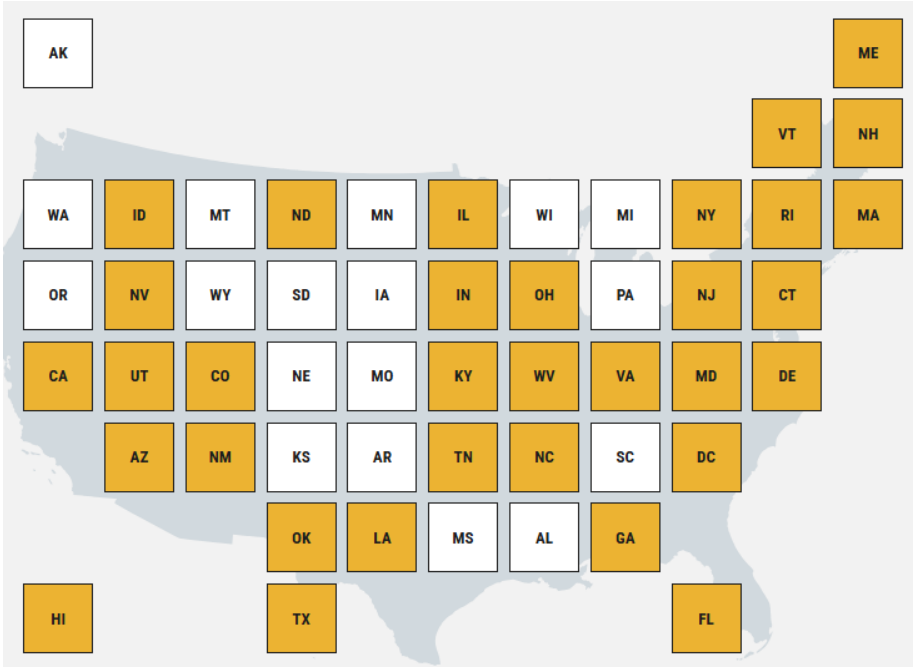
Laws Explicitly Authorizing SSPs

Temple University Beasley School of Law | Center for Public Health Law Research

As of January 1, 2010: 13 states and DC



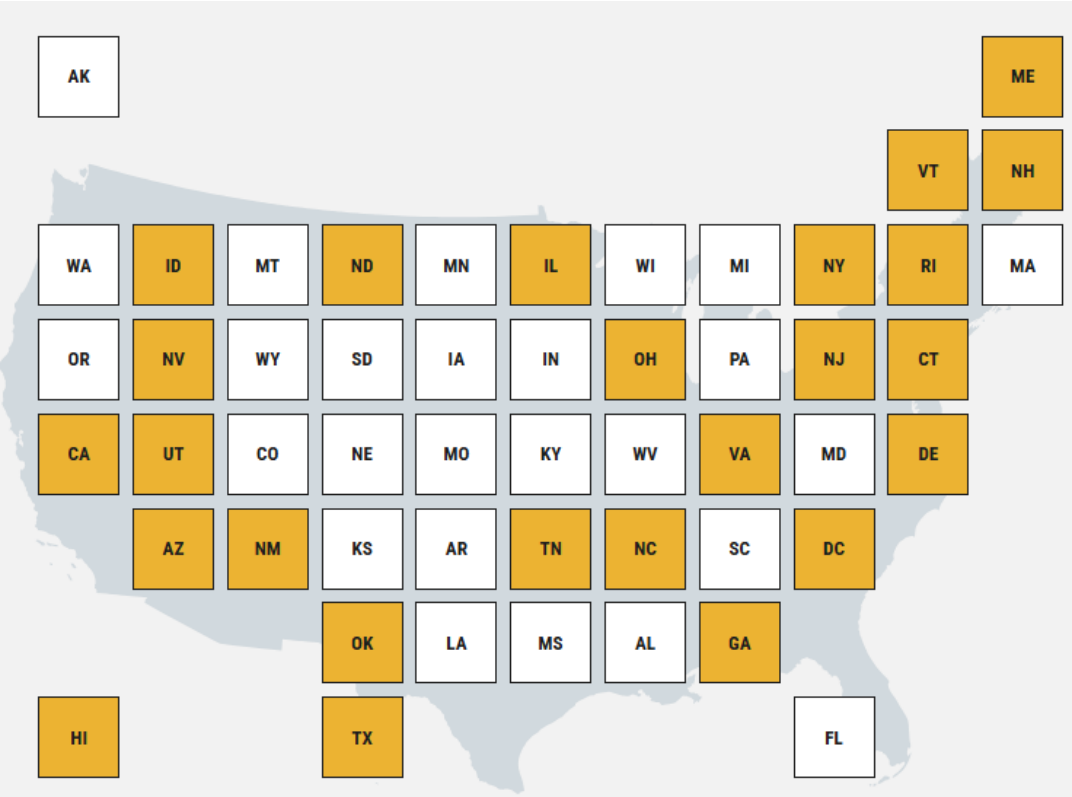
As of June 1, 2024: 32 states and DC



No Local Approval Required for SSPs

Temple University Beasley School of Law | Center for Public Health Law Research

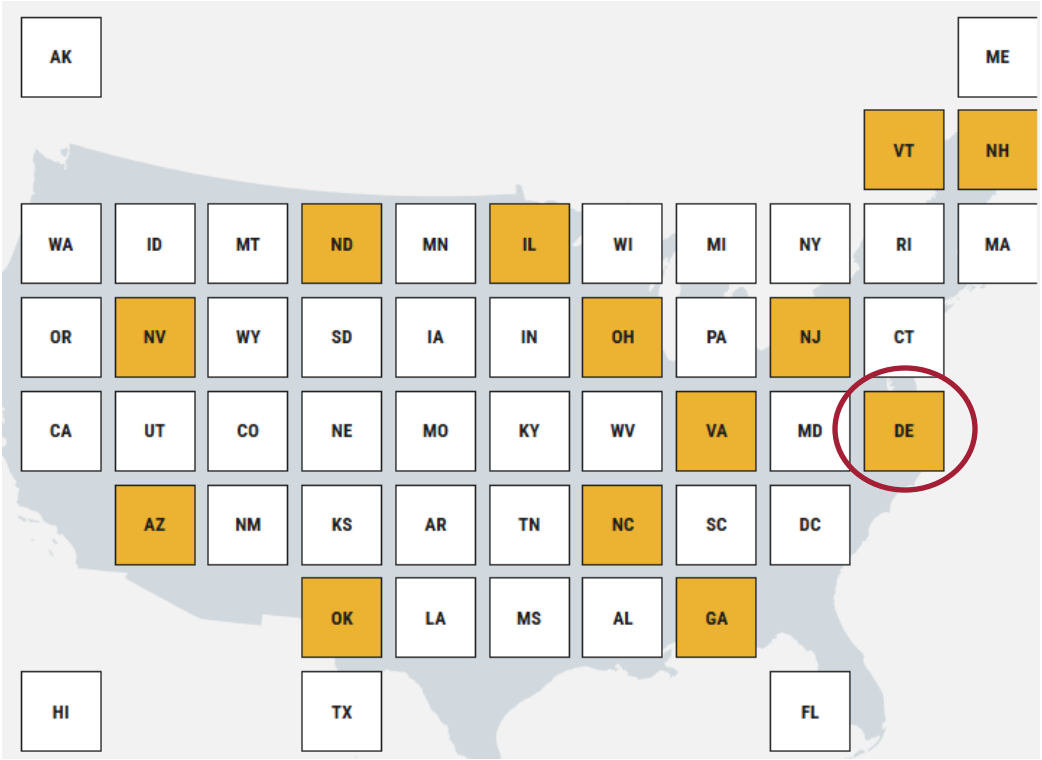
As of June 1, 2024: 24 states & DC (76% of jurisdictions that explicitly authorize SSPs)



No local approval, no required exchange & no max. number of syringes

Temple University Beasley School of Law | Center for Public Health Law Research

As of June 1, 2024: 13 states (39% of jurisdictions that explicitly authorize SSPs)

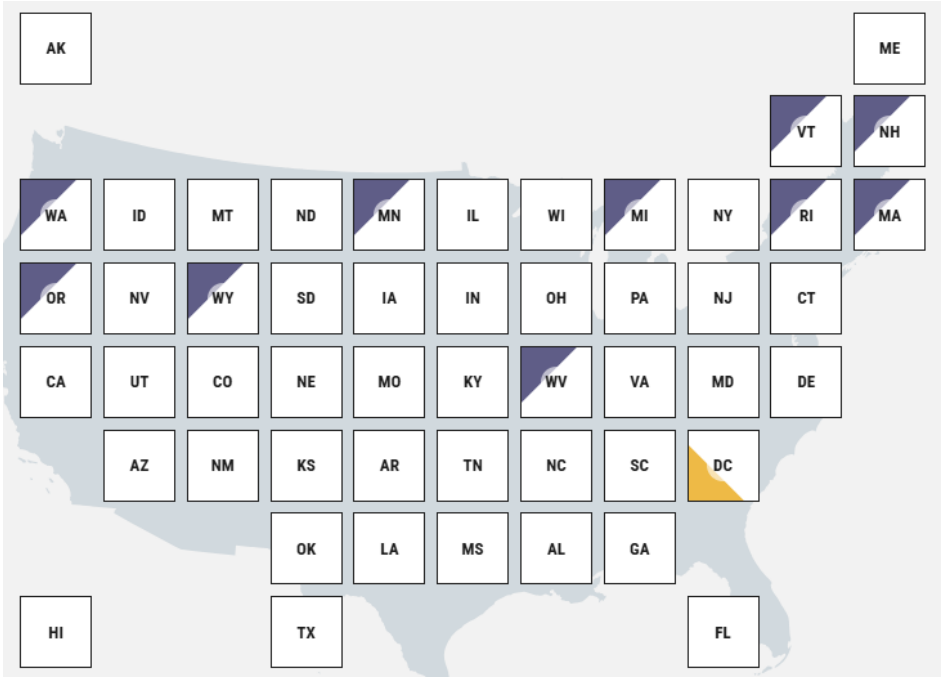


Of these, only Delaware prohibits secondary exchange of syringes

Drug paraphernalia possession laws as of June 1, 2024

Temple University Beasley School of Law | Center for Public Health Law Research

No prohibition on drug paraphernalia possession: 10 states (generally); DC (for personal use)

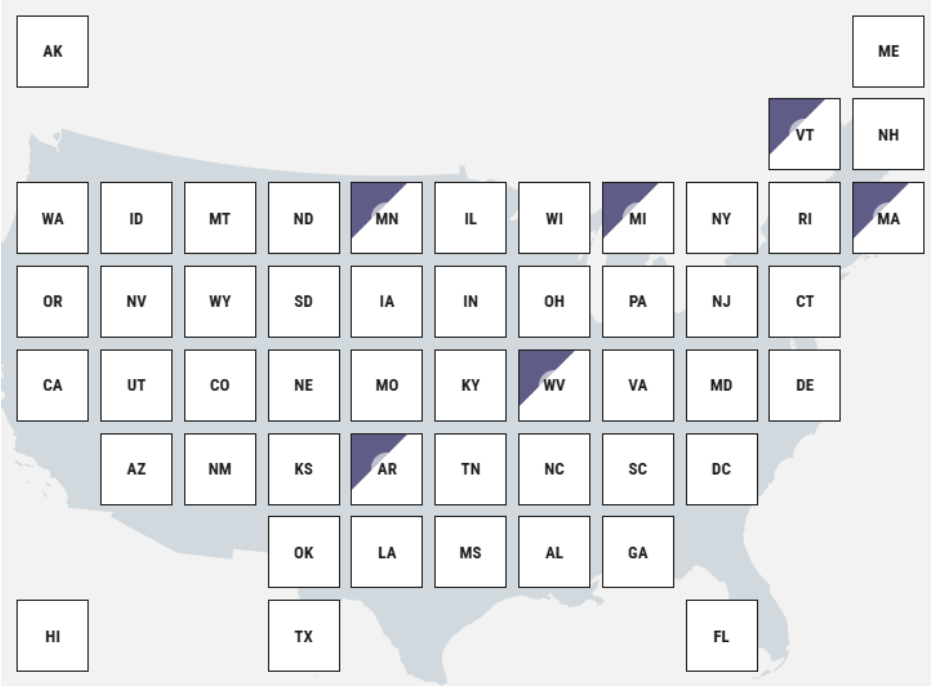


Law explicitly excludes syringes from prohibition on possession (4 states in blue), or exempts SSP participants (14 states & DC in red)

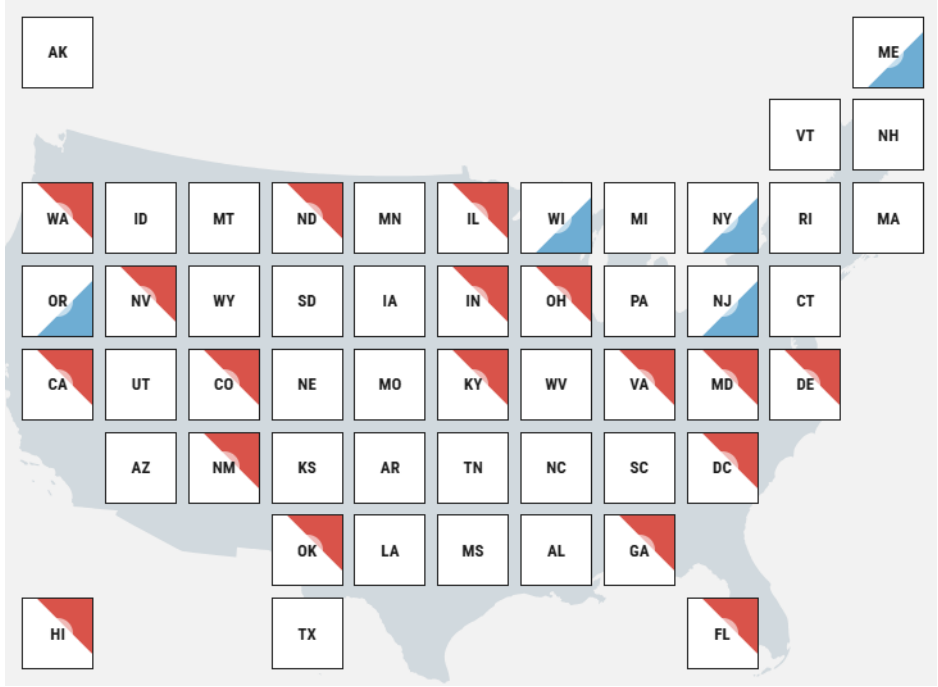
Drug paraphernalia distribution laws as of June 1, 2024

Temple University Beasley School of Law | Center for Public Health Law Research

No prohibition on free distribution of drug paraphernalia: 6 states



Law explicitly excludes syringes from prohibition on distribution (5 states in blue), or exempts SSP employees (17 states & DC in red)



Putting It All Together: As of June 1, 2024

Temple University | Center for Public Health Law Research

State explicitly authorizes SSPs

AND

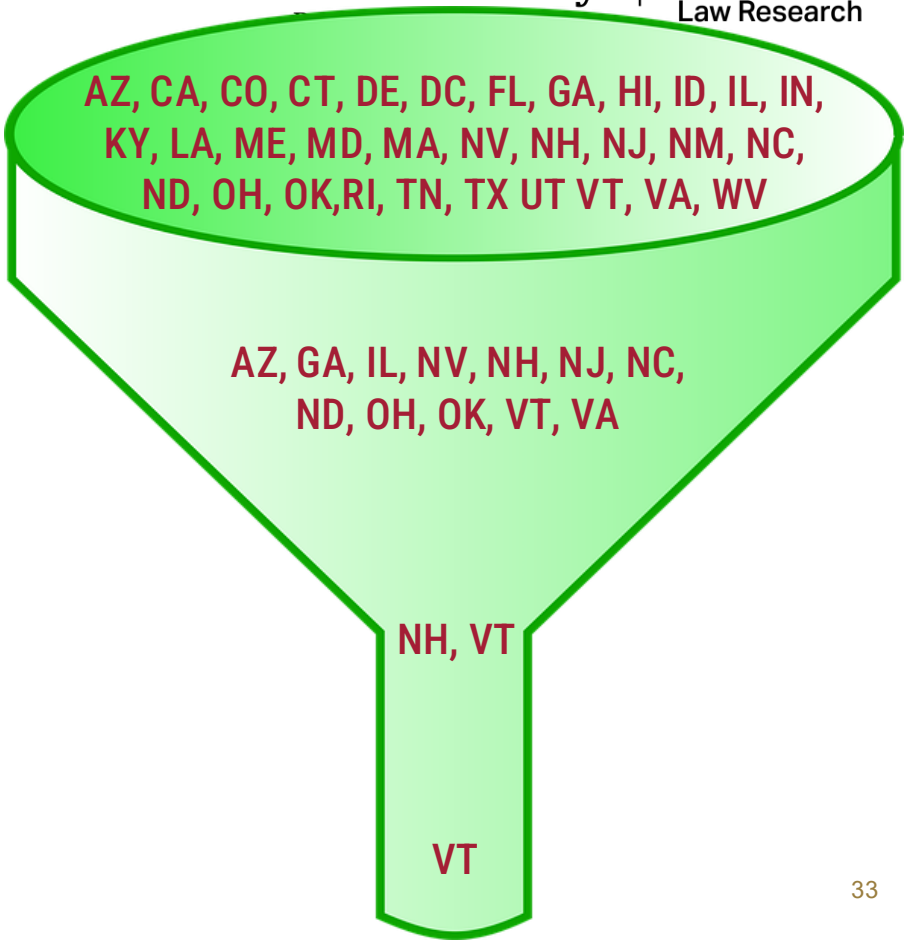
Law does not require local approval, exchange, or max. number of syringes, and does not prohibit secondary exchange

AND

Law does not penalize possession of drug paraphernalia

AND

State does not bar the free distribution of paraphernalia



Stay in Touch – Dataset coming soon!

Temple University Beasley School of Law | Center for Public Health Law Research

Katie Moran-McCabe (she/her)
Lead Law and Policy Analyst
Center for Public Health Law Research,
Temple University Beasley School of Law
Email: kathleen.mccabe@temple.edu

- Visit phlr.temple.org, LawAtlas.org, and PDAPS.org
- Sign up for our bi-weekly newsletter: https://bit.ly/CPHLRemail
- Follow us on social media
  - Instagram: @templelegalepi
  - Twitter/X: @PHLR_Temple
  - Facebook
  - LinkedIn
  - YouTube

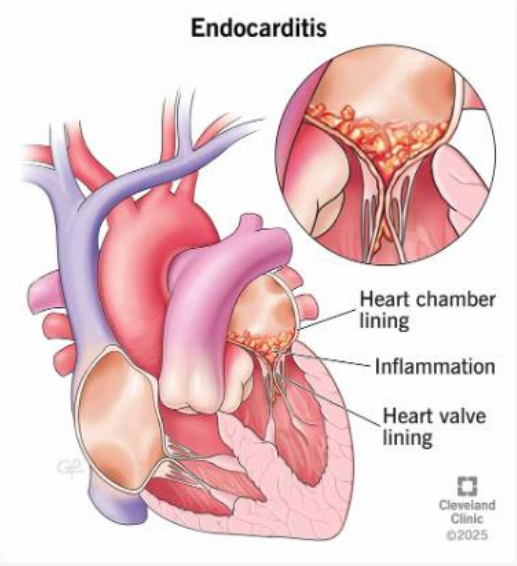
Legal epidemiology in action: Using legal data to evaluate the effect of laws addressing access to sterile syringes in the United States

Presenter: Tamara Rushovich, PhD, MPH

Co-investigators: Katie Moran-McCabe, Scott Burris, Ana V. Diez-Roux, and Alina Schnake-Mahl

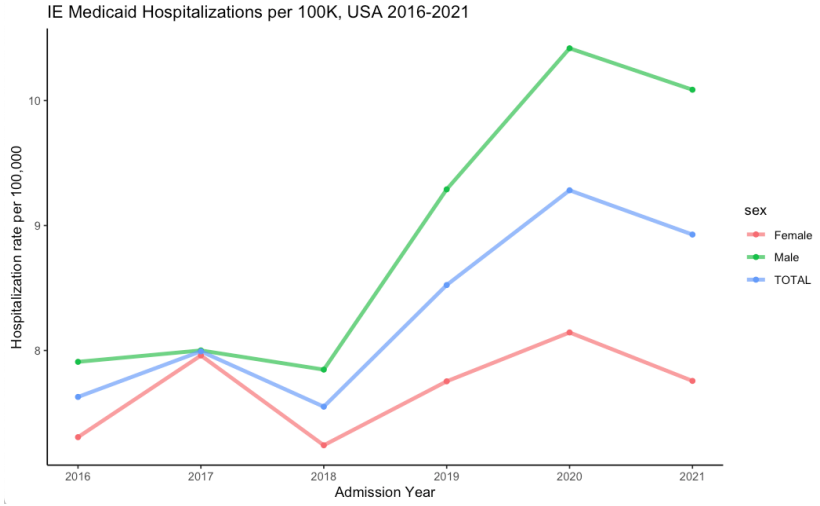
Injection drug use is a risk factor for skin infections and infective endocarditis

- People who use **injection drugs are at higher risk for contracting skin and soft tissue infections and infective endocarditis** because bacteria from dirty needles can enter the bloodstream.
- Infective endocarditis is a **serious and potentially fatal condition** where the lining of the heart becomes inflamed.

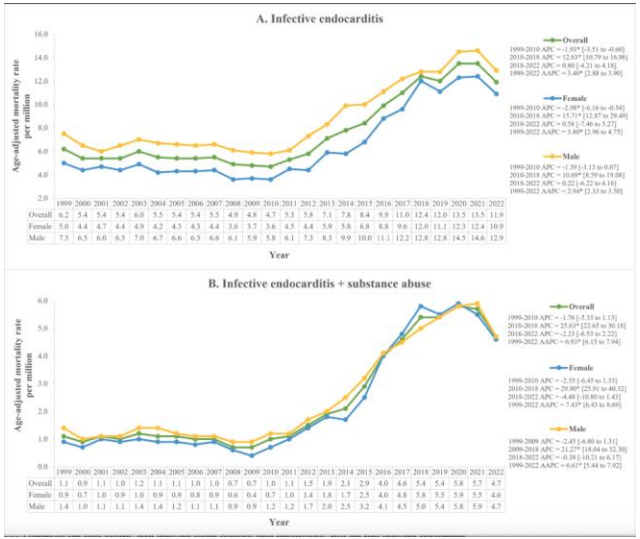


Citations: https://my.clevelandclinic.org/health/diseases/16957-endocarditis, https://www.mayoclinic.org/diseases-conditions/endocarditis/symptoms-causes/syc-20352576 , https://pubmed.ncbi.nlm.nih.gov/33303334/

Hospitalizations and mortality due to infective endocarditis have increased in the past ten years, with recent decreases

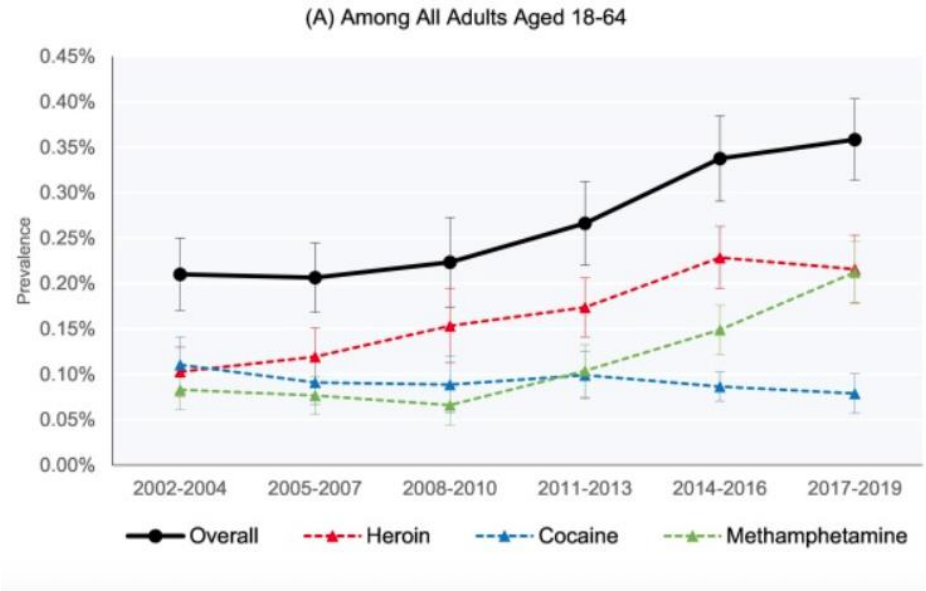


Medicaid claims data (excludes four states due to poor data quality (excluded states: CT, MA, OK, TN)



Abdul Jabbar, Ali Bin et al. "Trends of infective endocarditis mortality in young adult population of US: A concerning rise and its association with substance abuse." *International journal of cardiology. Cardiovascular risk and prevention* vol. 25 200404. 15 Apr. 2025, doi:10.1016/j.ijcrp.2025.200404

Prevalence of injection drug use has increased over the study period and decreased in recent years



Park, Daejun et al. "Trends and distinct profiles of persons who inject drugs in the United States, 2015-2019." *Preventive medicine* vol. 164 (2022): 107289. doi:10.1016/j.ypmed.2022.107289

Syringe service programs provide clean needles that help prevent the spread of infectious diseases

- Syring service programs have been shown to reduce the transmission of HIV effectively[1]
- Syringe service programs were associated with fewer skin and soft tissue infections[2]
- Syringe service programs were associated with fewer recurrences of infective endocarditis[3]

[1] Fernandes, Ricardo M., et al. "Effectiveness of needle and syringe Programmes in people who inject drugs–An overview of systematic reviews." *BMC public health* 17.1 (2017): 309.
[2] Tomolillo, C. M., Crothers, L. J., & Aberson, C. L. (2007). The Damage Done: A Study of Injection Drug Use, Injection Related Abscesses and Needle Exchange Regulation. *Substance Use & Misuse*, *42*(10). https://doi.org/10.1080/10826080701204763
[3] Bahji, Anees; Yanagawa, Bobby; Lamba, Wiplove. Harm Reduction for Injection Drug Users with Infective Endocarditis: A Systematic Review. The Canadian Journal of Addiction 11(2):p 13-23, June 2020. | DOI: 10.1097/CXA.0000000000000080

Research Question and Hypothesis

What is the effect of more permissive vs. restrictive syringe service program laws on Medicaid patient infective endocarditis hospitalizations in the US from 2016-2021?

We hypothesize that when states adopt more permissive syringe service program laws, there will be a larger decrease in incidence of infective endocarditis and skin/soft tissue infections than states in with less permissive laws.

Law vs implementation

WHEREAS, the Centers for Disease Control and Prevention has determined that a novel coronavirus ("COVID-19") presents a serious public health threat, and that this threat is likely to impact the State of Delaware; and

WHEREAS, the Delaware Department of Health & Social Services' Division of Public Health (DPH) has determined that it is vital for the State of Delaware to prepare for the possible community transmission of COVID-19 and take steps to avoid the transmission of the virus, which may include avoiding public gatherings; and

WHEREAS, it is in the best interests of the State to protect its citizens from a potential public health emergency that could threaten the lives of those who live and work here; and

WHEREAS, the predicted public health threat created by COVID-19 will likely continue to create dangerous and potentially life-threatening public health conditions and may result in additional public safety responses.

NOW, THEREFORE, I, JOHN C. CARNEY, pursuant to Title 20, Chapter 31 of the Delaware Code, do hereby declare a State of Emergency in Delaware. This State of Emergency will be effective as of Friday, March 13, 2020 at 8:00 a.m. E.S.T., and shall continue until terminated as provided under state law. The nature of the emergency is the public health threat from the COVID-19. Along with such other actions authorized by Title 20, Chapter 31 of the Delaware Code, I specifically direct and authorize:

1. All departments and agencies of the State of Delaware shall assist in response and recovery activities, as directed by and in coordination with the Delaware Emergency Management Agency (DEMA), in consultation with the Secretary of the Department of

Law vs implementation

WHEREAS, the Centers for Disease Control and Prevention has determined that a novel coronavirus ("COVID-19") presents a serious public health threat, and that this threat is likely to impact the State of Delaware; and

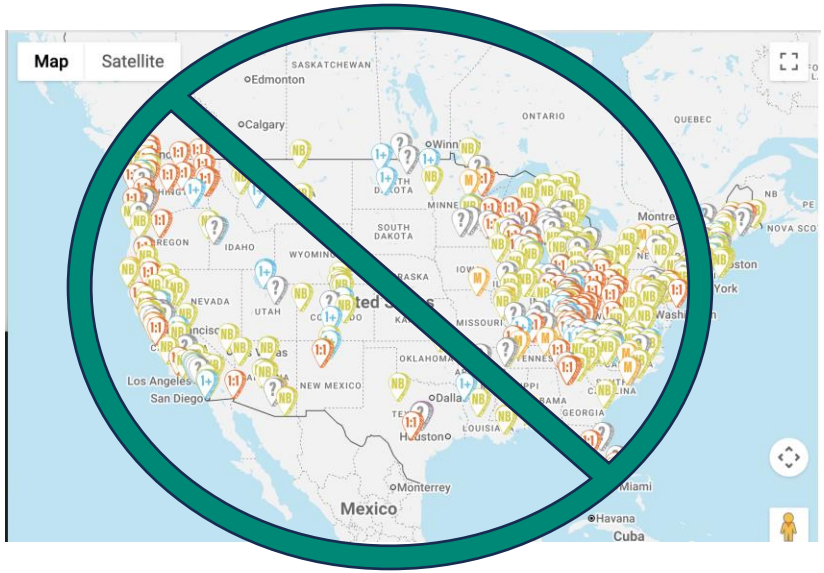
WHEREAS, the Delaware Department of Health & Social Services' Division of Public Health (DPH) has determined that it is vital for the State of Delaware to prepare for the possible community transmission of COVID-19 and take steps to avoid the transmission of the virus, which may include avoiding public gatherings; and

WHEREAS, it is in the best interests of the State to protect its citizens from a potential public health emergency that could threaten the lives of those who live and work here; and

WHEREAS, the predicted public health threat created by COVID-19 will likely continue to create dangerous and potentially life-threatening public health conditions and may result in additional public safety responses.

NOW, THEREFORE, I, JOHN C. CARNEY, pursuant to Title 20, Chapter 31 of the Delaware Code, do hereby declare a State of Emergency in Delaware. This State of Emergency will be effective as of Friday, March 13, 2020 at 8:00 a.m. E.S.T., and shall continue until terminated as provided under state law. The nature of the emergency is the public health threat from the COVID-19. Along with such other actions authorized by Title 20, Chapter 31 of the Delaware Code, I specifically direct and authorize:

1. All departments and agencies of the State of Delaware shall assist in response and recovery activities, as directed by and in coordination with the Delaware Emergency Management Agency (DEMA), in consultation with the Secretary of the Department of



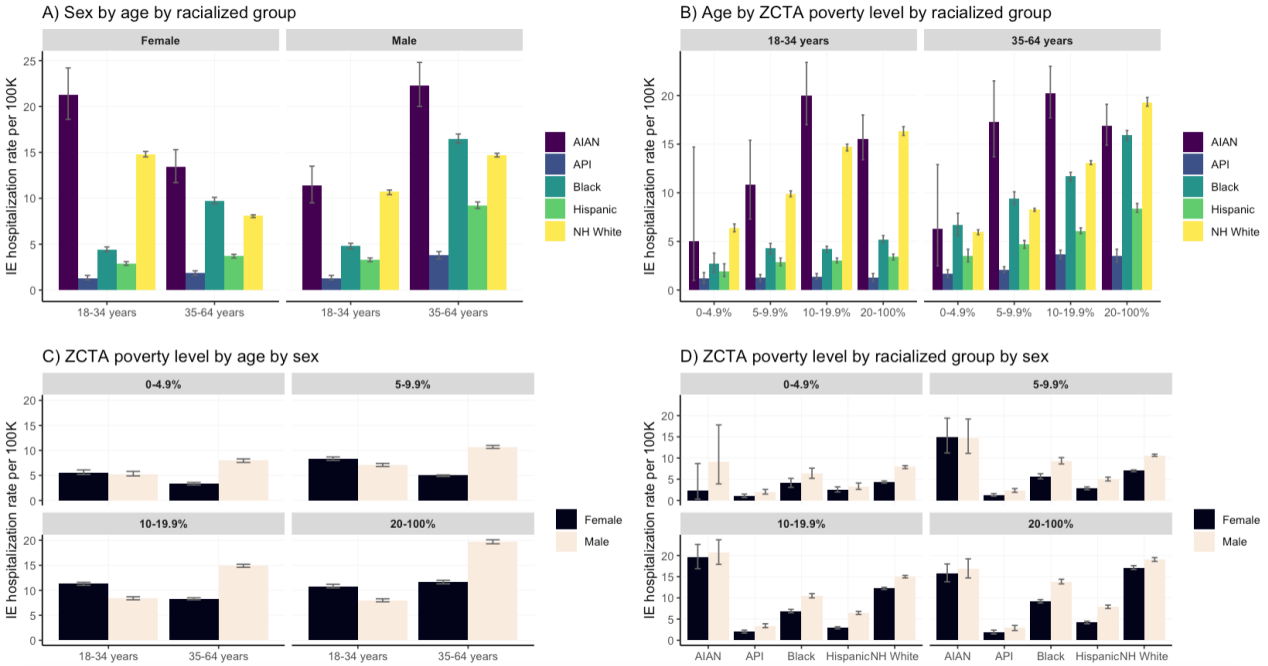
Data

- Syringe Service Program Laws – Temple Center for Public Health Law
  - **Binary**: ”Are syringe service programs explicitly allowed?” Yes/No
  - **Score**: range from -3 (most restrictive) to 6 (most permissive)
  - **Categorical: most restrictive** (-3 to 0), middle (0.5 to 2.5), most permissive (3 to 6).
  - **Categorical with untreated category:** 0, and then middle (0.5 to 2.5), most permissive (3 to 6).

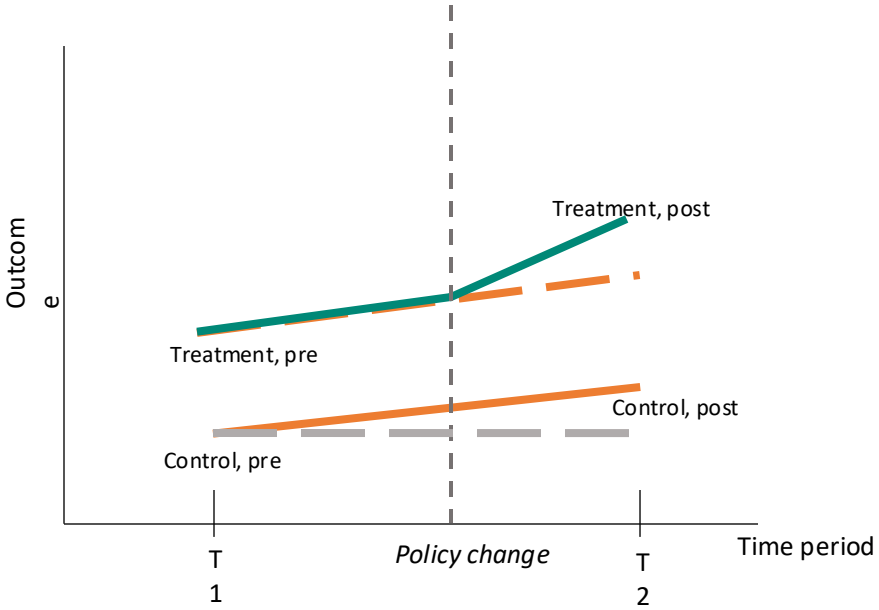
Data

- Medicaid inpatient hospitalization data (T-MSIS) – 46 states (2016-2021)
  - Infective Endocarditis and skin/soft tissue infections are defined using ICD-10 codes.
  - Aggregated counts by state, year, age, and sex (race and ethnicity data were unusable due to data quality).
- Population data: American Community Survey
- State-level covariate control data: poverty, homelessness, Medicaid expansion status, partisan control, heroin mortality rate.

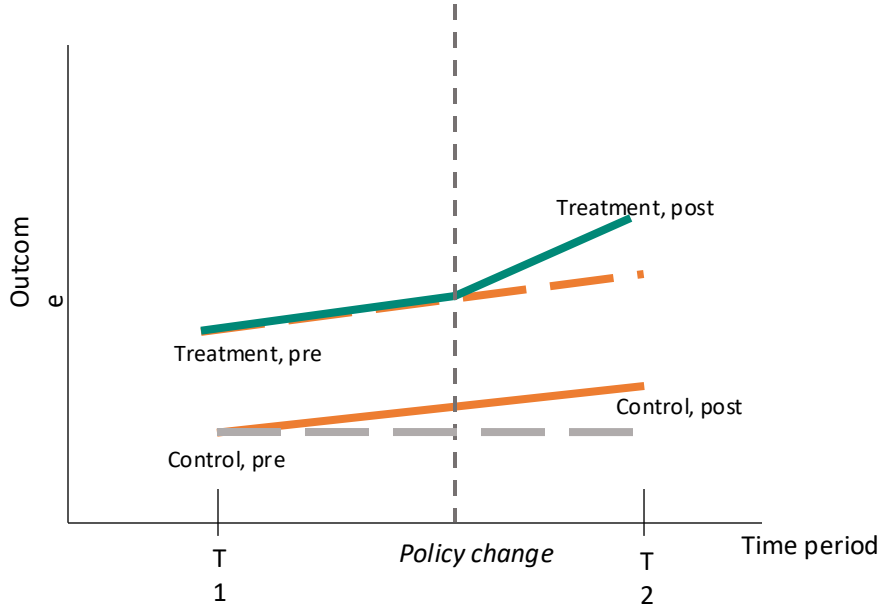
Epidemiology of Infective endocarditis

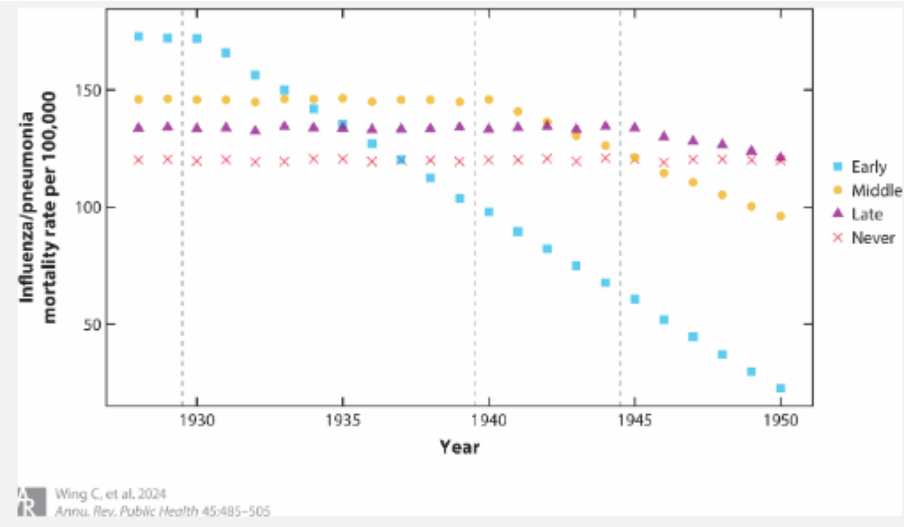


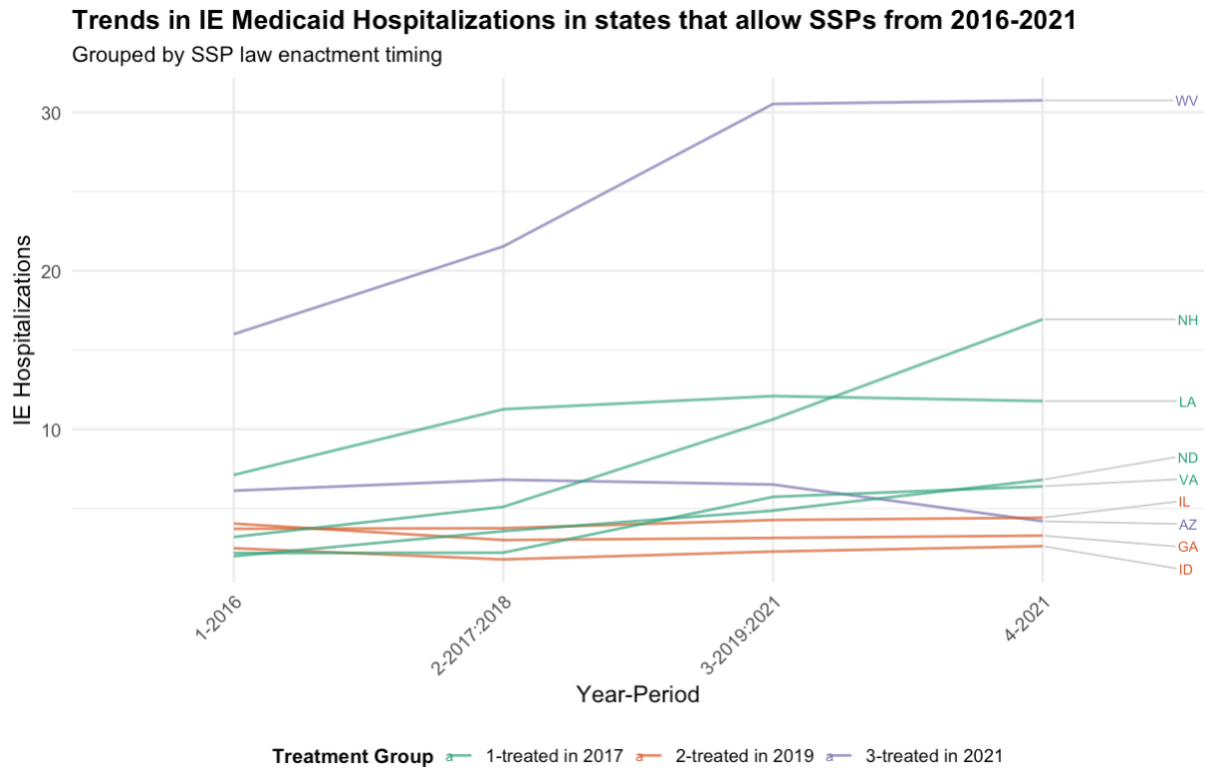
Difference in differences design



Difference in differences design – staggered adoption





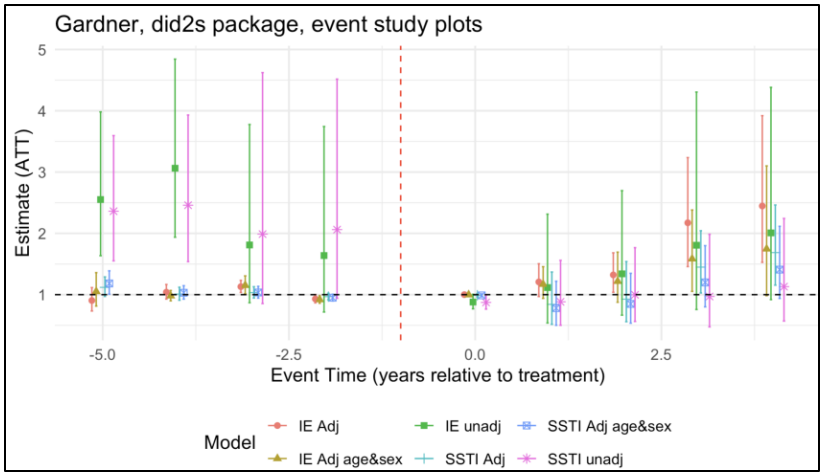


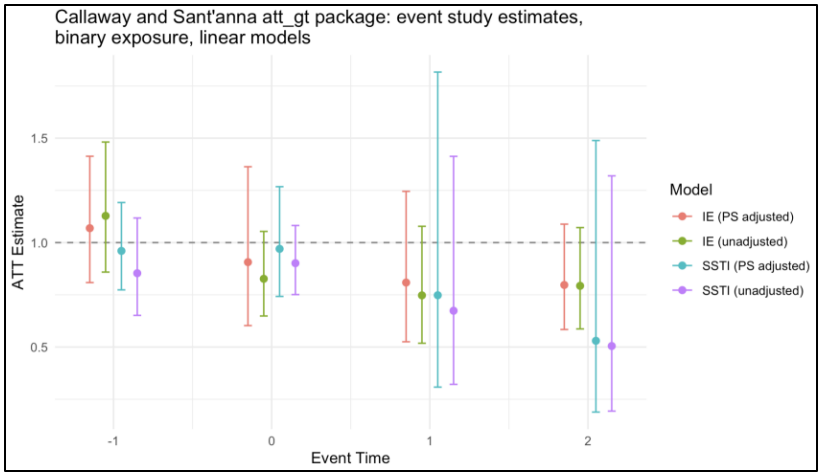
IE = infective endocarditis

	Stacked DID	Callaway & Sant'Anna (5)	Gardner (14)	Sun & Abraham (27)	Woolridge (32)	de Chaisemartin & D'Haultfoeuille (9)
Synopsis	Create subexperiments with clean controls and stack. Run regression on reshaped data.	Decide control group. Calculate all group-time treatment effects. Allow for flexible aggregation.	Two-stage DID: Estimate group and period fixed effects in untreated sample. Use to determine treatment effect in full sample.	Estimate a "saturated" event study with separate effects for each group and period. Reweight and aggregate.	Estimate all group-time treatment effects using a specific pooled OLS or fixed effects specification. Aggregate.	Use units who switch into or out of treatment to identify an average treatment effect.
Do you need a software package to implement?	A package is available (**STACKEDEV** in Stata) but not necessary. Researchers can implement directly using regressions in standard statistical software.	Packages are available (**Did** in R and **csdid** in Stata) and recommended.	A package is available (**Did2s** in R) but not necessary. Researchers can implement directly using regressions in standard statistical software.	A package is available (**eventsstudyinteract** in Stata) but not necessary. Researchers can implement directly using regressions in standard statistical software.	A package is not available. Researchers can implement directly using regressions in standard statistical software.	A package is available (**did_multiplegt** in Stata) and recommended.
What are the primary outputs?	Single aggregated treatment effect or event study estimates.	Individual treatment effects by group and period (group-time ATTs).	Single aggregated treatment effect or event study estimates.	Event study coefficients (which can be interpreted as group-time ATTs in the post-period).	Individual treatment effects by group and period (group-time ATTs).	Single aggregated treatment effect.
How do the outputs relate to	The estimate is interpreted as an	The group-time ATTs can be	The estimate is interpreted as an	The event study coefficients in the	The group-time ATTs can be	The estimate is interpreted as the

https://www.annualreviews.org/content/journals/10.1146/annurev-publhealth-061022-050825

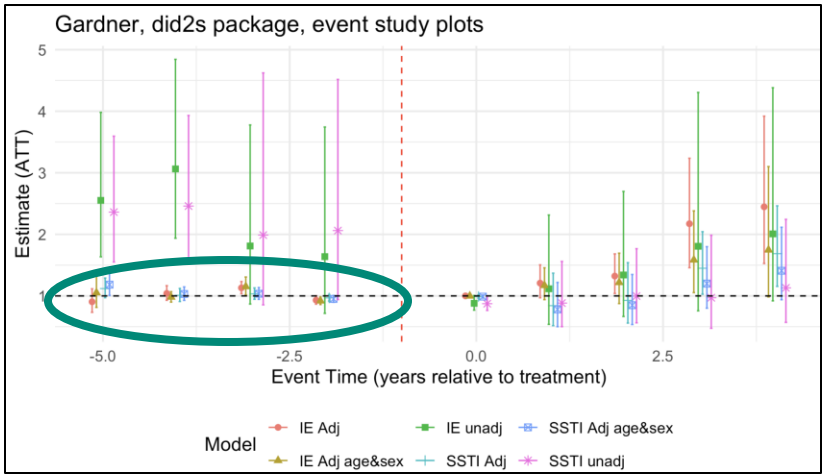
Conditional parallel pre-trends are present

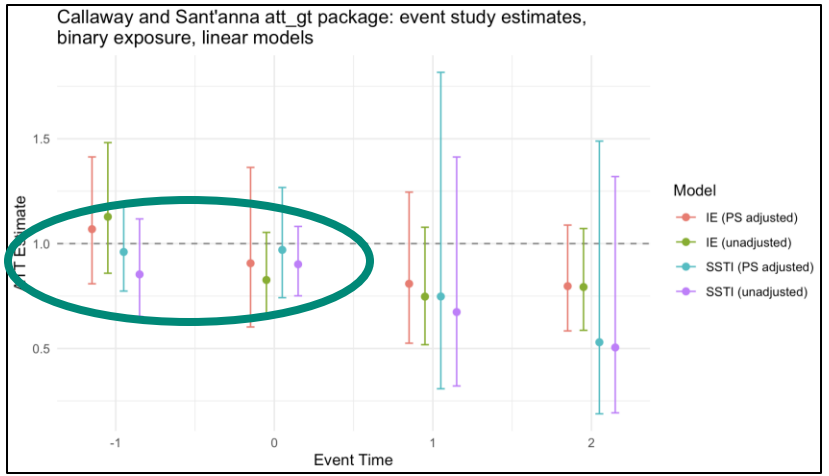




IE = infective endocarditis, SSTI = skin and soft tissue infections

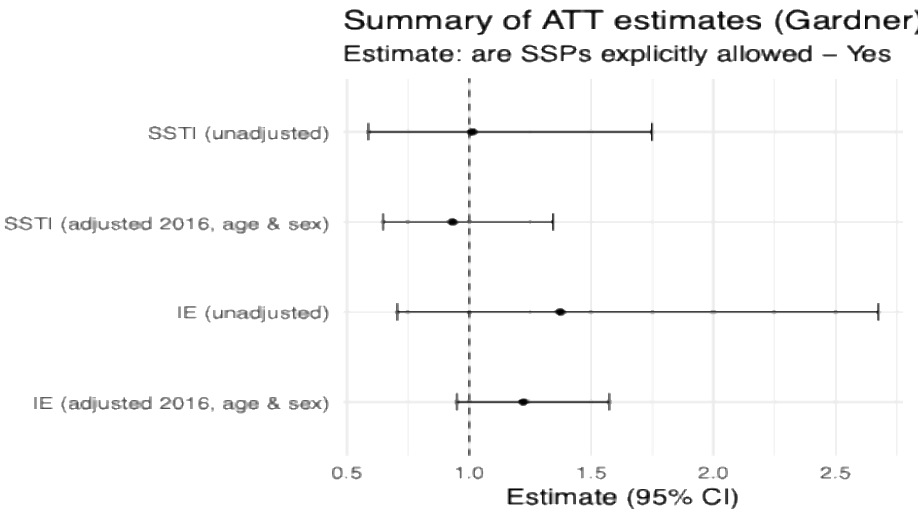
Conditional parallel pre-trends are present

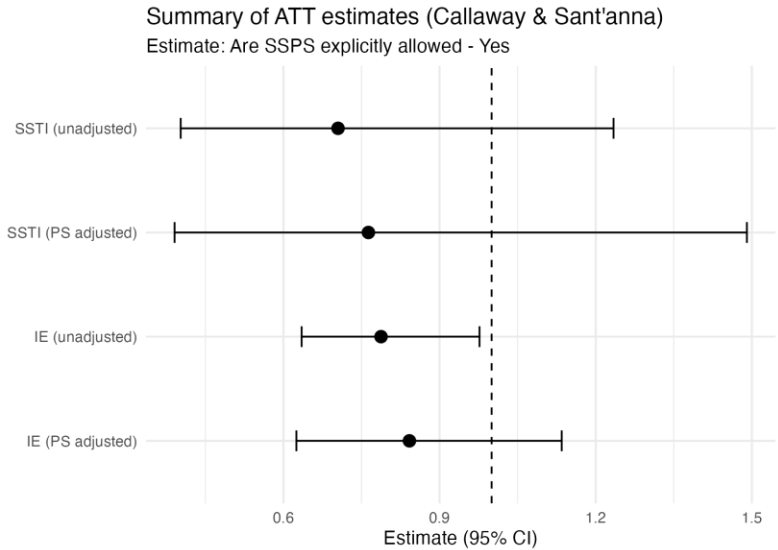




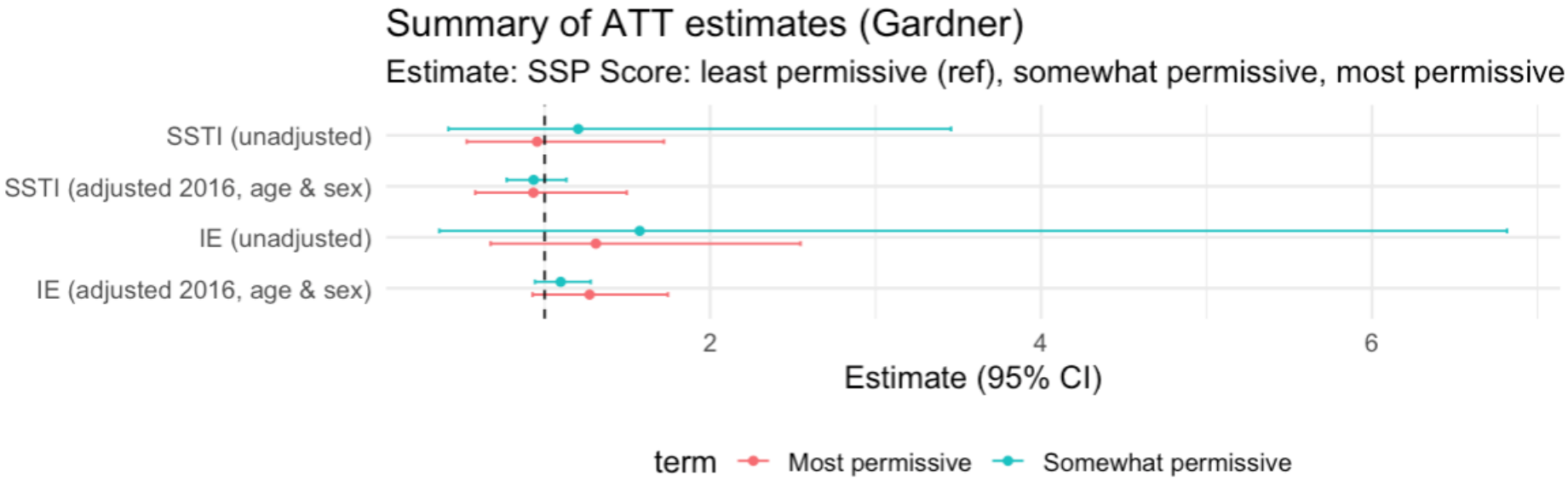
IE = infective endocarditis, SSTI = skin and soft tissue infections

Syring service program laws are not significantly associated with changes in infective endocarditis or skin/soft tissue infection rates





IE = infective endocarditis, SSTI = skin and soft tissue infections



IE = infective endocarditis, SSTI = skin and soft tissue infections

Sensitivity and robustness analyses showed similar results

- Replicated the analysis using hospitalization data from the AHRQ State Inpatient Dataset for 13 states
- Replicated the analysis with the Mundlak and basic DID estimators
- Replicated the analysis and iteratively drop one state
- Replicated the analysis with different ICD-10 definitions for skin and soft tissue infections

More permissive syringe service program laws may not be enough to reduce infective endocarditis.

Possible explanations include:

- Differences in implementation and or funding of the laws
- Syring service programs are known to operate underground in states that have restrictive laws
- There is variation in syringe service program laws within states at the local level
- The fact that individuals who use injection drugs may travel to states that have more permissive syringe service program laws so that they can receive services

Strengths and Limitations

Strengths:

- Comprehensive legal dataset with granular policy data
- Robust staggered difference in differences design
- Replication in two complementary hospitalization datasets

Limitations

- Due to the limited number of years of Medicaid data, we were unable to look at the full range of states that experienced a change in syringe service program laws over time.
- Lack of data on implementation or enforcement of syringe service program laws or funding of syringe service programs.

Conclusions

- The presence of a law permitting the operation of syringe service programs does not significantly change the rate of infective endocarditis or skin and soft tissue infections.
- Understanding implementation alongside law and policy changes related to syringe service program laws is a vital component of a legal epidemiology evaluation project.

THANK YOU!

Tamara Rushovich, PhD MPH
tr842@Drexel.edu

2025 PUBLIC HEALTH LAW CONFERENCE

Connection. Collaboration. Community.

Machine Learning–Assisted Causal Analysis of Public Health Laws Across County-Level Subgroups

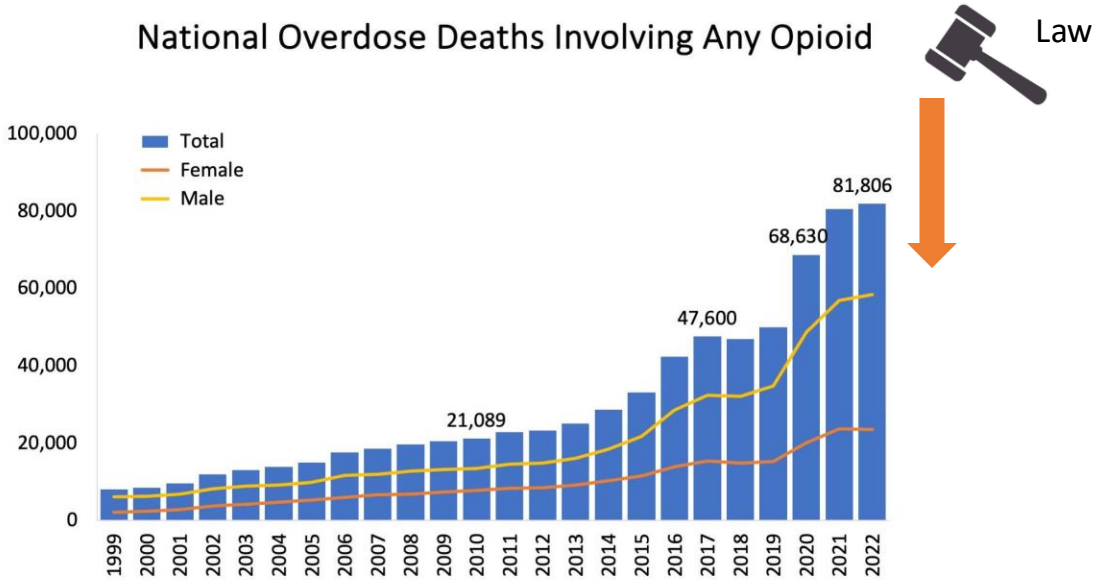
Presenter: Klaus Mueller, PhD [1]

Co-Investigators: Yanming Zhang [1], Recai Yucel, PhD [2], Scott Burris, JD [2]

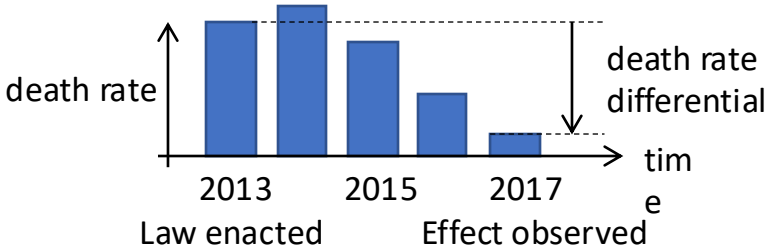
[1] Stony Brook University [2] Temple University

The Network for Public Health Law

Mission: Explore the Effect of Public Health Law to Lower Death from Opioid Abuse



What We Want: Gauge the Causality



Cause → Public Health Law → (causal relation) → Opioid Death Rate Differential ← Effect

For example:

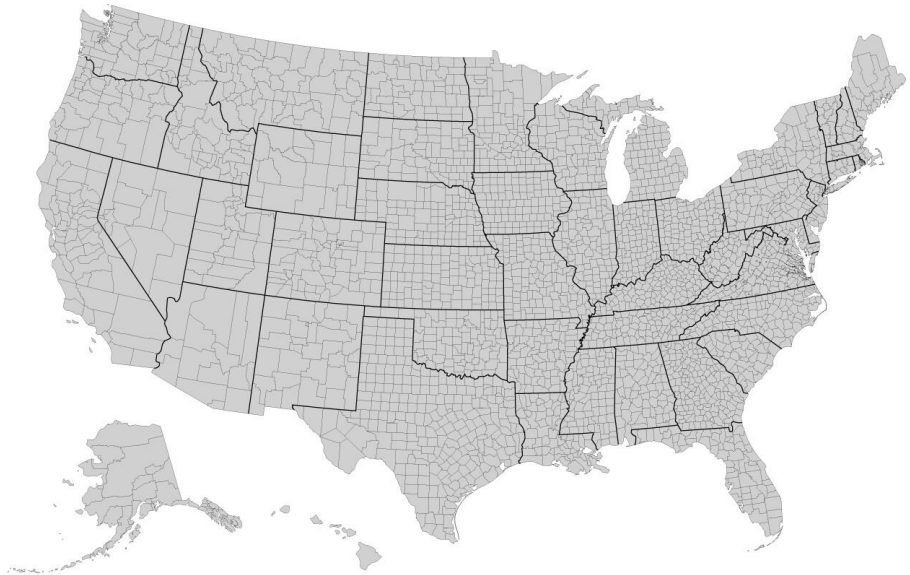
Naloxone Dispensing w/o Presciption → Opioid Death Rate 2017 - Opioid Death Rate 2013

Gauge Causality: Conduct Experiments

US Counties = 3,143 Unique Public Health Experiments

Sufficiently

- Numerous
- Homogenous
- Characterized



Data: NORC Dataset + Opioid Mortality from CDC Wonder

NORC covers these variables for 3 time spans (2009-2013-2017-2021) for 3,143 counties

Socio-Demographic

Race-Ethnicity

- White non-Hispanic
- Black non-Hispanic
- Hispanic or Latino
- Asian non-Hispanic
- American Indian/Alaska Native non-Hispanic
- Native Hawaiian/Pacific Islander non-Hispanic

Age

- Aged <15
- Aged 15-64
- Aged 65+

Education

- Completed High School
- Completed College

Other

- Disability Status
- Broadband Access

Economic

Labor

- Population Employed in Mining and Natural Resources
- Population Employed in Construction
- Population Employed in Manufacturing
- Population Employed in Trade Transportation and Utilities
- Poverty Rate
- Median Household Income
- Unemployment Rate

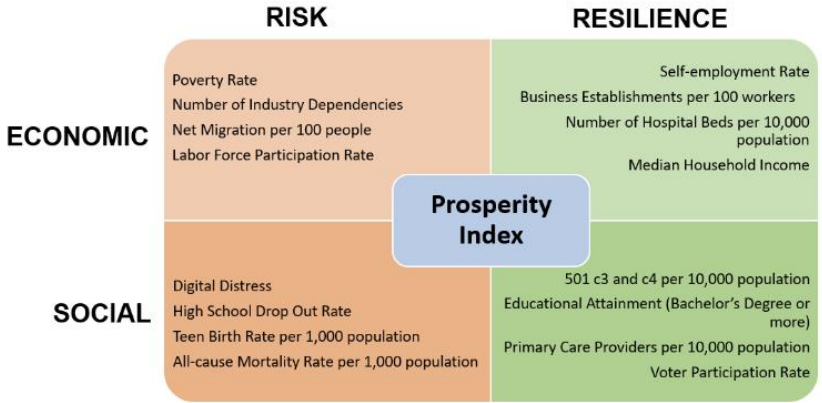
Behavioral Health Resources

- Number of Mental Health Facilities per 100,000 population
- Number of Substance Use Facilities per 100,000 population

Prosperity Index

- Prosperity Index Score
- Economic Risk Score
- Economic Resilience Score
- Social Risk Score
- Social Resilience Score

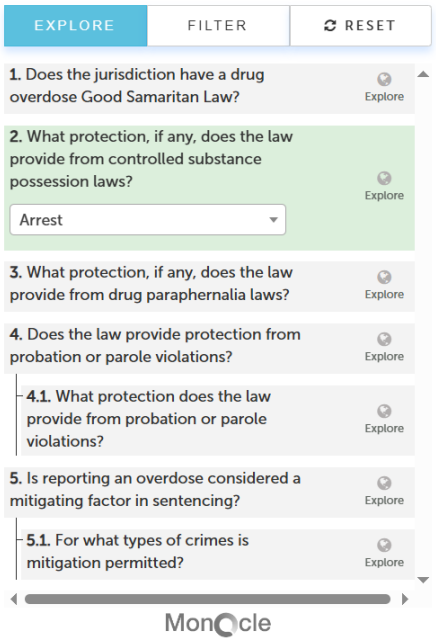
Some of these factors are provided in the data

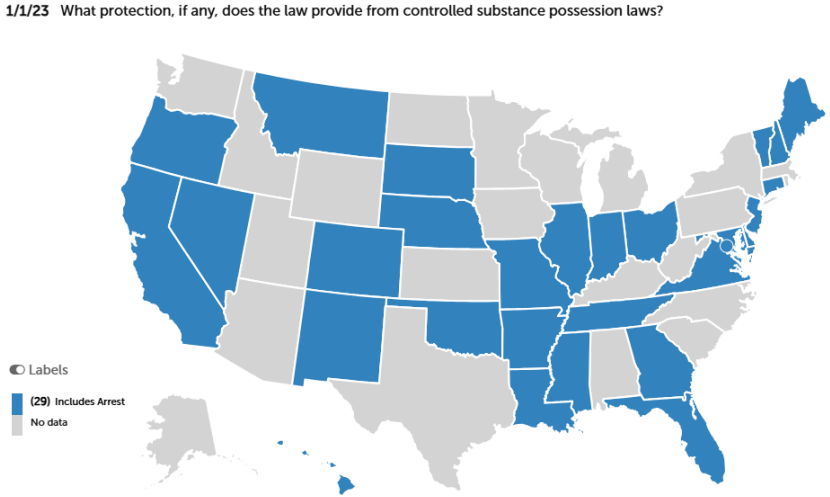


Laws: Temple CPHLR PDAPS Database

Download

DATA CODEBOOK PROTOCOL SUMMARY





The Network for Public Health Law

https://pdaps.org/datasets/good-samaritan-overdose-laws-1501695153

Causality Metric: Conditional Average Treatment Effect (CATE)

Want to know whether the opioid death rate **Y** of a given county **C** will improve after treating it with law **L**, conditional on a set of covariates **x**

$$CATE(x) = E[Y(1) - Y(0) \mid X = x]$$

Y(1): death rate differential in county **C** with law **L** applied

Y(0): death rate differential in county **C** with law **L** not applied

***x**:* the county's socioeconomic profile (NORC data)

Problem: We can either observe **Y(1)** or **Y(0)**, but not both

Solution: Estimate the Counterfactual

Train a **Bayesian Additive Regression Tree (BART)** with observed data

- Some counties were treated with **L** → **Y(1)**
- Some counties were not treated with **L** → **Y(0)**

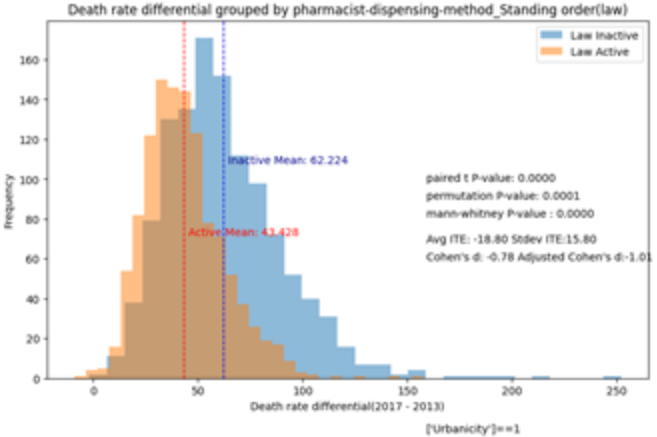
Then use the trained model to estimate the counterfactuals for each **C**

- Estimate **Y(1)** for the untreated counties
- Estimate **Y(0)** for the treated counties

Problem: The US is too heterogeneous in **X** to reach statistical significance for most/all **L**

Algorithm

1. Choose a law **L**
2. Identify counties with and without **L** → L_{active} and $L_{inactive}$
3. Pick a time interval and compute death rate differentials
4. Train BART model, estimate counterfactuals → yields a complete set of L_{active} and $L_{inactive}$
5. Test statistical significance (several tests)
6. Compare distributions of L_{active} and $L_{inactive}$ to gauge **L**'s effectiveness

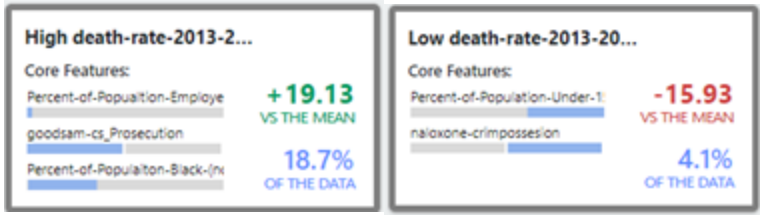


Solution: Test Law on Carefully Selected Subgroups of Counties

Problem: There are an infinite number of county subgroups → tedious to find

Solution: Use **pattern mining** to identify promising county subgroups that associate with death rate differentials that (on average) are lower (or higher) than the global average

- Not necessarily geographically connected
- Formed by combination of intervals of some **X** and possibly **L**s
- Fall into a **hyperbox** in the high-dimensional space formed by all **X** and **L**s

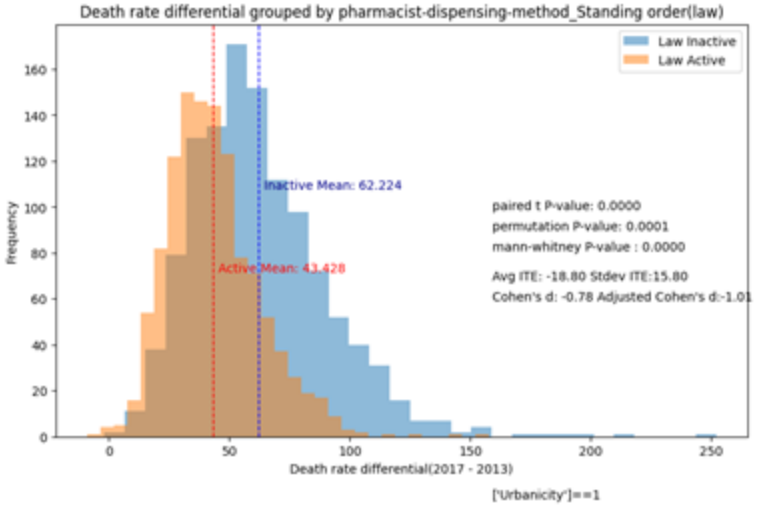


Result: for Naloxone Use

Subgroup: urban counties

Law: Pharmacist-dispensing-method_Standing order

→ Pharmacists are allowed to dispense or distribute naloxone without a patient-specific prescription from another medical professional



When the law is active the mean opioid death rate differential is **43.43** whereas it is **62.22** when the law is inactive.

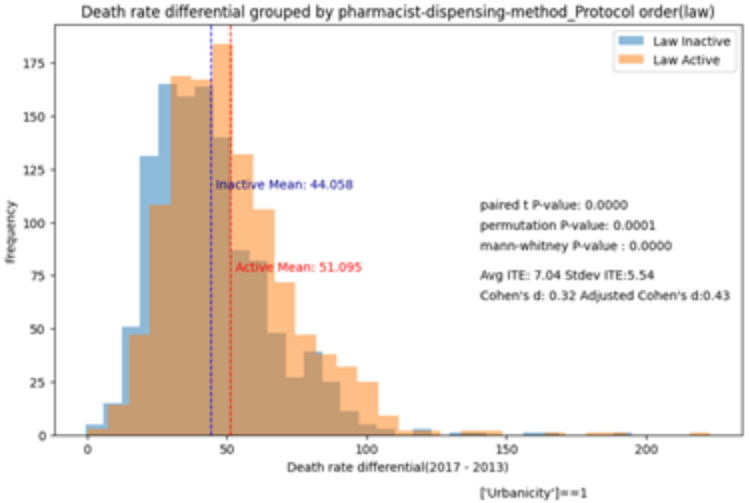
EFFECTIVE

Another Result: for Naloxone Use

Subgroup: urban counties

Law: Pharmacist-dispensing-method_Protocol order

→ More restrictions for pharmacists to provide naloxone



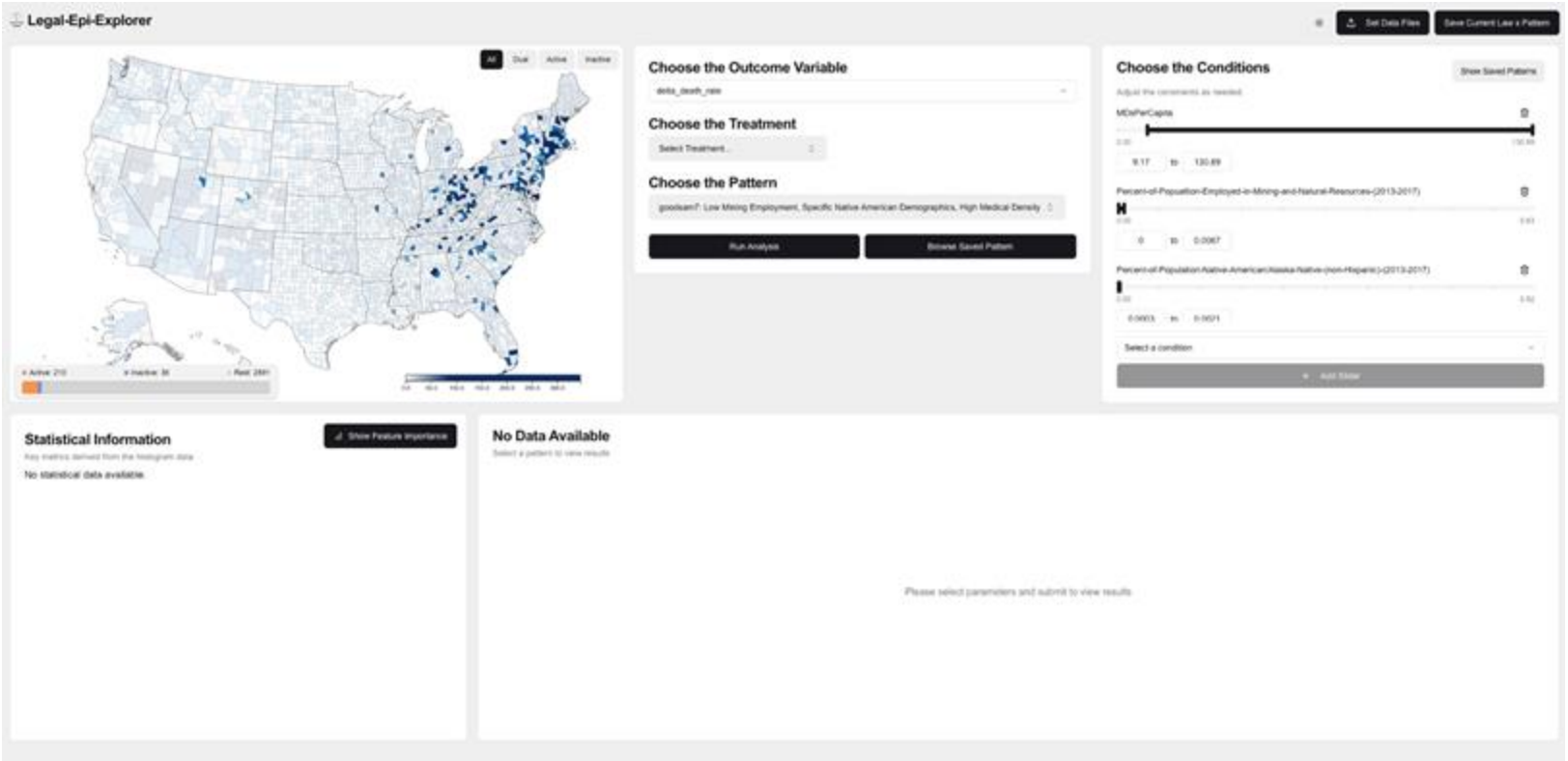
When the law is active the mean opioid death rate differential is **51.10** whereas it is **44.06** when the law is inactive.

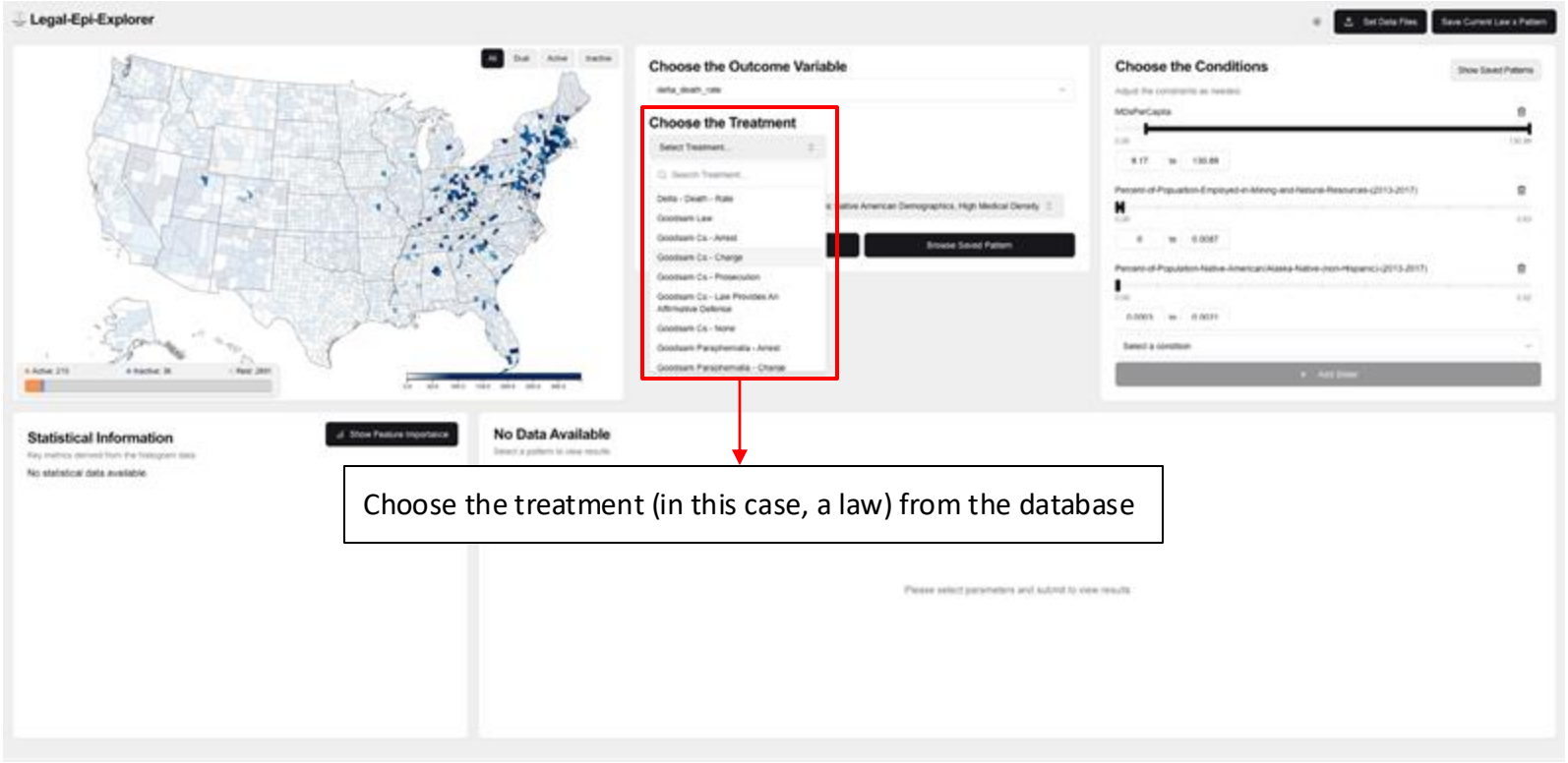
INEFFECTIVE

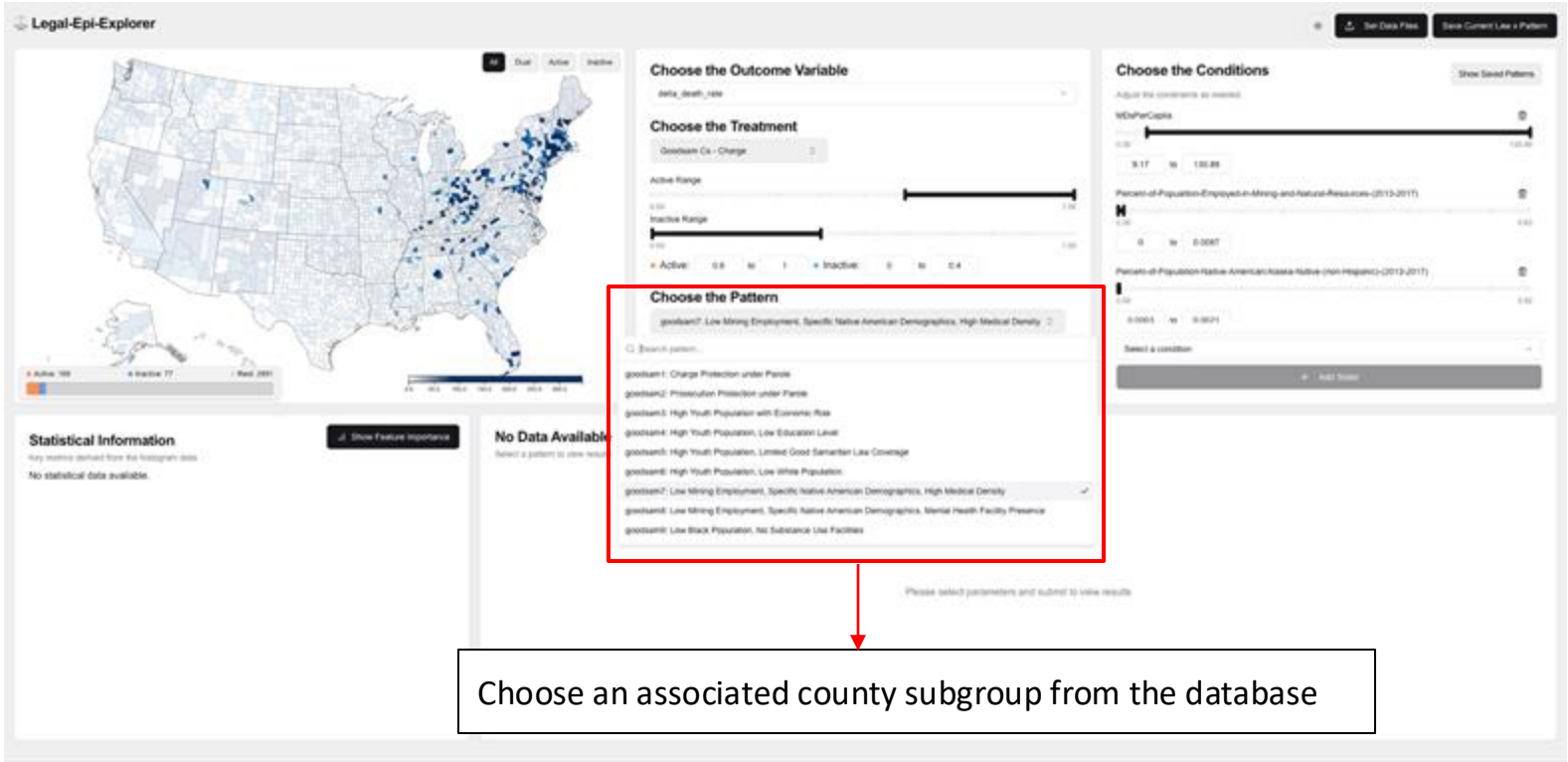
Legal-Epi-Explorer: An Interactive Visual Dashboard for Practical Use

Legal-Epi-Explorer allows analysts to

- Test laws if they're statistically significant (and effective) for a subgroup of counties
- Save valuable laws to a database along with the associated subgroup definitions → we call it a **pattern**
- Obtain recommendations on possibly effective laws for a selected county with the ability to fine tune the subgroup definitions


Legal-Epi-Explorer
Choose the Outcome Variable
Choose the Treatment
Choose the Pattern
Run Analysis
Browse Saved Pattern
Choose the Conditions
Statistical Information
No statistical data available.
No Data Available
Please select parameters and submit to view results.

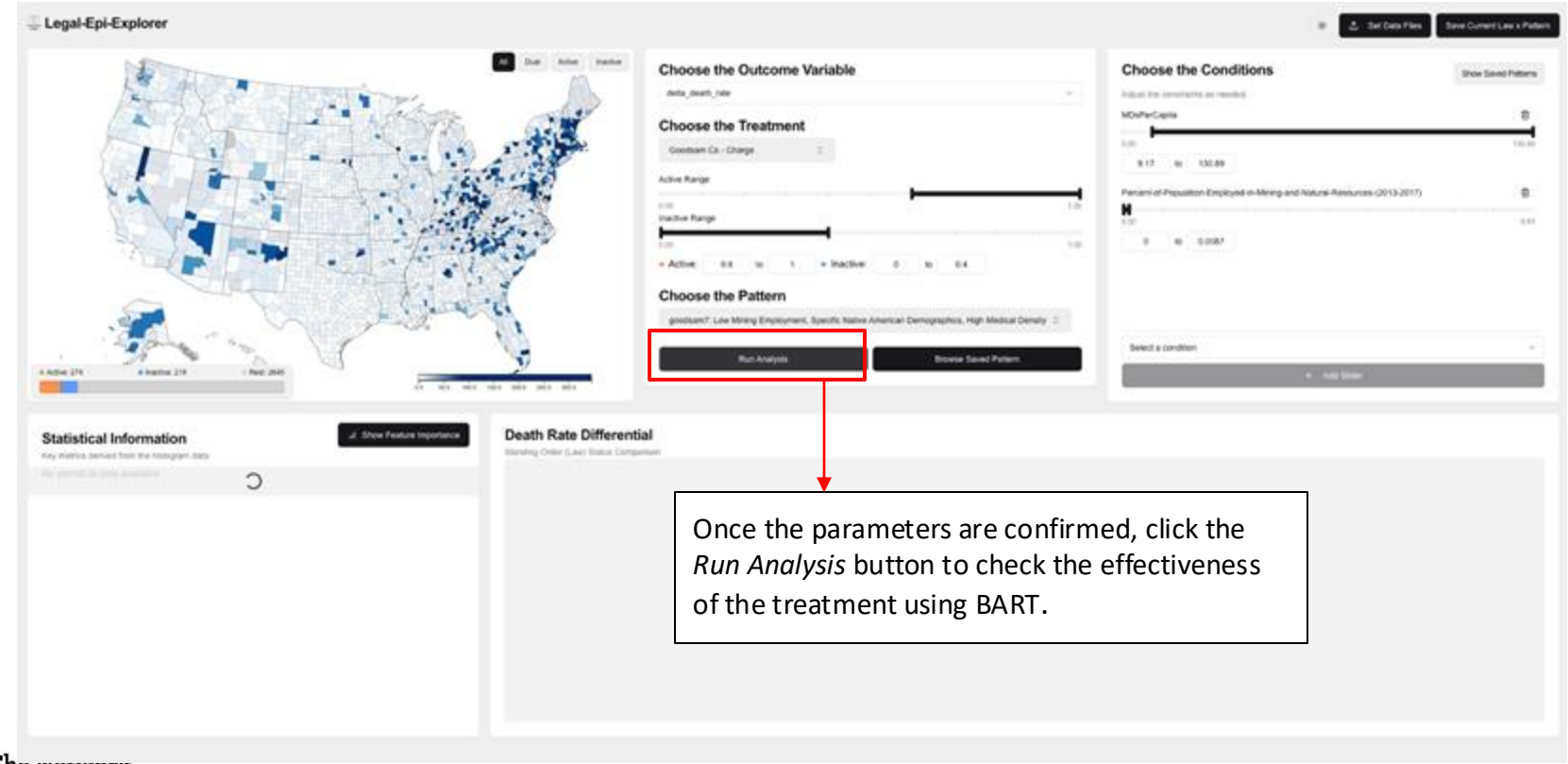

Legal-Epi-Explorer
Choose the Outcome Variable
Choose the Treatment
Choose the Conditions
Statistical Information
No Data Available
Choose the treatment (in this case, a law) from the database

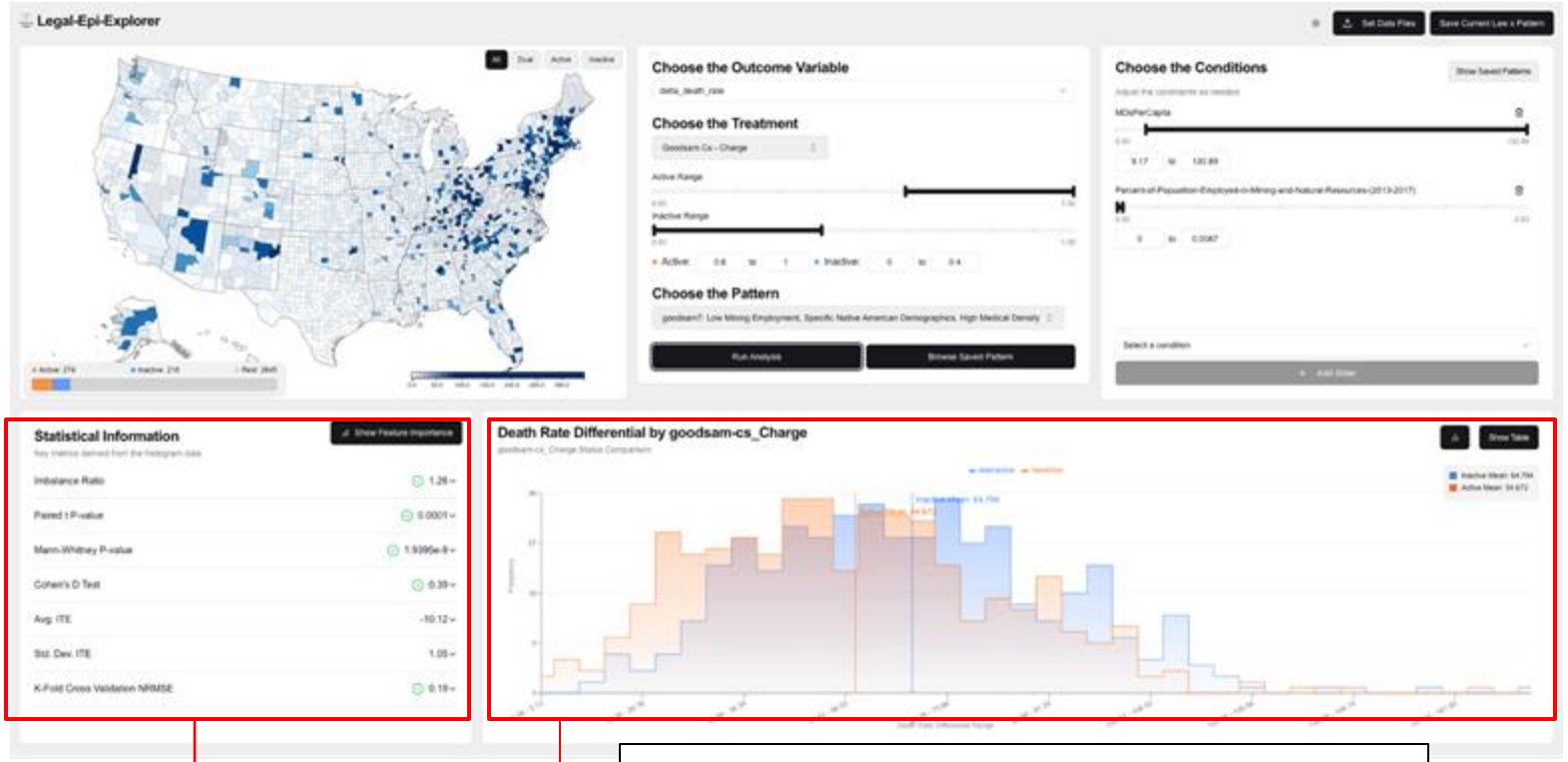

Legal-Epi-Explorer
Choose the Outcome Variable
Choose the Treatment
Choose the Conditions
Choose the Pattern
Statistical Information
No statistical data available.
No Data Available
Choose an associated county subgroup from the database

Number of counties with and without the law in the selected subgroup, also highlighed on the geomap

Every treatment (law or other intervention) will be converted to a binary value (on/off). Specify the value/range for active (treated) and inactive (control) level.

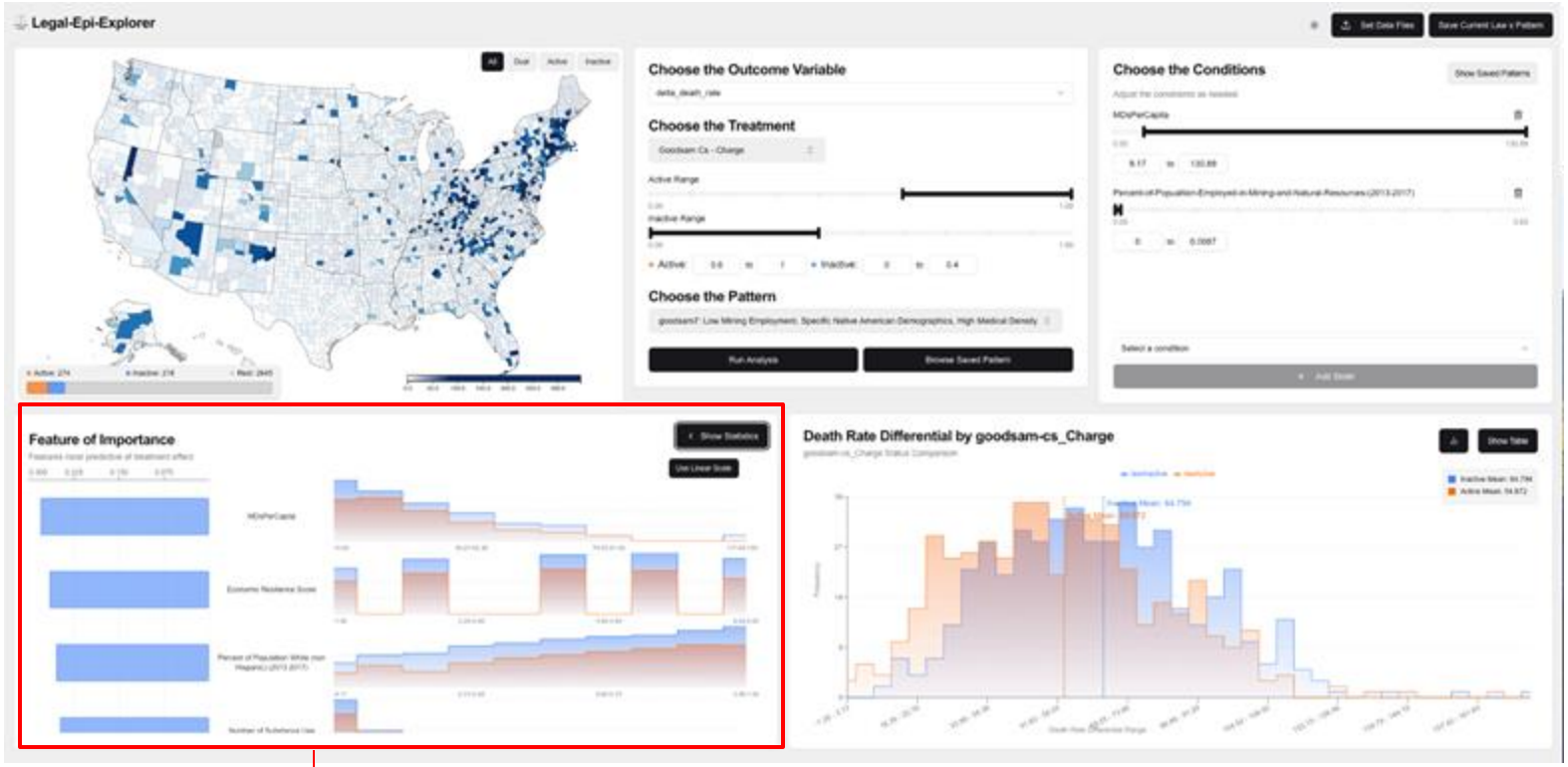
Play with the sliders to adjust the subgroup definition before BART-based testing.


Legal-Epi-Explorer
Choose the Outcome Variable
Choose the Treatment
Active Range
Inactive Range
Choose the Pattern
Run Analysis
Browse Saved Pattern
Choose the Conditions
Statistical Information
Death Rate Differential
Once the parameters are confirmed, click the *Run Analysis* button to check the effectiveness of the treatment using BART.



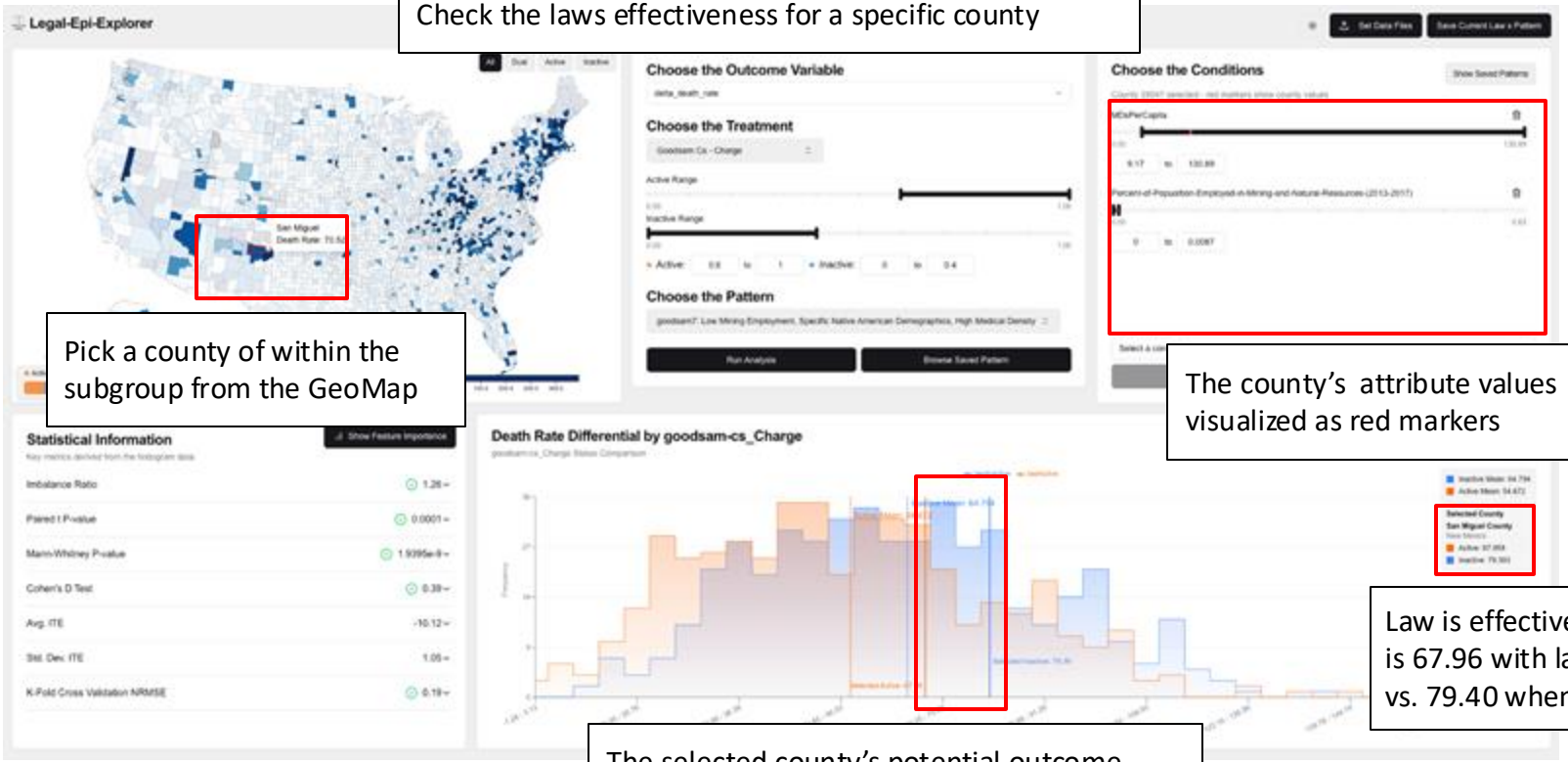
The law passed all statistical tests

The BART-inferred potential outcomes for all counties in the subgroup, visualized as a histogram.



Feature importance plots with value histograms

Check the laws effectiveness for a specific county

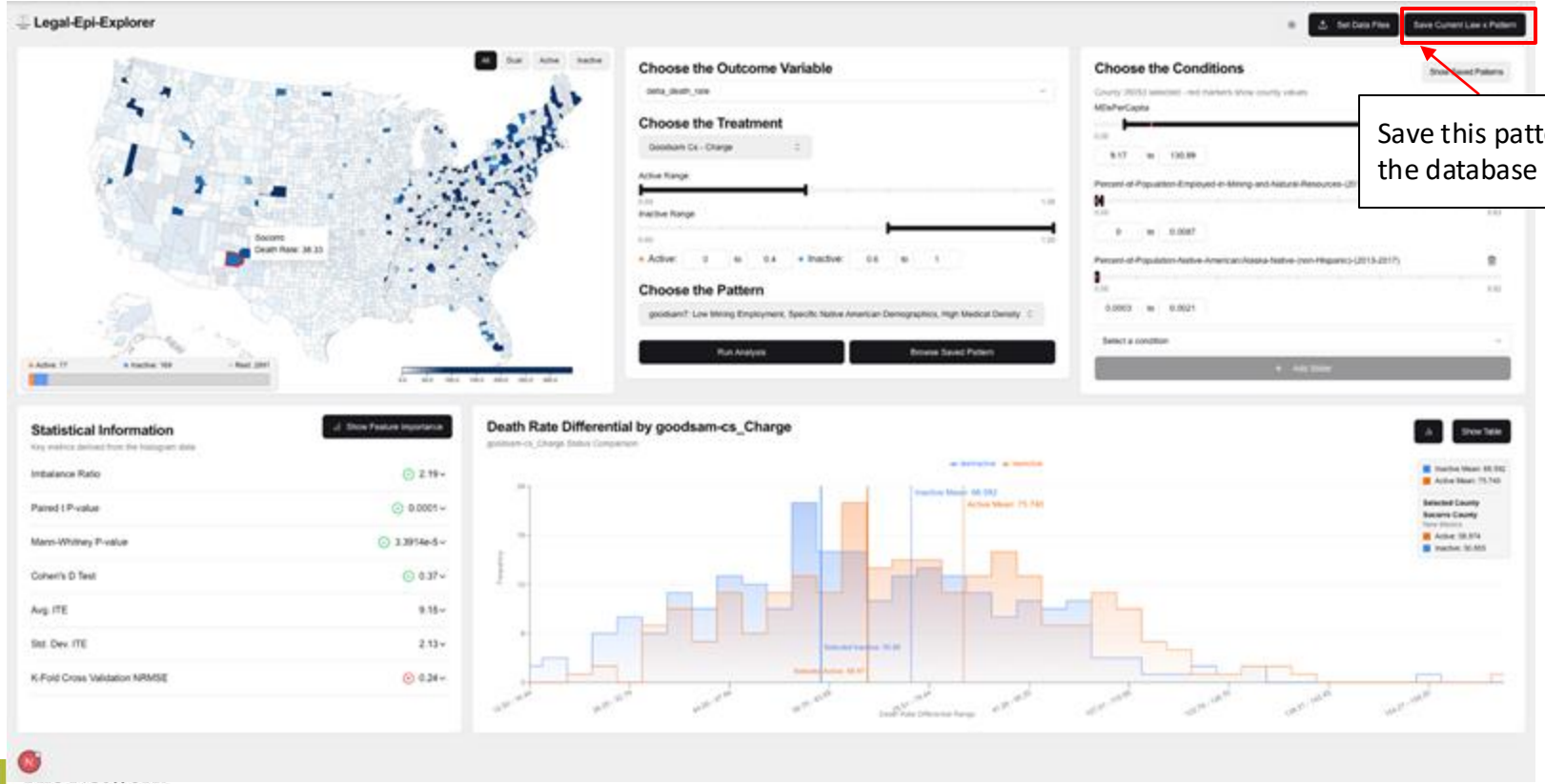


Pick a county of within the subgroup from the GeoMap

The county's attribute values visualized as red markers

Law is effective: Death rate is 67.96 with law in place vs. 79.40 when not

The selected county's potential outcome


Legal-Epi-Explorer
Choose the Outcome Variable
Choose the Treatment
Choose the Pattern
Run Analysis
Choose the Conditions
Save this pattern to the database
Statistical Information
Imbalance Ratio
Paired t P-value
Mann-Whitney P-value
Cohen's D Test
Avg. ITE
Std. Dev. ITE
K-Fold Cross Validation NRMSE
Death Rate Differential by goodsam-cs_Charge

Recommendations: Find the Law That Best Fits Your Specific Community

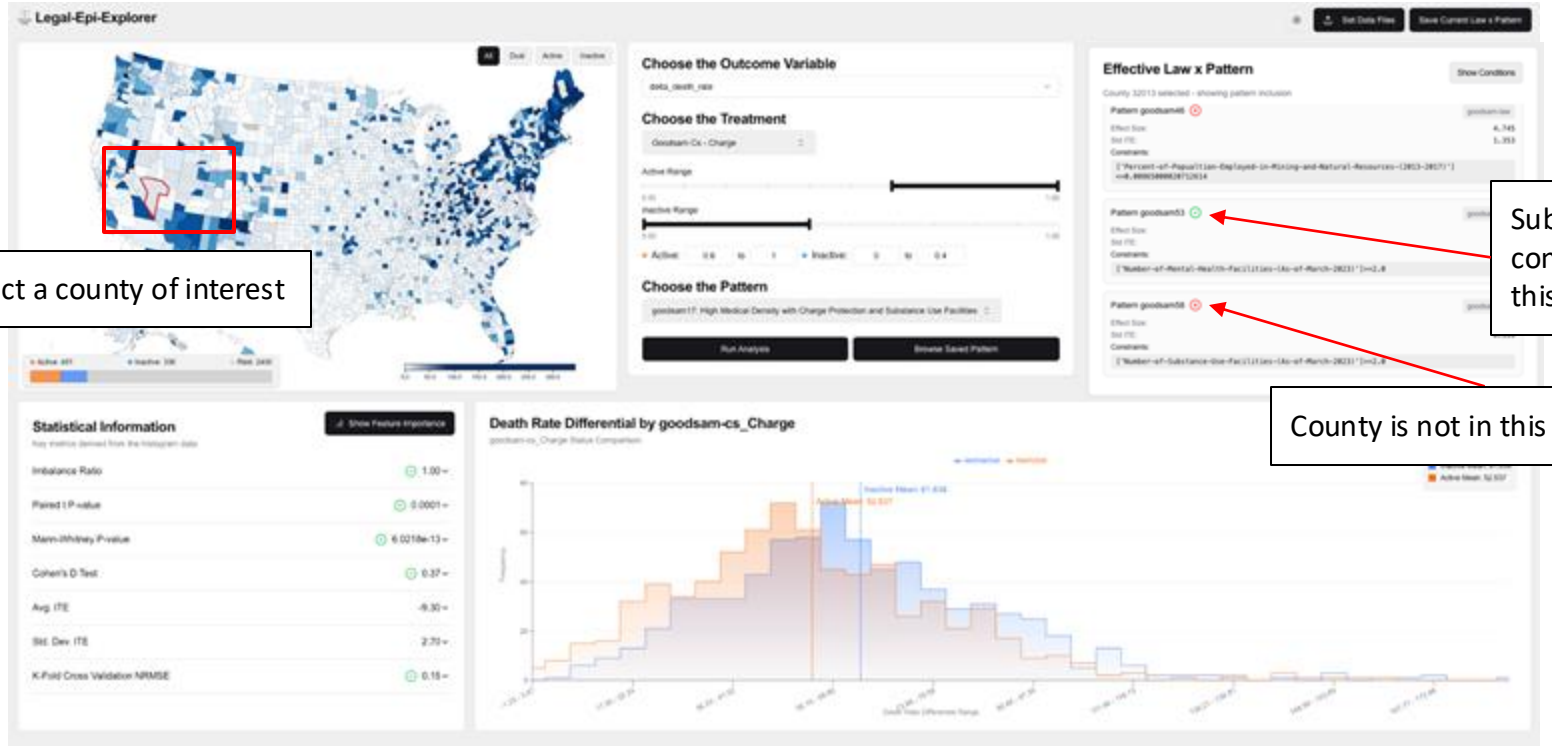
Often laws are incompatible with a community's socio-economic profile

- Can lead to friction, non-compliance, or plain ineffectiveness
- It's therefore important to find the right law for a given community

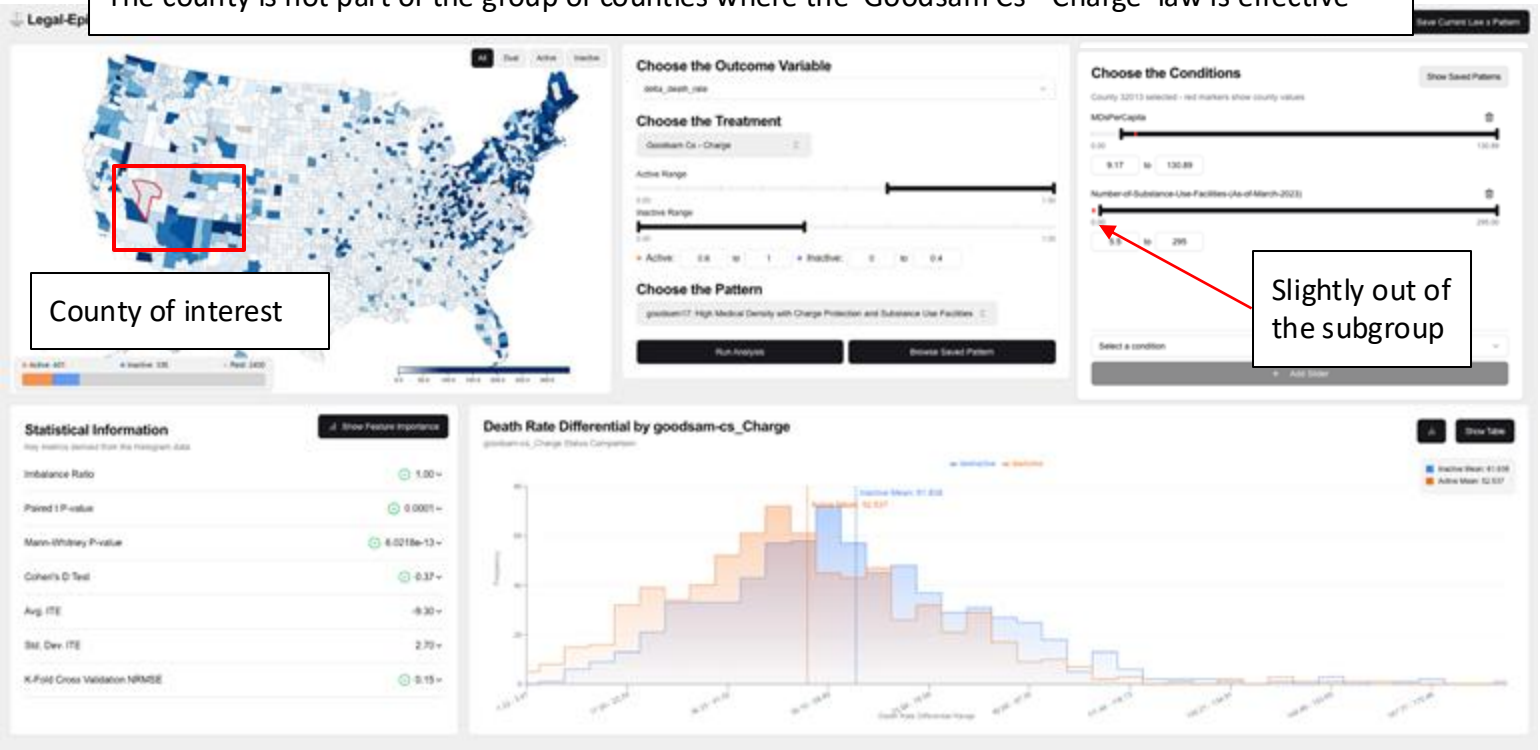
As Legal-Epi-Explorer learns more patterns

- It can use its knowledgebase to recommend laws to local policymakers
- Laws with high prospects of fitting the local socioeconomic profile

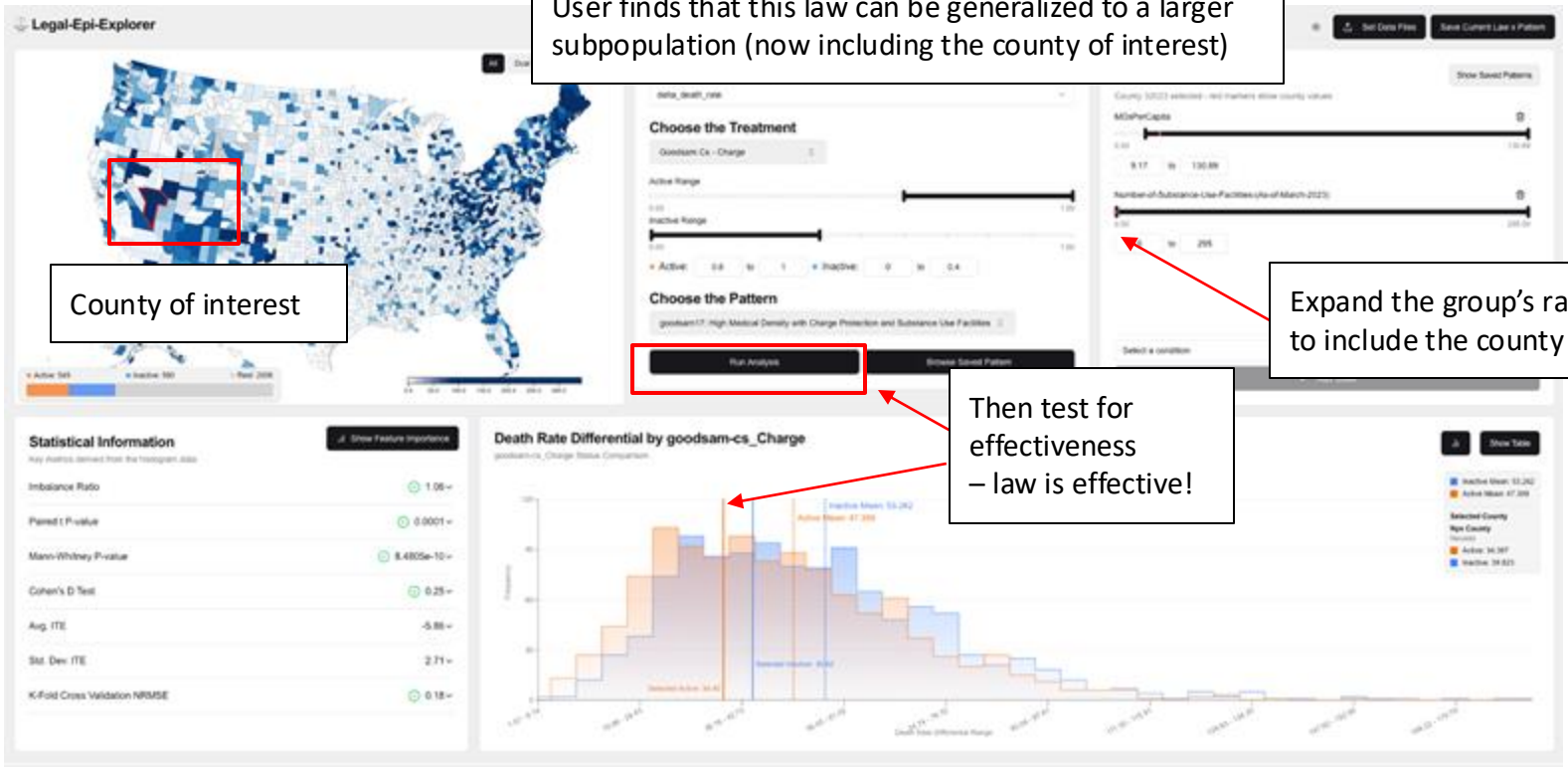
Recommendation Mode


Legal-Epi-Explorer
Choose the Outcome Variable
Choose the Treatment
Choose the Pattern
Run Analysis
Browse Saved Pattern
Effective Law x Pattern
Statistical Information
Death Rate Differential by goodsam-cs_Charge
Select a county of interest
Subgroup contains this county
County is not in this subgroup

The county is not part of the group of counties where the ‘Goodsam Cs - Charge’ law is effective



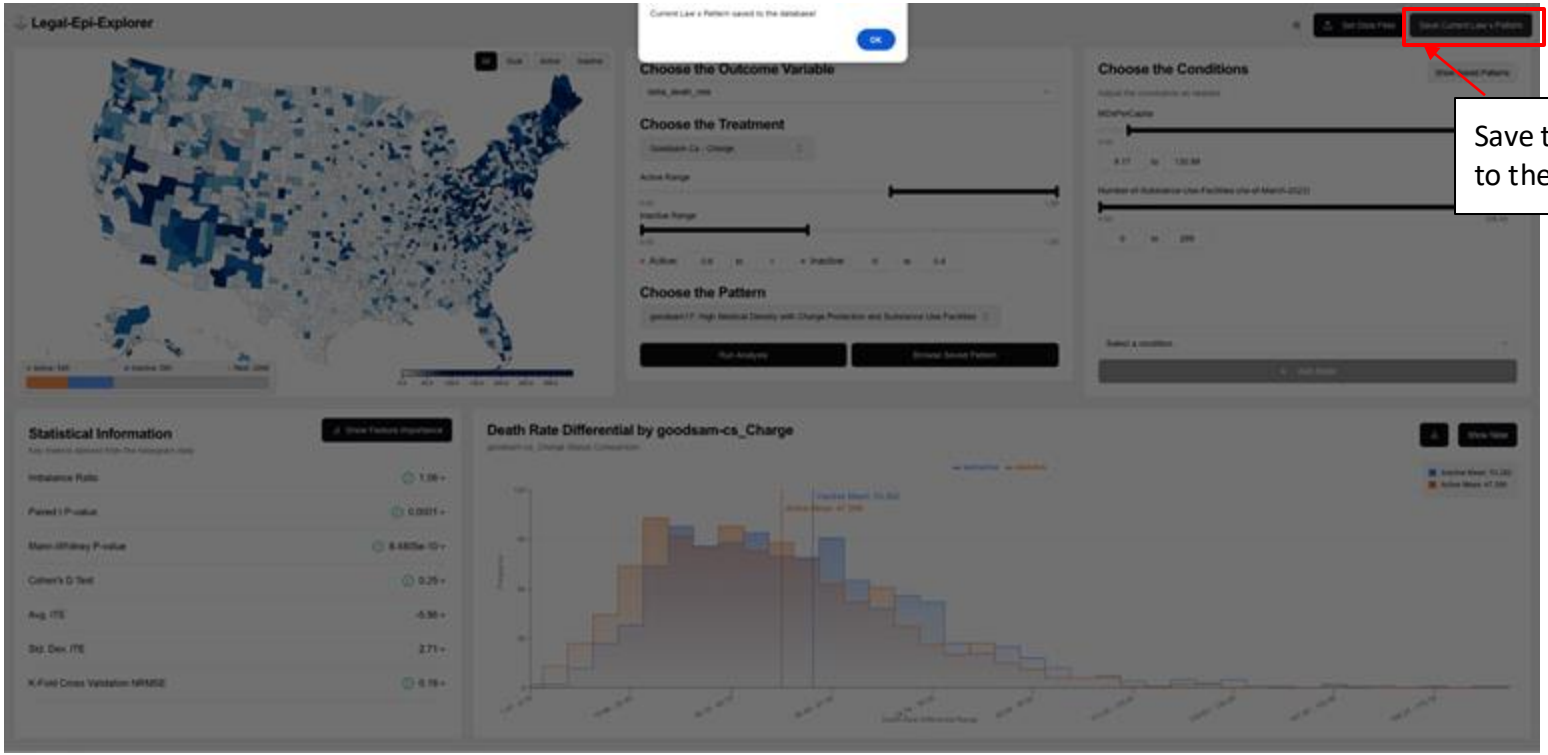
User finds that this law can be generalized to a larger subpopulation (now including the county of interest)



County of interest

Expand the group's range to include the county

Then test for effectiveness – law is effective!


Legal-Epi-Explorer
Choose the Outcome Variable
Choose the Treatment
Choose the Pattern
Choose the Conditions
Save this pattern to the database
Statistical Information
Death Rate Differential by goodsam-cs_Charge

Conclusions

As more patterns are identified Legal-Epi-Explorer gets better at recommending

- Can spare local communities from ill-fitting health policies
- Important especially since it takes several years to see what works and what not
- Learn from the experiences of other communities and contribute your own

Public health laws are not the only interventions that can be tested

- Socioeconomic “treatments”, like better schools or food environments, can also be tested within the dashboard, for any outcome variable

Legal-Epi-Explorer runs on a hosted server for platform independence

- Development is ongoing

Please take this survey to evaluate conference sessions.

THANK YOU

Why Can BART Estimate Causality?

Enables counterfactual prediction: BART models outcomes flexibly by combining many weak trees

Great for heterogeneous treatment effects: BART can estimate CATEs smoothly across subgroups of $\boldsymbol{X}$**;** captures nonlinearities and interactions

Full posterior: gives credible intervals (uncertainties) for CATEs (as opposed to causal forests)

When Can BART Estimate Causality?

Consistency: all treated counties received the same treatment → law **L** must be well defined

Unconfoundedness (Ignorability): no hidden confounders → include a comprehensive set of covariates **X** with domain expertise

Positivity (Overlap): every county has some chance of receiving treatment and control → no law **L** is inherently impossible for county **C**