

University of Nebraska Medical Center DigitalCommons@UNMC

EMET Projects

College of Medicine Students

Spring 2022

Interrogating Race and Place-Based Inequities in HIV and COVID-19

Rohan Khazanchi University of Nebraska Medical Center

Follow this and additional works at: https://digitalcommons.unmc.edu/emet_posters

Part of the Epidemiology Commons, Geographic Information Sciences Commons, Health Services
Research Commons, Inequality and Stratification Commons, Medical Education Commons, Medicine and
Health Commons, Pharmacy Administration, Policy and Regulation Commons, Place and Environment
Commons, Race and Ethnicity Commons, Social Justice Commons, and the Virus Diseases Commons

Recommended Citation

Khazanchi, Rohan, "Interrogating Race and Place-Based Inequities in HIV and COVID-19" (2022). *EMET Projects*. 30.

https://digitalcommons.unmc.edu/emet_posters/30

This Poster is brought to you for free and open access by the College of Medicine Students at DigitalCommons@UNMC. It has been accepted for inclusion in EMET Projects by an authorized administrator of DigitalCommons@UNMC. For more information, please contact digitalcommons@unmc.edu.

Interrogating Race and Place-Based Inequities in HIV and COVID-19



Rohan Khazanchi, MPH





With gratitude to Drs. Jasmine Marcelin & Sara Bares (UNMC), Ishani Ganguli (Harvard/Brigham & Women's Hospital), and Kathleen McManus (UVA) for their mentorship.







Neighborhood Deprivation and Racial Inequities in HIV Viral Suppression

Research Question

Do downstream consequences of structural racism in Omaha explain Black-White disparities in HIV viral suppression?

UNMC EHR Query - People with HIV from 2012-2018, excluding those with care lapse >2y Primary endpoint: HIV-1

RNA < 200 copies/mL

("Viral Suppression"; VS)

947 PWH (52% White, 30% Black, 13% Hispanic)

Greater VS rates among White vs. Black PWH (90% vs. 84%, p = 0.016)

Multivariate logistic regressions for predicted odds of VS, with adjustment for age, sex, race/ethnicity, poverty, rurality, and neighborhood deprivation

Fig 1. Left: Homeowner's Loan Corp. Redlined Map of Omaha (1930s) Middle: Racial Dot Map of Omaha based on 2010 U.S. Census data Right: Area Deprivation Index Map of Omaha based on 2015 ADI data

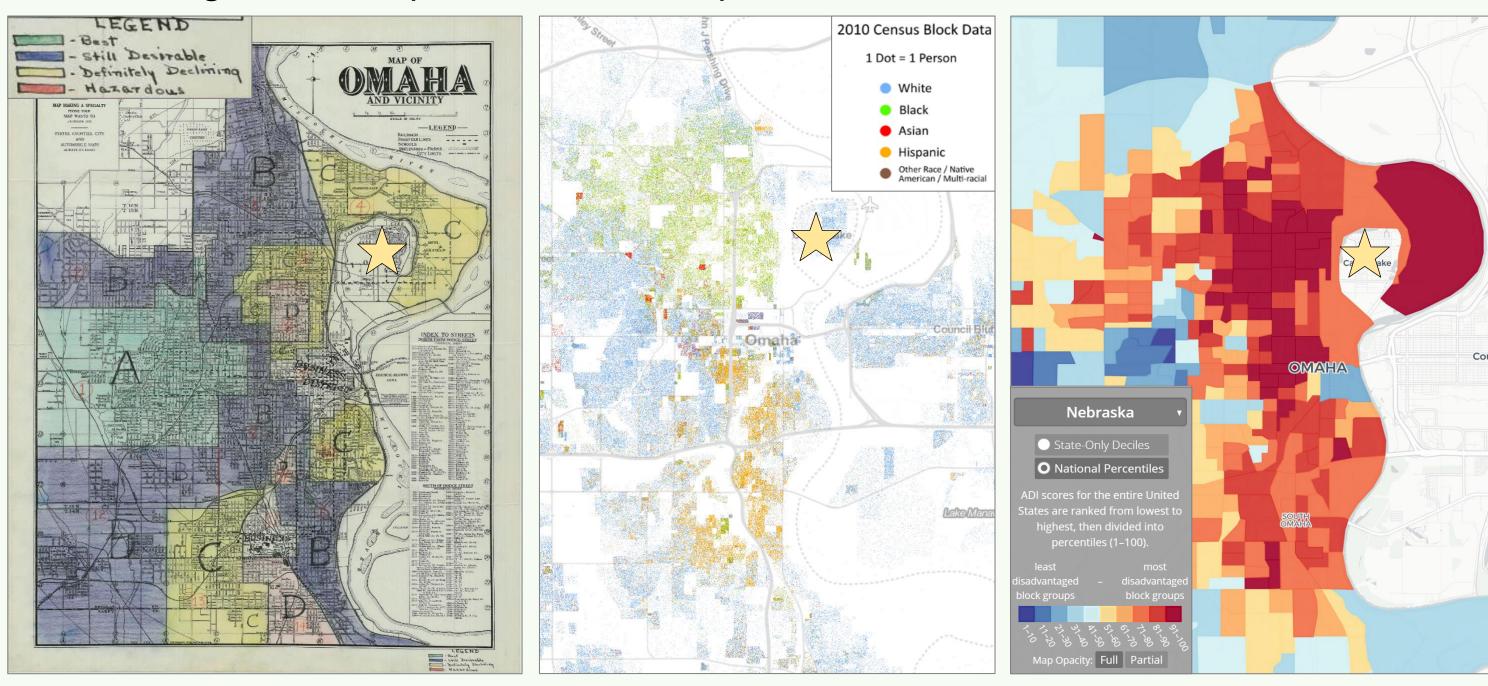


Table 1. Inde	ependent predictor	rs of HIV viral sup	pression
---------------	--------------------	---------------------	----------

	Suppressed, n=851	Not Suppressed, n=96	Adjusted Odds Ratio (95% CI)	p-value
	Mean (S.D.) or <i>N</i> (%)	Mean (S.D.) or <i>N</i> (%)		
Age, years	46.2 (11.6)	40.6 (11.1)	1.04 (1.02, 1.06)	<0.001
Sex Assigned at Birth				
Male	657 (77%)	66 (69%)	Ref.	Ref.
Female	194 (23%)	30 (31%)	0.71 (0.44, 1.16)	0.170
Race/Ethnicity				
Non-Hispanic White	452 (53%)	44 (46%)	Ref.	Ref.
Non-Hispanic Black	241 (28%)	41 (43%)	0.90 (0.55, 1.48)	0.681
Hispanic	123 (14%)	8 (8%)	2.15 (0.96, 4.81)	0.062
Other (Native American, Asian)	35 (4%)	3 (3%)	1.57 (0.45, 5.50)	0.480
Income ≤ 138% Federal Poverty Level	456 (54%)	71 (74%)	0.47 (0.29, 0.76)	0.002
Rurality*				
Urban	758 (89%)	88 (92%)	Ref.	Ref.
Rural	93 (11%)	8 (8%)	1.12 (0.50, 2.47)	0.787
			0.88 (0.79, 0.98) for	
Area Deprivation Index (ADI)	65.7 (22.2)	72.6 (22.3)	a 10-point increase in ADI (1-100 scale)	0.023

The distribution of neighborhood-level deprivation and individual-level SES, downstream consequences of racial segregation and structural racism, accounted for Black-White disparities in HIV viral suppression.



County-Level Social Vulnerability and COVID-19 Cases & Deaths

Research Question

How was place-based vulnerability related to COVID-19 incidence and deaths in rural and urban communities during the "first wave"?

NYTimes Query

- County-level case and death rates as of April 19th, 2020
- Stratified by vulnerability using CDC Social **Vulnerability Index (below)** + rurality using USDA ERS **Urban Influence Codes**

612,404 cases + 25,978 deaths across 2,754 counties Population-weighted, quasi-Poisson

regression models

with state fixed

effects

Social Vulnerability Index

Q1=315,Q4=202

Q1=319,Q4=521

Q1=351,Q4=163

Q1=296,Q4=547

Q1=436,Q4=169

Q1=251,Q4=522

Minority Status &

Q1=162,Q4=377

Q1=463,Q4=329

Q1=291,Q4=286

Q1=321,Q4=444

Housing Type &

Transportation

& Disability

Language

Household Composition

Socioeconomic Status

Primary outcomes included positive tests per capita and deaths per capita

95% CI

1.57 - 2.00

1.60 - 2.17

1.36 - 1.91

1.30 - 1.81

0.84 - 1.37

Ratio

Cases per 100k 0.92 0.68 – 1.24

Deaths per 100k 0.66 0.36 - 1.19

Deaths per 100k **1.86*** 1.50 – 2.30

Cases per 100k 0.64 0.44 - 0.94

Deaths per 100k 0.77 0.36 - 1.62

Cases per 100k 1.00 0.79 - 1.28

Deaths per 100k 1.29 1.01 - 1.66

Cases per 100k 1.05 0.82 – 1.35

Deaths per 100k 1.42 0.95 - 2.12

Cases per 100k 5.02* 3.20 - 7.88

Deaths per 100k **5.30*** 3.03 – 9.28

Cases per 100k 3.74* 2.66 - 5.25

Deaths per 100k 1.60 0.88 - 2.93

Deaths per 100k **1.29*** 1.05 – 1.59

Deaths per 100k 1.27 0.87 - 1.84

Cases per 100k 1.53*

Cases per 100k 1.08

Table 2. Association of SVI and COVID-19 outcomes

Cases per 100k **1.77***

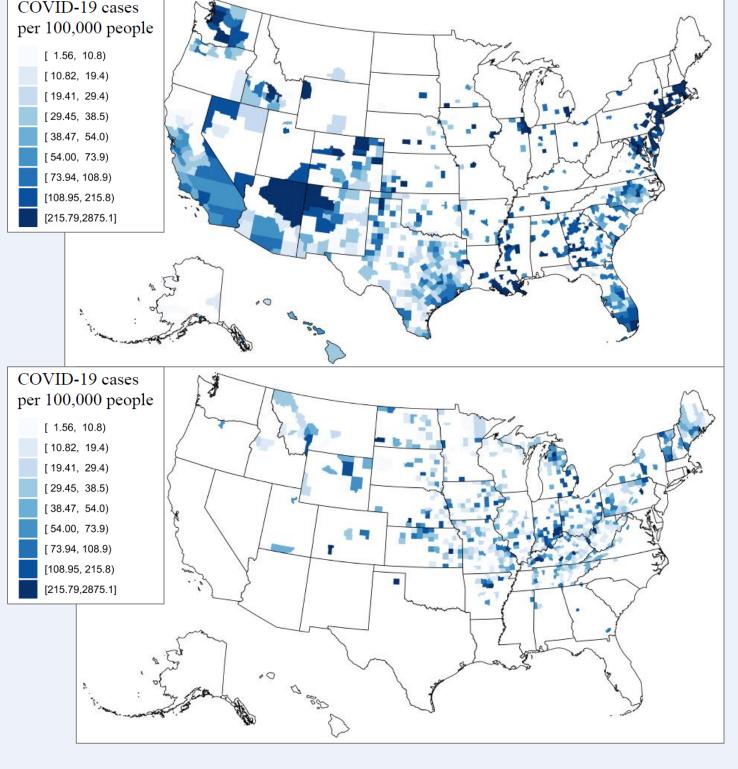
Deaths per 100k **1.87***

Cases per 100k 1.61*

Fig 2. Social Vulnerability Index Domains

	To 21 Godiai Tamorability mask Bomains				
Socioeconomic Status		Below Poverty			
	Socioeconomic	Unemployed			
	Income				
		No High School Diploma			
Housing Type 8		Aged 65 or Older			
		Aged 17 or Younger			
		Civilian with a Disability			
	Disability	Single-Parent Households			
<u>></u>	Minority Status	Minority			
ral	& Language	Speaks English "Less than Well"			
1100		Multi-Unit Structures			
	Housing Type &	Mobile Homes			
	Transportation	Crowding			
		No Vehicle			
		Group Quarters			

Fig 3. COVID-19 Cases per Capita in the Highest (Q4, top) and Lowest (Q1, bottom) Vulnerability U.S. Counties



Overall, compared to people in least vulnerable counties, those in the most vulnerable had as greater risk of COVID-19 diagnosis greater risk of COVID-19 death

Area-level characteristics like racial composition, limited English proficiency, poverty, unemployment, crowded housing, and poor transportation are strongly associated with COVID-19 incidence and death.



Tract-Level Inequities in Access to COVID-19 Therapeutic Trials

Research Question

How does the geographic distribution of trial sites influence differences in clinical trial access by age, race, ethnicity, and rurality?

ClinicalTrials.gov Query

- Included only pharmacotherapeutic RCTs initiated as of Sept 20th, 2020
- Keywords: "coronavirus disease 2019", "COVID-19", "SARS-CoV-2"

310 biomedical therapeutic trials, with 2,432 trial sites

Geocoded all trial sites

Mapped one-way drive times from the population center of each Census tract to the nearest trial site, using cumulative distributions of Census demographics & USDA ERS RUCA codes

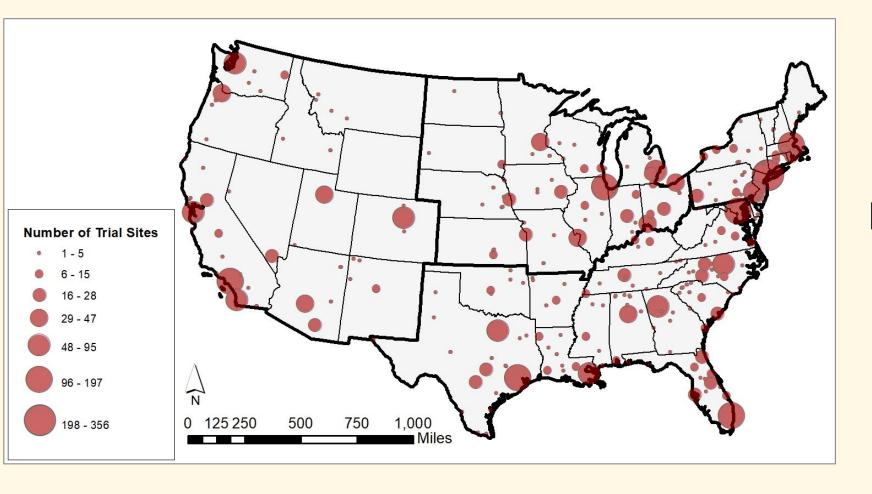
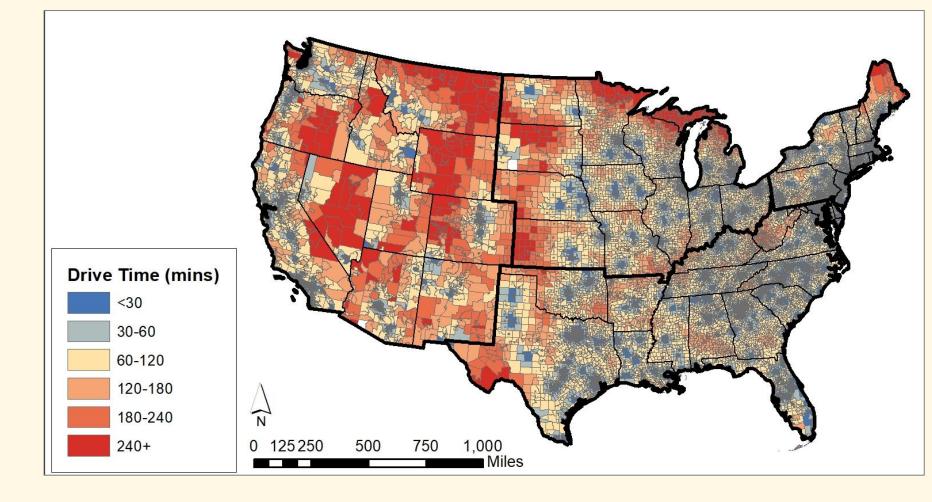


Fig 4. Distribution of COVID-19 Therapeutic Trial Sites

Fig 5. One-Way Drive Time to Nearest COVID-19 Trial Site



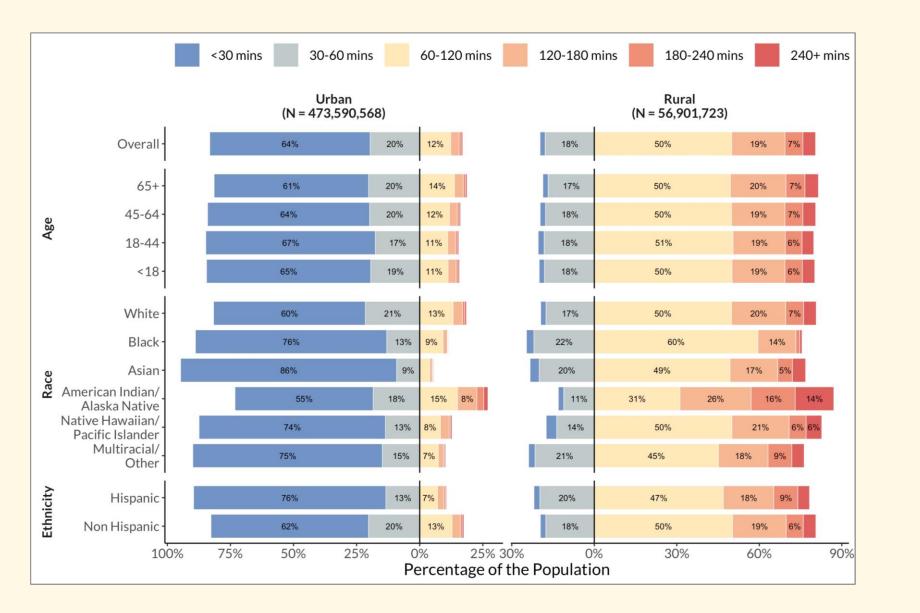


Fig 6. One-Way Drive Time to Nearest COVID-19 Therapeutic Trial Site by Demographic Subgroup & Rurality

Almost one-third of the U.S. population, >80% of the rural population, and >50% of American Indian/Alaskan Native people, lived more than 60 minutes from the nearest COVID-19 trial site.

