

# What is Rural, Anyway?

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# How do we define rural now?

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# Purpose

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“Rural” is a subjective concept, yet policy requires formal definitions.

There are multiple definitions used across policies, programs, research analyses and narratives.

Meanwhile, readers often have their own lens of what “rural” means.

Today we will

- present these various definitions
- outline some potential approaches to sorting through when to use each, and
- discuss potential future directions.

# Session Overview

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- Introduction to Rural definitions & Quiz
- Rural from a resource perspective: socioeconomic and health care
- Rural heterogeneity –misclassification issues
- Challenges of current definitions for research/policy
- Towards a new definition
- Q&A





# Online Poll - Instructions

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Text kevinbennett671 to the number 22333

On the next slides, send the letter to that number

OR go to [pollev.com/kevinbennett671](http://pollev.com/kevinbennett671) to vote



## Without looking it up, what level of rural is your county?

Urban  
(Metropolitan)

Rural  
(Non-Metropolitan)



# Without looking it up, what level of rural is your county?

Urban

Micropolitan

Small Adjacent  
Rural

Remote /  
Isolated Rural

# Without looking it up, what level of rural is your county?



When poll is active, respond at **PollEv.com/kevinbennett671**



Text **KEVINBENNETT671** to **22333** once to join

Counties in metro areas of 1 million  
population or more

Counties in metro areas of 250,000 to 1  
million population

Counties in metro areas of fewer than  
250,000 population

Urban population of 20,000 or more,  
adjacent to a metro area

Urban population of 20,000 or more, not  
adjacent to a metro area

Urban population of 2,500 to 19,999,  
adjacent to a metro area

Urban population of 2,500 to 19,999, not  
adjacent to a metro area

Completely rural or less than 2,500 urban  
population, adjacent to a metro area

# Without looking it up, what level of rural is your county?

In large metro area of 1+ million residents

In small metro area of less than 1 million residents

Micropolitan area adjacent to large metro area

Noncore adjacent to large metro area

Micropolitan area adjacent to small metro area

Noncore adjacent to small metro area and contains a town of at least 2,500 residents

Noncore adjacent to small metro area and does not contain a town of at least 2,500 residents

Micropolitan area not adjacent to a metro area

Noncore adjacent to micro area and contains a town of at least 2,500 residents

Noncore adjacent to micro area and does not contain a town of at least 2,500 residents

Noncore not adjacent to metro or micro area and contains a town of at least 2,500 residents

Noncore not adjacent to metro or micro area and does not contain a town of at least 2,500 residents

# Without looking it up, what level of rural is your residence?

Metropolitan area core: primary flow within an urbanized area (UA)

Metropolitan area high commuting: primary flow 30% or more to a UA

Metropolitan area low commuting: primary flow 10% to 30% to a UA

Micropolitan area core: primary flow within an Urban Cluster of 10,000 to 49,999 (large UC)

Micropolitan high commuting: primary flow 30% or more to a large UC

Micropolitan low commuting: primary flow 10% to 30% to a large UC

Small town core: primary flow within an Urban Cluster of 2,500 to 9,999 (small UC)

Small town high commuting: primary flow 30% or more to a small UC

Small town low commuting: primary flow 10% to 30% to a small UC

Rural areas: primary flow to a tract outside a UA or UC

# Now, let's look it up

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Go to:

<https://www.ruralhealthinfo.org/am-i-rural>

Look up your home / clinic / facility address

What was the match?

# US Census Bureau's urban-rural classification (2010)

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Fundamentally a delineation of geographical areas, identifying both individual urban areas and the rural areas of the nation. The Census Bureau's urban areas represent densely developed territory, and encompass residential, commercial, and other non-residential urban land uses.

For the 2010 Census, an urban area will comprise a densely settled core of census tracts and/or census blocks that meet minimum population density requirements, along with adjacent territory containing non-residential urban land uses as well as territory with low population density included to link outlying densely settled territory with the densely settled core. To qualify as an urban area, the territory identified according to criteria must encompass at least 2,500 people, at least 1,500 of which reside outside institutional group quarters. The Census Bureau identifies two types of urban areas:

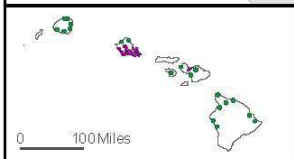
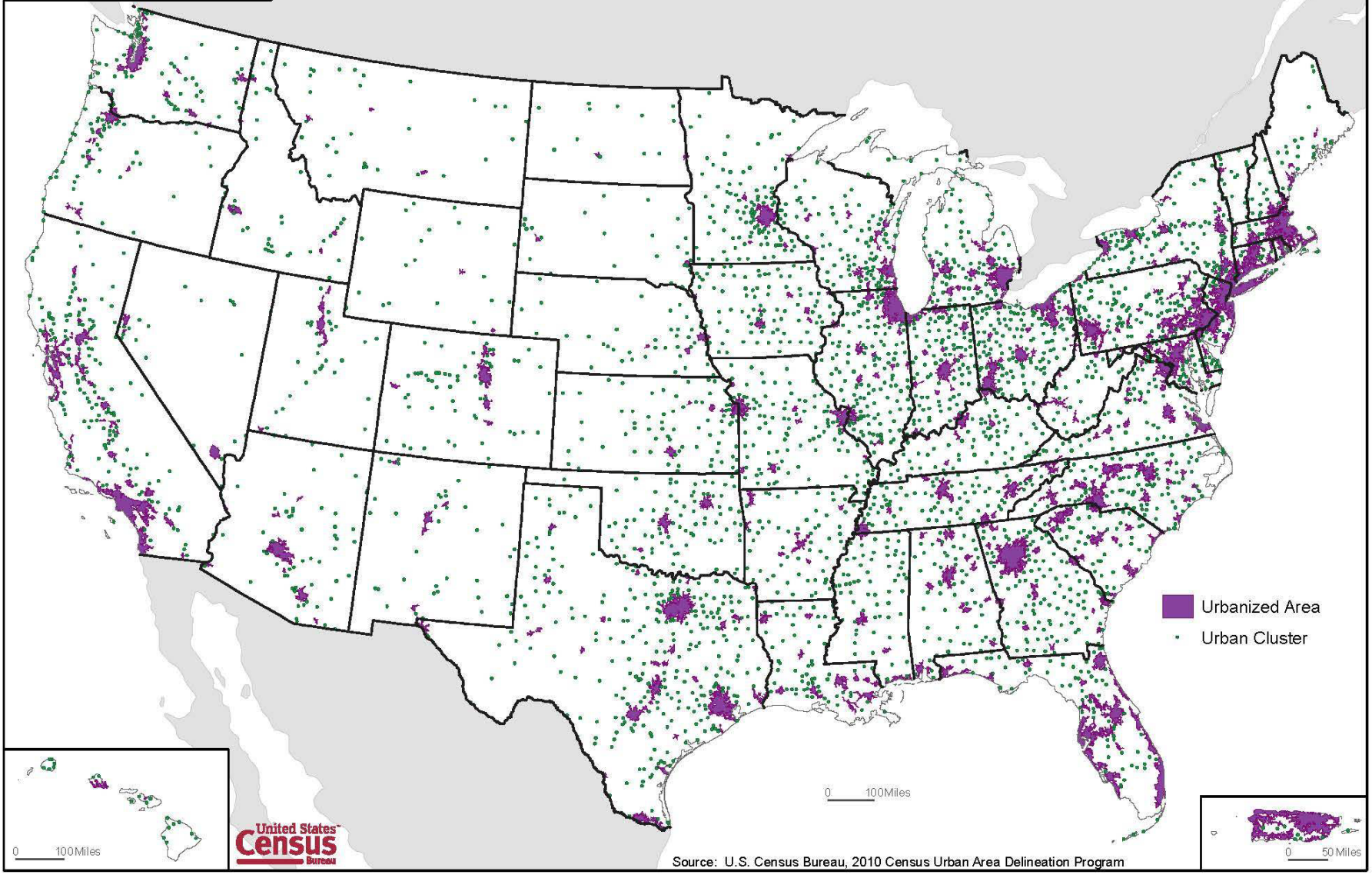
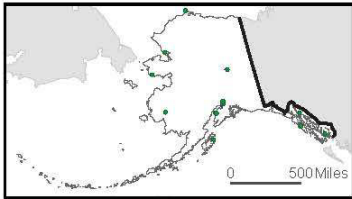
Urbanized Areas (UAs) of 50,000 or more people

Urban Clusters (UCs) of at least 2,500 and less than 50,000 people

"Rural" encompasses all population, housing, and territory not included within an urban area

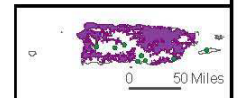


# Urbanized Areas and Urban Clusters: 2010



United States  
**Census**  
Bureau

Source: U.S. Census Bureau, 2010 Census Urban Area Delineation Program



# The Office of Management and Budget (2013)

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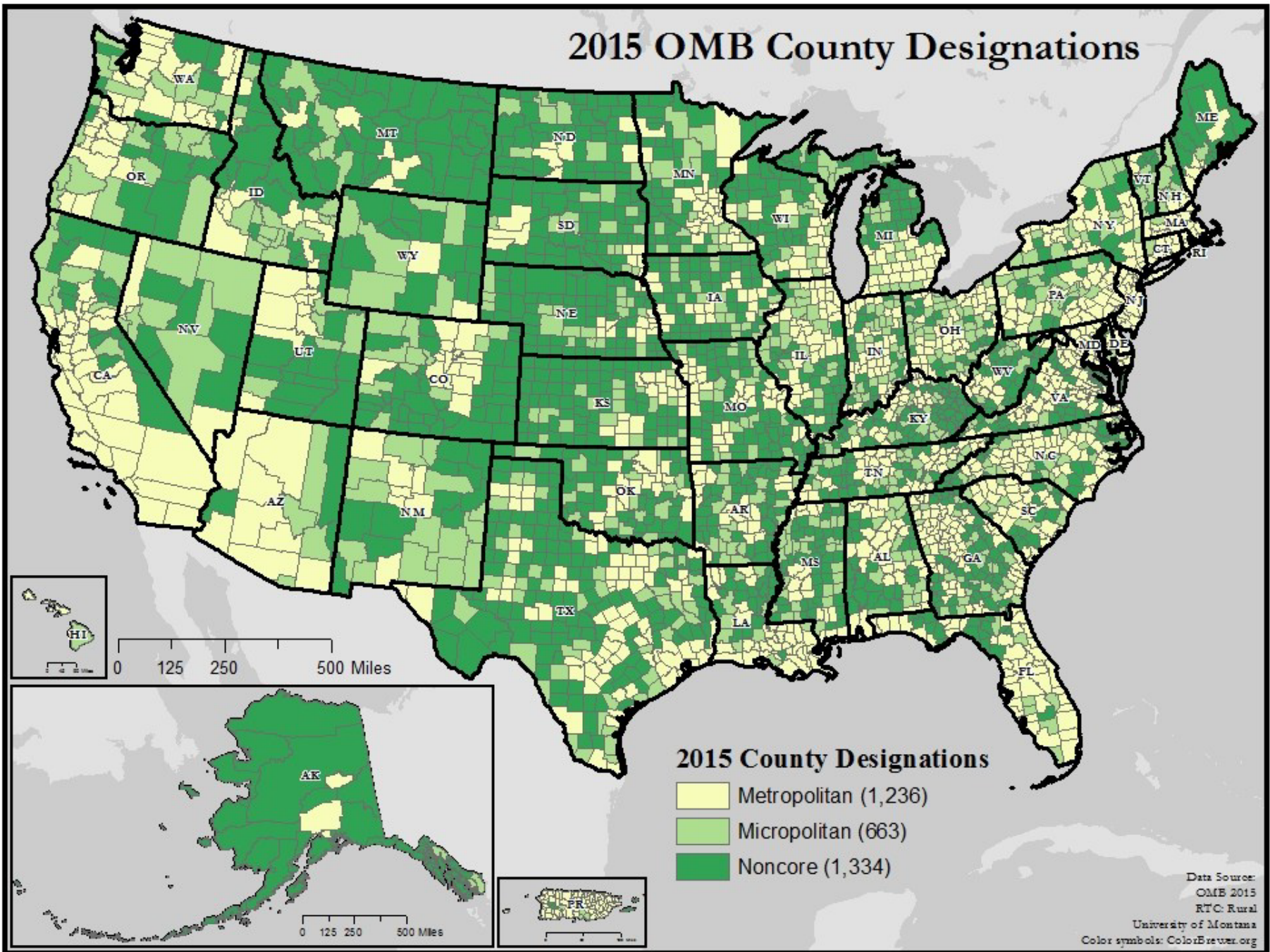
**Metropolitan Counties:** Metropolitan counties consist of at least one urbanized area of 50,000 or more population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties.

**Nonmetropolitan Counties:** Nonmetropolitan counties consist of some combination of open countryside, rural towns (places with fewer than 2,500 people), and urban areas with populations ranging from 2,500 to 49,999. Two types of nonmetropolitan counties are:

- **Micropolitan Counties:** Micropolitan counties have at least one urban cluster of at least 10,000 but less than 50,000 population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties.
- **Noncore counties:** Noncore counties are those that do not have a urban core population of 10,000 or more. These counties are considered the most rural of this designation.



# 2015 OMB County Designations



# Rural-Urban Continuum Codes (2013)

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A classification scheme that distinguishes metropolitan counties by the population size of their metro area, and nonmetropolitan counties by degree of urbanization and adjacency to a metro area. The official Office of Management and Budget (OMB) metro and nonmetro categories have been subdivided into three metro and six nonmetro categories.

Each county in the U.S. is assigned one of the nine codes listed below. Codes 49 are typically considered to be rural.

RUCC 1: Counties in metro areas of 1 million population or more

RUCC 2: Counties in metro areas of 250,000 to 1 million population

RUCC 3: Counties in metro areas of fewer than 250,000 population

RUCC 4: Population of 20,000 or more, adjacent to a metro area

RUCC 5: Population of 20,000 or more, not adjacent to a metro area

RUCC 6: Population of 2,500 to 19,999, adjacent to a metro area

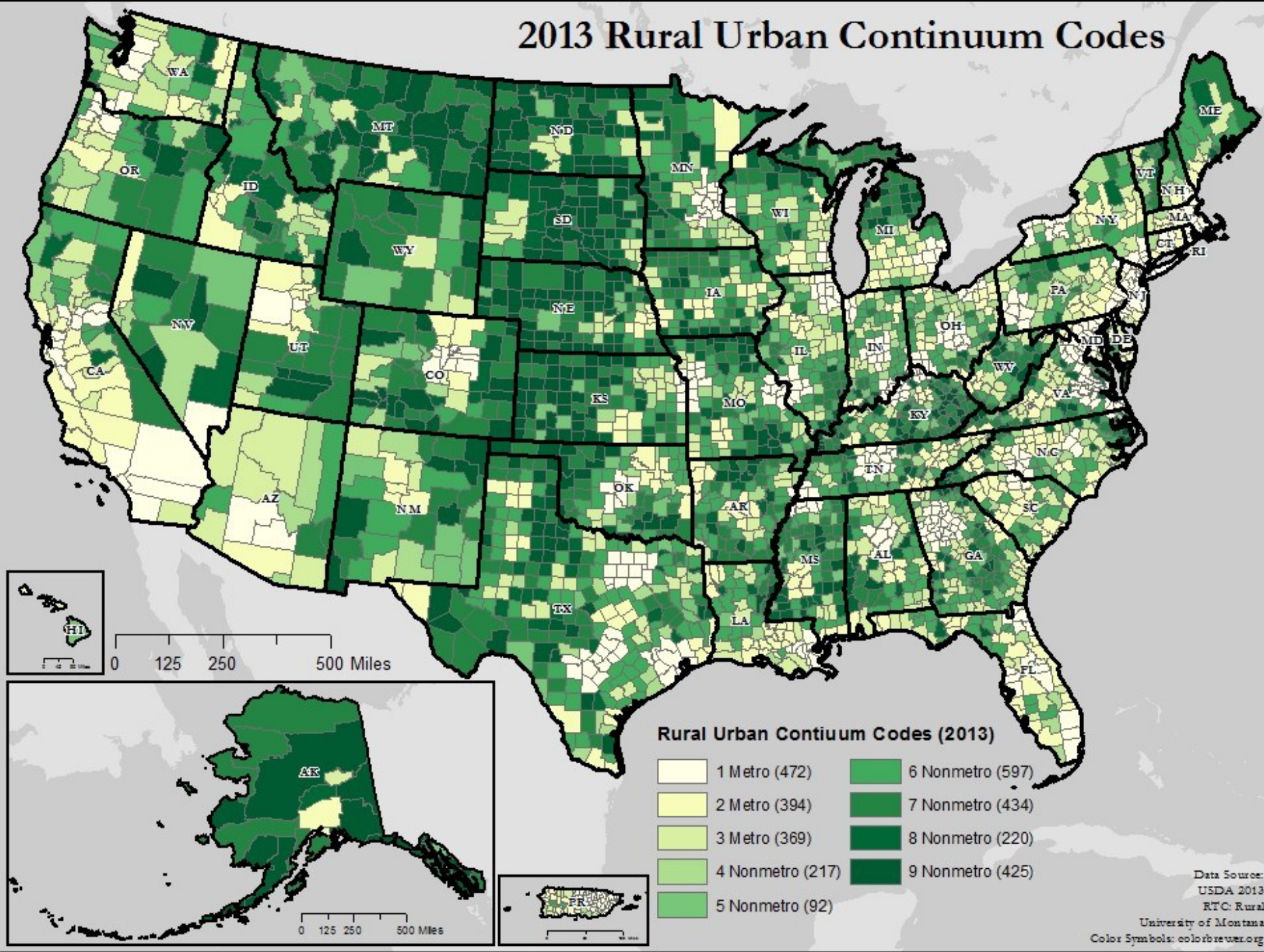
RUCC 7: Population of 2,500 to 19,999, not adjacent to a metro area

RUCC 8: Less than 2,500 population, adjacent to a metro area

RUCC 9: Less than 2,500 urban population, not adjacent to a metro area



# 2013 Rural Urban Continuum Codes



Data Source:

USDA 2013

RTC: Rural

University of Montana

Color Symbols: colorbrewer.org

# Urban Influence Codes (2013)

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A classification scheme that distinguishes metropolitan counties by population size of their metro area, and nonmetropolitan counties by size of the largest city or town and proximity to metro and micropolitan areas. The standard Office of Management and Budget (OMB) metro and nonmetro categories have been subdivided into two metro and 10 nonmetro categories, resulting in a 12-part county classification. Codes 3-12 may be considered rural with 12 being the most rural.

UIC 1: Large metro area over 1 million population

UIC 2: Small metro area less than 1 million population

UIC 3: Micropolitan area adjacent to large metro area

UIC 4: Noncore area adjacent to large metro area

UIC 5: Micropolitan area adjacent to small metro area

UIC 6: Noncore area adjacent to small metro area with town of at least 2,500 population

UIC 7: Noncore area adjacent to small metro area with town of less than 2,500 population

UIC 8: Micropolitan area not adjacent to metro area

UIC 9: Noncore area adjacent to micro area with town of at least 2,500 population

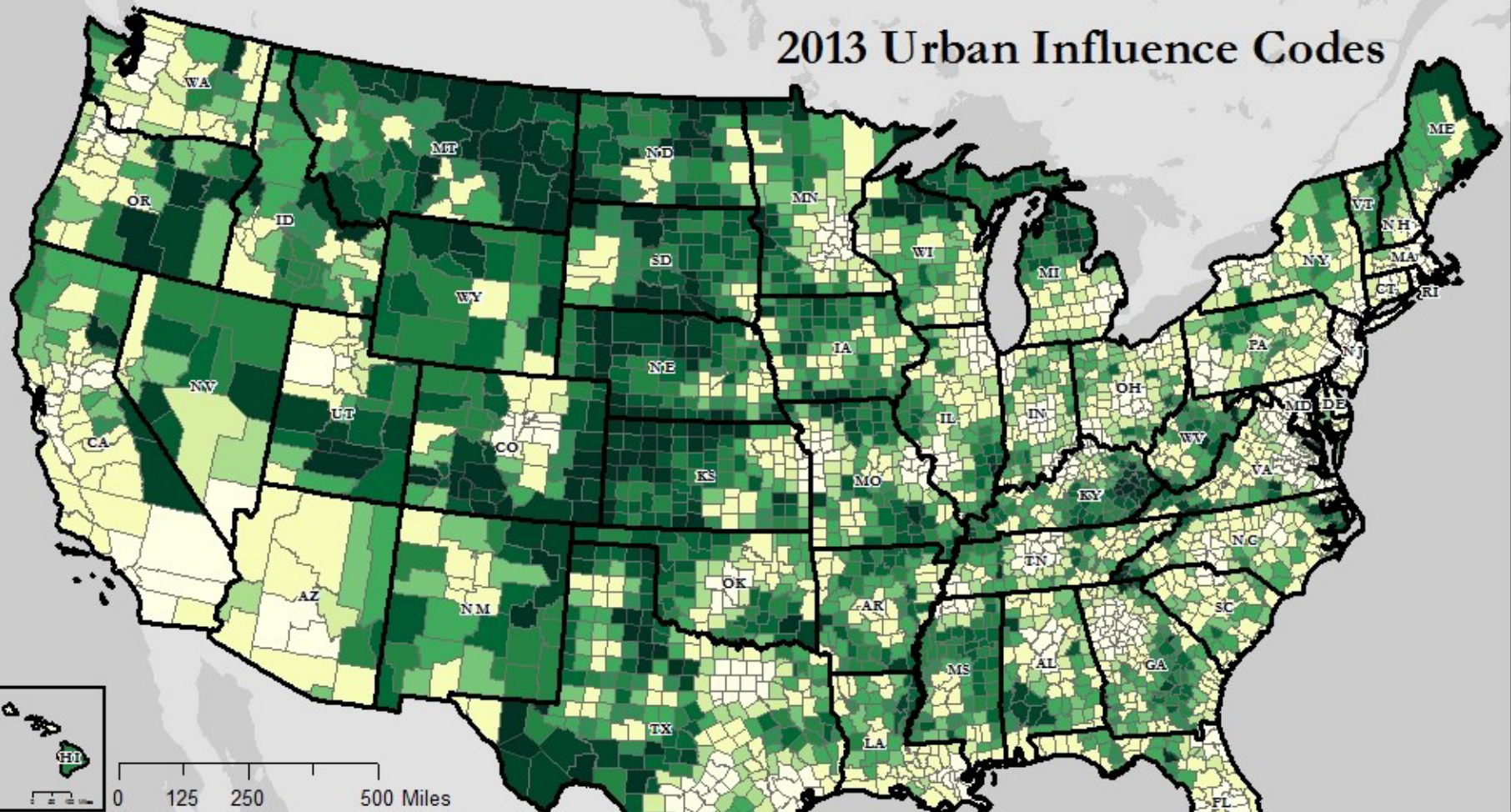
UIC 10: Noncore area adjacent to micro area with town of less than 2,500 population

UIC 11: Noncore not adjacent to metro or micro area with town of 2,500 population

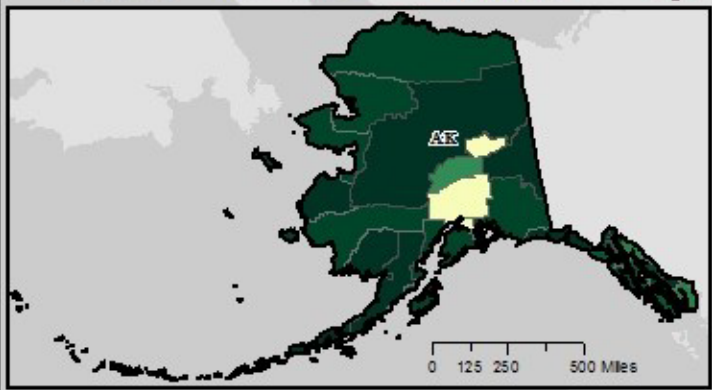
UIC 12: Noncore not adjacent to metro or micro area with town of less than 2,500 population



# 2013 Urban Influence Codes



0 125 250 500 Miles



0 125 250 500 Miles

## Urban Influence Codes (2013)

1 Metropolitan (472)	7 Noncore (164)
2 Metropolitan (763)	8 Micropolitan (269)
3 Micropolitan (132)	9 Noncore (184)
4 Noncore (149)	10 Noncore (189)
5 Micropolitan (245)	11 Noncore (125)
6 Noncore (344)	12 Noncore (184)

Data Source:  
 USDA 2013  
 RTC: Rural  
 University of Montana  
 Color Symbols: Colorbrewer.org

# Other Definitions / Scales

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## [Frontier and Remote Areas](#) (2010)

- Zip Codes
- Levels 1-4

## [Amenities Scale](#) (1999)

- Six measures of climate, topography, and water area

## [ERS County Typology Codes](#) (2015)

- 0=Nonspecialized    1=Farm-dependent
- 2=Mining-dependent    3=Manufacturing-dependent
- 4=Federal/State government-dependent    5=Recreation

## [Index of Relative Rurality](#) (IRR, 2010)

- 0 – 1 (most rural)



# **Rural / Urban Residence: A Simplistic Proxy for Population and Health System Factors?**

Ty Borders, PhD

FHK Endowed Chair in Rural Health Policy

Professor, Health Management and Policy

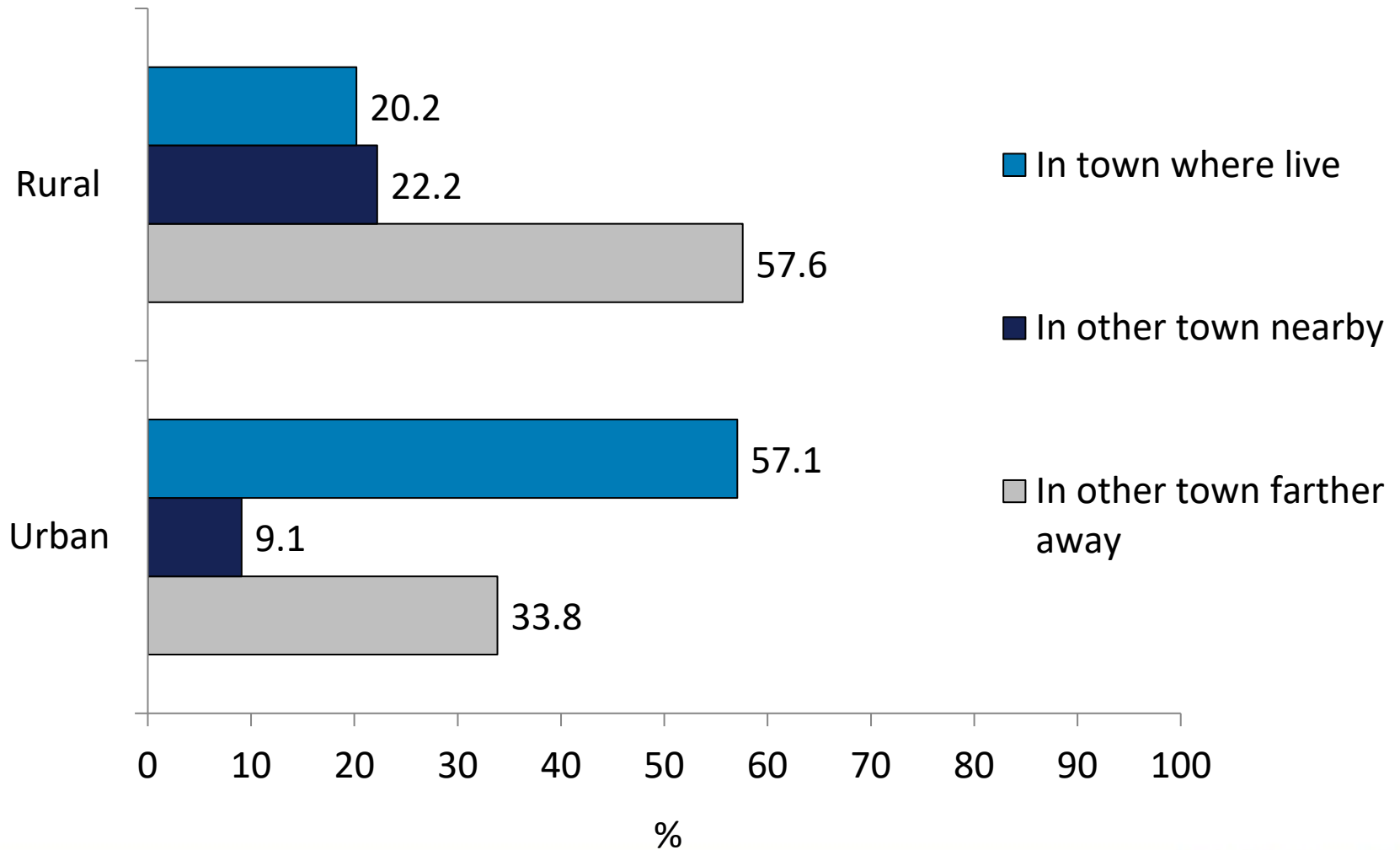
Director, Rural and Underserved Health Research Center

Editor, *The Journal of Rural Health*

# Why Do We Focus on Rural / Urban?

- In research
  - Sample size limitations
  - Only indicator in many existing datasets
  - Tradition
  - Vast majority of *JRH* articles test for rural/urban differences with little regard to underlying causes
- In policy
  - It's easy to understand
  - Tradition

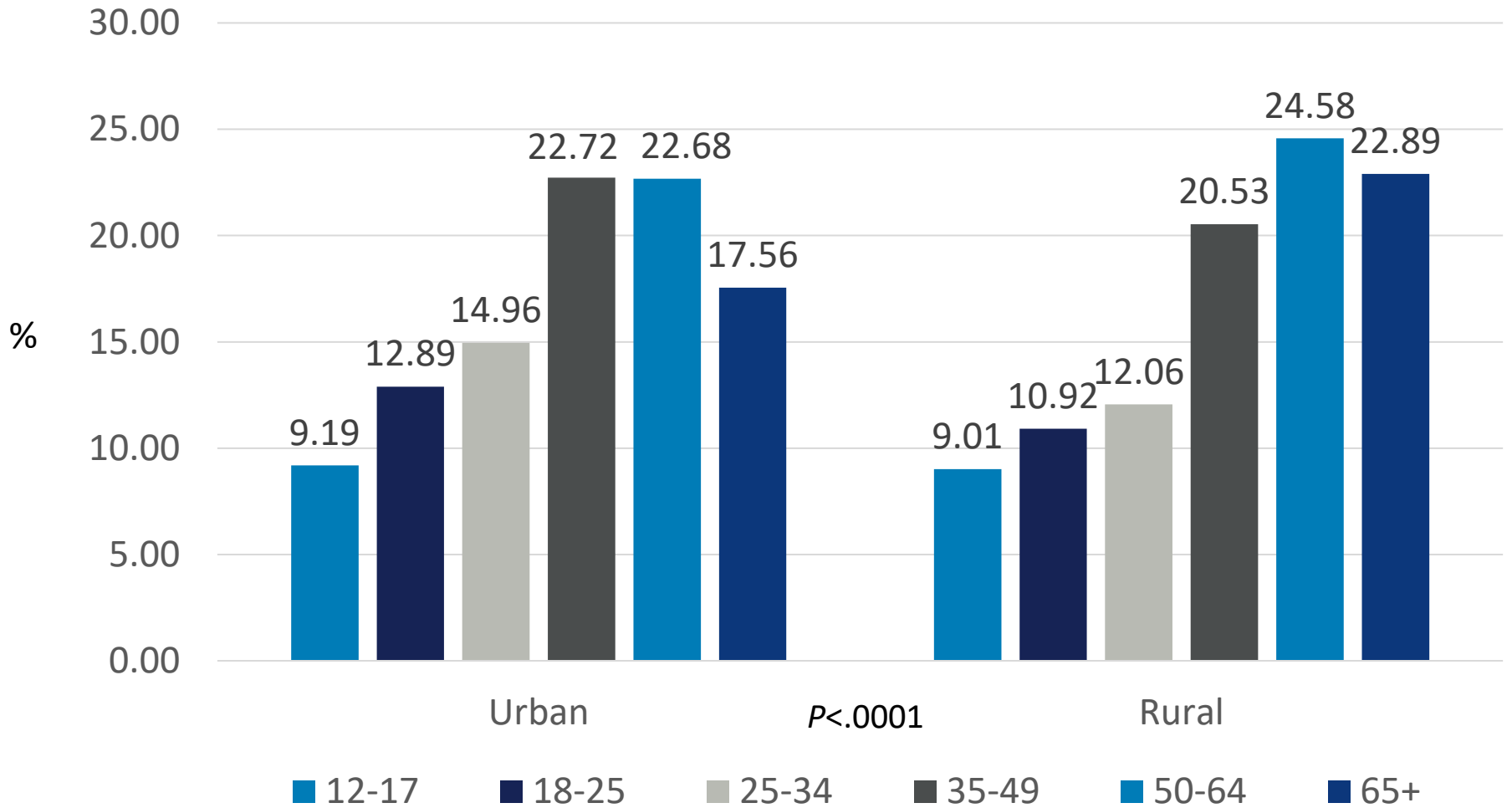
# Example of Informative R/U Comparison: Preferred Treatment Site among Cocaine Users



# What is Rural / Urban Anyway?

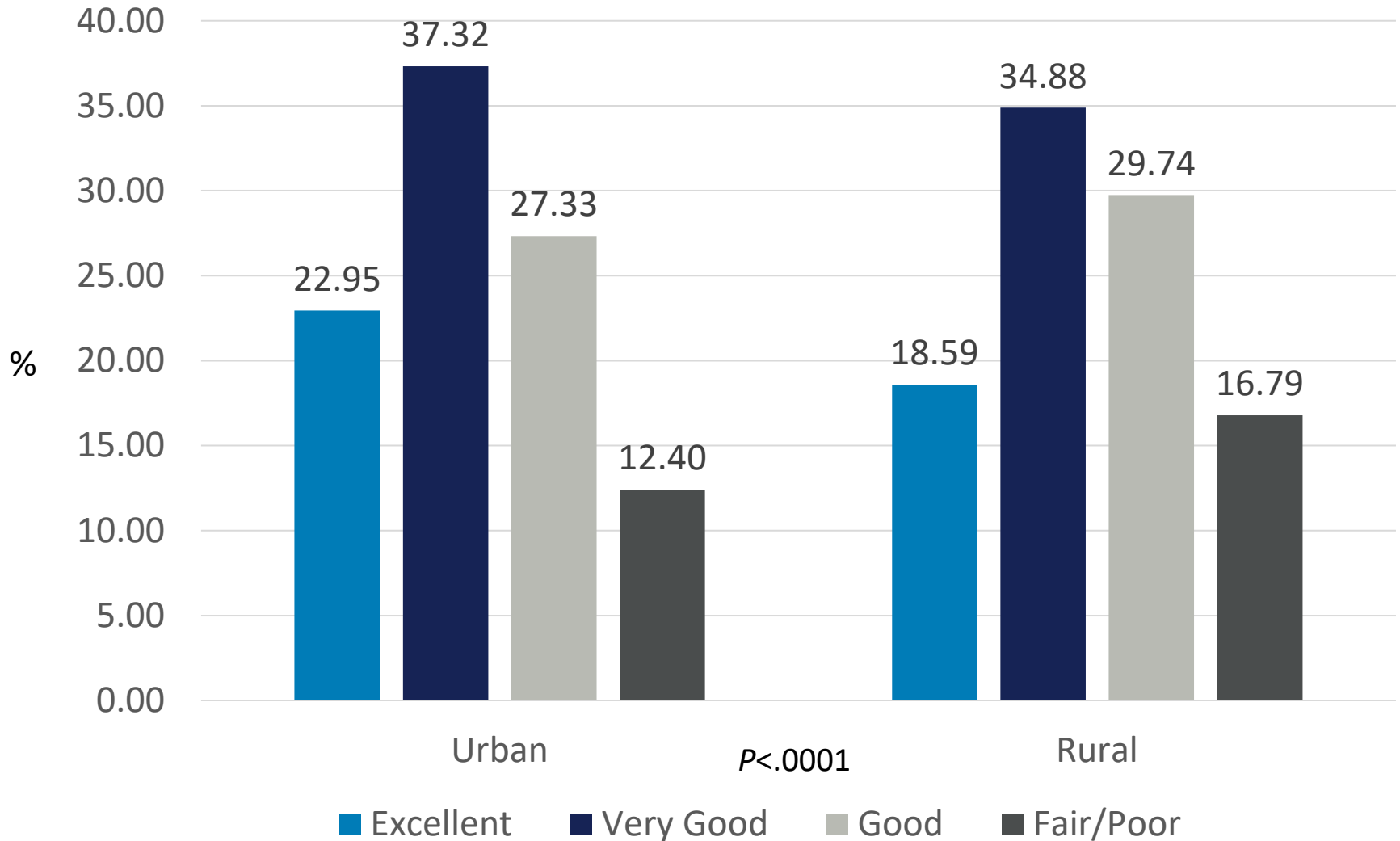
- Rural / urban is a rather simplistic indicator of many other things
  - Population characteristics
  - Environment
  - Health care system
- A focus on rural / urban may lead to inequitable and inefficient decisions

# Age Distributions from 2017 NSDUH



# Self-Rated Overall Health

from 2017 NSDUH



# Usual Analysis Approach

- Test for R/U difference without adjustment
- Test for R/U difference after adjustment for potential confounders
- If differences remains significant, conclude that rural residents are worse off
- But what does that really mean for policy, management, and practice?

# *What's In a County?*



**Erika Ziller, PhD**





# Counties are Geographic Workhorses

- Many rural definitions are county-based  
(e.g., Urban Influence Codes, Rural-Urban Continuum Codes, National Center for Health Statistics)
  - All states have them (*or equivalents*)
  - Distinct geographic boundaries
  - Some governmental authority in most states

# **But: Are Counties (& Equivalents) Equivalent?**

- 3,142 counties—and equivalents—in the US, including the District of Columbia
- Extreme heterogeneity between counties
- Excluding DC, number of counties per state ranges from 3 (DE) to 254 (TX)

# Land Size & Population Size

## *Kalawao, HI*

- 53 sq. miles (12 land)
- < 100 population



## *Falls Church, VA*

- 2 sq. miles

## *Yukon–Koyukuk, AK*

- 146k sq. miles

## *Los Angeles, CA*

- 10 mil population

# Geographically Mixed Counties

Counties classified as urban may contain rural places, especially when large

## Coconino County, AZ

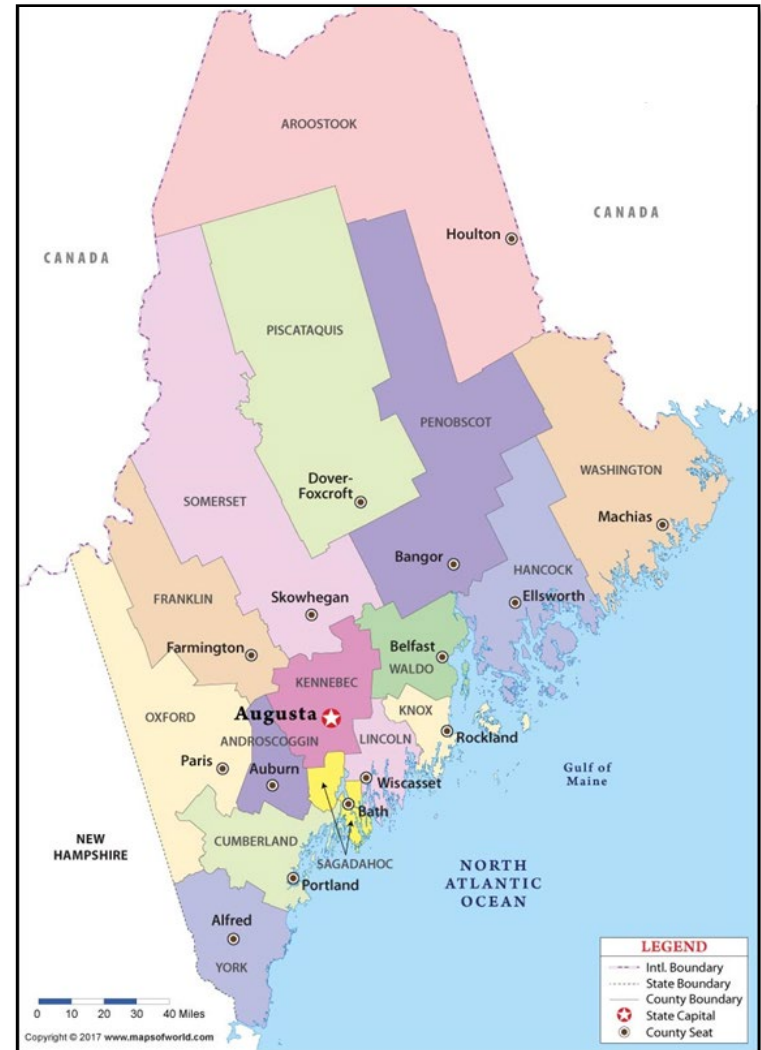
- Urban (Flagstaff)
- ~19k sq. miles, 38% reservation lands representing 5 tribes



# Geographically Mixed Counties

## Mount Chase, ME

- Town, pop. ~200
- 100 mi. N of Bangor
- 1 hour, 7 mins from nearest CAH



# Urban Maine





# Urban South Carolina\*



\*Winnsboro, SC – Columbia CBSA, rural census tract



## Other 'Urban' Places





# Challenges in Measurement and Interpretation: Examples from Rural Maternity Care Research



Katy B. Kozhimannil, PhD, MPA

National Rural Health Association Annual Meeting



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# A Few Examples of the Challenges

- What is a “rural resident” and the diversity of “rural residents”
- What is a “rural county” and how county-level analyses mask community-specific experiences



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# Our research, and how we measured “rural”

1. Opioid-affected births to rural residents, location of childbirth for rural residents: residents of non-metropolitan counties (non-core and micropolitan)
2. Rural maternity unit closures and effects of closures on rural communities: loss of all hospital-based obstetric services in a non-metropolitan county, stratified by urban adjacency



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# Example 1: Where Do Rural Residents Give Birth?

- Do rural residents give birth locally? Or do they travel to urban hospitals?
- How about those with more complicated pregnancies?
  - What about those with preterm infants?
  - What about those with opioid use disorder?



# Who is a “Rural Resident”?

- Address used on hospital discharge forms is in a non-metropolitan county
- Data: HCUP hospital discharge data
  - PL\_NCHS (2012-2016)
  - PL\_NCHS2006 (2007-2012)
  - PL\_UR\_CAT4 (2003-2006)
- Only rural distinction possible is micropolitan/non-core (2007 and later)



# Data notes (part 1)

- PL\_NCHS is a six-category urban-rural classification scheme for U.S. counties developed by the National Center for Health Statistics (NCHS) especially for use in health care research. The classification emphasizes urban distinctions and is unique in differentiating between central and fringe counties of large metropolitan areas. Smaller metropolitan counties are subdivided by population. Non-metropolitan counties are divided simply into micropolitan and non-core categories.



## Data notes (part 2)

- The county classifications are based on the Office of Management and Budget (OMB) metropolitan/micropolitan assignments. These assignments were refined using information from the Rural-Urban Continuum Code (RUCC) and Urban Influence Code (UIC) of the Economic Research Service of the U.S. Department of Agriculture and county characteristics from the Census Bureau population estimates.





## Data notes (part 3)

- Although the six NCHS categories may conceptually be mapped into the four categories of the PL\_UR\_CAT4 classification used elsewhere in HCUP, the two schemes are not entirely compatible. A few counties are categorized differently in the two schemes because they are based on inconsistent population estimates produced on different dates.





# What We Found – And Why Rural Matters

- Almost 75% of rural residents give birth locally
  - Significant differences by micropolitan vs. non-core and urban-adjacent vs. non-adjacent. (Non-core less likely, adjacent less likely)
- More than half of rural residents with preterm births
  - Most at risk: younger, Medicaid beneficiaries, black folks
- 60% of rural residents with opioid use disorder
  - More than half of rural residents with opioid use disorder and preterm birth
- Variability of “rural residents”



# Example 2: What Rural Communities are Losing Maternity Services?

- From 2004-2014, how many rural communities lost hospital-based obstetric services?
  - What rural communities are most vulnerable?
- What is the impact of the loss of hospital-based obstetric services?





# Data Sources

<b>Hospital-level</b>	American Hospital Association Annual Survey	2003-2014
<b>County-level</b>	Area Health Resources Files	2004, 2014
	US Census data	2000, 2010
<b>Individual-level</b>	Restricted Use Natality Detail File (NDF) with county identifiers (maternal residence, hospital location)	2004-2014



# What is a “Rural County”?

- Non-metropolitan county, based on OMB classifications, using CBSA
- Data: birth certificates, Census, AHA, AHRF
  - We needed a common definition of “rural”
- Distinctions we were able to make by county
  - Micropolitan vs. Non-core
  - Urban adjacent vs. non-adjacent



# What We Found – And Why Rural Matters



Effects of losing hospital-based obstetric services (on out-of-hospital birth, emergency birth, and preterm birth) were stronger in rural counties **that are not adjacent to urban areas.**



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# Summary: Common Definitions of Rural

- Urban / Rural
  - Metro / Non Metro
- Within Non Metro
  - Micropolitan/Non-core
  - Urban adjacent/non-adjacent
  - Frontier areas
  - Rural-urban commuting patterns



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# Defining Rural, for real

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Mark Holmes, PhD

University of North Carolina





# Defining *rural*

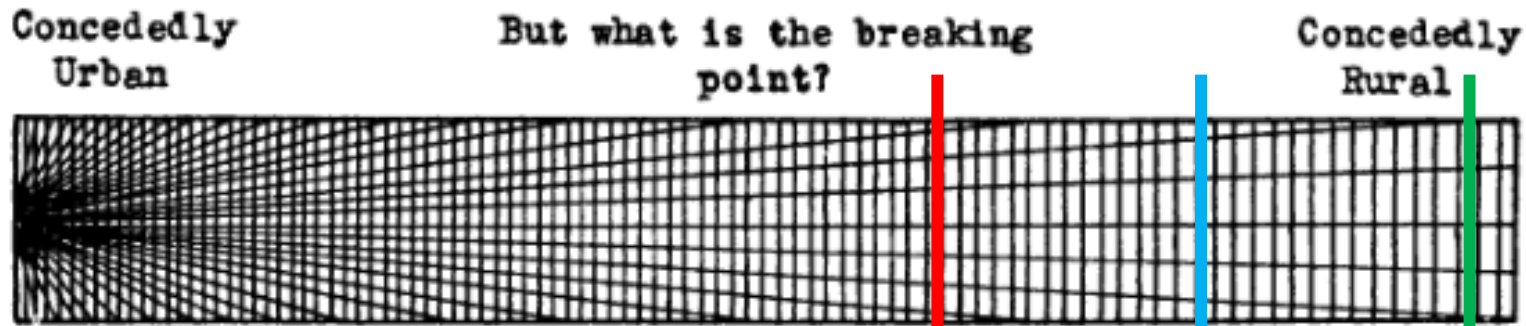
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- Rural means different things to different people
  - “There’s a farm near us.”
  - “There is no hospital for 122 miles.”
- Is this “rural”?
  - ㄟ( ͡ʷ)ㄟ
- Rurality is a spectrum, subjectively defined
- For policy, we need formal definitions
- Can be important distinction (e.g. poverty rates)
  - Urbanized areas > non-urbanized areas
  - Metro areas < non-metro areas
  - *Census Bureau has reported it both ways*





# We've Known Since 1938 "Rural" is a Continuum



It is not possible to justly indicate the place at which rurality ends -- or where urban conditions begin.

Urban Area

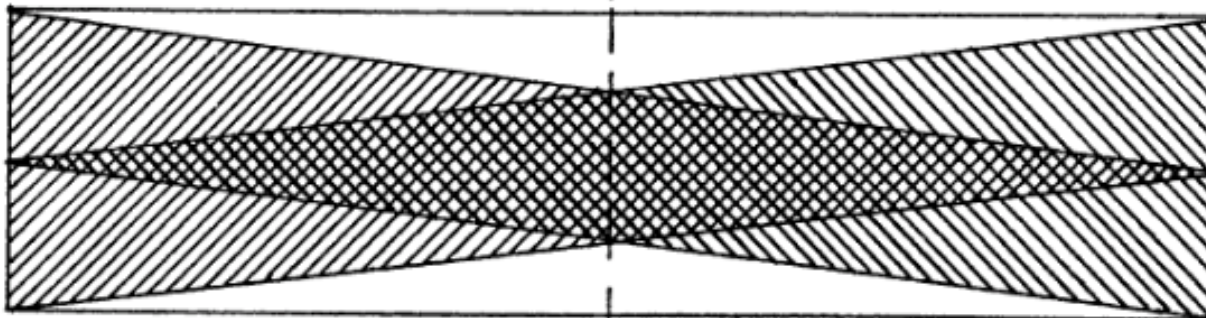
Metro

FAR~=4

FIGURE 1

Urban people and urban places

Rural people and rural places



Sharp separation at any point, if made on a purely numerical basis, fails to take into account the overlapping of urban and rural characteristics.

FIGURE 2

Meserole WH. What Do You Mean: Rural and Urban?  
*Journal of Marketing*. Vol. 2, No. 3 (Jan., 1938), pp. 233-235

# Blue sky: how you would *you* define rural?

Throw out the definitions you know. You are the “rural czar”. How do you define it?

Think to yourself what constructs you would use.

Seriously, y’all. Take a moment.

My gripe: most rural definitions focus on the *deficit*:

- Not many people
- Far from other places
- Not very dense
- Or the worst: “and everything else we consider rural”.
- Can we define rural by the *strength* of a feature rather than its deficit?

From “nonmetro” or  
“noncontiguous” or  
(shudder) “NonCore” to  
“bucolic” or “pastoral” (???)



**Allen Stanton** @atstanton · 13h

When I give presentations, I ask people to define “rural.” There’s usually an awkward silence. I love the maps in the NYT article for the same reason I love that awkward silence.



1



1



**mark holmes**  
@gmarkholmes

Replying to @atstanton and @USDA\_ERS

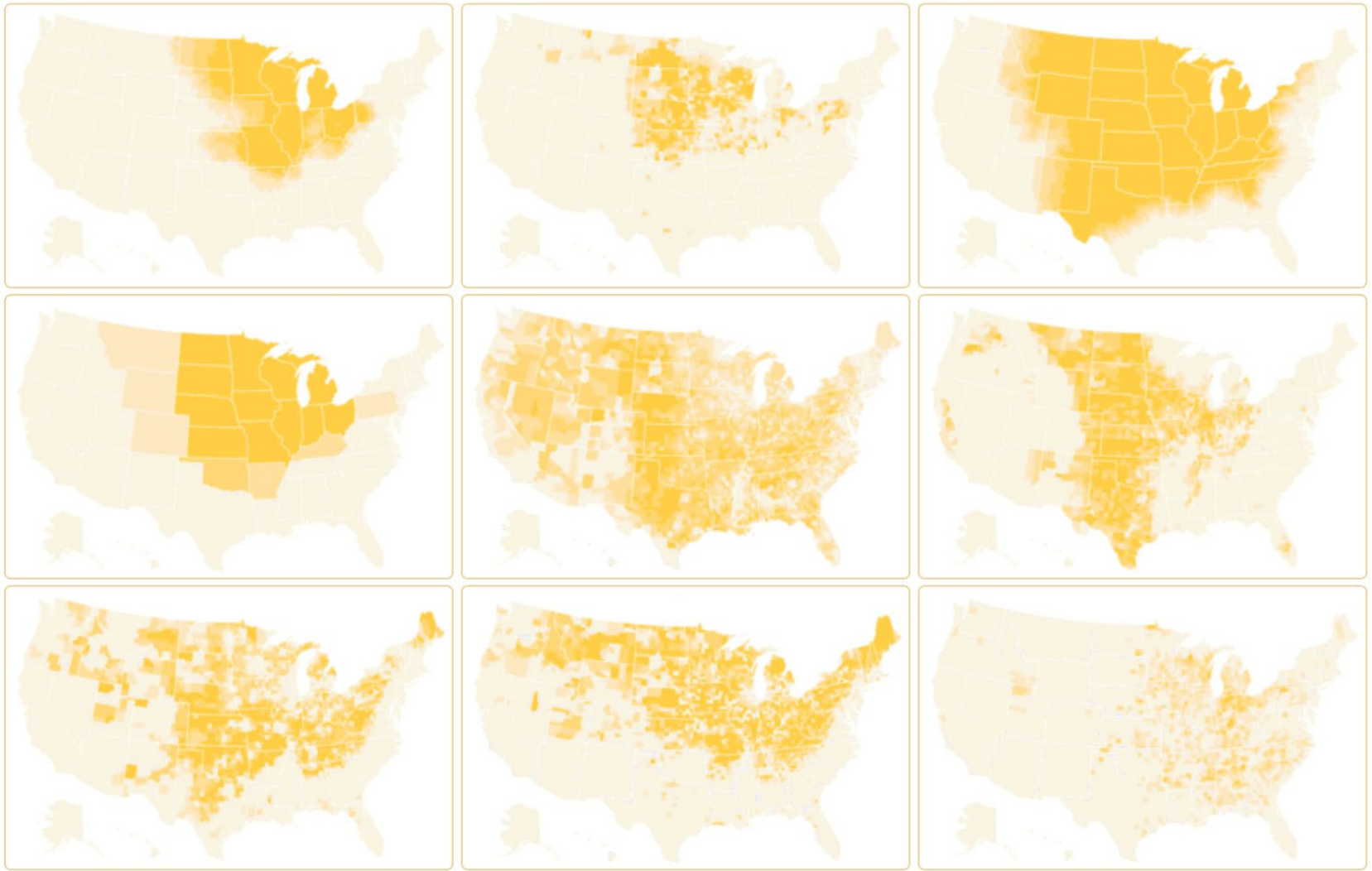
Stealing this for next week’s session at [@ruralhealth](#).

## Introduction

What image comes to mind when thinking of a rural place? Does it include the farmhouse down the road? Does it include the new housing subdivision on the outskirts of town? Does it include the community that has formed at the crossroads?

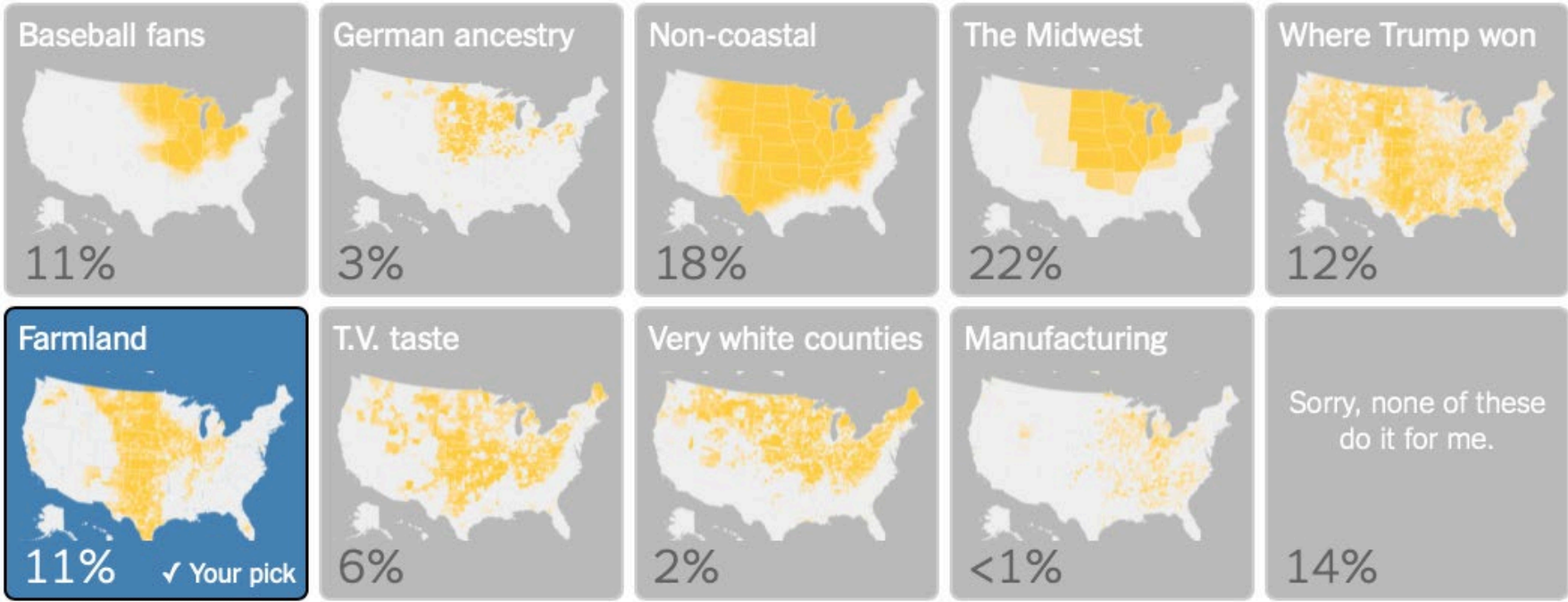
The U.S. Census Bureau defines rural as what is not urban—that is, after defining individual urban areas, rural is what is left. Other federal agencies and

# Where Is America's Heartland? Pick Your Map



<https://www.nytimes.com/interactive/2017/01/03/upshot/where-is-americas-heartland-pick-your-map.html>





# How do you pick?

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Purpose – What is the main reason you are doing the analysis?

Funding – What does the funder need/require?

History – Maintain consistency with prior research

Audience – Understanding, clarity, and utility

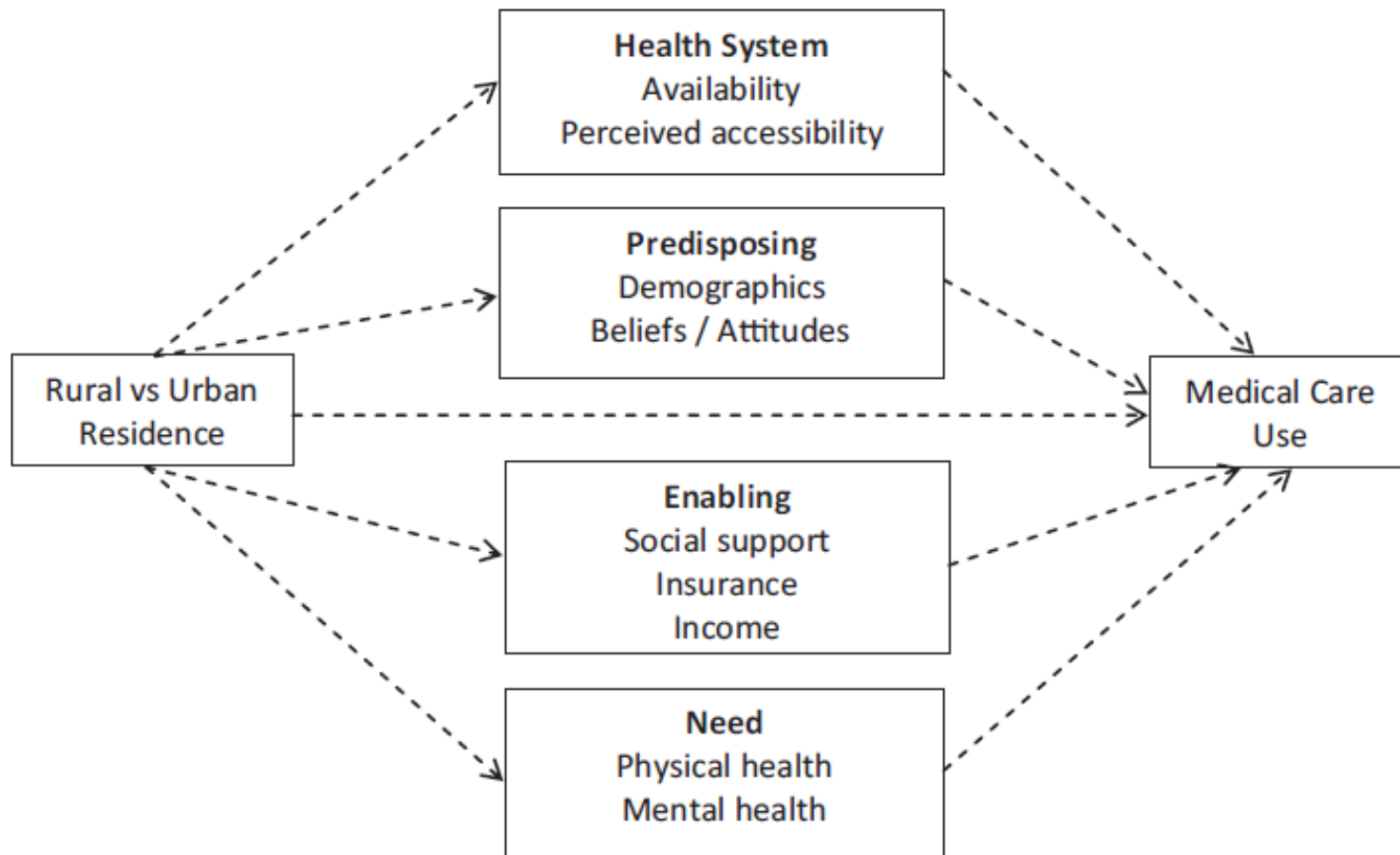
Analysis - Type of analysis

- County vs. Zip/ZCTA vs. Census Tract
- Commuting vs. density vs. adjacency

Or, is it time for a new measure?

# Moving Beyond Simple Rural / Urban Definitions

**Figure 1** Hypothetical Multiple Mediation Model of Medical Care Utilization.



*Borders TF. Advancing the field of rural health research: moving beyond simply documenting rural vs urban differences. The Journal of Rural Health. 2017 Jan;33(1):3-4.*

# Moving Beyond Simple Rural / Urban Definitions and Analysis

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- Better measurement of underlying population and health system factors
  - More analyses of R/U mediators
  - Better understanding of rural contexts
- Testing of interactions or stratified analyses to understand intra rural and intra urban effects
- Inclusion of subpopulations – e.g. rural south vs. southwest vs. west



# Towards a new definition

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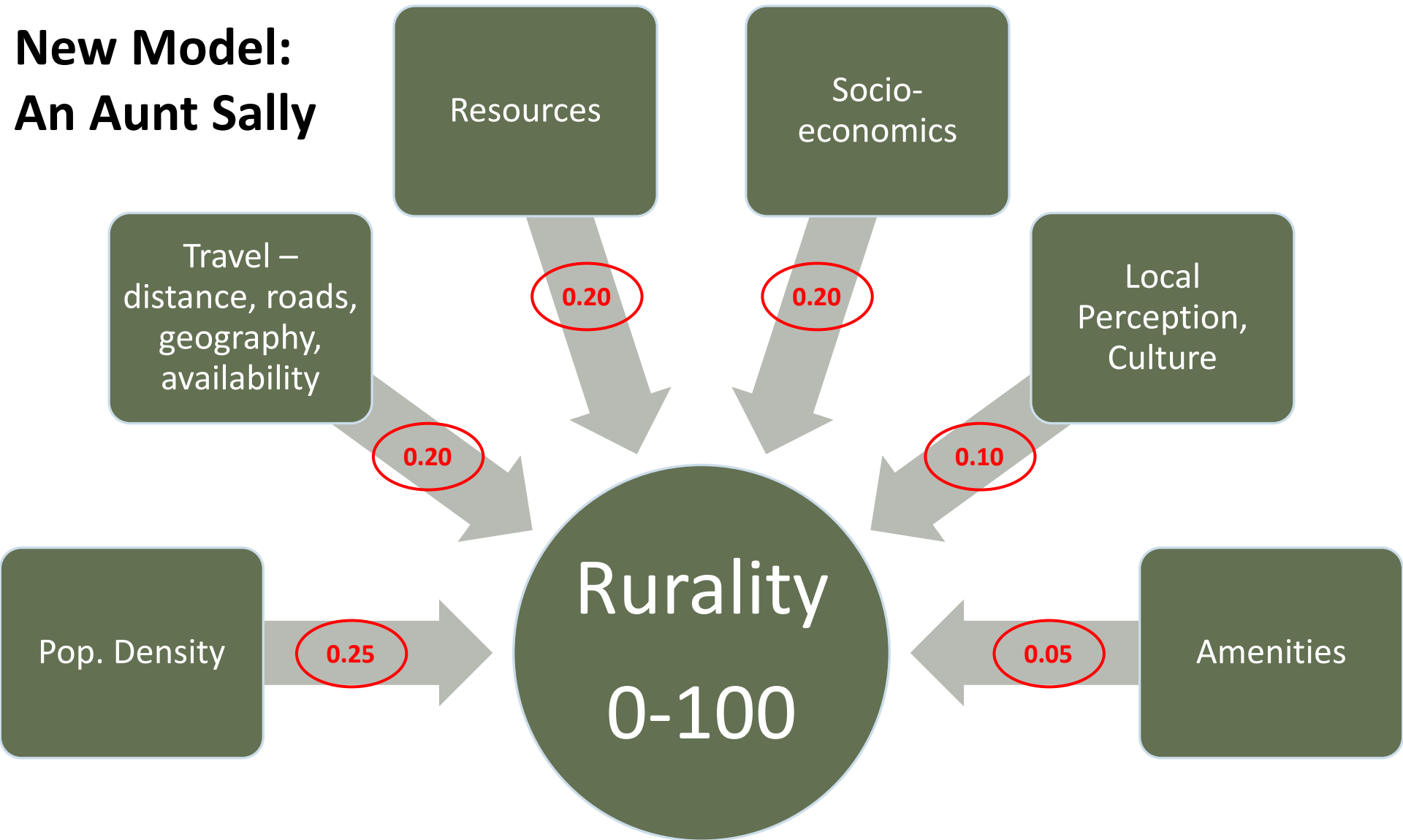
- What are the primary drivers of Rural?
  - Population Density
  - Travel to resources
    - Roads – primary and secondary
    - Public transport
    - Access to care / transport
    - Weather/terrain
  - Local resources, economy
  - Amenities
  - Perceptions
  - Culture

# Towards a new definition

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- What Geographic units to use?
  - County
  - Zip/ZCTA
  - Census Tract
  - Neighborhood
  - Cross border
- What about the overlap?
- Place based vs. individual based?\*

# Toward a New Model: An Aunt Sally



# Recommendations?

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- Move towards unified, common terms
  - More descriptive terms (no more Non Core!)
  - Non MSA / MSA  $\neq$  rurality!
- Move towards a single(!) definition?
- Be aware of definitional, geographic limitations
- Choose your measure (if you can) based on how it as designed, and what it tells you






Gateway provides easy and timely access to research  
conducted by the Rural Health Research Centers

**ruralhealthresearch.org**

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# Questions?

