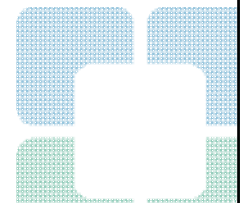


Rural vs Urban Challenges

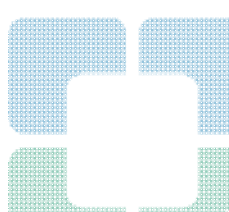
April 16th, 2021
G. Abbas Kharal MD, MPH
Staff, Cerebrovascular Center
Cleveland Clinic



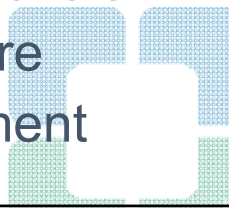
- Disclosures: None



Disparities in Health Care in the US

- 2011: US Dept of Health & Human Services Goal
 - “A nation free of disparities in health care by 2020”
 - Significant disparities still persist in the US in 2021
 - Major inequities in cardiovascular and cerebrovascular care
- 

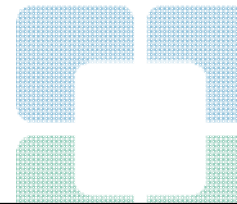
The Rural-Urban Divide

- 25% of US population lives in rural areas which have:
 - Higher number of elderly population
 - Higher prevalence of stroke risk factors
 - Lower number of physicians and specialists
 - Less medical facilities and infrastructure
 - Delays in seeking and receiving treatment
- 

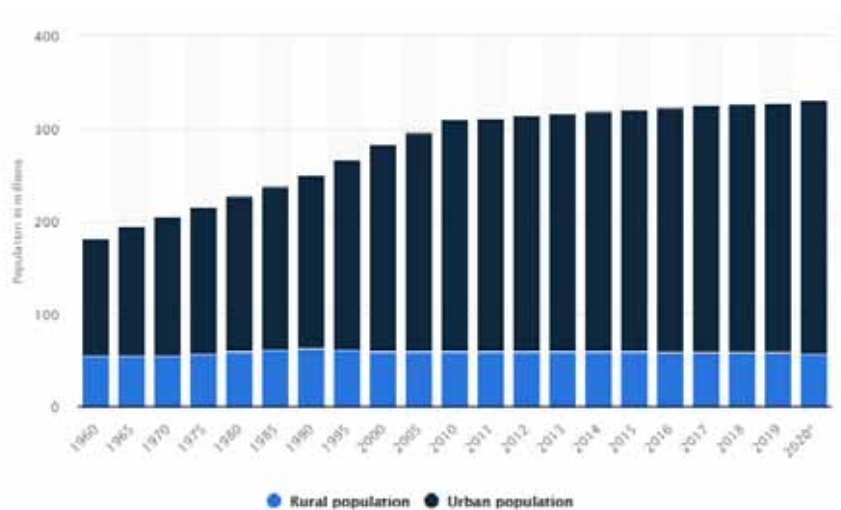
A snapshot of rural and urban America: Population characteristics and leading health indicators³

	Rural (nonmetropolitan)	Urban (metropolitan)
Population characteristics		
Population (% in 2015) ¹	14.3	85.7
People aged 65 and over (% in 2017) ^{2a}	18.1	14.3
Household income (median in 2014) ^{2b}	US\$43,616	US\$58,229
Access to care		
Primary care physicians per 10,000 people (2014) ^{3a}	5	8
Total physicians per 10,000 (2014) ^{3b}	13	33
Percentage saying access to good doctors and hospitals is a major problem in their local community (2018) ⁴	23	18
Longest average drive time to the nearest hospital, in minutes (2018) ⁵	34	18.7
Health status		
Diagnosed diabetes prevalence (% in 2016) ^{6a}	12.6	9.9
Obesity prevalence (% in 2016) ^{6b}	33.5	28
Preventable hospitalization (hospital stays for ambulatory-care sensitive conditions per 1,000 Medicare enrollees in 2013) ⁷	64.6	50.6
Mortality⁸ (age-adjusted rate per 100,000 in 2014)		
All-cause	830.5	703.5
Suicide	16.8	12.4
Drug poisoning	15.6	14.7

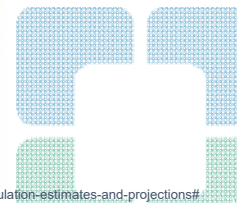
Source: Deloitte analysis.

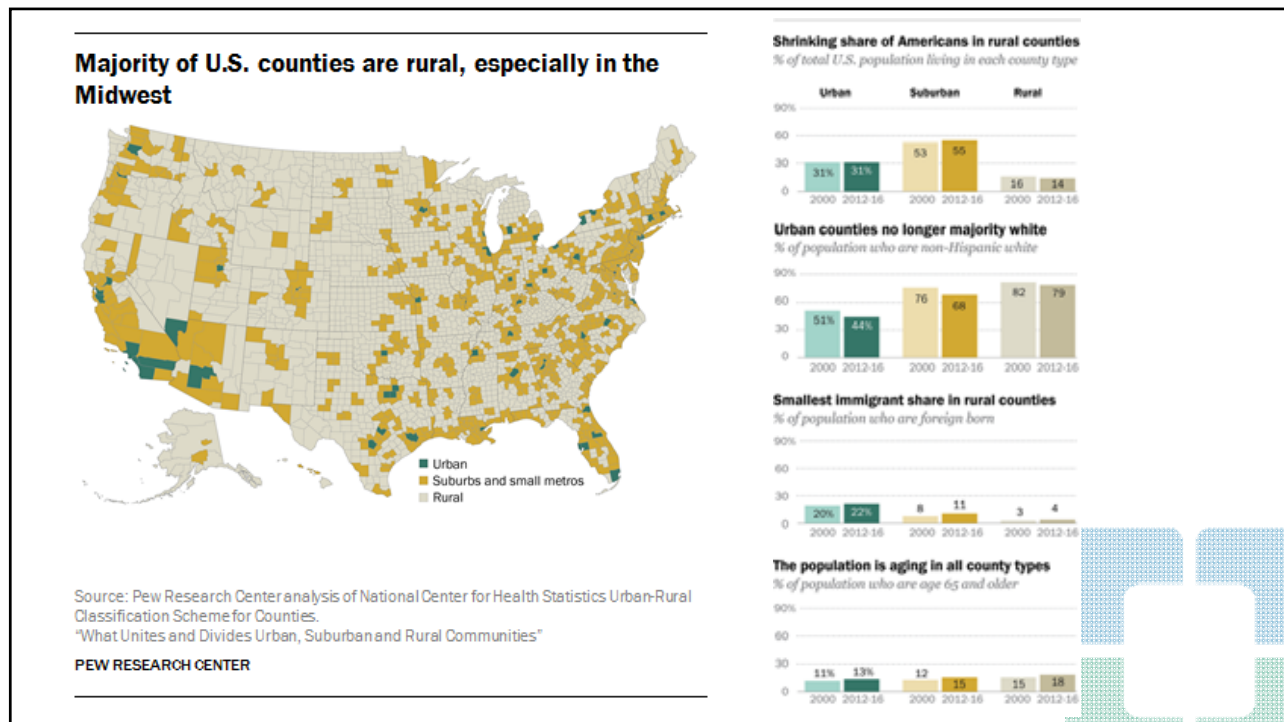


Size of the Urban and Rural Population of the United States from 1960 to 2020



<https://databank.worldbank.org/data/source/population-estimates-and-projections#>



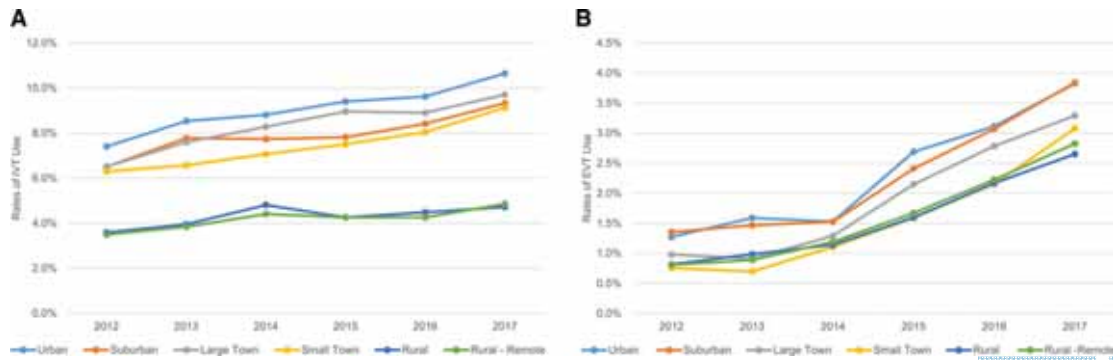


Progressive Rural-Urban Disparity in Delivery of Acute Stroke Care

- Hammond et al. Retrospective cohort study using National Inpatient Sample data from 2012 to 2017, ~792K acute stroke admissions
- Rural patients were more often white (78% versus 49%), older than 75 (44% versus 40%), and in the lowest quartile of income (59% versus 32%) compared with urban patients
- Patients in rural areas were half as likely to receive iv thrombolysis (4.2% vs 9.2%) or mechanical thrombectomy (1.6% vs 2.4%) compared to the those being treated at urban health care centers
- This trend persisted over the years
- Higher stroke related mortality in rural areas (6.87% versus 5.82%, $P < 0.001$)

Gmeric Hammond. Stroke. Urban-Rural Inequities in Acute Stroke Care and In-Hospital Mortality. Volume: 51, Issue: 7, Pages: 2131-2138, DOI: (10.1161/STROKEAHA.120.029318)

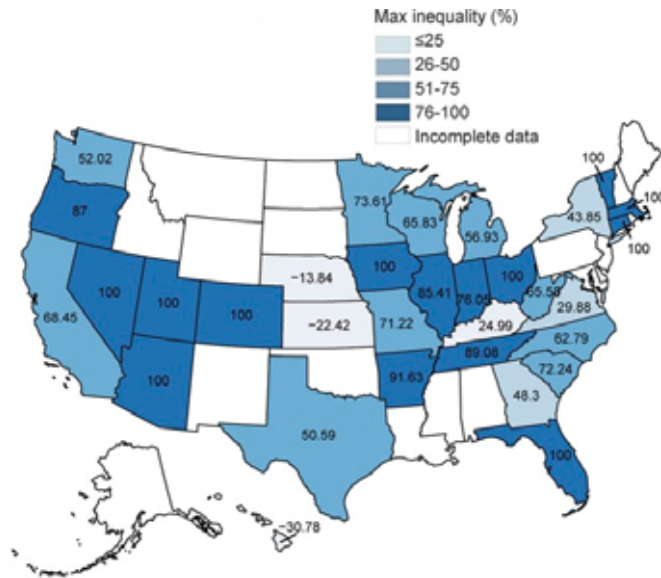
Rural vs Urban Trends for Acute Stroke Treatment



(A) Trends in intravenous thrombolytic therapy (IVT) use for AIS by rural strata; (B) trends in EVT use for AIS by rural strata.

Gmrice Hammond. Stroke. Urban-Rural Inequities in Acute Stroke Care and In-Hospital Mortality, Volume: 51, Issue: 7, Pages: 2131-2138, DOI: (10.1161/STROKEAHA.120.029318)

Rural-Urban Inequality in Tissue Plasminogen Activator Use in the United States



Gonzales, Sergio, et al. "Progressive rural-urban disparity in acute stroke care." *Neurology* 88.5 (2017).

Contributors to Rural-Urban Disparities in Stroke Care

Structure

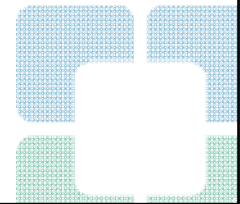
- Provider
- Facility
- Organizational characteristics
- Accreditation
- Access to MT
- MSTU
- Telestroke

Process

- Diagnosis
- Treatment
- Transfer Process

Patient Specific Barriers

- Delays in arrival
- TPA eligibility
- Lack of awareness
- Disease Severity



Rural vs Urban Disparities in Epilepsy Care

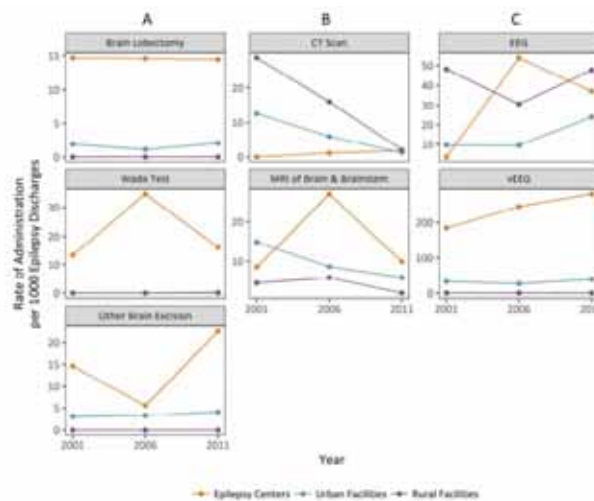


Figure 3: Rate of select procedures (per 1,000 epilepsy/seizure discharges). Column A is surgical procedures, Column B is diagnostic imaging, Column C is electrophysiological monitoring

Bensken, Wyatt P., Gina Norato, and Omar I. Khan. "Hospital Resource Utilization in Epilepsy: Disparities in Rural vs Urban Care." *medRxiv* (2019): 19002766.



Rural-Urban Disparities in Dementia Care

- Dementia patients in rural counties more likely to hospitalized for preventable causes
- Higher proportion of underdiagnosed patients in rural counties
- Higher mortality rates in dementia patients in rural areas
- Less access to specialty care

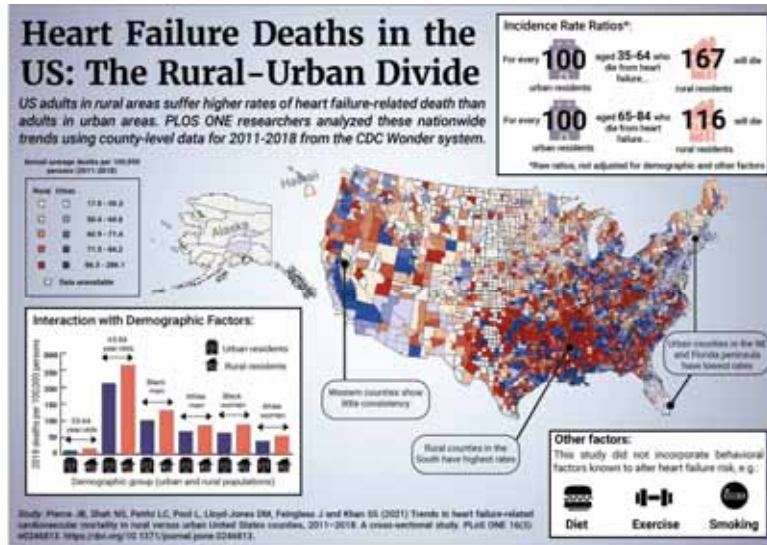
Thorpe, Joshua M., et al. "Rural-urban differences in preventable hospitalizations among community-dwelling veterans with dementia." *The Journal of Rural Health* 26.2 (2010): 146-155.

Rural-Urban Disparities in Cardiovascular Mortality

- Between 1999 and 2017, there were ~16M deaths attributed to cardiovascular disease.
- Data stratified by age group (<25, 25-64, and ≥65 years) & AAMR calculated
- Rural areas had consistently higher AAMR than non-rural areas in all subgroups
- In all regions, black people had higher AAMRs than other races and males had higher AAMRs than females.

Cross, Sarah H., et al. "Rural-urban differences in cardiovascular mortality in the US, 1999-2017." *JAMA* 323.18 (2020): 1852-1854

Rural vs Urban Disparity in Heart Failure Mortality

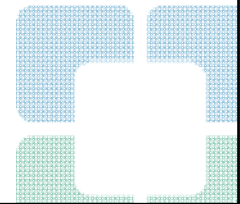


Bridging the Disparity Gap

- Improving access to primary & specialty care in rural areas
- Wide spread use of telehealth services
- Funding and Resource Allocation at federal & state levels
- Building on pillars of structure, process and patient specific factors

“Of all the forms of inequality, injustice in health is the most shocking and inhuman.”

—Martin Luther King Jr



Panel Discussion

Moderator: G. Abbas Kharal MD. MPH, Cerebrovascular Center, Cleveland Clinic

Panelists:

- **Todd Breaux, MD** Glickman Urological & Kidney Institute, Cleveland Clinic
- **Geoffrey Lake, MBA, MSW** Care Coordination Manager, Cleveland Clinic
- **Andrew Russman, DO** Cerebrovascular Center, Cleveland Clinic
- **Dylan Wint MD**, Lou Ruvo Center for Brain Health, Cleveland Clinic Las Vegas
- **Shazam Hussain MD**. Director, Cerebrovascular Center, Cleveland Clinic
- **George Howard, DrPH** Chair, Biostatistics, University of Alabama
- **Muhammad Samad** Community Outreach Program Manager, Minority Stroke Program, Cerebrovascular Center, Cleveland Clinic

