

# Urban/Rural/Racial Disparities in Access to Buprenorphine Providers and Opioid Treatment Programs

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# Disclosure Information



**Solmaz Amiri, PhD**

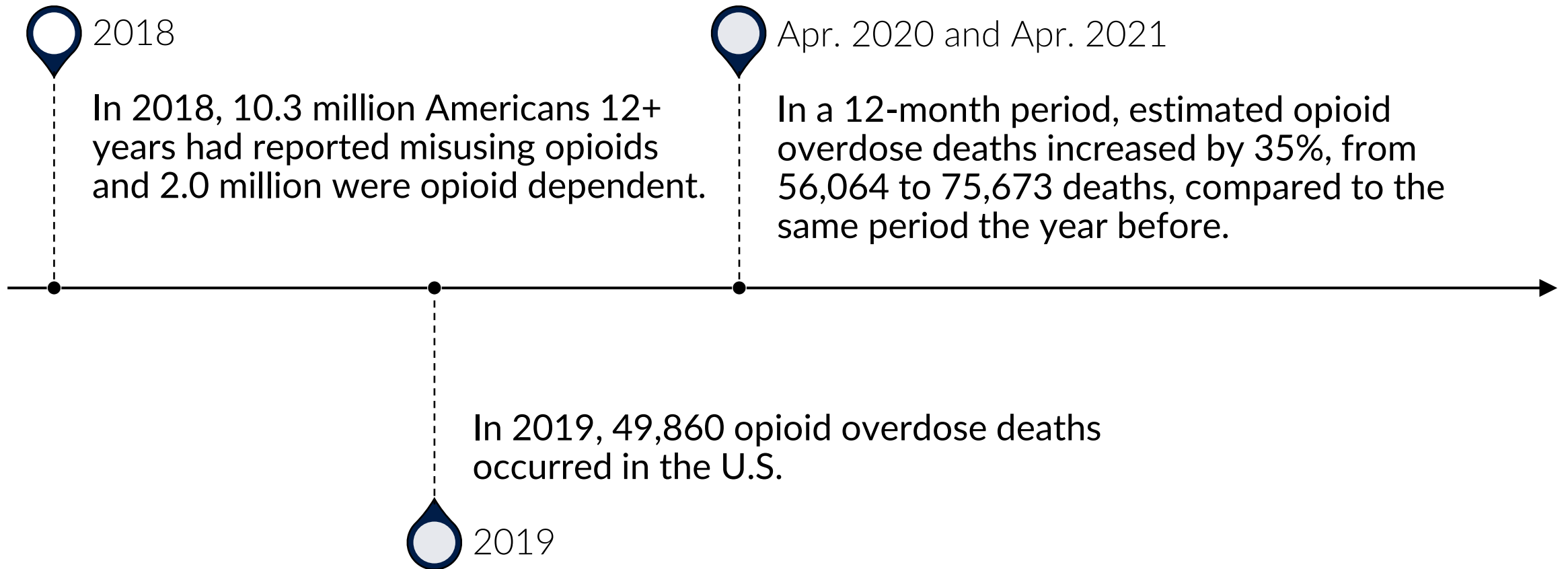
- No Disclosures

# Session Learning Objectives

## **At the end of the session, you will be able to:**

- Illustrate travel distance and drive time to opioid treatment programs and buprenorphine providers across the U.S.
- Demonstrate disparities in access to opioid treatment programs and buprenorphine providers by race/ethnicity, deprivation, and rurality across the U.S.
- Demonstrate associations between access to treatment, deprivation, and rurality and treatment outcomes.

# Opioid Use Disorders and Mortality



SAMHSA, Mental Health Services Administration.(2017). Key substance use and mental health indicators in the United States: Results from the 2018 National Survey on Drug Use and Health. Rockville, MD  
CDC. (2021). Drug Overdose Deaths in the U.S. Top 100,000 Annually.  
[https://www.cdc.gov/nchs/pressroom/nchs\\_press\\_releases/2021/20211117.htm](https://www.cdc.gov/nchs/pressroom/nchs_press_releases/2021/20211117.htm)

# Medication for Addiction Treatment

- Methadone, buprenorphine, and naltrexone are approved by the U.S. Food and Drug Administration for the treatment of opioid use disorders.
- In the U.S., methadone can only be administered (in-person dosing) and dispensed (take-home dosing) at federally certified opioid treatment programs.
- Federal regulations require clients to present for methadone administration 6 days a week for at least the first 90 days, with increasing take-home allowance as appropriate.

# Medication for Addiction Treatment

- The Drug Addiction Treatment Act of 2000, enabled physicians who have received training to request a waiver from the Substance Abuse and Mental Health Services Administration (SAMHSA) and offer office-based buprenorphine treatment.
- Currently, in addition to physicians, nurse practitioners, physician assistants, clinical nurse specialists, certified registered nurse anesthetists, and certified nurse-midwives may offer office-based buprenorphine treatment.
- Within the first year of obtaining a waiver, eligible providers are permitted to treat up to 30 patients, which can be increased to 100 and 275 in the following years subject to approval by the SAMHSA.

# Distance and Missed Methadone Doses

- Data for 892 clients treated between Feb 2015 and Dec 2017.
- Outcome: the number of missed doses of methadone during the first month of treatment.
- Independent variable: distance to the opioid treatment program.

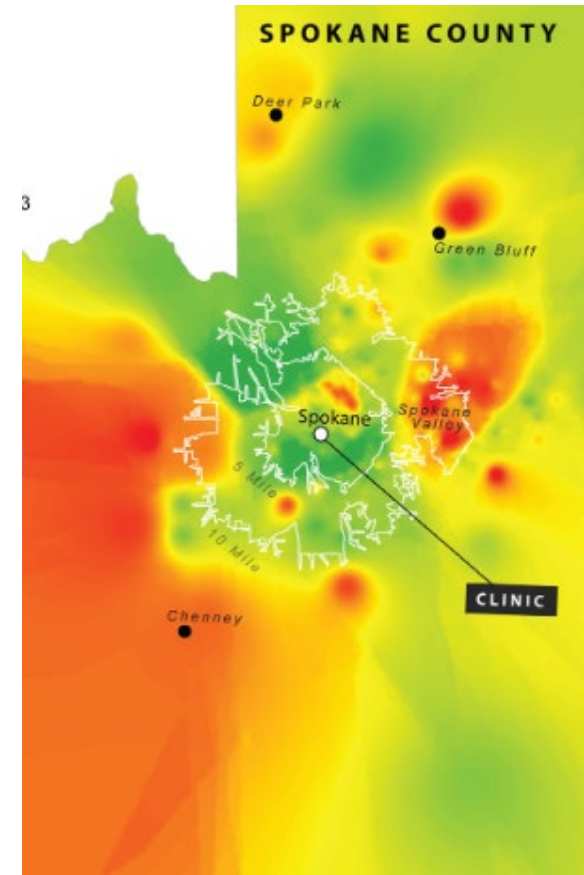
Variable	Unadjusted		Adjusted	
	B (SE)	IRR (95% CI)	B (SE)	IRR (95% CI)
Distance (Ref: < 5 miles)				
> 5 miles & < 10 miles	0.09 (0.09)	1.09 (0.91–1.31)	0.02 (0.1)	1.02 (0.84–1.23)
> 10 miles	0.37 (0.11)**	1.44 (1.17–1.78)**	0.26 (0.11)*	1.29 (1.03–1.61)*
Age	–	–	–0.02 (0.02)***	0.98 (0.98–0.99)***
Gender (Ref: Female)	–	–	–0.12 (0.08)	0.89 (0.76–1.04)
Race (Ref: non-Hispanic white)	–	–	–0.08 (0.1)	0.92 (0.75–1.13)

NOTES: IRR: Incident risk ratio; B: Unstandardized regression coefficients; SE Standard error.

\*\*\*  $p < 0.001$ .

\*\*  $p < 0.01$ .

\*  $p < 0.05$



# Distance and Missed Methadone Doses

- Data for 752, 689, and 584 clients who remained in treatment, respectively, for at least 3, 6, and 9 months .
- Outcome: the number of missed doses of methadone during the first, second and third 90 days of treatment.
- Independent variables: distance to the opioid treatment program, cannabis and alcohol retail outlets.

Characteristics	First 90 days of treatment (n = 725)		Second 90 days of treatment (n = 671)		Third 90 days of treatment (n = 576)	
	IRR (95%CI)	p-value	IRR (95%CI)	p-value	IRR (95%CI)	p-value
Age	<b>0.98 (0.98–0.99)</b>	<b>&lt; 0.001</b>	<b>0.99 (0.98–0.99)</b>	<b>0.006</b>	<b>0.99 (0.98–0.99)</b>	<b>0.009</b>
Gender						
Female	Reference		Reference		Reference	
Male	1.00 (0.85–1.18)	0.98	<b>1.30 (1.10–1.53)</b>	<b>0.002</b>	<b>1.29 (1.08–1.55)</b>	<b>0.004</b>
Race						
Non-Hispanic white	Reference		Reference		Reference	
Other	0.96 (0.79–1.18)	0.70	1.22 (0.99–1.51)	0.06	1.05 (0.84–1.32)	0.66
Methadone dose	<b>0.99 (0.98–0.99)</b>	<b>&lt; 0.001</b>	<b>0.98 (0.98–0.98)</b>	<b>&lt; 0.001</b>	<b>0.98 (0.98–0.98)</b>	<b>&lt; 0.001</b>
Distance to the OTP	<b>1.05 (1.03–1.07)</b>	<b>&lt; 0.001</b>	1.01 (0.98–1.03)	0.57	0.98 (0.96–1.01)	0.13
Distance to the closest						
Cannabis retail	<b>0.91 (0.86–0.95)</b>	<b>&lt; 0.001</b>	<b>0.92 (0.88–0.97)</b>	<b>0.003</b>	1.03 (0.98–1.09)	0.23
Off-premise alcohol outlet	0.91 (0.74–1.12)	0.37	0.95 (0.79–1.15)	0.62	<b>0.72 (0.59–0.89)</b>	<b>0.002</b>
On-premise alcohol outlet	1.16 (0.95–1.40)	0.15	1.06 (0.85–1.32)	0.63	1.22 (0.98–1.53)	0.08
Area deprivation index						
Less-deprived	Reference		Reference		Reference	
More-deprived	0.99 (0.83–1.19)	0.94	0.90 (0.74–1.08)	0.24	0.90 (0.74–1.10)	0.31

Notes: OTP: opioid treatment program; IRR: incidence risk ratio; CI: confidence interval

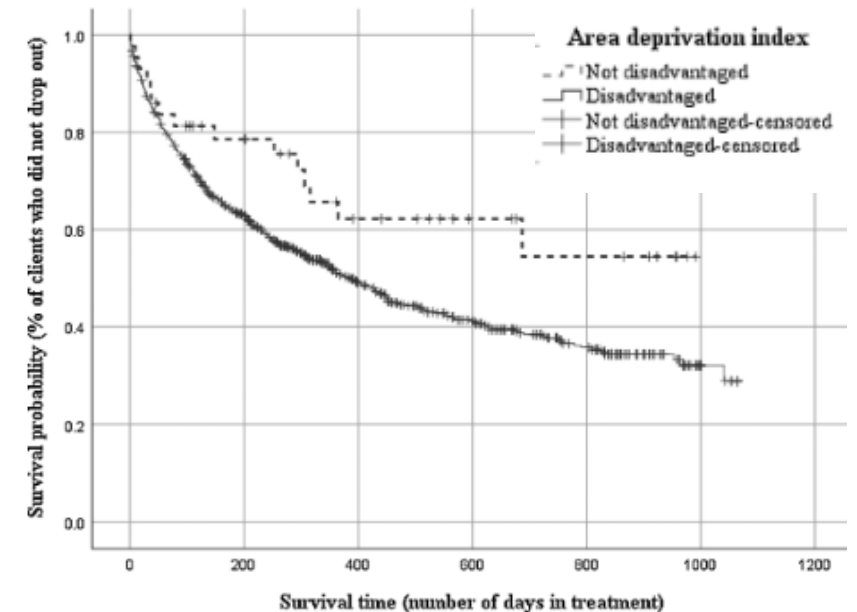


# Distance and Missed Methadone Doses

- Data for 752, 689, and 584 clients who remained in treatment, respectively, for at least 3, 6, and 9 months .
- Outcome: time to treatment discontinuation.
- Independent variable: neighborhood deprivation.

Characteristics	HR (95%CI)
<b>Demographic factors</b>	
Age (Mean, SD)	0.99 (0.98-0.99)
Gender	
Female	Reference
Male	1.17 (0.96-1.41)
Race	
Non-Hispanic white	Reference
Other	1.00 (0.79-1.26)
<b>Clinical factors</b>	
Methadone Dose (Mean, SD)	0.98 (0.98-0.98)
Years on treatment (Median, IQR)	1.12 (1.06-1.18)
<b>Contextual factors</b>	
<b>Area deprivation index (ADI)</b>	
Least deprived (ADI < 100)	Reference
Most deprived (ADI > 100)	1.79 (1.02-3.15)
<b>Distance to OTP</b>	
< 5 miles	Reference
> 5 miles & < 10 miles	0.84 (0.65-1.09)
> 10 miles	1.12 (0.82-1.54)
Cannabis retail outlets (Median, IQR)	1.08 (0.99-1.18)
Off-premise alcohol outlets (Median, IQR)	0.99 (0.96-1.03)
On-premise alcohol outlets (Median, IQR)	1.00 (0.99-1.00)

NOTE: HR: hazard ratio; CI: confidence interval.



# Years of Potential Life Lost (YPLL)

- Death certificates for 5,265 individuals with opioid overdose.
- Outcome: YPLL calculated by subtracting age at the time of death from a predetermined end point age (75 years).
- Independent variables: demographics, rurality, deprivation, and distance to opioid treatment programs.

Independent variables	Model 1	Model 2	Model 3
<b>Race and ethnicity</b>			
White	Ref	Ref	Ref
Black	0.78 (-1.00-2.57)	-1.30 (-2.81-0.21)	-1.09 (-2.61-0.42)
AI/AN	2.58 (0.85-4.31)	0.36 (-1.11-1.84)	0.45 (-1.02-1.92)
Asian or NHOPI	5.07 (2.58-7.55)	3.29 (1.19-5.39)	3.41 (1.30-5.51)
Multiracial	12.75 (5.71-19.79)	8.65 (2.70-14.60)	8.73 (2.79-14.67)
Hispanic of any race	5.84 (4.11-7.57)	3.49 (2.02-4.96)	3.55 (2.08-5.02)
Unknown	2.19 (-1.10-5.48)	4.26 (1.46-7.07)	4.24 (1.44-7.05)
<b>Sex</b>			
Female	Ref	Ref	Ref
Male	4.58 (3.84-5.33)	1.16 (0.51-1.81)	1.17 (0.53-1.82)
<b>Educational attainment</b>			
No high school diploma		Ref	Ref
High school diploma or equivalent		-0.49 (-1.36-0.39)	-0.49 (-1.36-0.39)
Some college or associate degree		-0.04 (-0.98-0.89)	-0.06 (-1.00-0.88)
Bachelor's degree and above		-4.11 (-5.37 to -2.85)	-4.11 (-5.37 to -2.85)
Unknown		-8.86 (-11.27 to -6.45)	-8.79 (-11.20 to -6.38)
<b>Marital status</b>			
Married or living with domestic Partner		Ref	Ref
Never married		12.43 (11.59-13.27)	12.51 (11.67-13.34)
Divorced or separated		-1.56 (-2.44 to -0.68)	-1.45 (-2.33 to -0.57)
Widowed		-9.27 (-10.90 to -7.63)	-9.2 (-10.83 to -7.56)
Unknown		0.58 (-2.49-3.65)	0.75 (-2.31-3.82)
<b>RUCA</b>			
Metropolitan			Ref
Micropolitan			-0.52 (-1.99-0.96)
Small town or rural			-1.5 (-3.11-0.11)
<b>Area deprivation index</b>			
Less deprived			Ref
Most deprived			0.46 (-0.79-1.71)
Unknown			0.29 (-2.21-2.79)
<b>Access to OTP</b>			
≤5 miles			Ref
>5 miles			1.36 (0.68-2.03)

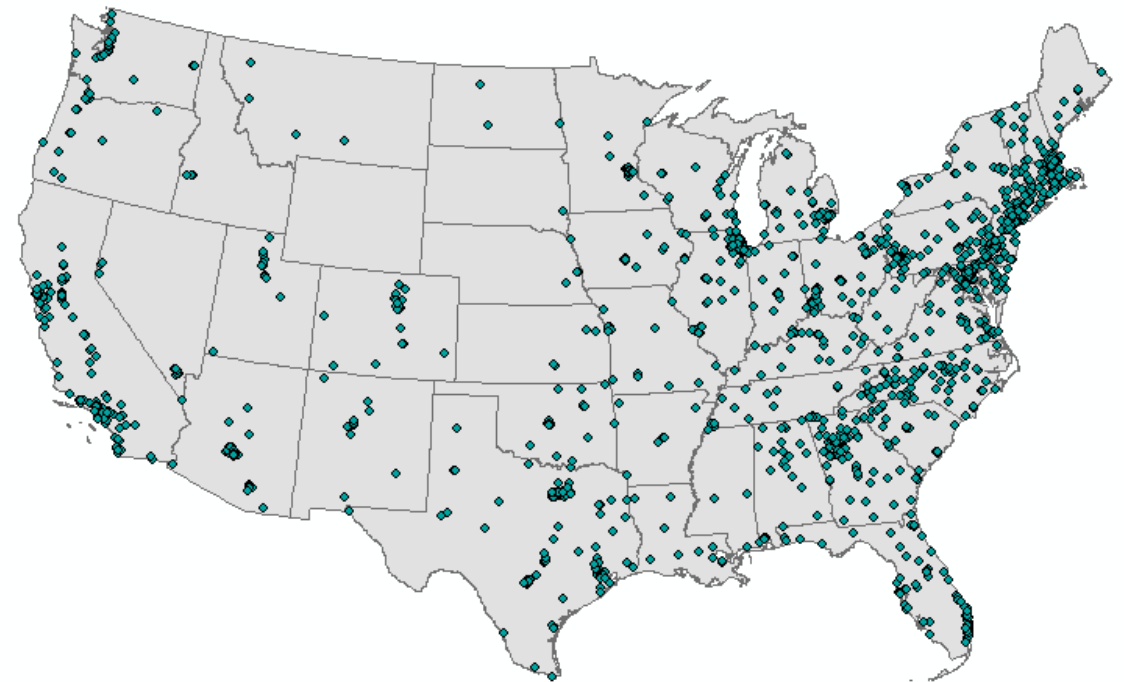
# Disparities in Access to Treatment

- Cross-sectional studies at the level of block groups (600 and 3,000 people) in the U.S. excluding Alaska and Hawaii.
- Substance Abuse and Mental Health Services Administration provided data on the location of opioid treatment program and buprenorphine providers.
- Drive time and distance were then calculated between the longitude and latitude of block group centroids and the longitude and latitude of the nearest treatment locations.
- Disparities in drive time and distance was assessed using Bayesian spatial or generalized linear mixed models.

# Travel Time to Opioid Treatment Programs

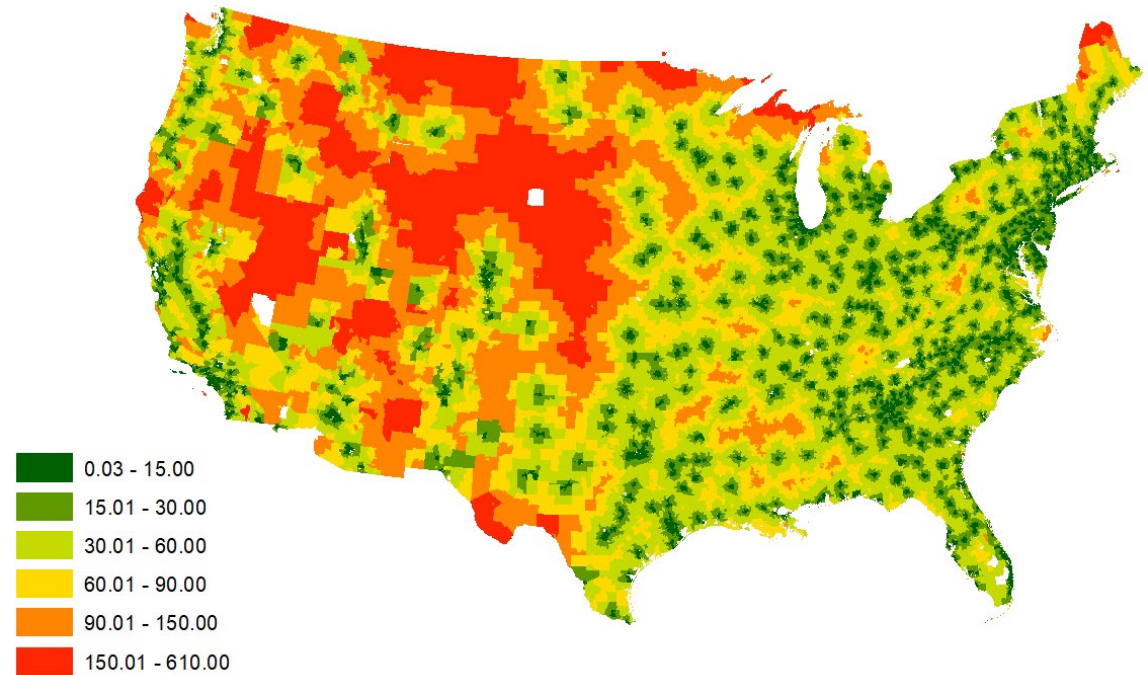
- 1,643 opioid treatment programs (OTPs).
- 91% located in metropolitan, 7% in sub-urban, and 2% in small towns or rural areas.
- The median travel time to the nearest OTP:

	<i>Travel time (minutes (IQR))</i>
Metropolitan	10 (6-15)
Sub-urban	39 (23-60)
Small town	48 (34-68)
Rural	57 (40-84)



# Travel Time to Opioid Treatment Programs

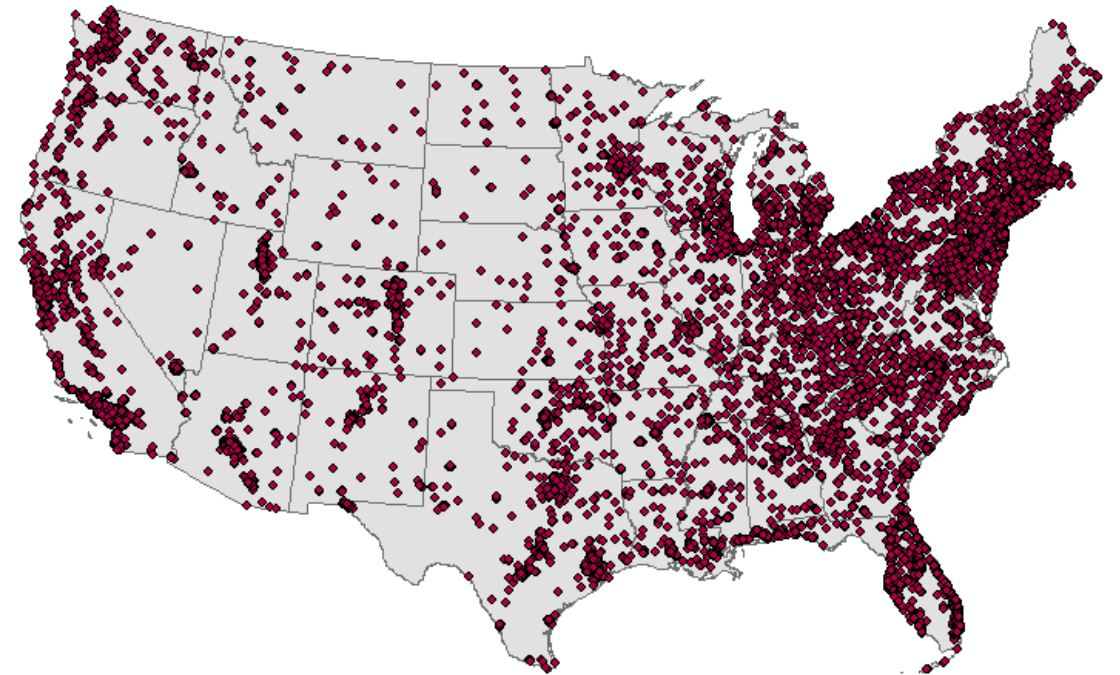
- 57%, 25%, 13%, and 5% of the contiguous U.S. population 18+ years lived, respectively, <15, 15-30, 30-60, or >60 minutes of an OTP.
- Travel burden to the nearest OTP was estimated to be >60 minutes for more than 13 million people and >90 minutes for 5 million people.
- Average drive time to the nearest OTP was <10 minutes in the DC, DE, RI, MD, CT, and MA and >60 minutes in ID, MT, ND, SD, and WY.



# Travel Time to Buprenorphine Providers

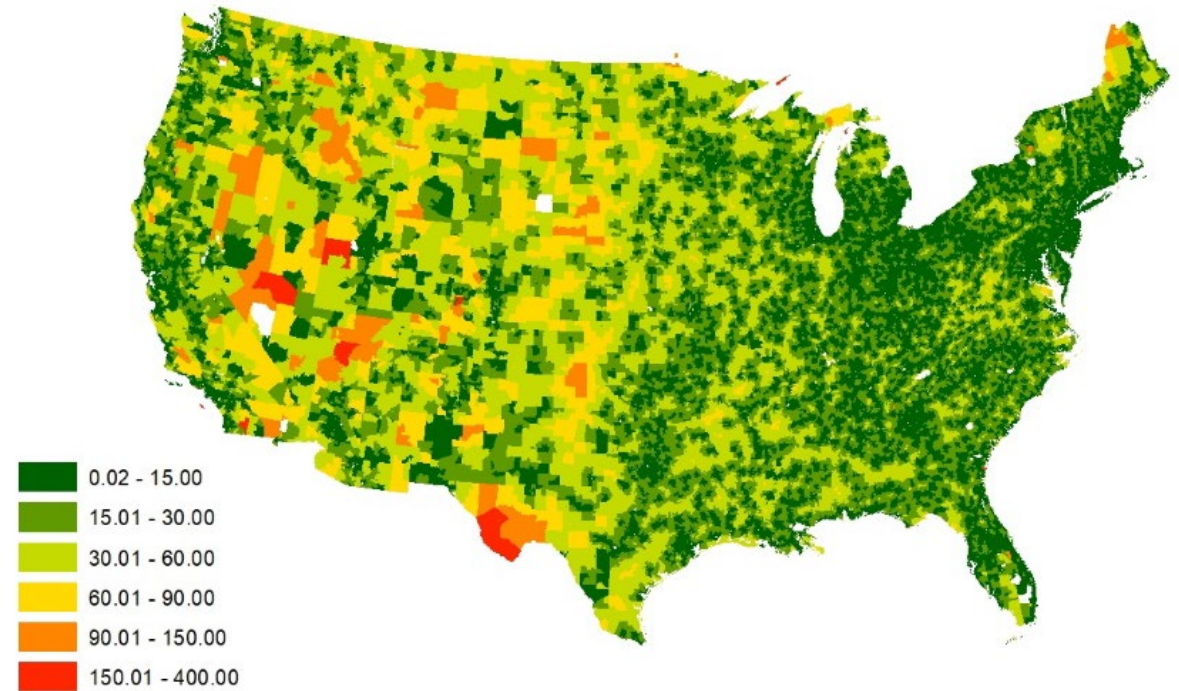
- 38,014 buprenorphine providers.
- 88% located in metropolitan, 8% in sub-urban, and 5% in small towns or rural areas.
- The median travel time to the nearest buprenorphine provider:

	<i>Travel time (minutes (IQR))</i>
Metropolitan	4 (3-6)
Sub-urban	6 (4-12)
Small town	16 (5-28)
Rural	25 (15-37)

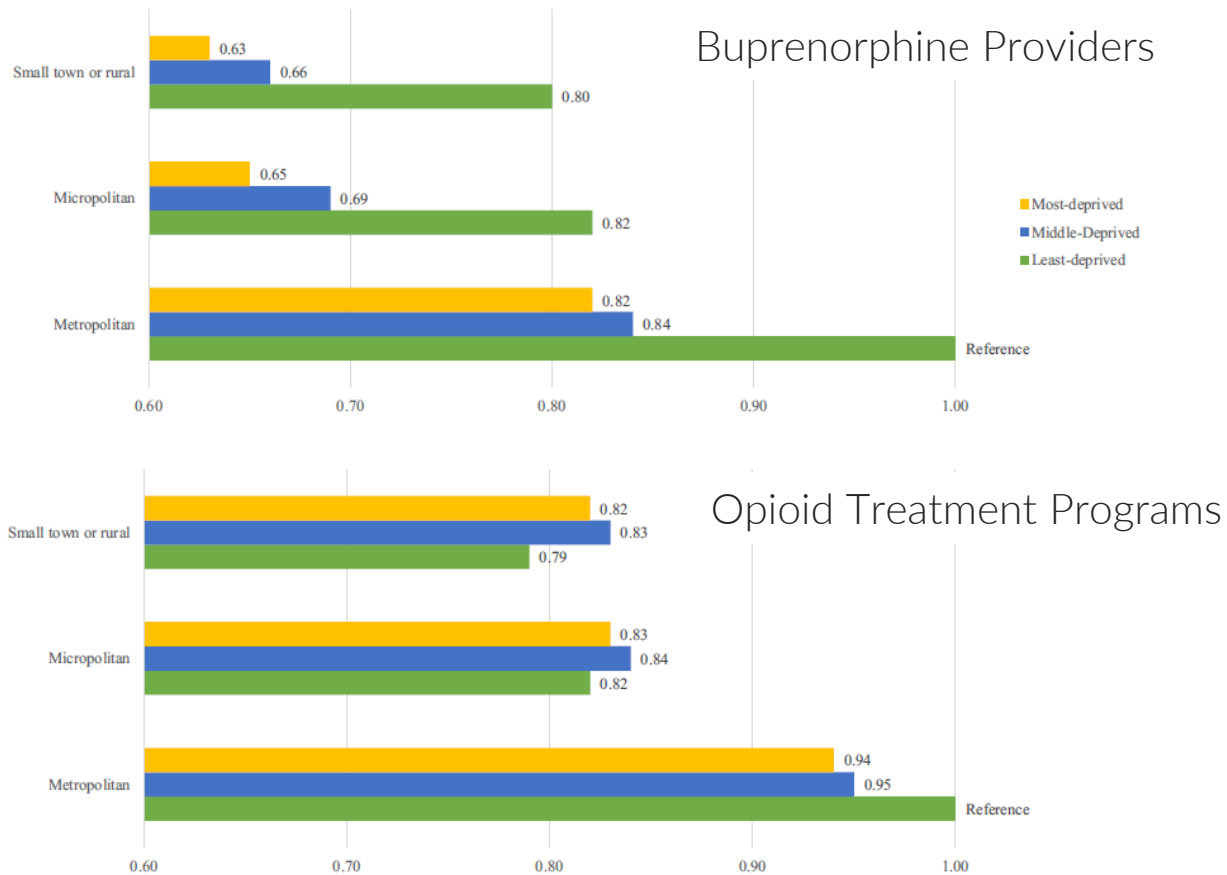


# Travel Time to Buprenorphine Providers

- 87%, 10%, 3%, <1% of the contiguous U.S. population 18+ years lived, respectively, <15, 15-30, 30-60, or >60 minutes of a buprenorphine provider.
- Travel burden to the nearest buprenorphine provider was estimated to be >60 minutes for 1 million people and >90 minutes for 150 thousand people.
- Average drive time to the nearest provider was >20 minutes in ND and SD. In all other states, the average travel time to the closest provider was 2-19 minutes.



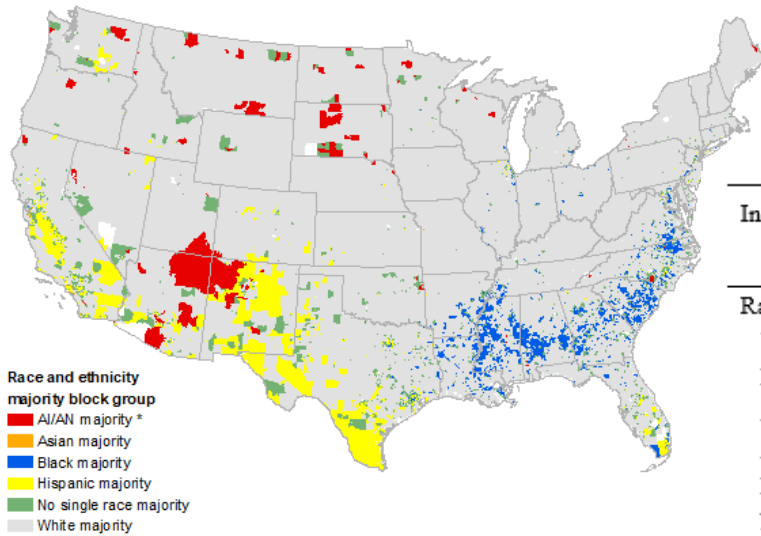
# Travel Time to Buprenorphine Providers



- Sub-urban and small towns had lower mean access to opioid treatment programs and buprenorphine providers compared to metropolitan block groups.
- Mean access to opioid treatment programs and buprenorphine providers was lower for middle- and most-deprived areas compared to least-deprived block groups.

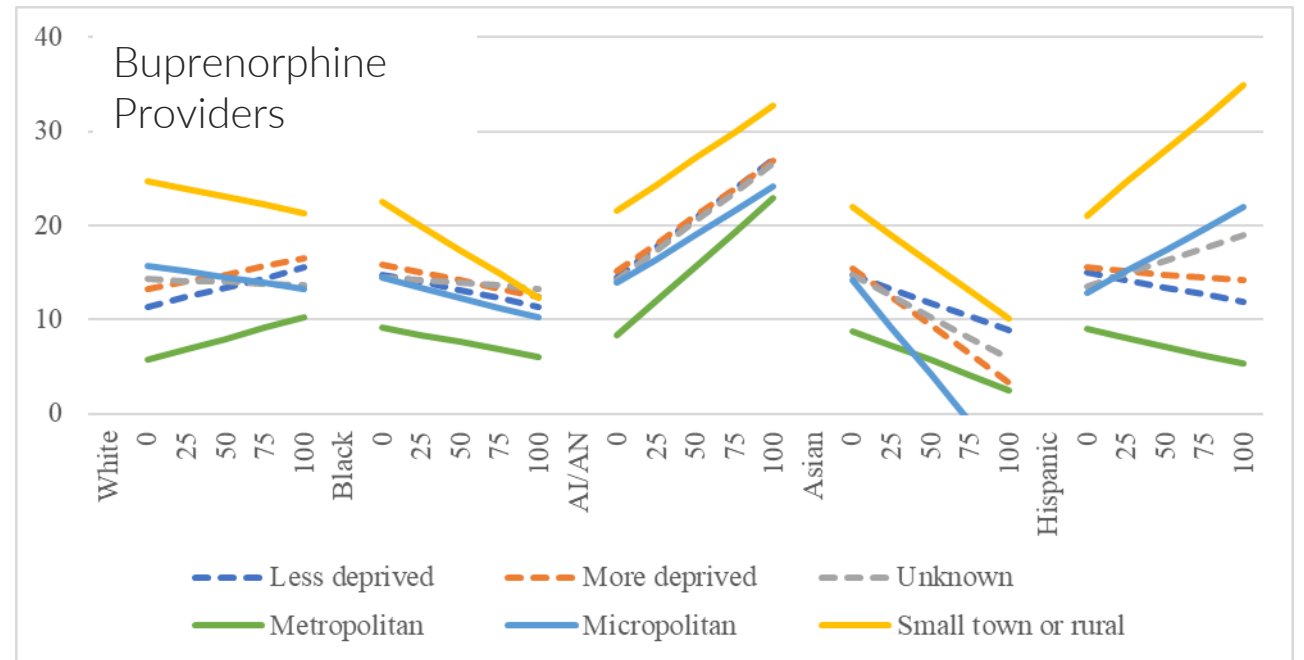
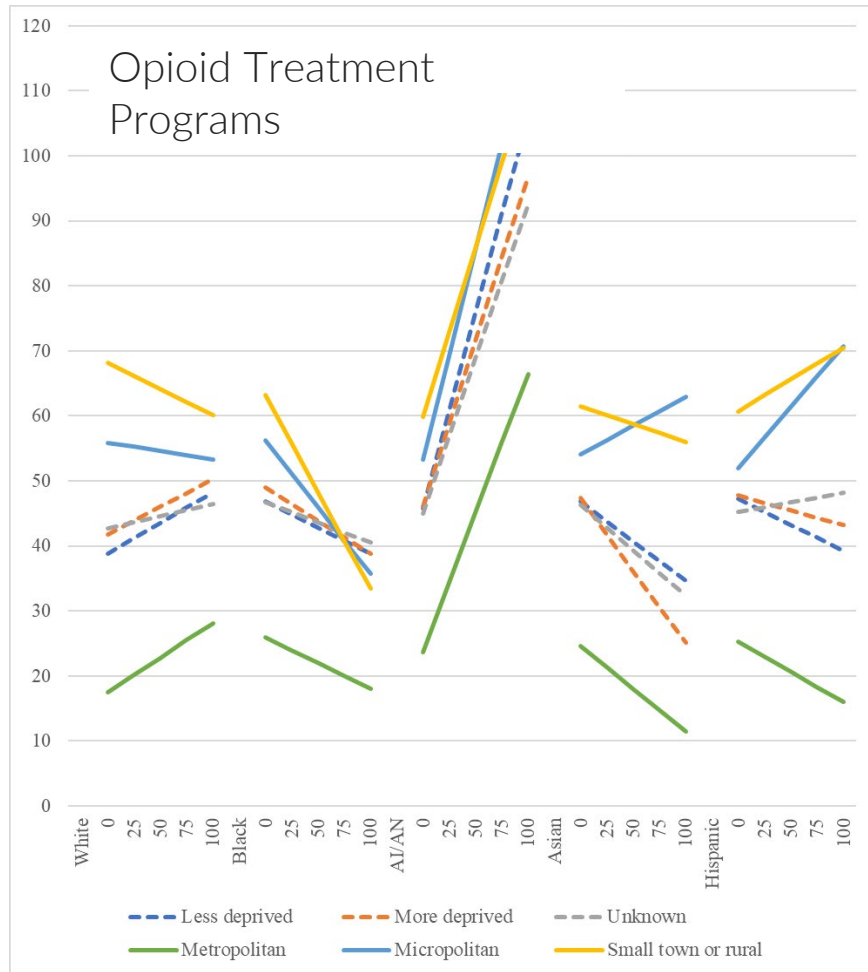


# Travel Time to Buprenorphine Providers



Independent Variables	Opioid treatment programs		Buprenorphine providers	
	Unadjusted	Adjusted	Unadjusted	Adjusted
<b>Racial and ethnic majority block groups</b>				
White	Ref	Ref	Ref	Ref
Black	-9.1 (-9.4 – -8.7)	-5.5 (-5.8 – -5.2)	-2.7 (-2.9 – -2.6)	-2 (-2.1 – -1.9)
American Indian/Alaska Native	52.5 (50.3 – 54.6)	35.9 (34.2 – 37.7)	16.1 (15.4 – 16.9)	9.6 (9.0 – 10.3)
Asian	-9.5 (-10.5 – -8.5)	-4.9 (-5.7 – -4.1)	-3.0 (-3.4 – -2.6)	-1.8 (-2.1 – -1.5)
Hispanic*	-7.6 (-7.9 – -7.2)	-4.7 (-5.0 – -4.5)	-2.1 (-2.2 – -1.9)	-1.3 (-1.5 – -1.2)
No single race majority	-8.6 (-8.9 – -8.3)	-4.4 (-4.7 – -4.2)	-3.0 (-3.2 – -2.9)	-1.9 (-2.0 – -1.8)
<b>Overdose mortality burden</b>				
Lower than national average		Ref		Ref
Higher than national average		-0.8 (-1.0 – -0.6)		-0.4 (-0.5 – -0.31)
Unknown (data suppressed)		23 (22.6 – 23.5)		13.7 (13.5 – 13.9)
<b>Area Deprivation Index</b>				
Less deprived (score < 81)		Ref		Ref
More deprived (score ≥ 81)		1.7 (1.5 – 1.9)		1.0 (0.9 – 1.1)
Unknown		0.1 (-0.5 – 0.7)		0.0 (-0.2 – 0.2)
<b>Rural-Urban Commuting Area classification</b>				
Metropolitan		Ref		Ref
Micropolitan		29.0 (28.8 – 29.2)		5.1 (5.0 – 5.2)
Small town or rural		35.4 (35.0 – 35.8)		12.7 (12.6 – 12.9)

# Travel Time to Buprenorphine Providers



# Final Takeaways

- Disparities exist in travel distance and drive time to opioid treatment programs and buprenorphine providers and disparities affect patient outcomes.
- Increasing access to treatment:
  - Prescribing or dispensing methadone through primary care clinics, federally qualified health centers, pharmacies, or mobile vans.
  - Encouraging providers to offer treatment at or near their capacity.
  - Identifying and encouraging providers to obtain buprenorphine waivers in high-need and rural areas.

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