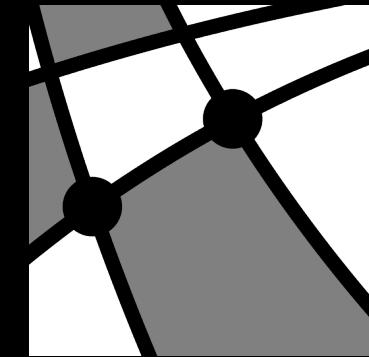


# Opioid Environment Policy Scan: Open data for analyzing and visualizing the opioid risk environment

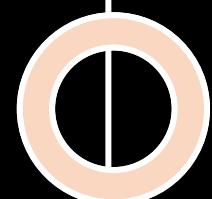
Susan Paykin

Center for Spatial Data Science  
University of Chicago

AAG 2022 | Feb 28



THE CENTER FOR  
**SPATIAL  
DATA  
SCIENCE**  
THE UNIVERSITY OF CHICAGO



Healthy Regions  
+ Policies Lab



Since the late 1990s, the opioid epidemic has impacted nearly all communities across the US.

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This is not just a public health crisis.

→ Multiple social and economic impacts felt in different regions and communities

- Spatial considerations
- Policy implications
- Equity concerns

## THE OPIOID EPIDEMIC BY THE NUMBERS



**70,630**

people died from drug overdose in 2019<sup>2</sup>



**10.1 million**

people misused prescription opioids in the past year<sup>1</sup>



**1.6 million**

people had an opioid use disorder in the past year<sup>1</sup>



**2 million**

people used methamphetamine in the past year<sup>1</sup>



**745,000**

people used heroin in the past year<sup>1</sup>



**50,000**

people used heroin for the first time<sup>1</sup>



**1.6 million**

people misused prescription pain relievers for the first time<sup>1</sup>



**14,480**

deaths attributed to overdosing on heroin (in 12-month period ending June 2020)<sup>3</sup>



**48,006**

deaths attributed to overdosing on synthetic opioids other than methadone (in 12-month period ending June 2020)<sup>3</sup>



### SOURCES

1. 2019 National Survey on Drug Use and Health, 2020.

2. NCHS Data Brief No. 394, December 2020.

3. NCHS, National Vital Statistics System. Provisional drug overdose death counts.

The COVID-19 pandemic has only intensified the crisis.

100,000

Opioid overdose deaths in the US increased by **28.5%**, to more than **100,000 deaths**, from April 2020 – April 2021. (CDC, Nov. 2021)

Figure 1a. 12 Month-ending Provisional Counts of Drug Overdose Deaths: United States

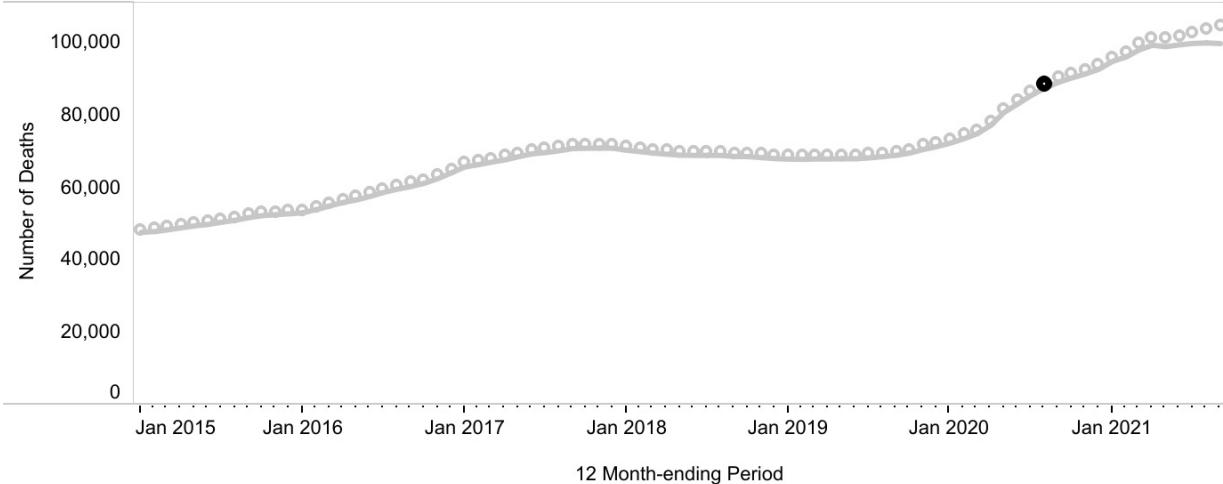
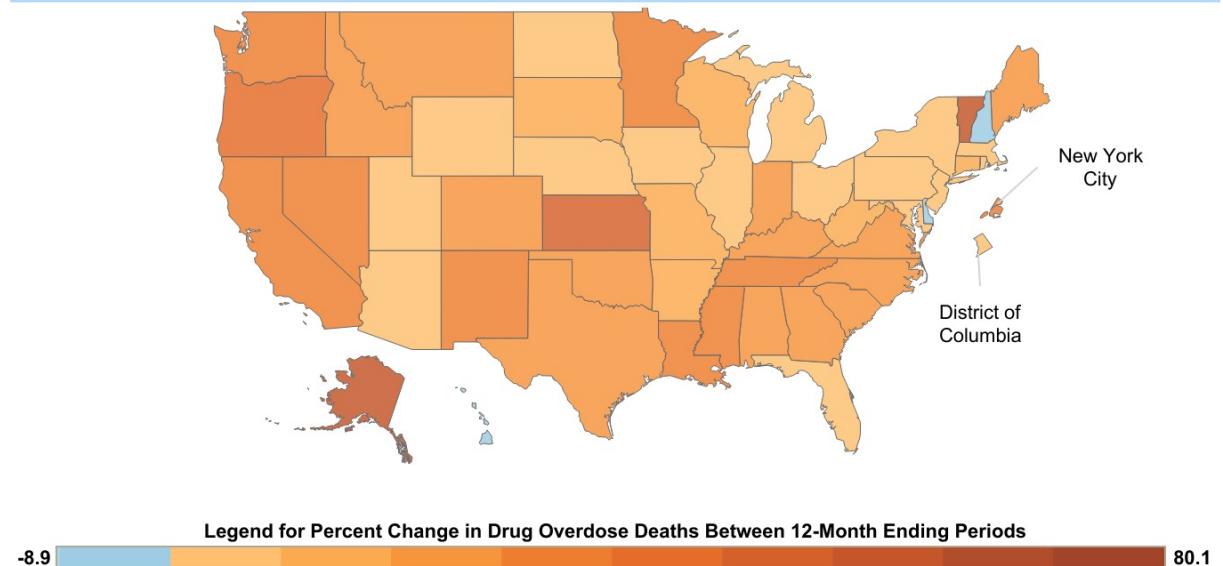


Figure 1b. Percent Change in Predicted 12 Month-ending Count of Drug Overdose Deaths, by Jurisdiction: September 2020 to September 2021



Source: CDC

# What does this mean for open spatial data science?

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Expanded access to open source,  
health geography data & infrastructure  
has never been more critical

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Knowing pre-pandemic baselines can  
help providers and decision makers  
understand communities  
disproportionately impacted

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*Who is being impacted, where are  
resources needed now, and how does  
this intersect with COVID and other  
healthcare needs?*

# Framework:

Addressing opioid use disorder (OUD) requires understanding of varying spatial, social and environmental dimensions of risk.

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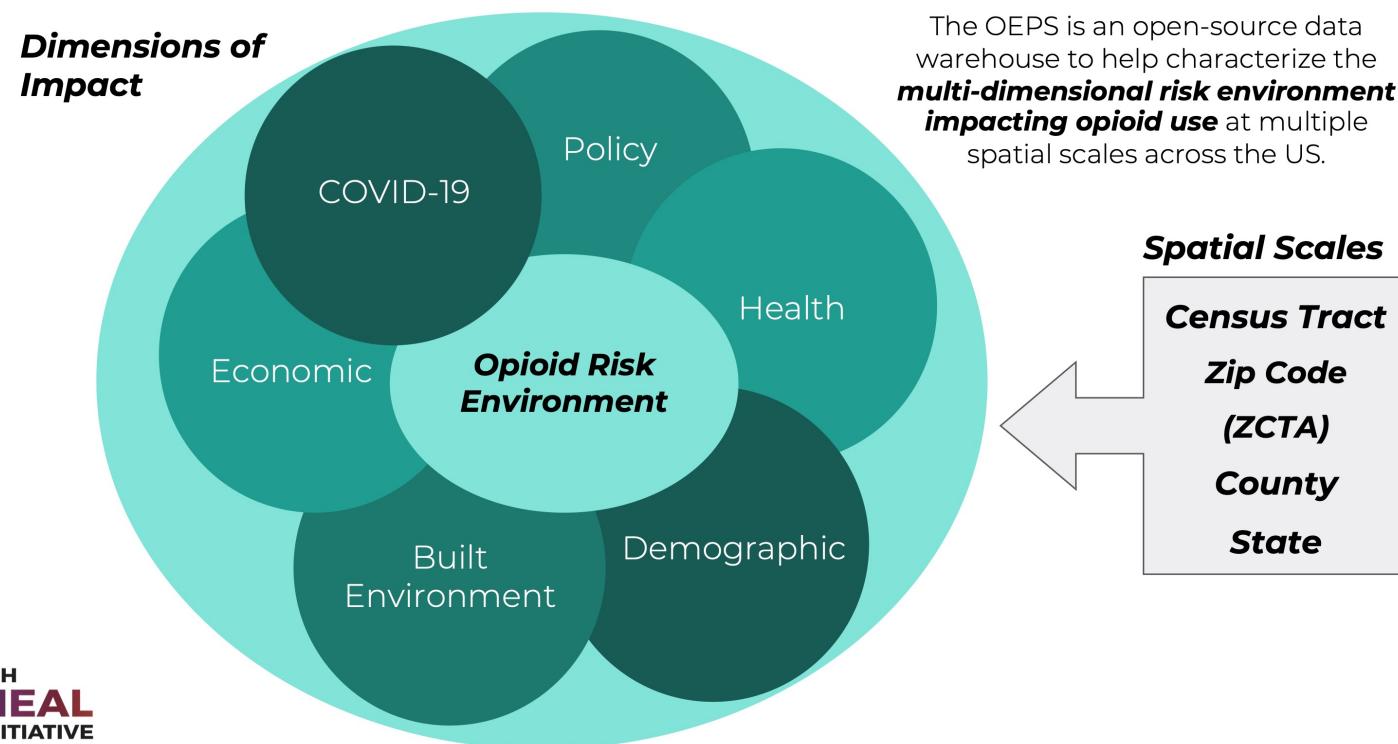
We created an open data warehouse for cleaned spatial data related to the opioid epidemic.

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We integrate community data and social determinants of health applying the **risk environment framework**:

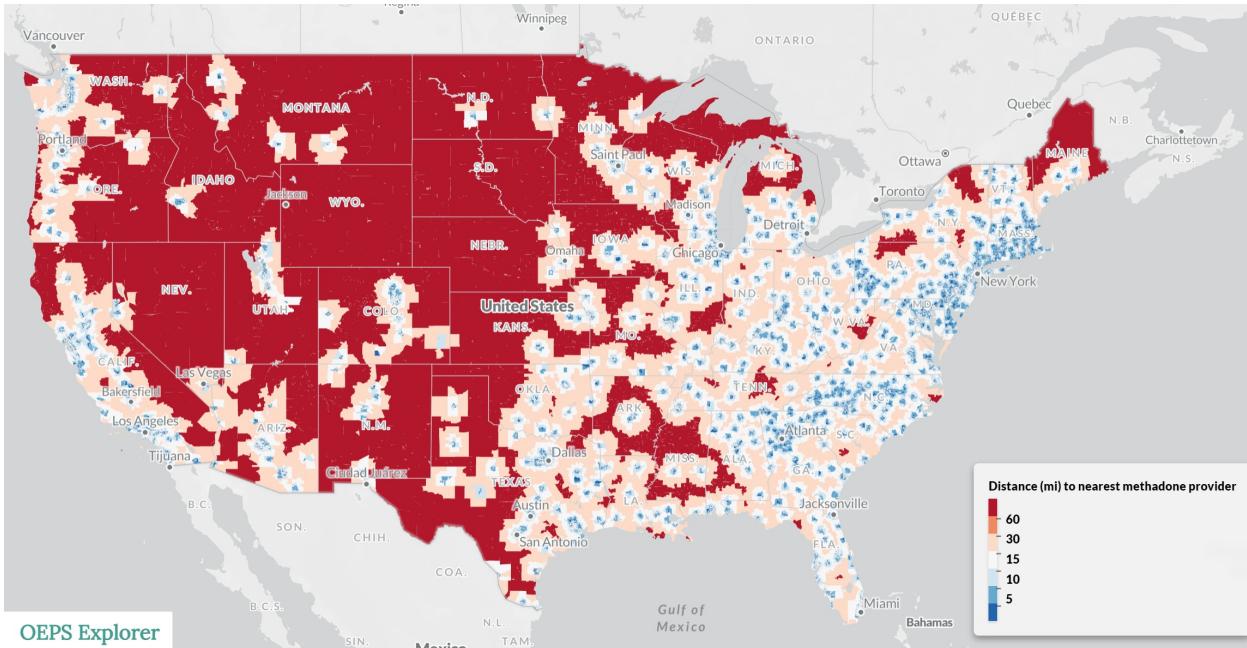
*Drug-related harm is a product of influences from social, physical, economic, and political factors. (Rhodes 2002)*

# The Opioid Environment Policy Scan: An open source data warehouse with health, policy, and community data related to the opioid crisis at a nation-wide scale.

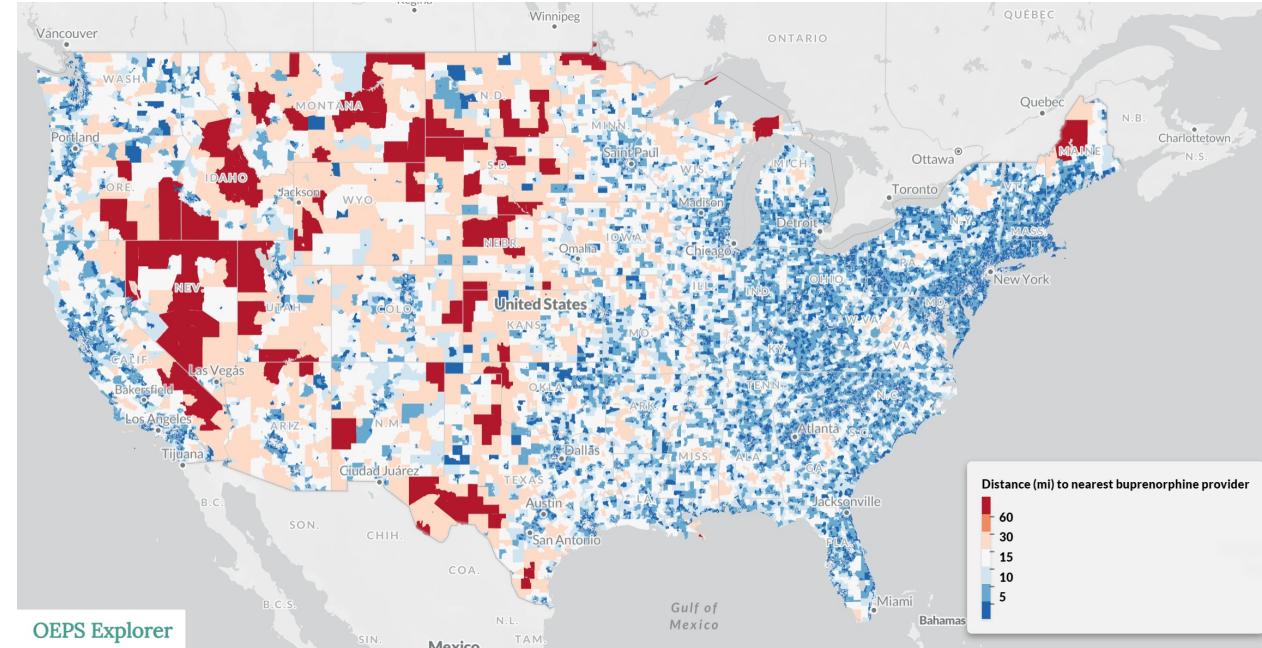


- Integrating social and structural determinants of health
- Data is grouped thematically, across six dimensions of impact
- More than 50 variable constructs, available at multiple spatial scales
- Data available for download and via API

# Access metrics for all medications for opioid use disorder (MOUDs), addiction treatment, and other health resources -- for all Census tracts and zip codes



Distance to nearest methadone clinic



Distance to nearest buprenorphine provider

Data Source: SAMHSA

# Open Data

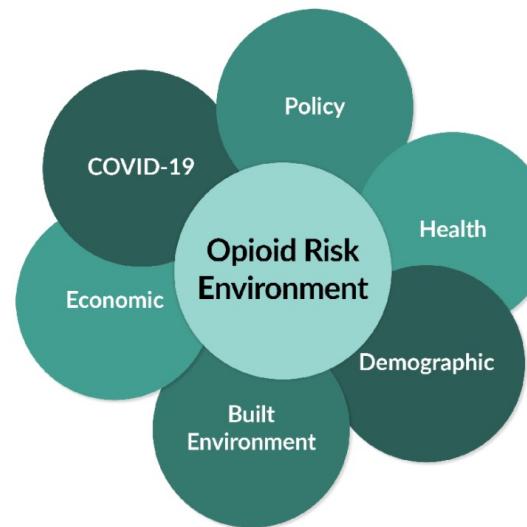
# Open Infrastructure

## GitHub Repository

Collaboration, data collection, code development, documentation

## OEPS Explorer

Static web application based on **WebGeoDa** & **NextJS**, **jsgeoda** for spatial computation, **deck.gl** for map rendering



# Opioid Environment Policy Scan

An open data warehouse exploring the multi-dimensional risk environment, from neighborhoods to states, impacting opioid use and health outcomes across the United States.



## Data

Access data by theme or spatial scale and explore our methodology.

[Download >](#)[Documentation >](#)[Methodology >](#)

## Map

Visualize data with our interactive web map.

[Start mapping >](#)

## Insights

Learn about research insights from our lab and partners.

[Insights >](#)[About >](#)

# Data Download

Download all data, or select particular topics or geographic scales.

Download all data  
ZIP File

Download all data  
TAR Ball

View on  
GitHub

## Filter Data and Download

### Filter by Theme

Geographic Boundaries Policy Variables Health Variables

Demographic Variables Economic Variables Built Environment Variables

COVID Variables

### Filter by Scale

State County Tract Zip

# Data Docs

Variable constructs are grouped thematically below to highlight the multi-dimensional risk environment of opioid use in justice populations. In the **Metadata** column, linked pages provide more detail about the data source, descriptions of data cleaning or processing, and individual variables included.

## Filter by Topic

[Geographic Boundaries](#) [Policy Variables](#) [Health Variables](#)

[Demographic Variables](#) [Economic Variables](#) [Built Environment Variables](#)

[COVID Variables](#)

## Filter by Scale

[State](#) [County](#) [Tract](#) [Zip](#)

About :: OEPS Dashboard x +

oeps.netlify.app/docs

OEPS Explorer

Menu

# Data Docs

## Built Environment Variables

Variable Construct	Variable Proxy	Source	Metadata	Spatial Scale
Housing Occupancy Rate	Percent occupied units	ACS, 2018 5-year	BE01 / <a href="#">Housing</a>	State, County, Tract, Zip
Housing Vacancy Rate	Percent vacant units	ACS, 2018 5-year	BE01 / <a href="#">Housing</a>	State, County, Tract, Zip
Long Term Occupancy	Percentage of population living in current housing for 20+ years	ACS, 2018 5-year	BE01 / <a href="#">Housing</a>	State, County, Tract, Zip
Mobile Homes	Percent of housing units classified as mobile homes	ACS, 2018 5-year	BE01 / <a href="#">Housing</a>	State, County, Tract, Zip
Rental Rates	Percent of housing units occupied by renters	ACS, 2018 5-year	BE01 / <a href="#">Housing</a>	State, County, Tract, Zip
Housing Unit Density	Housing units per square mile	ACS, 2018 5-year	BE01 / <a href="#">Housing</a>	State, County, Tract, Zip
Urban/Suburban/Rural Classification	Classification of areas as rural, urban or suburban using percent rurality (County) or RUCA Codes (Tract, Zip)	USDA & ACS, 2014-2018	BE02 / <a href="#">Rural-Urban Classifications</a>	County, Tract, Zip
Alcohol Outlet Density	Alcohol outlets per square mile, alcohol outlets per capita	InfoGroup, 2018	BE03 / <a href="#">Alcohol Outlets</a>	State, County, Tract, Zip
Hypersegregated Cities	US metropolitan areas where black residents experience hypersegregation	Massey et al, 2015	BE04 / <a href="#">Community Overlays</a>	County

## Policy Variables

Variable Construct	Variable Proxy	Source	Metadata	Spatial Scale
Prison Incarceration Rates	Prison population rate and prison admission rate by gender and ethnicity	Vera Institute of Justice, 2016	PS01 / <a href="#">Prison Variables</a>	County
Jail Incarceration Rates	Jail population rate by gender and ethnicity	Vera Institute of Justice, 2017	PS02 / <a href="#">Jail Variables</a>	County
Prescription Drug Monitoring Programs (PDMP)	Any PDMP; Operational PDMP; Must-access PDMP; Electronic PDMP	OPTIC, 2017	PS03 / <a href="#">PDMP</a>	State
Good Samaritan Laws	Any Good Samaritan Law; Good Samaritan Law protecting arrest	OPTIC, 2017	PS04 / <a href="#">GSL_2018</a>	State
Naloxone Access Laws	Any Naloxone law; law allowing distribution through a standing or protocol order; law allowing pharmacists prescriptive authority	OPTIC, 2017	PS05 / <a href="#">NAL</a>	State
Medicaid Expenditure	Total Medicaid spending	KFF, 2019	PS06 / <a href="#">MedExp</a>	State
Medicaid Expansion	Spending for adults who have enrolled through Medicaid expansion	KFF, 2018	PS07 / <a href="#">MedExpan</a>	State

AAG 2022

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## OEPS Explorer

## Menu

## Theme Select

Health Variables



## Variable Select

Driving time (min) to nearest methadone provider



## Geography Select

US States

US Counties

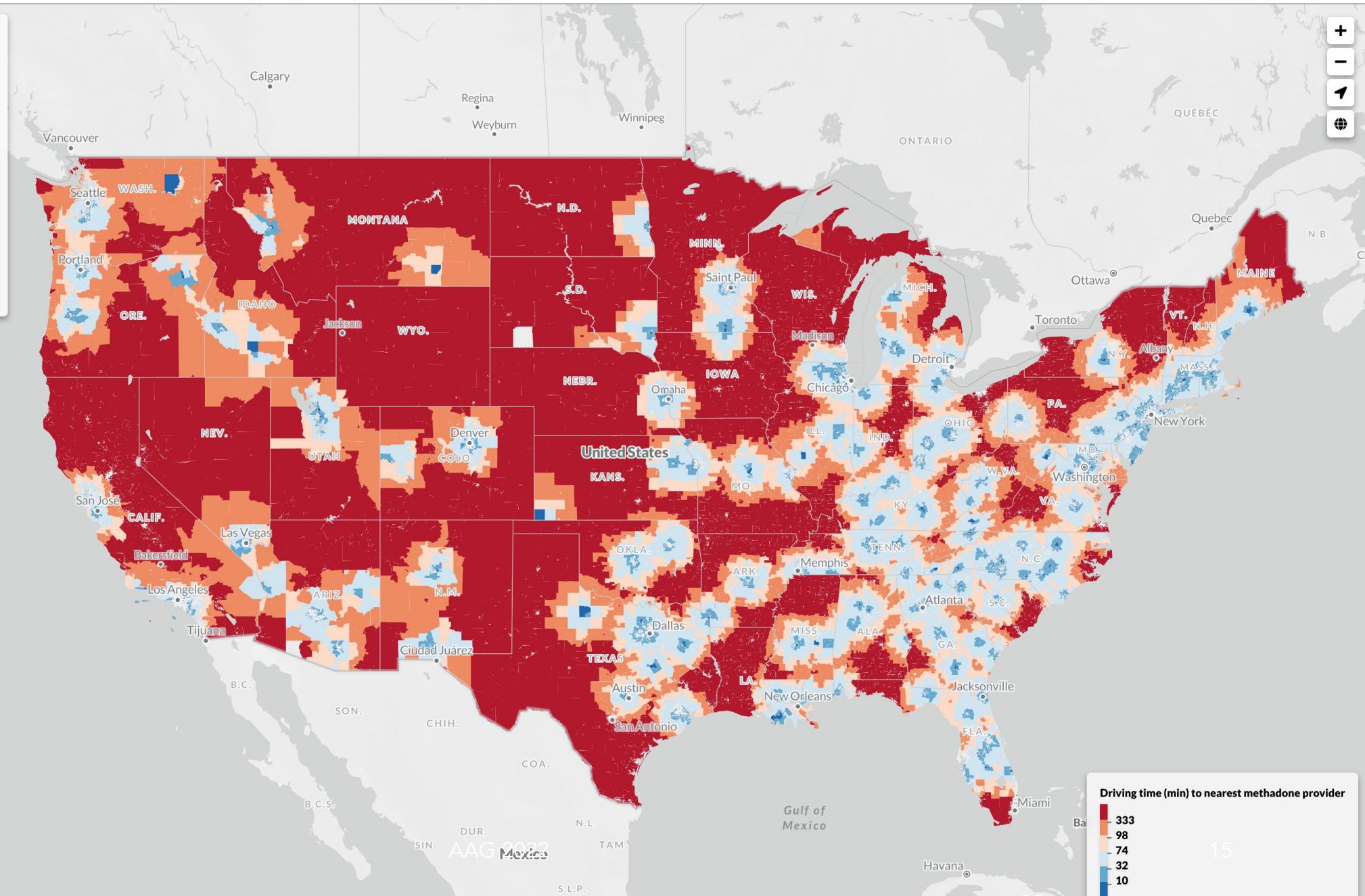
US Zip Codes

US Tracts

[Read more about this data](#)

Dataset: Access01

Column: metTime



OEPS Explorer

Theme Select

## Health Variables

## Variable Select

### Driving time (min) to nearest methadone provider

## Drug-Related Death Rate

## HCV Infection Rate

## HCV Mortality Rate

### Count of Primary Care Physicians (PCPs)

### Count of Specialty Physicians

**Distance (mi) to nearest MQUID (all)**

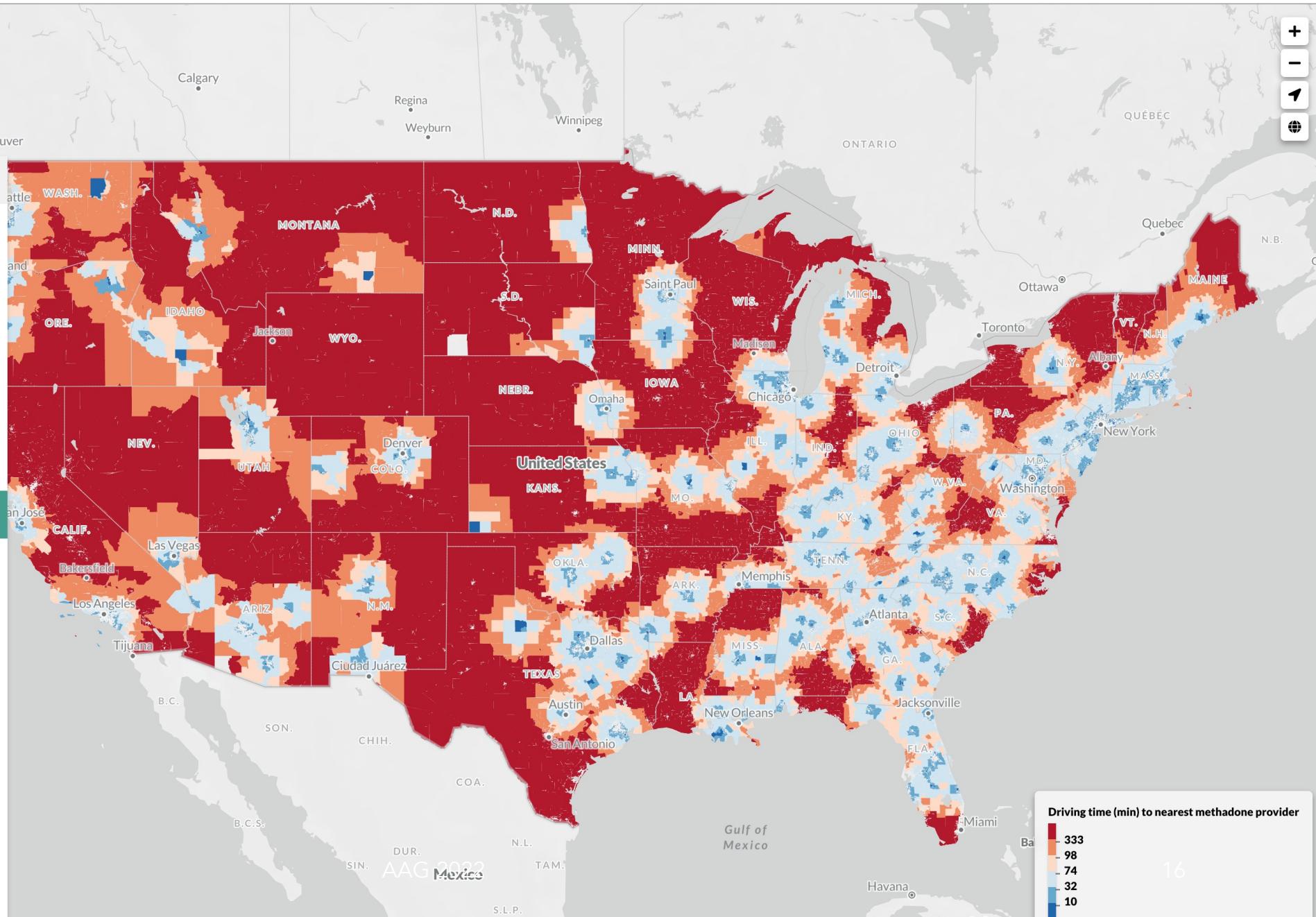
Distance (mi) to nearest methadone provider

Driving time (min) to nearest methadone provider

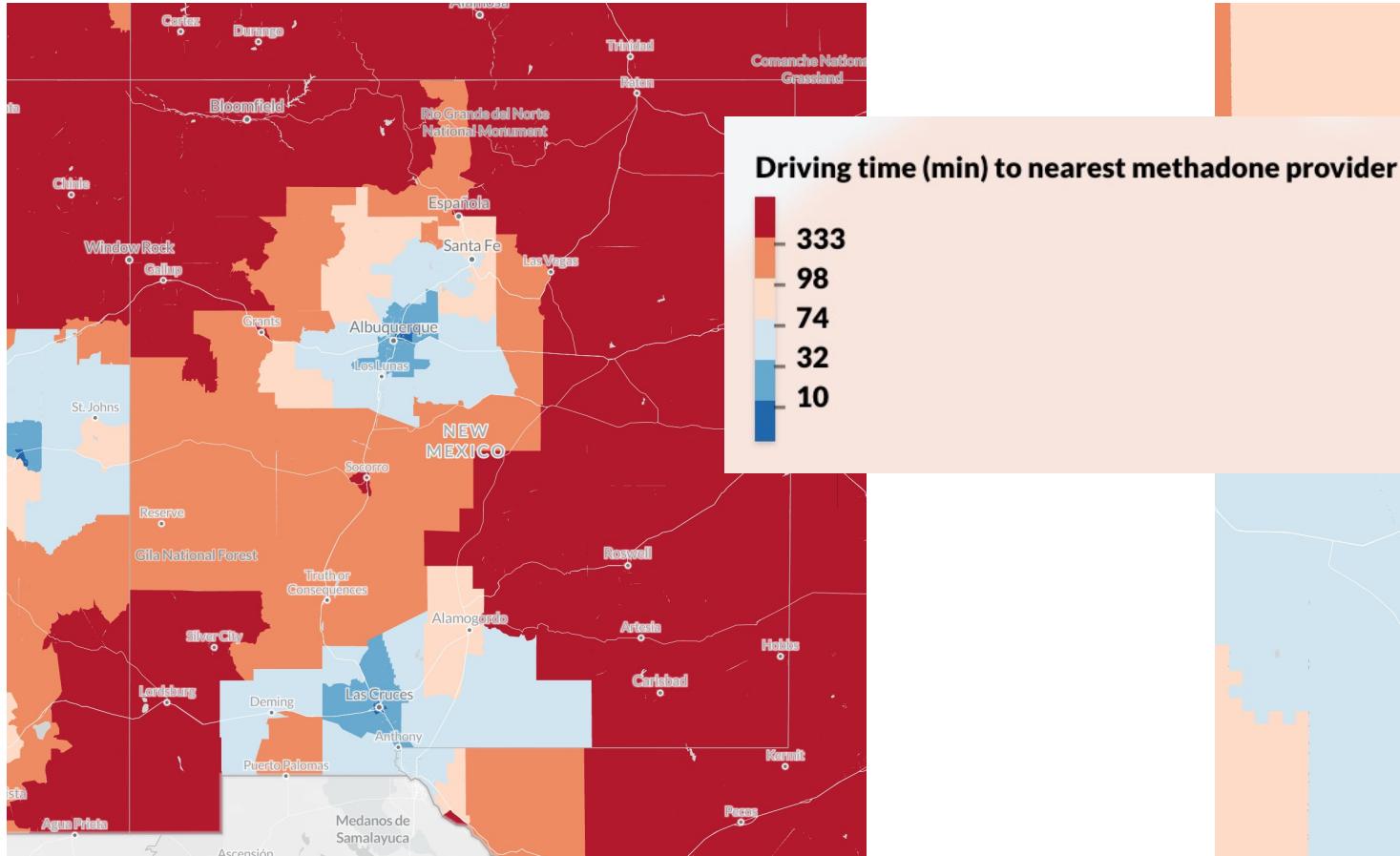
Comments that are off topic or contain

### Driving time (min) to nearest hair care provider

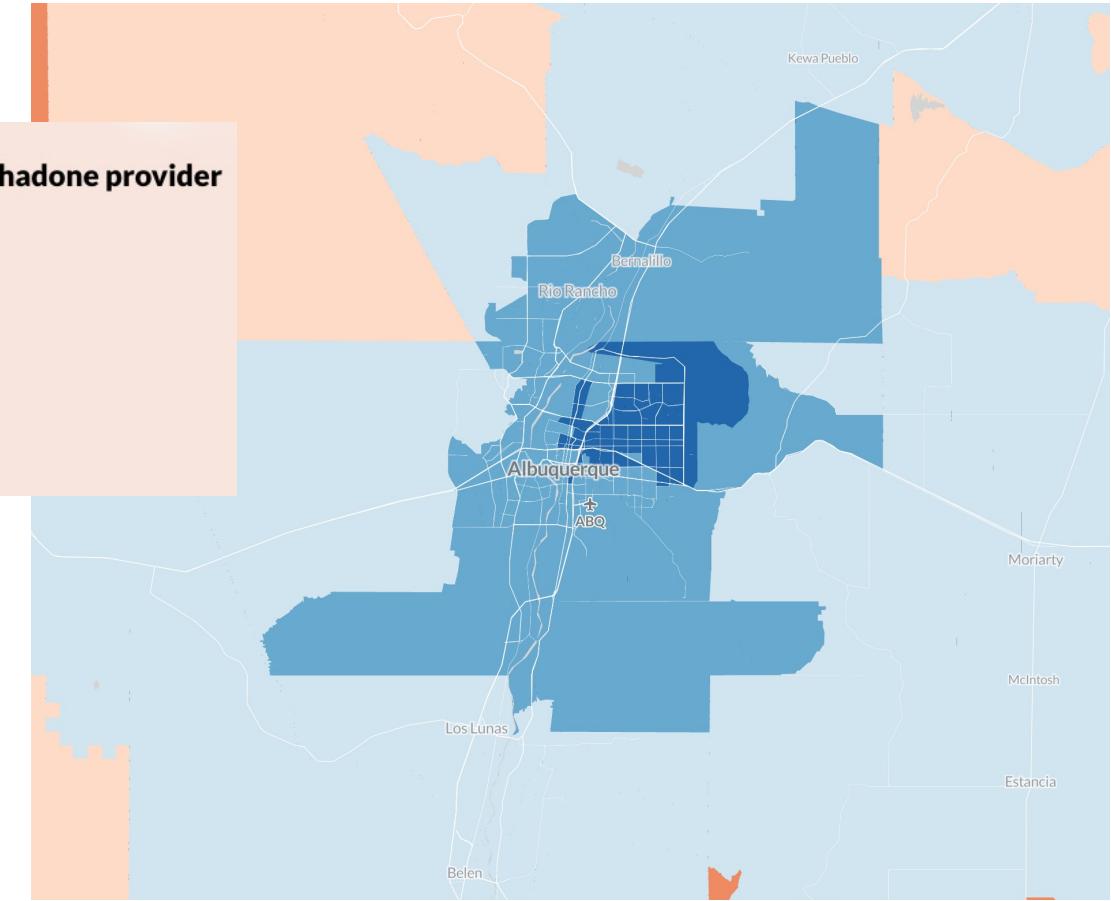
### Count of health exome providers in 30 minutes



# Quickly and easily visualize data at multiple scales to help uncover spatial gaps or inequities



New Mexico: Driving time to nearest methadone provider; ABQ appears to have “good” access



Albuquerque: Only tracts on the NE side are within a 10-minute drive radius from a methadone provider

# Current Impact

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**Collaborative data model:** The Rural Opioid Initiative forked the OEPS repo to build from for their rural research data collection and network resource

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**Cross-sectional analyses:** Access to MOUD across regional community typologies; social vulnerability to disasters (Yale School of Medicine); drug court treatment outcomes (Columbia/NYSPI)

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**Spatial data workshops and trainings:** Justice Community Opioid Innovation Network (JCOIN) and NIH-HEAL Initiative networks

# Future Directions

## Integrate

Integrate temporal data across variables;  
Ex: Methadone clinic locations back to 1990, access over time

## Expand

Expand beyond opioid-related topics, policies, harms;  
Apply to **structural factors impacting health** more broadly

## OS Development

Open source data and infrastructure collaborations, forks;  
Community data standards and QAQC



Thank you

## Susan Paykin

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[github.com/spaykin](https://github.com/spaykin) || @spaykin

## Opioid Environment Policy Scan



<https://github.com/GeoDaCenter/opioid-policy-scan>

OEPS Explorer: <https://oebs.ssd.uchicago.edu/>