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

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

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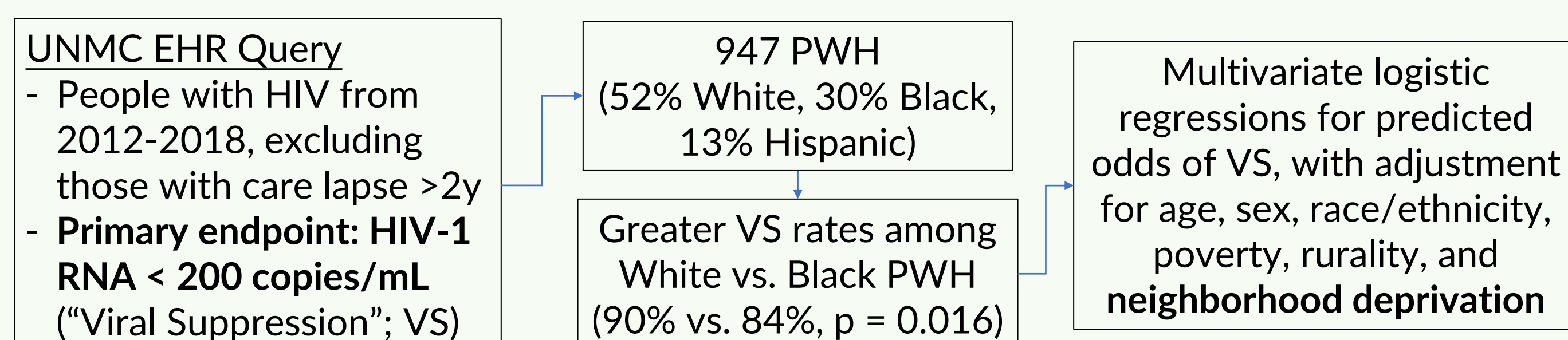
With gratitude to Drs. Jasmine Marcelin & Sara Bares (UNMC), Ishani Ganguli (Harvard/Brigham & Women's Hospital), and Kathleen McManus (UVA) for their mentorship.



## Neighborhood Deprivation and Racial Inequities in HIV Viral Suppression

### Research Question

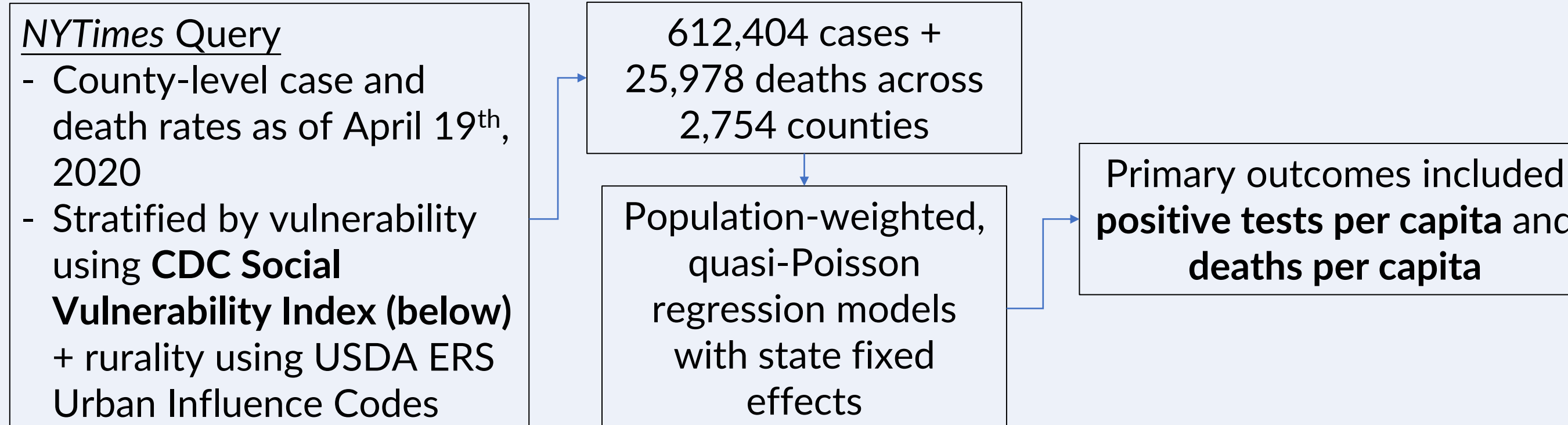
Do downstream consequences of structural racism in Omaha explain Black-White disparities in HIV viral suppression?



## 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"?



## 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?

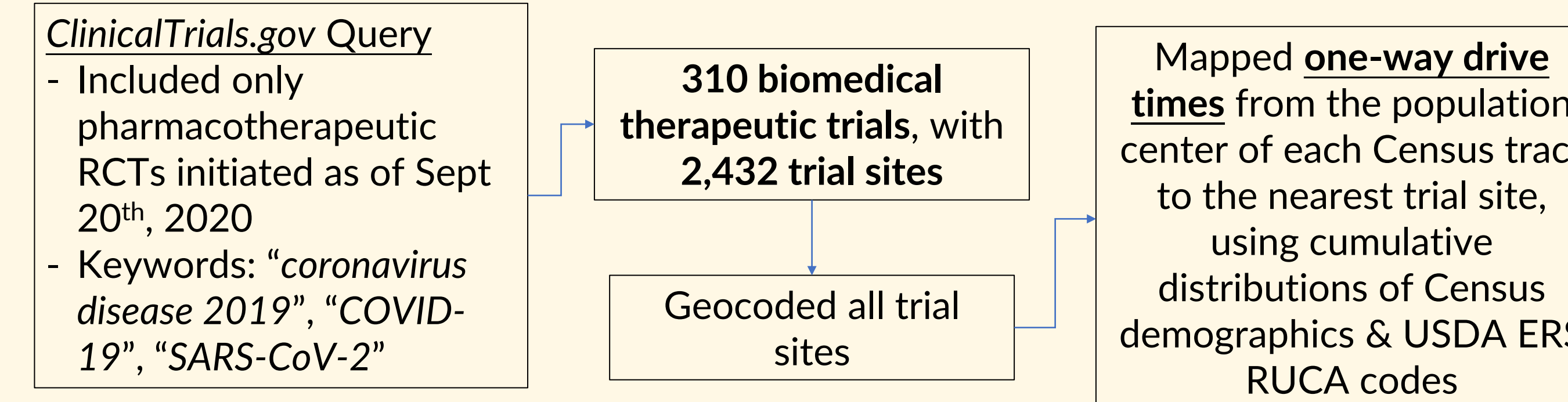


Fig 1. Left: Homeowner's Loan Corp. Redlined Map of Omaha (1930s)  
Middle: Racial Dot Map of Omaha based on 2010 U.S. Census data  
Right: Area Deprivation Index Map of Omaha based on 2015 ADI data

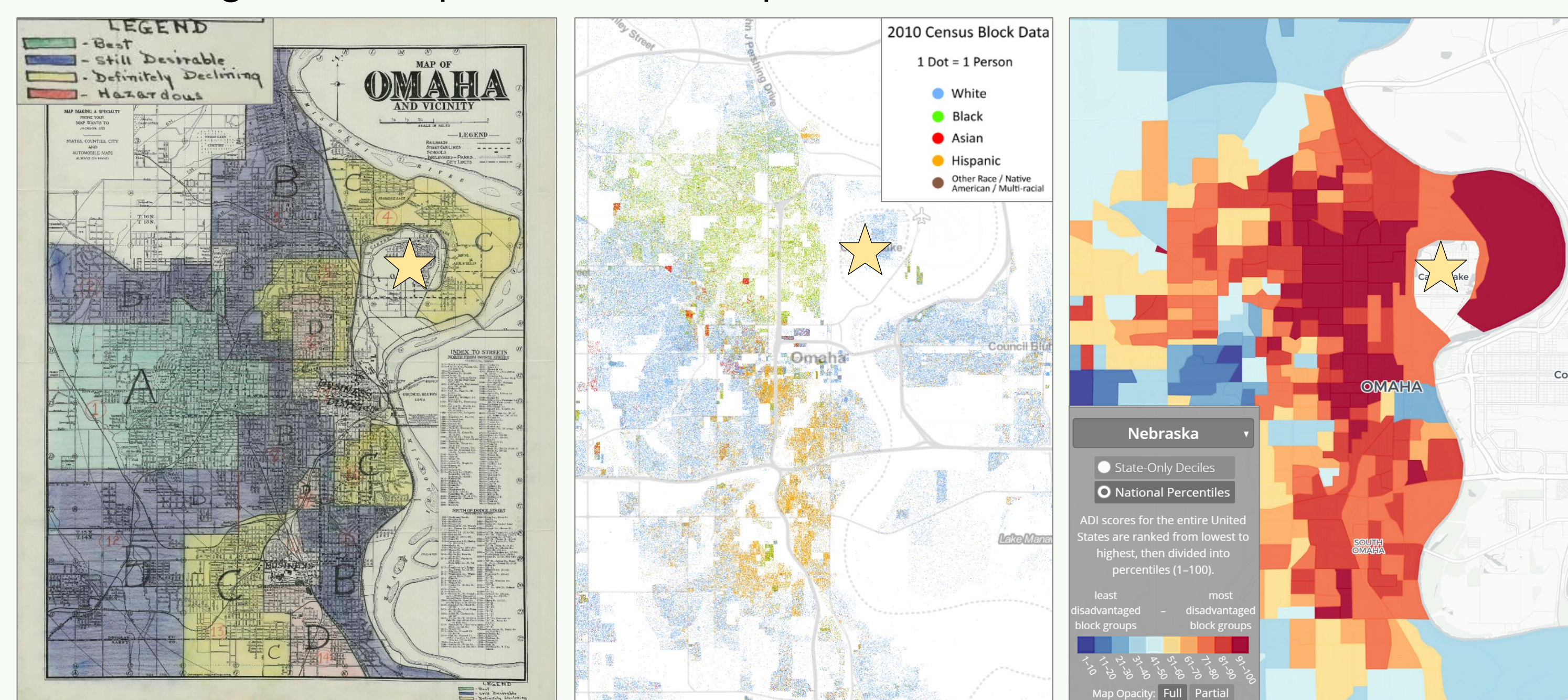


Table 1. Independent predictors of HIV viral suppression

	Suppressed, n=851 Mean (S.D.) or N (%)	Not Suppressed, n=96 Mean (S.D.) or N (%)	Adjusted Odds Ratio (95% CI)	p-value
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
Area Deprivation Index (ADI)	65.7 (22.2)	72.6 (22.3)	0.88 (0.79, 0.98) for a 10-point increase in ADI (1-100 scale)	0.023

Fig 2. Social Vulnerability Index Domains

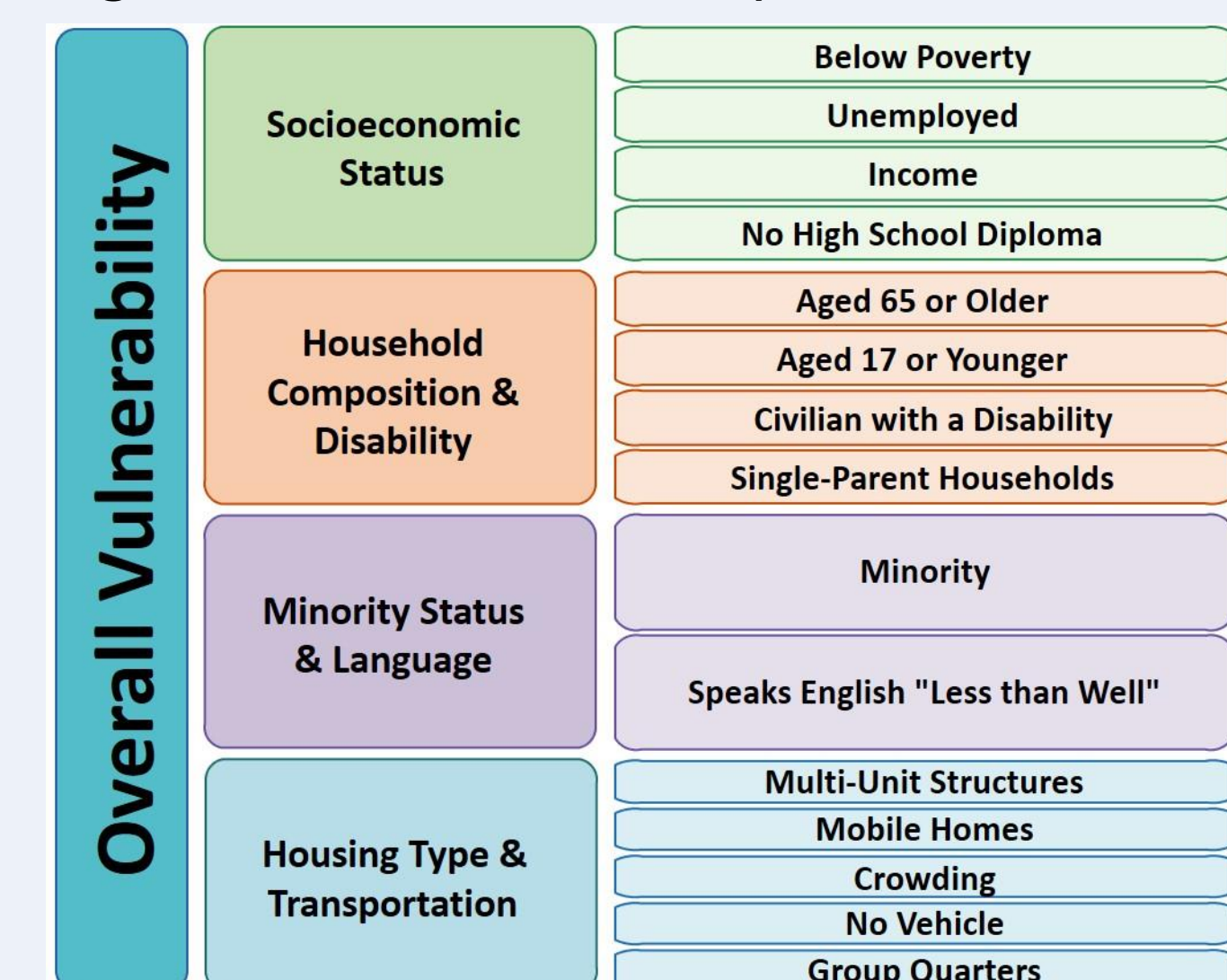
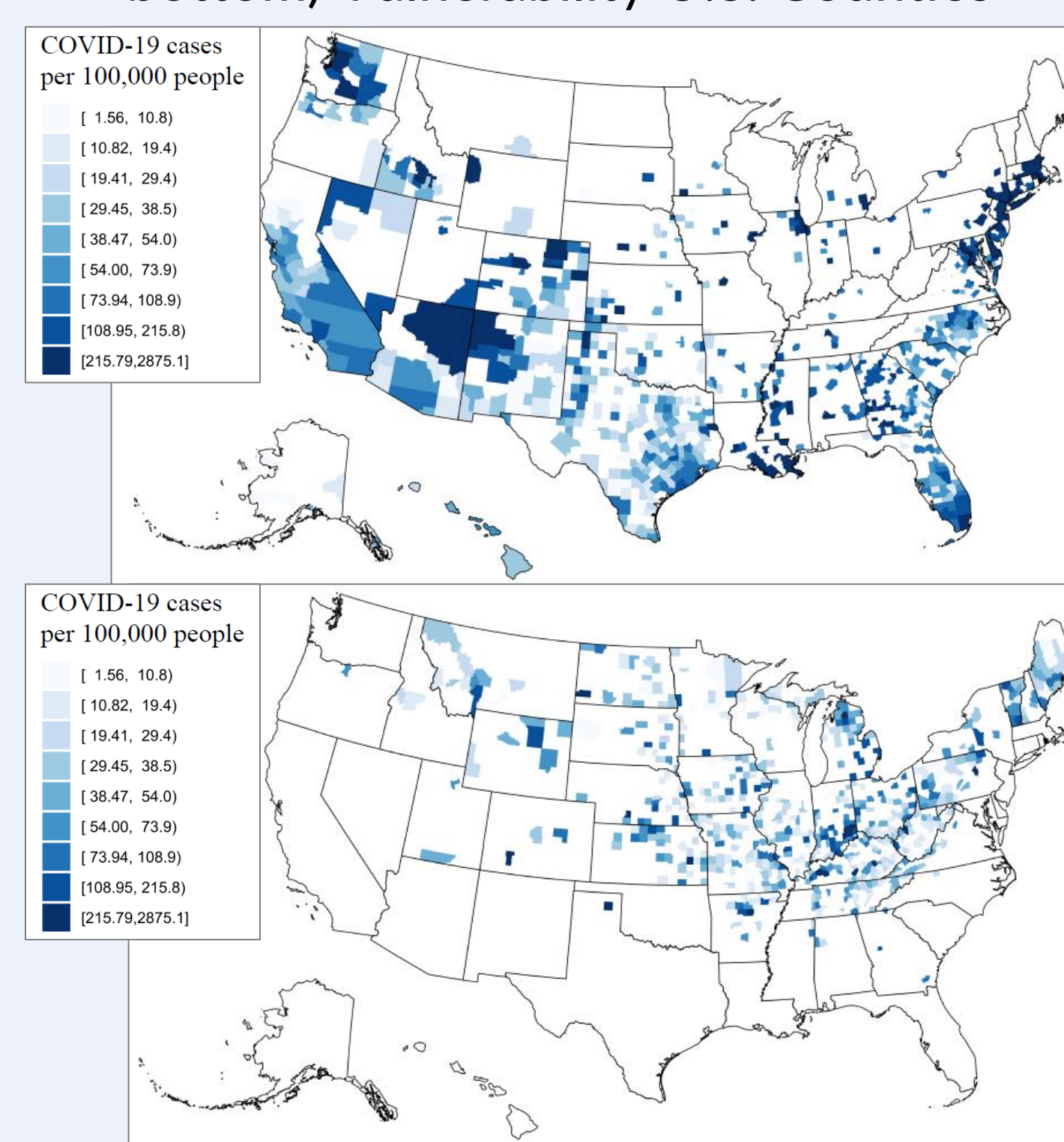


Table 2. Association of SVI and COVID-19 outcomes

	Risk Ratio	95% CI
<b>Social Vulnerability Index</b>		
Urban	Cases per 100k <b>1.77*</b>	1.57 - 2.00
Q1=315, Q4=202	Deaths per 100k <b>1.87*</b>	1.60 - 2.17
Rural	Cases per 100k 0.92	0.68 - 1.24
Q1=319, Q4=521	Deaths per 100k 0.66	0.36 - 1.19
<b>Socioeconomic Status</b>		
Urban	Cases per 100k <b>1.61*</b>	1.36 - 1.91
Q1=351, Q4=163	Deaths per 100k <b>1.86*</b>	1.50 - 2.30
Rural	Cases per 100k 0.64	0.44 - 0.94
Q1=296, Q4=547	Deaths per 100k 0.77	0.36 - 1.62
<b>Household Composition &amp; Disability</b>		
Urban	Cases per 100k 1.00	0.79 - 1.28
Q1=436, Q4=169	Deaths per 100k 1.29	1.01 - 1.66
Rural	Cases per 100k 1.05	0.82 - 1.35
Q1=251, Q4=522	Deaths per 100k 1.42	0.95 - 2.12
<b>Minority Status &amp; Language</b>		
Urban	Cases per 100k <b>5.02*</b>	3.20 - 7.88
Q1=162, Q4=377	Deaths per 100k <b>5.30*</b>	3.03 - 9.28
Rural	Cases per 100k <b>3.74*</b>	2.66 - 5.25
Q1=463, Q4=329	Deaths per 100k 1.60	0.88 - 2.93
<b>Housing Type &amp; Transportation</b>		
Urban	Cases per 100k <b>1.53*</b>	1.30 - 1.81
Q1=291, Q4=286	Deaths per 100k <b>1.29*</b>	1.05 - 1.59
Rural	Cases per 100k 1.08	0.84 - 1.37
Q1=321, Q4=444	Deaths per 100k 1.27	0.87 - 1.84

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 a:

- 1.6x greater risk of COVID-19 diagnosis
- 1.7x greater risk of COVID-19 death

People in the most vulnerable counties by the minority status & language domain had a:

- 4.9x greater risk of COVID-19 diagnosis
- 4.8x greater risk of COVID-19 death

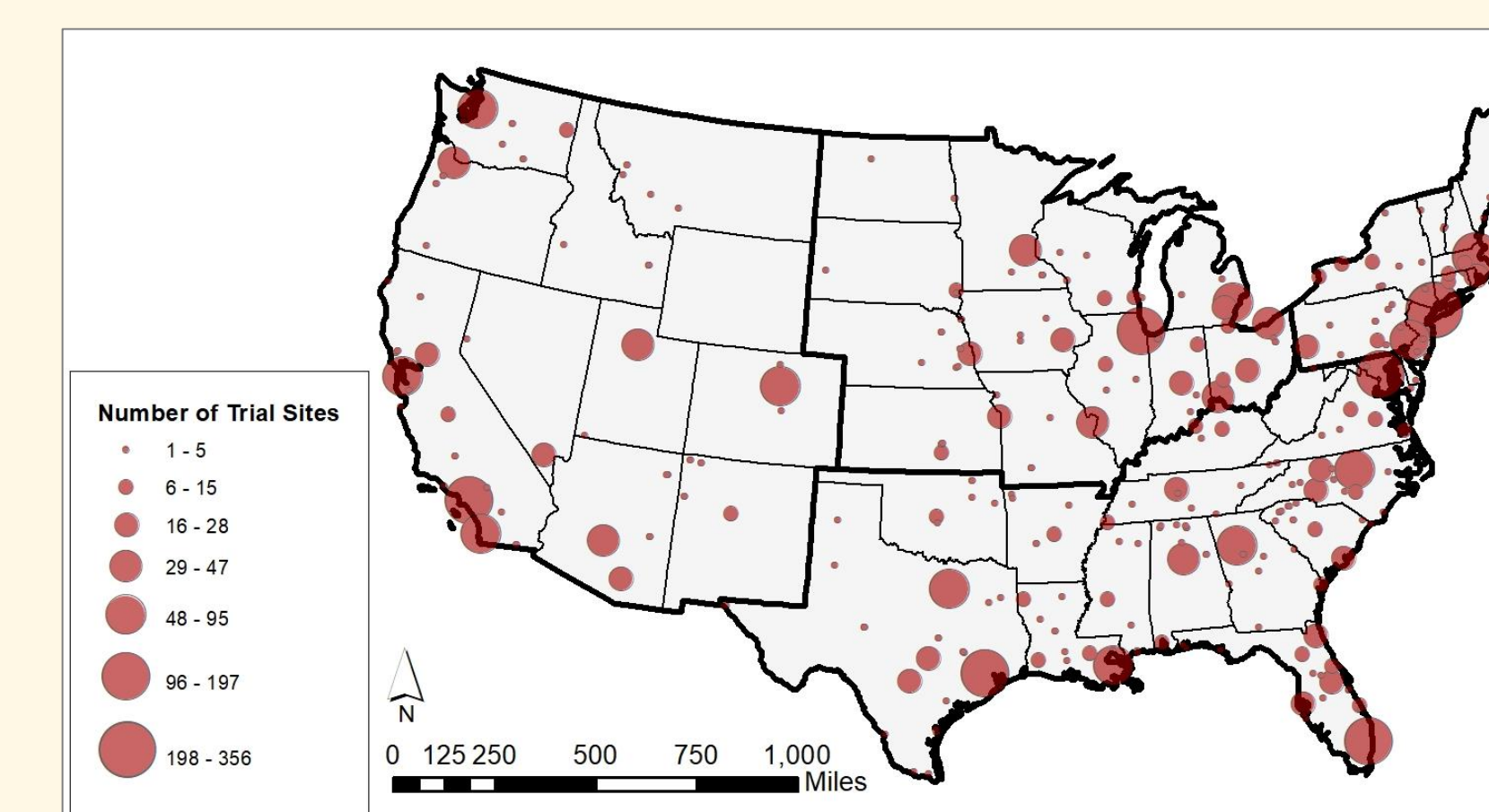


Fig 4. Distribution of COVID-19 Therapeutic Trial Sites

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

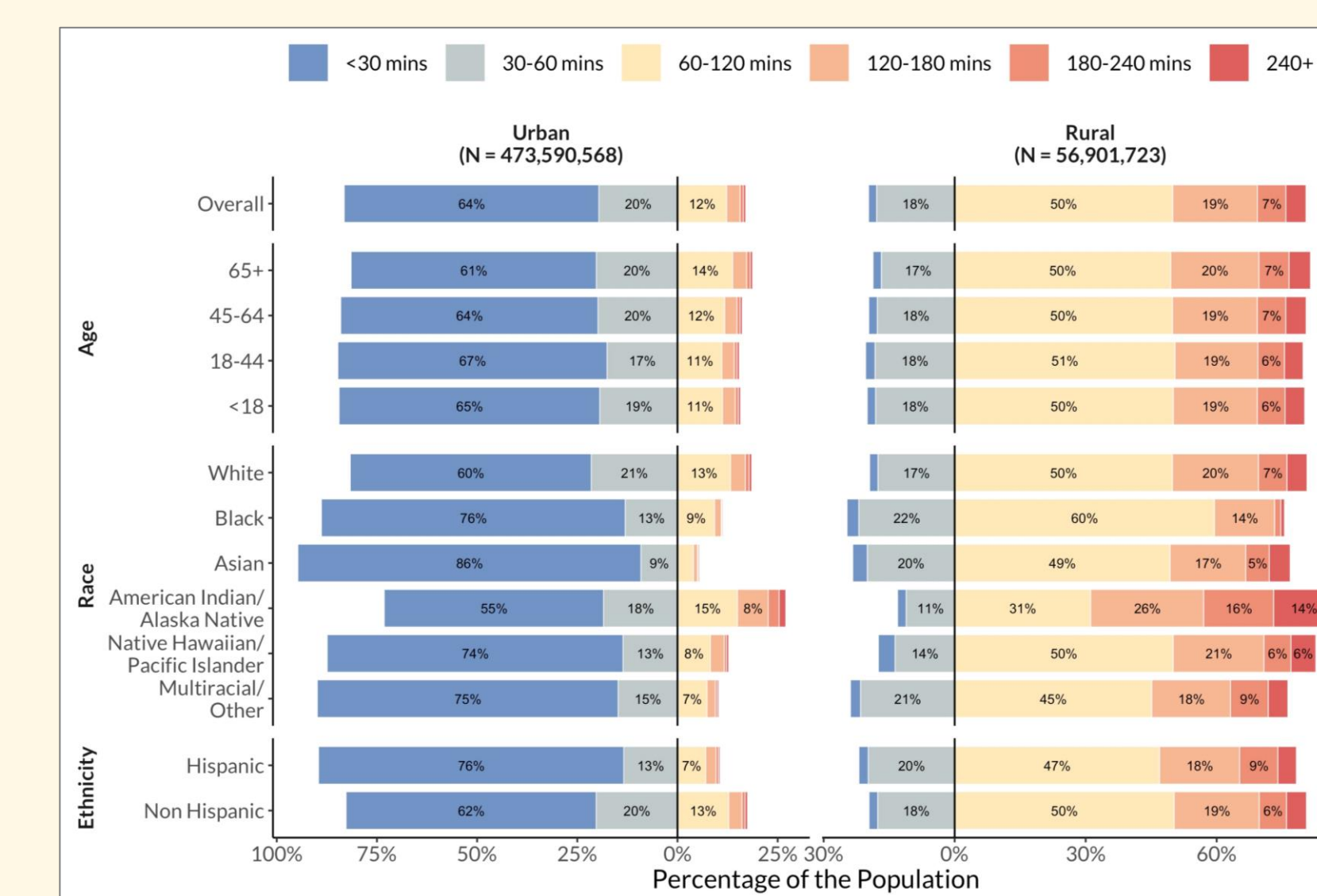
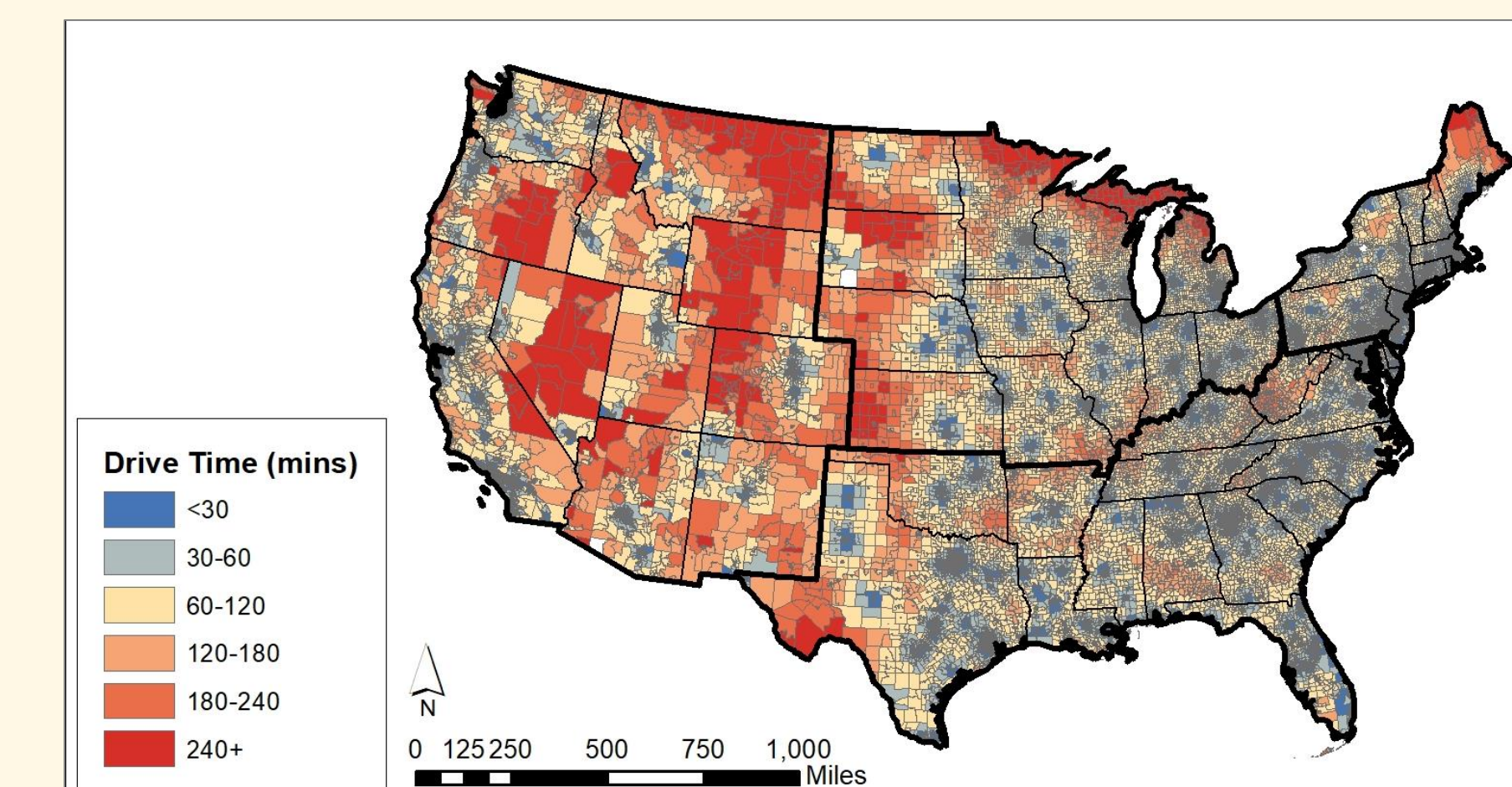


Fig 6. One-Way Drive Time to Nearest COVID-19 Therapeutic Trial Site by Demographic Subgroup & Rurality

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.



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.



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.

