IDeA-CTR N3C Investigator Engagement Event: Jumpstarting Access to Clinical Data for COVID-19 Research

Thursday, February 17, 2022 | 2:00-5:00 PM EST

CTR N3C Studies

Higher Hospitalization and Mortality Rates among SARS-CoV-2 Infected Persons in Rural America

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Higher Hospitalization and Mortality Rates Among SARS-CoV-2 Infected Persons in Rural America

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February 2022

Background

Importance

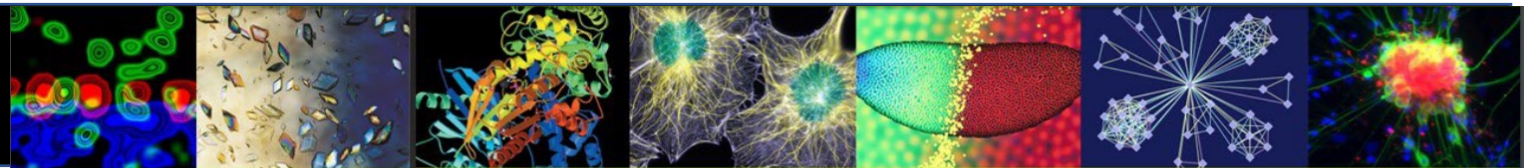
Rural communities are among the most underserved and resource-scarce populations in the United States (US), yet there are limited data on COVID-19 mortality in rural America

What we know

Rural patients were more likely to be older, white, have higher body mass index, and diagnosed with SARS-CoV-2 later in the pandemic compared with their urban counterparts

What we don't know

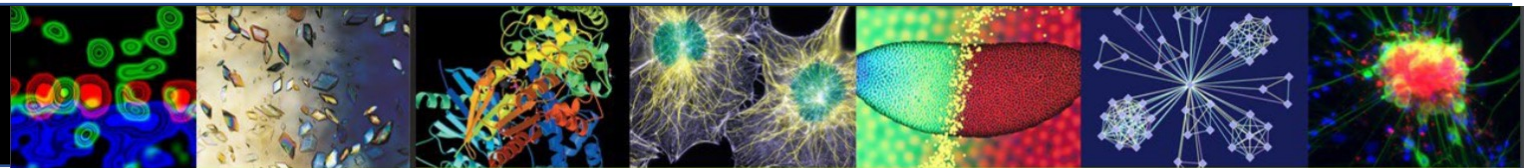
Do mortality and hospitalization rates among rural SARS-CoV-2 infected patients in the United States differ from that of their urban counterparts when adjusting for these differences?



Objectives

To assess disparities in hospitalization rates and all-cause inpatient mortality among persons with definitive COVID-19 diagnoses residing in rural and urban areas in the United States

Research Hypothesis: Rural dwellers are more likely to be hospitalized with SARS-CoV-2 and are more likely to die in the hospital in the N3C population.



Outcomes, Measures, and Methods

Outcomes

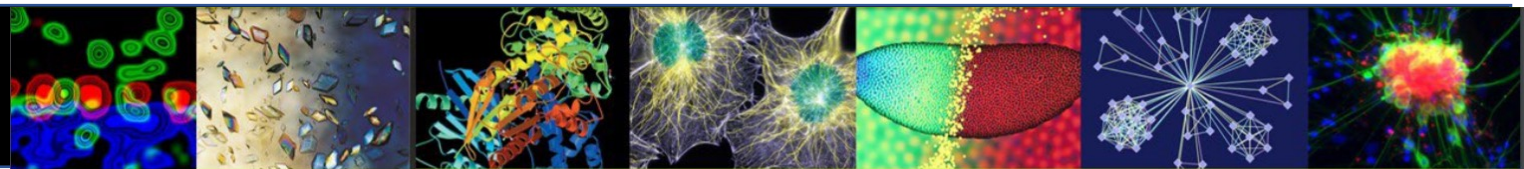
Hospitalization and all-cause, 90-day inpatient mortality

Measures

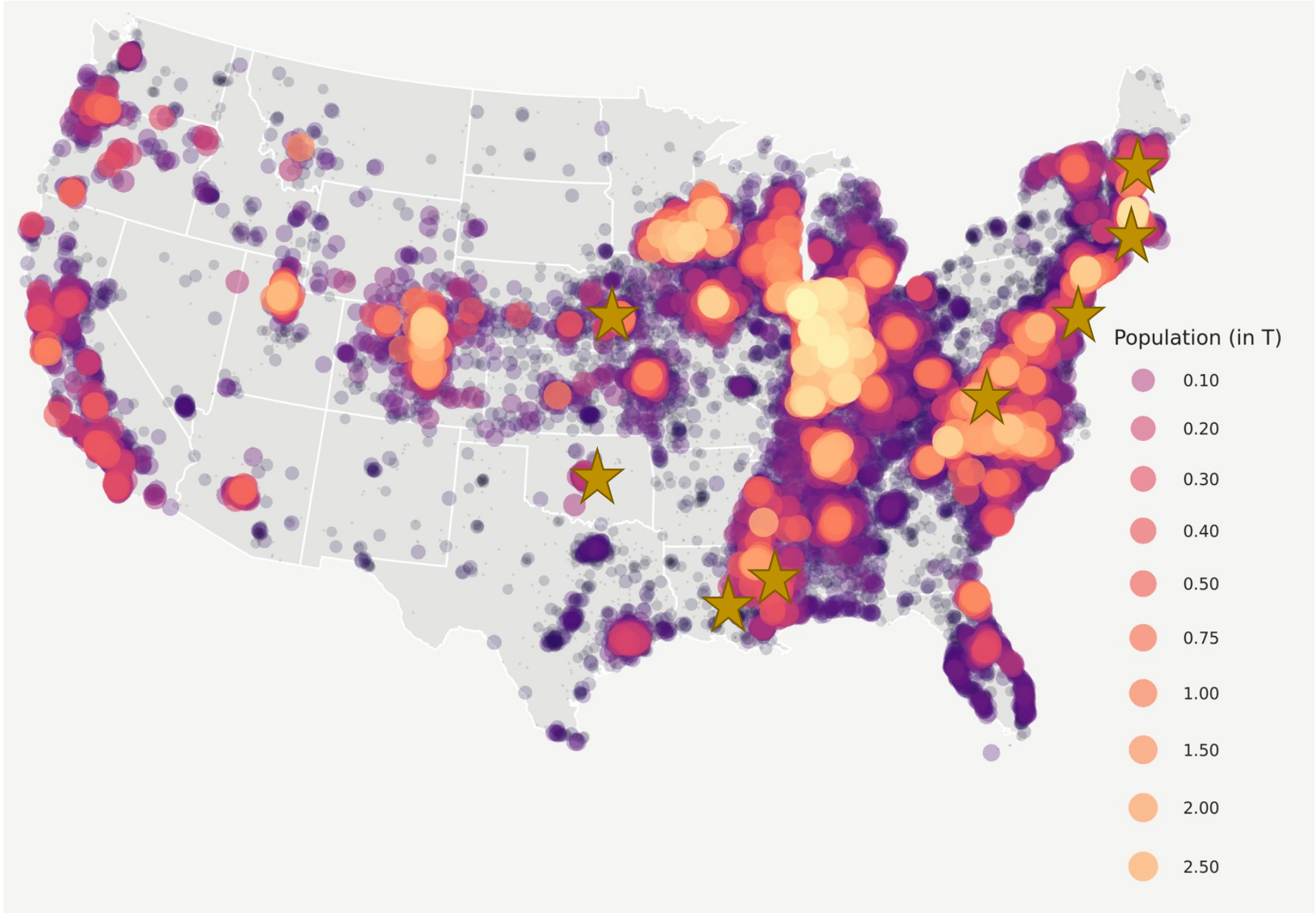
Rurality, gender, age, race, ethnicity, body mass index, Charlson Comorbidity Index score, tobacco usage, Census subregion, and quarter of diagnosis.

Methods

Kaplan-Meier analysis and mixed effects logistic regression were used to estimate 90-day survival in hospitalized patients and associations between rurality, hospitalization, and inpatient mortality while, controlling for major risk factors.

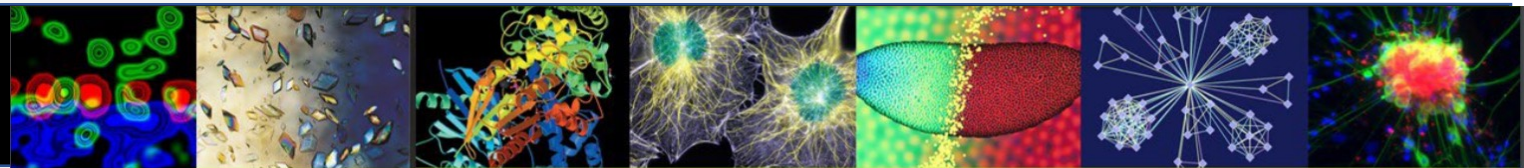


IDeA-CTR contributing sites



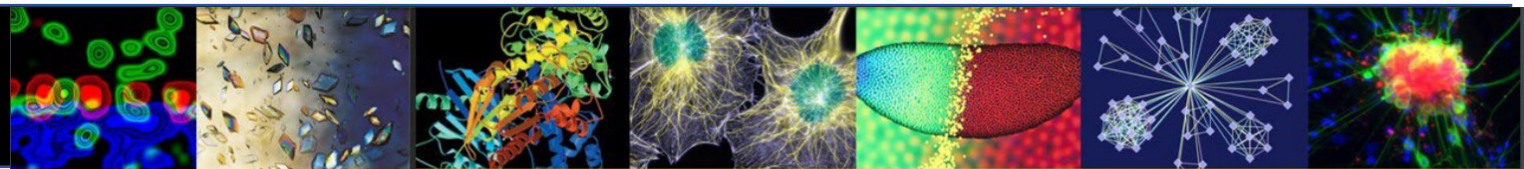
ISCORE

IDeA States Consortium for Clinical Research



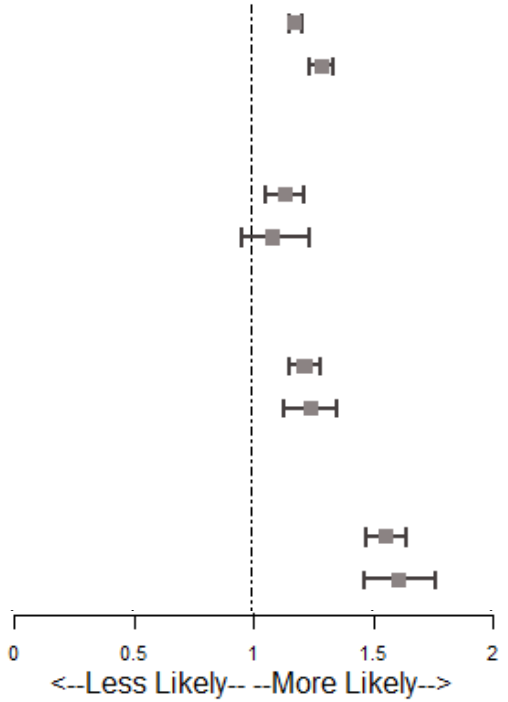
Cohort Sizes

SAS-CoV-2 Infected Overall	Urban, N = 907,953	Urban-Adjacent Rural N = 100,219	Nonurban-Adjacent Rural N = 25,057
SARS-COV-2 Infected Hospitalized	Urban, N = 165,483 (18%)	Urban-Adjacent Rural N = 16,974 (17%)	Nonurban-Adjacent Rural N = 4,425 (18%)



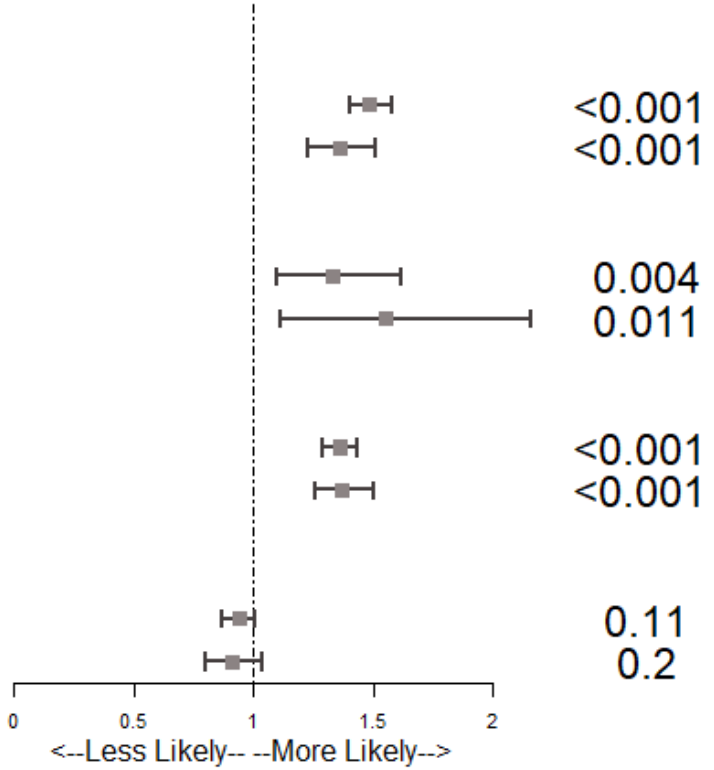
Adjusted Odds Ratios for Adverse Events

Outcome	Rural Category	Adjusted Odds Ratio (95% CI)	p value
Hospital Admission			
	Urban (reference)		
	Urban-Adjacent Rural	1.18 (1.16, 1.21)	<0.001
	Nonurban-Adjacent Rural	1.29 (1.24, 1.34)	<0.001
Oxygen Support			
	Urban (reference)		
	Urban-Adjacent Rural	1.14 (1.06, 1.22)	<0.001
	Nonurban-Adjacent Rural	1.09 (0.96, 1.24)	0.2
Major Adverse Cardiovascular Event			
	Urban (reference)		
	Urban-Adjacent Rural	1.22 (1.16, 1.29)	<0.001
	Nonurban-Adjacent Rural	1.25 (1.14, 1.36)	<0.001
Invasive Mechanical Ventilation			
	Urban (reference)		
	Urban-Adjacent Rural	1.56 (1.48, 1.65)	<0.001
	Nonurban-Adjacent Rural	1.61 (1.47, 1.77)	<0.001



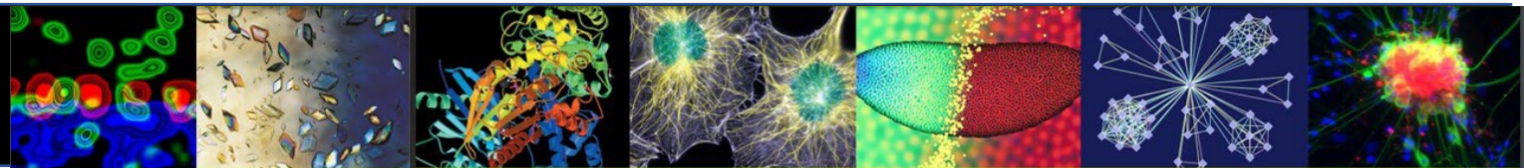
Adjusted Odds Ratios for Adverse Events

Outcome	Rural Category	Adjusted Odds Ratio (95% CI)	p value
Vasopressor Support	Urban (reference)		
	Urban-Adjacent Rural	1.48 (1.40, 1.58)	<0.001
	Nonurban-Adjacent Rural	1.36 (1.23, 1.51)	<0.001
Extracorporeal Membrane Oxygenation	Urban (reference)		
	Urban-Adjacent Rural	1.33 (1.10, 1.62)	0.004
	Nonurban-Adjacent Rural	1.55 (1.11, 2.16)	0.011
Death or Transfer to Hospice	Urban (reference)		
	Urban-Adjacent Rural	1.36 (1.29, 1.43)	<0.001
	Nonurban-Adjacent Rural	1.37 (1.26, 1.50)	<0.001
Hospital Readmission	Urban (reference)		
	Urban-Adjacent Rural	0.94 (0.87, 1.01)	0.11
	Nonurban-Adjacent Rural	0.91 (0.80, 1.04)	0.2



Conclusions

- Hospitalization, death, and other adverse events were significantly higher among rural C19 patients than their urban counterparts after adjusting for multiple factors, including age, sex, race, Census subregion, and comorbidities
- Rural residents (both urban adjacent and non-adjacent) with COVID-19 were more likely to be hospitalized (adjusted Odds Ratio [aOR] 1.18, 95% Confidence Interval [CI], 1.16-1.21 and aOR 1.29, CI 1.24-1.1.34) and to die or be transferred to hospice (aOR 1.36, CI 1.29-1.43 and 1.37, CI 1.26-1.50), respectively
- Further research is needed to understand this disparity for both acute and chronic health conditions.



Ongoing Projects

- Differences in rural-urban outcomes over time, notably in the Delta- and Omicron-dominant time periods
- Role of vaccine hesitancy, lower vaccination rates, and higher community transmission rates on rural mitigation strategies
- Differences in direct access to care by rural-dwelling status
- **We meet the first Monday of each month at 2 PM EST.**

Reach out to Jerrod Anzalone or Sharon Patrick if you're interested in joining!