

COVID-19: The Impact on Housing and Rural America

Steve Guggenmos (Discussant), Lance George, Deepayan Debnath and Xian Bak

RURAL RESEARCH SYMPOSIUM

NOV. 9-10 | AN **ALL FOR HOME** EVENT

 Freddie Mac

#RuralResearchSymposium

COVID-19: The Impact on Housing and Rural America

Lance George, Director of Research and Information, Housing Assistance Council

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RURAL HOUSING IN THE UNFOLDING PANDEMIC

Lance George, Director of Research and Information,
Housing Assistance Council

Setting the stage.

01

COVID-19 in
rural America

02

Second order
effects from
the pandemic

03

Uneven impact
of the pandemic on
housing markets

04

Housing and
basic health

05

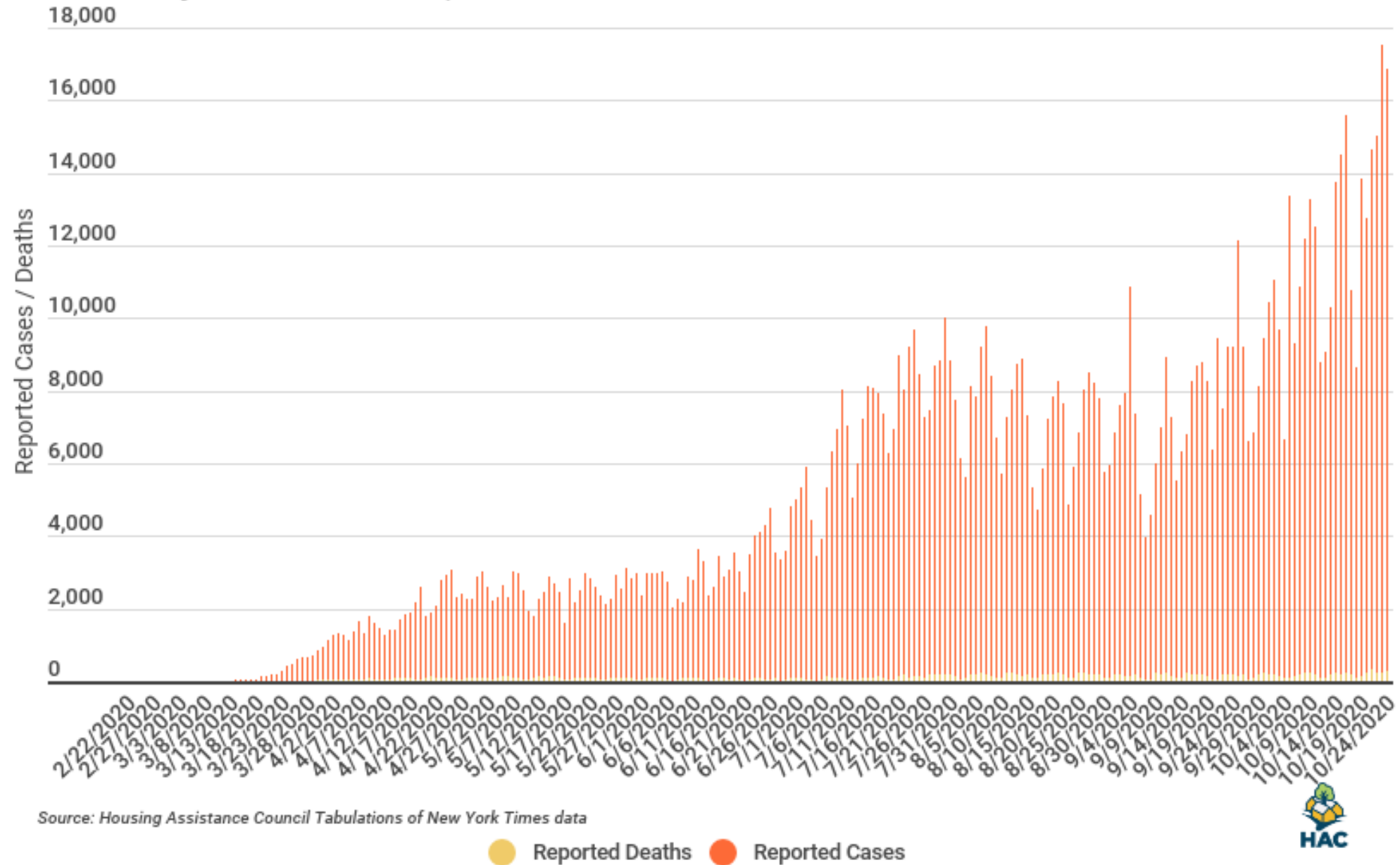
Housing
affordability



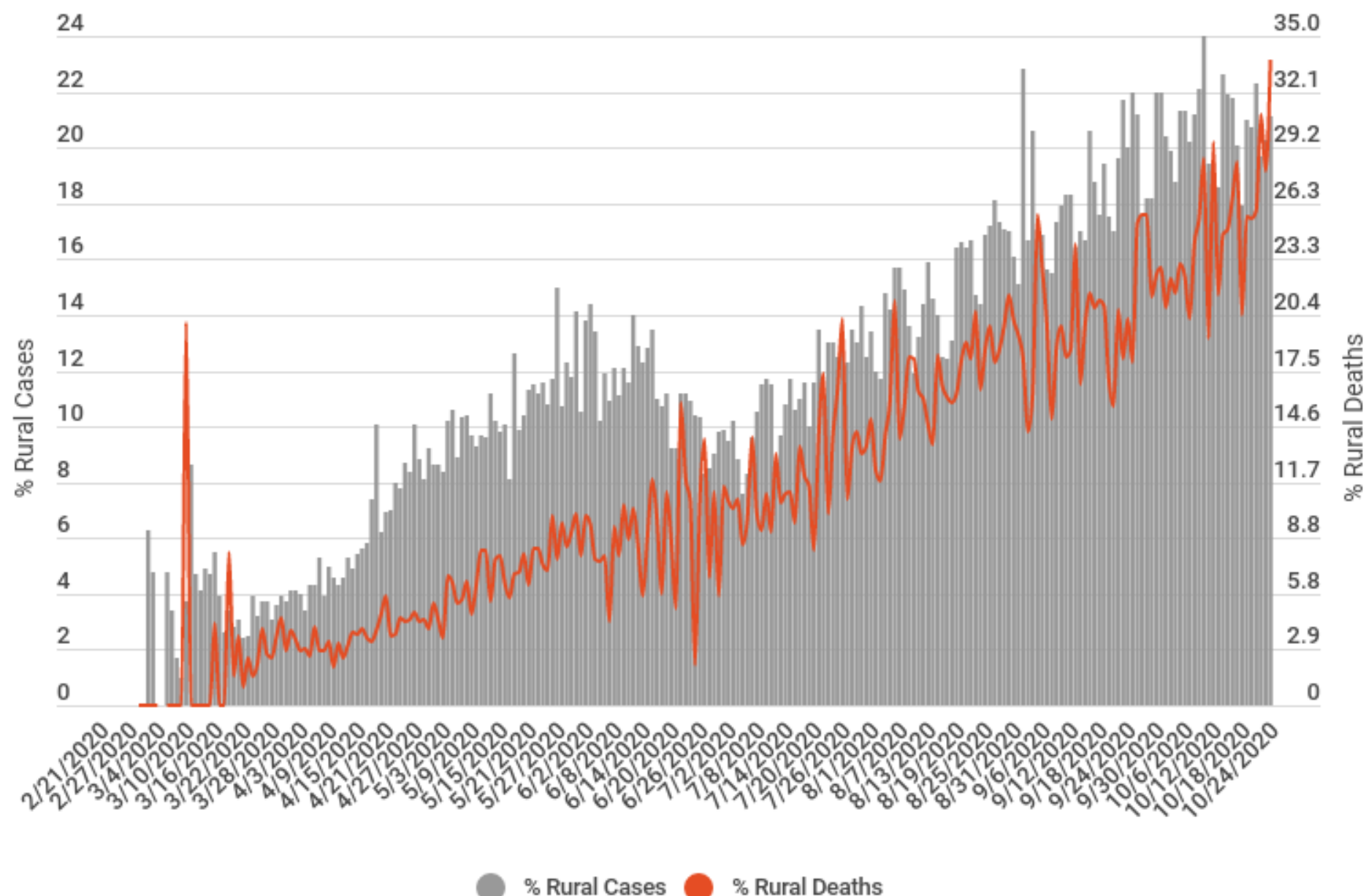
1. COVID-19 continues to evolve in rural communities

COVID-19 Reported Cases and Deaths Outside of Metropolitan Areas

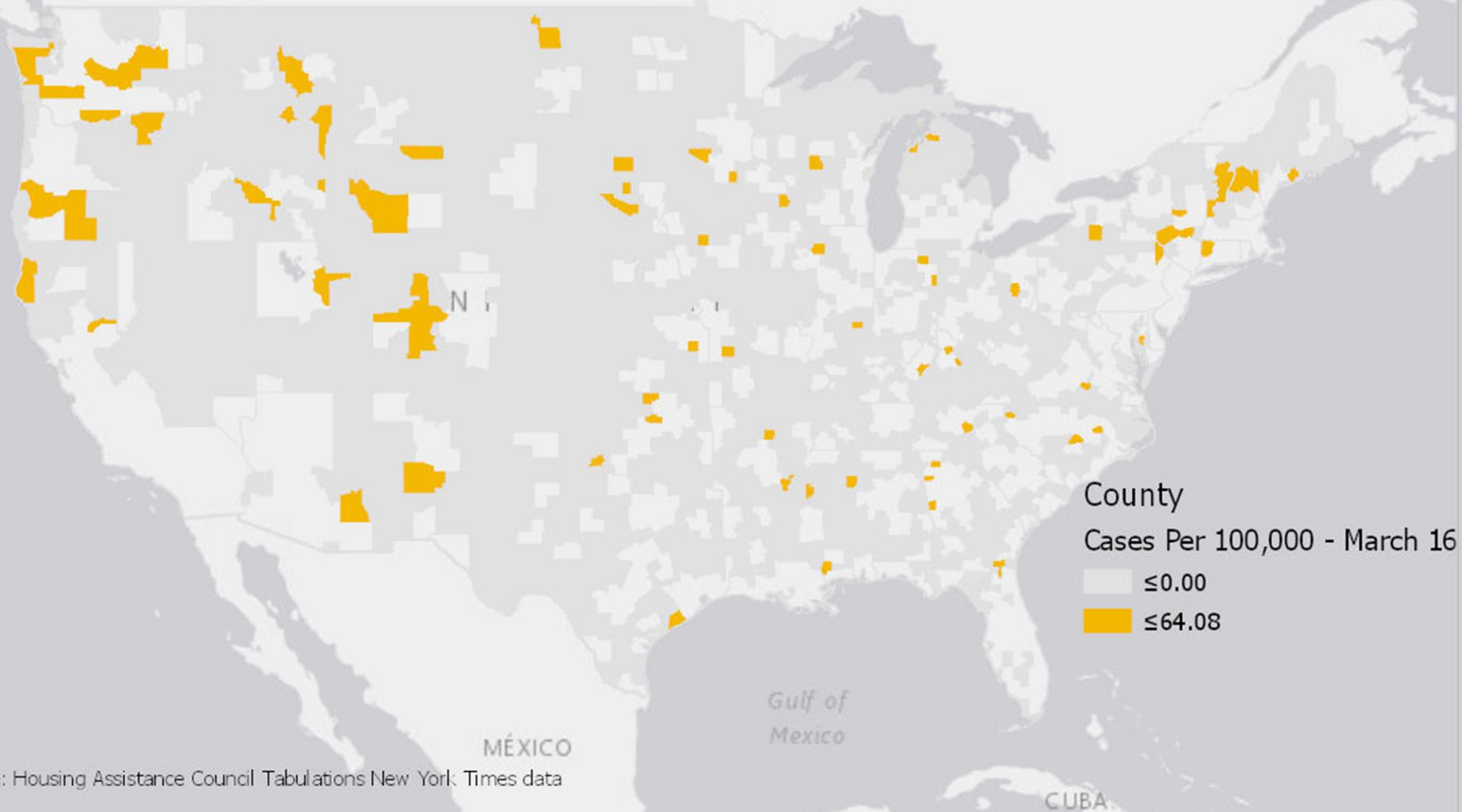
February 20 - October 24, 2020



Rural COVID-19 Cases/Deaths as a Percentage of U.S. Total February 20 - October 24, 2020

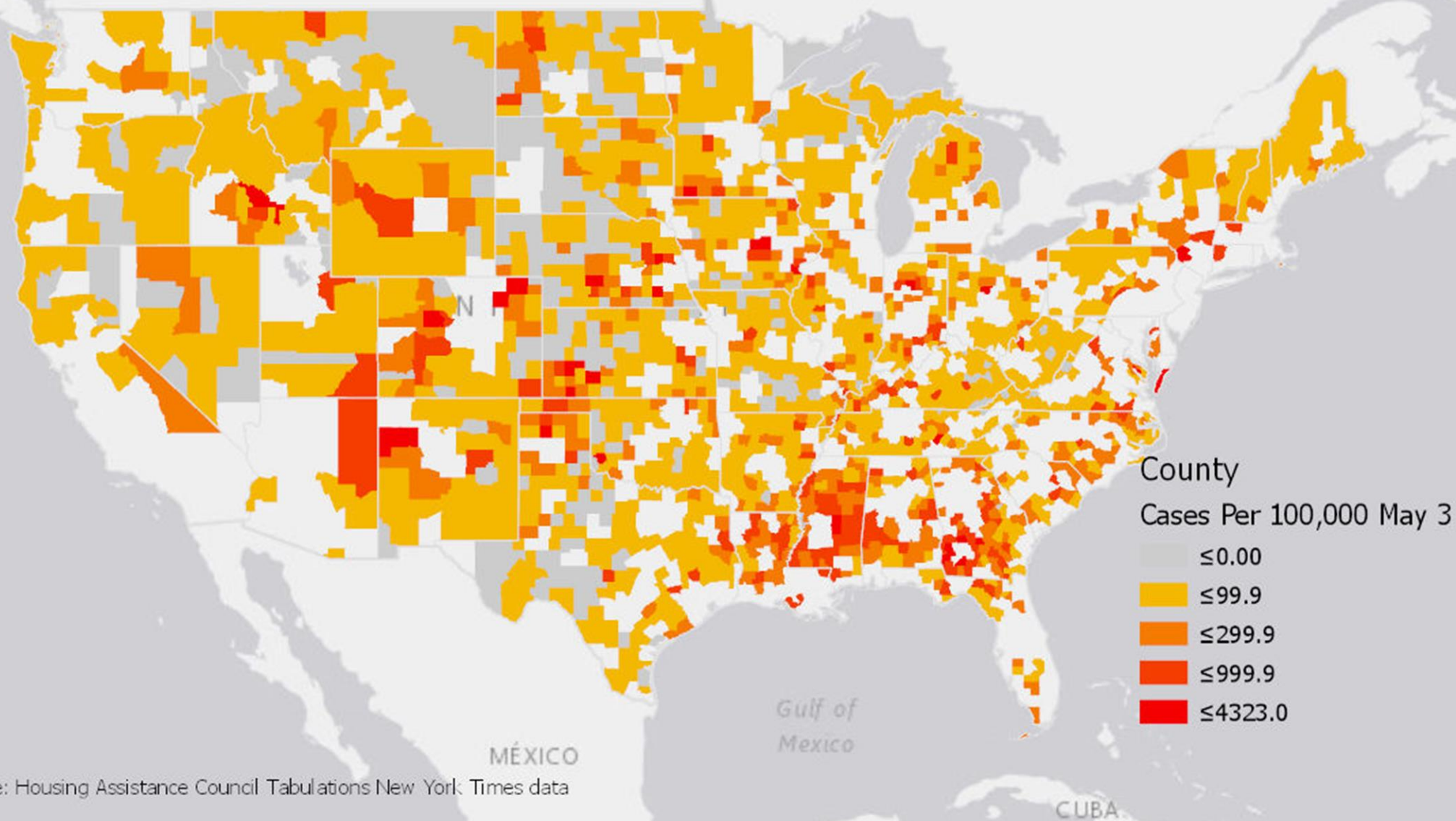


Rural COVID-19 Cases Per 100,000, March 16



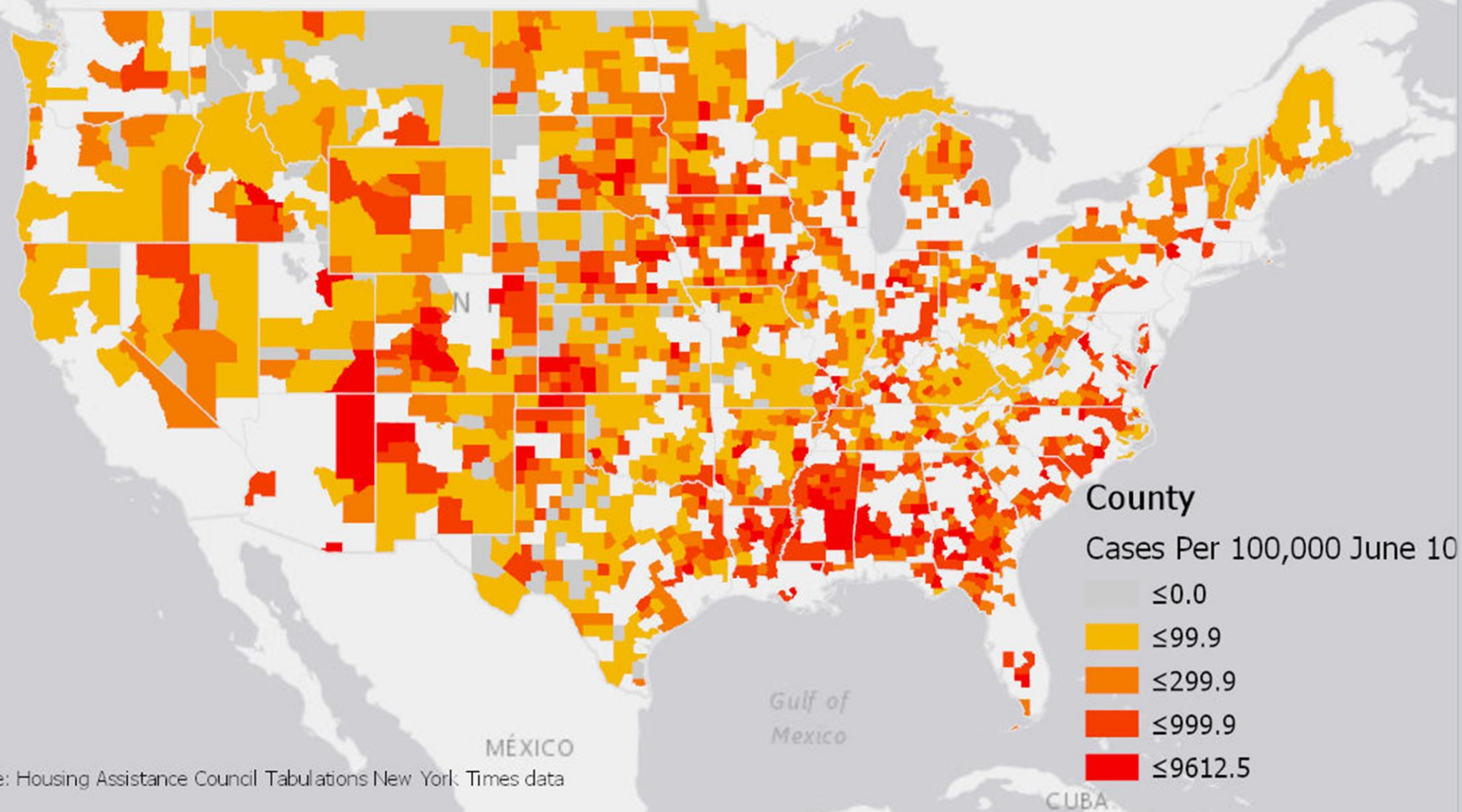
Source: Housing Assistance Council Tabulations New York Times data

Rural COVID-19 Cases Per 100,000, May 3



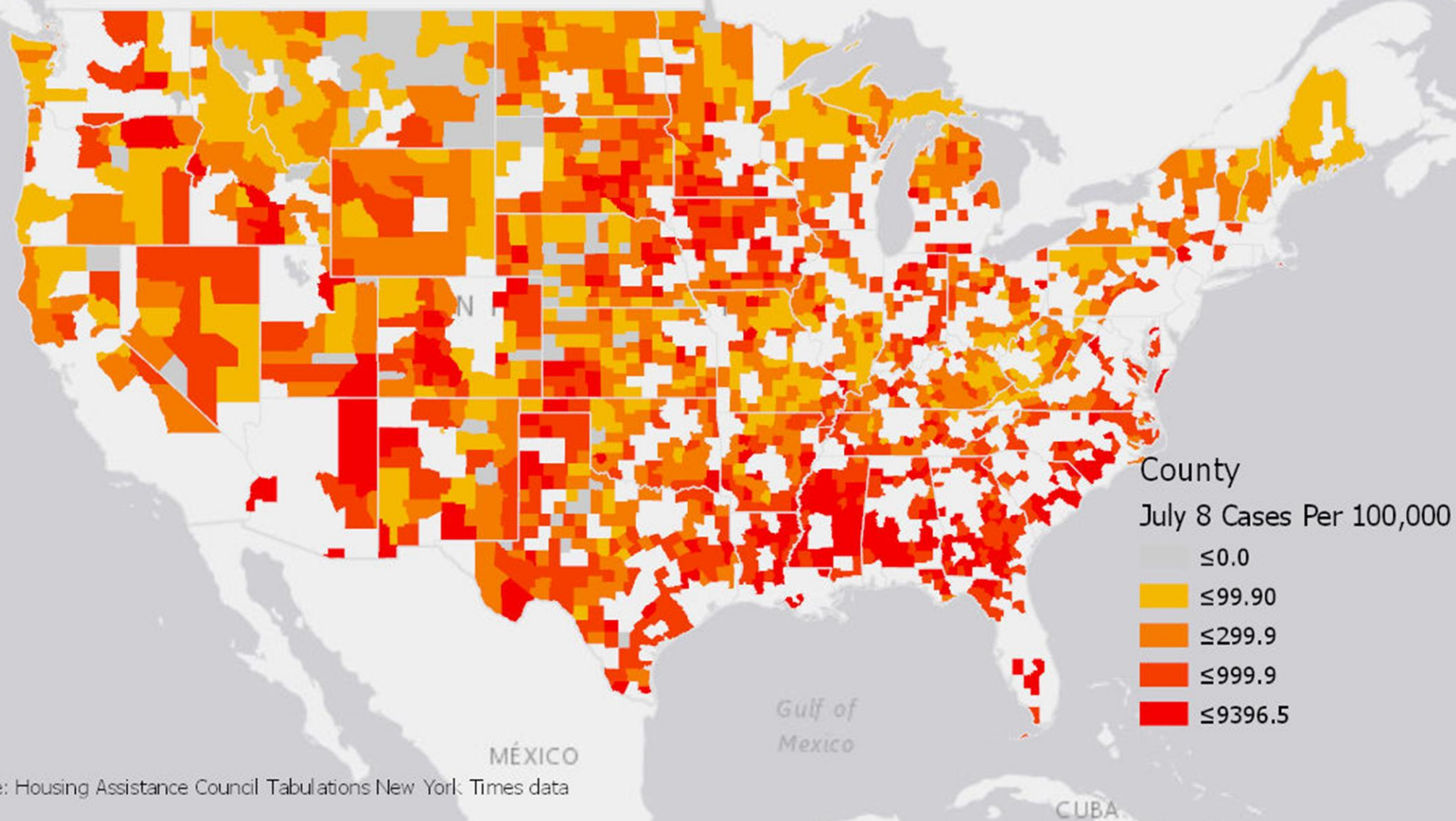
Source: Housing Assistance Council Tabulations New York Times data

Rural COVID-19 Cases Per 100,000, June 10



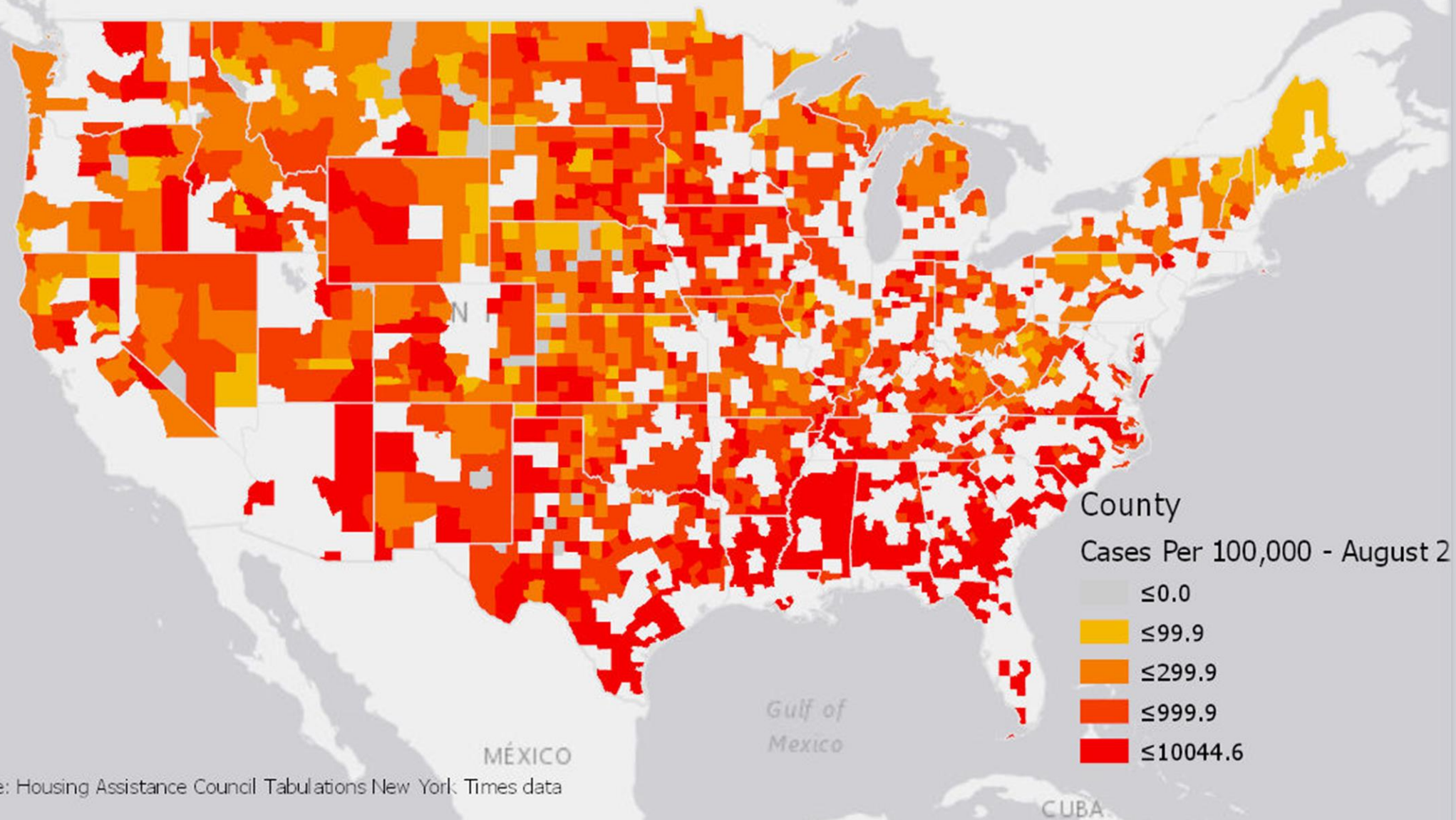
Source: Housing Assistance Council Tabulations New York Times data

Rural COVID-19 Cases Per 100,000, July 8



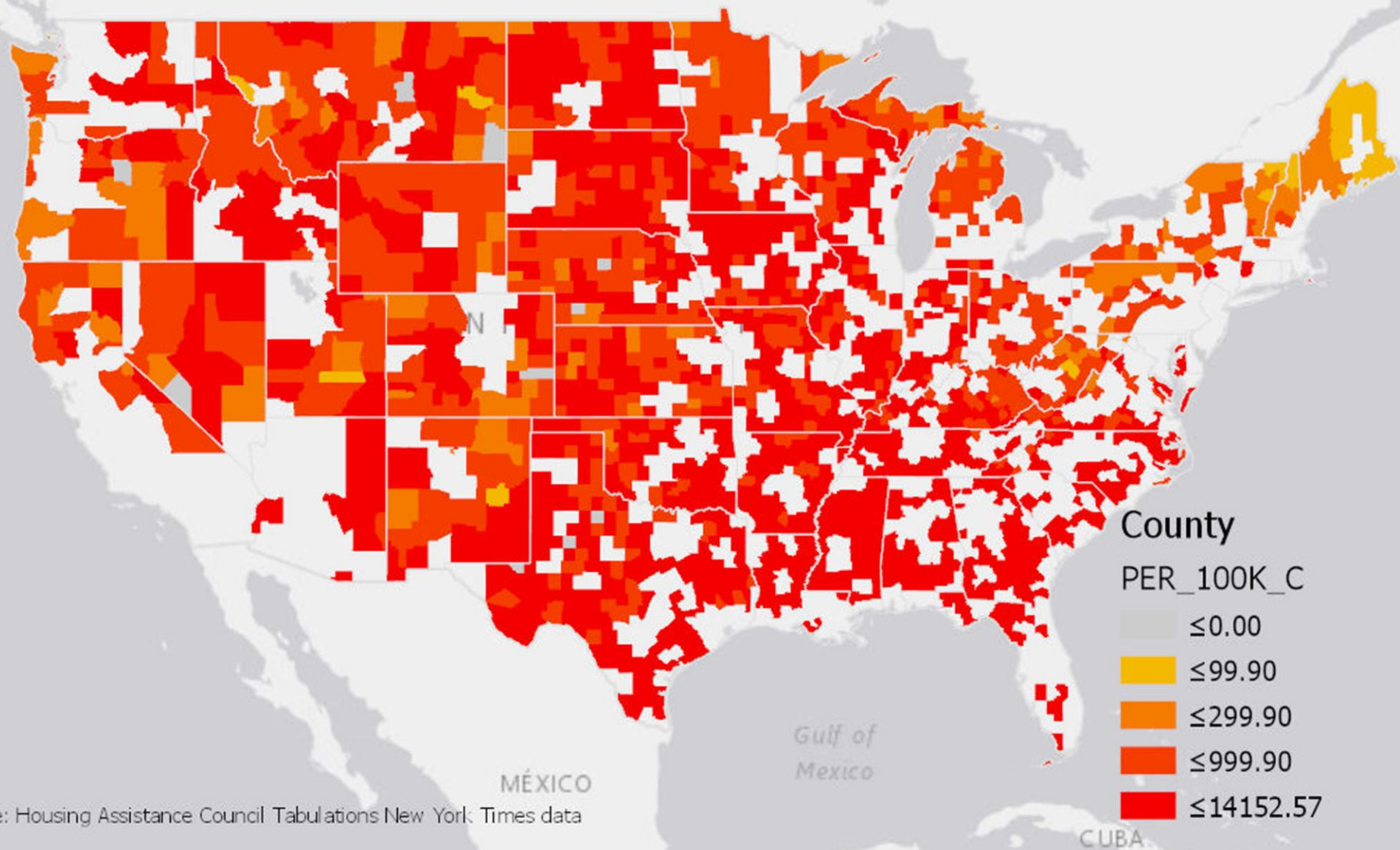
Source: Housing Assistance Council Tabulations New York Times data

Rural COVID-19 Cases Per 100,000, August 2



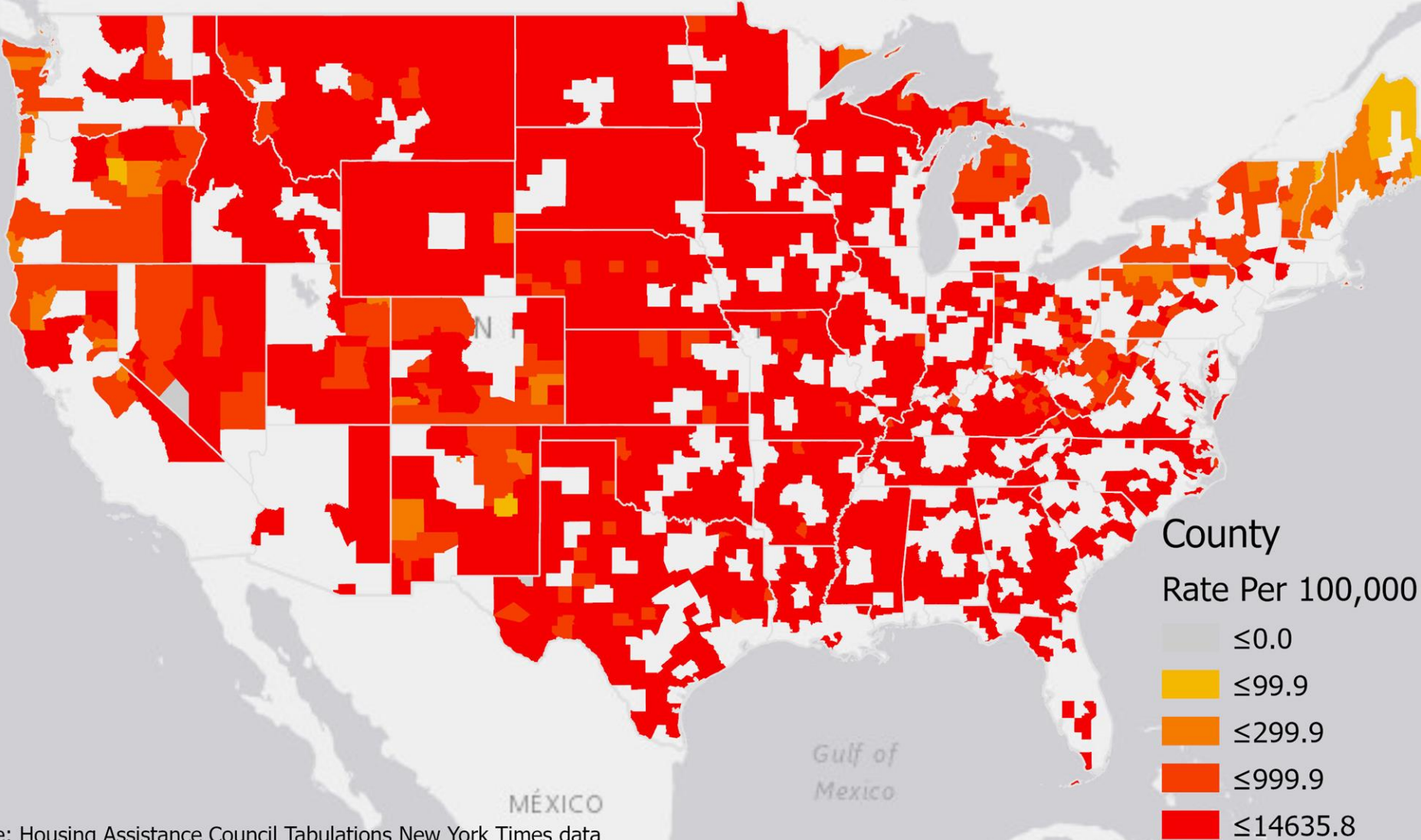
Source: Housing Assistance Council Tabulations New York Times data

Rural COVID-19 Cases Per 100,000, September 20



Source: Housing Assistance Council Tabulations New York Times data

Rural COVID-19 Cases Per 100,000, October 24



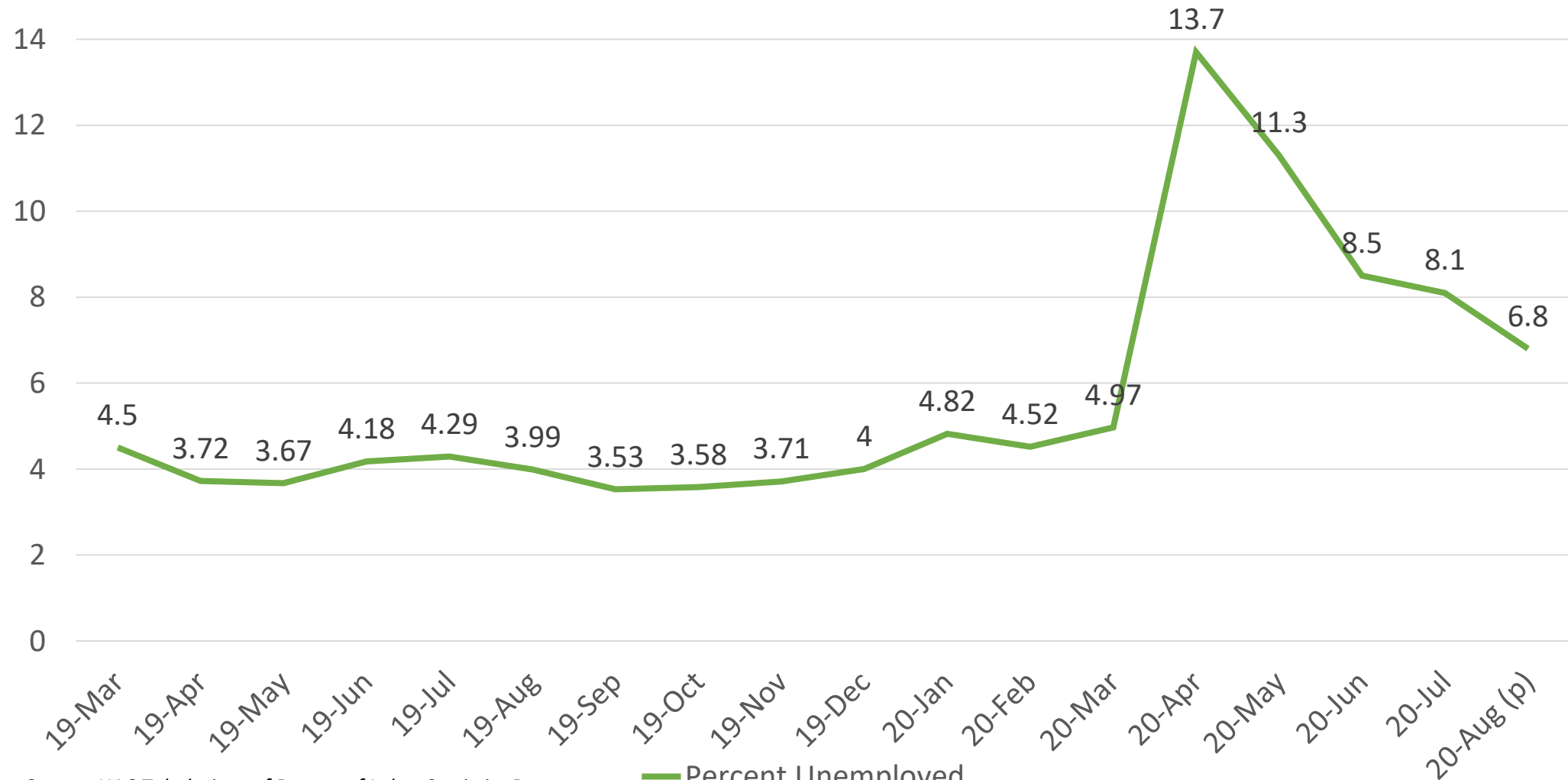
Source: Housing Assistance Council Tabulations New York Times data

A collection of various colored and worn hard hats arranged in rows on a wooden surface. The hats are in shades of yellow, white, blue, orange, and grey, showing signs of use and age. A semi-transparent dark blue rectangular box is centered over the image, containing white text.

2. Employment is a leading indicator for rural housing markets

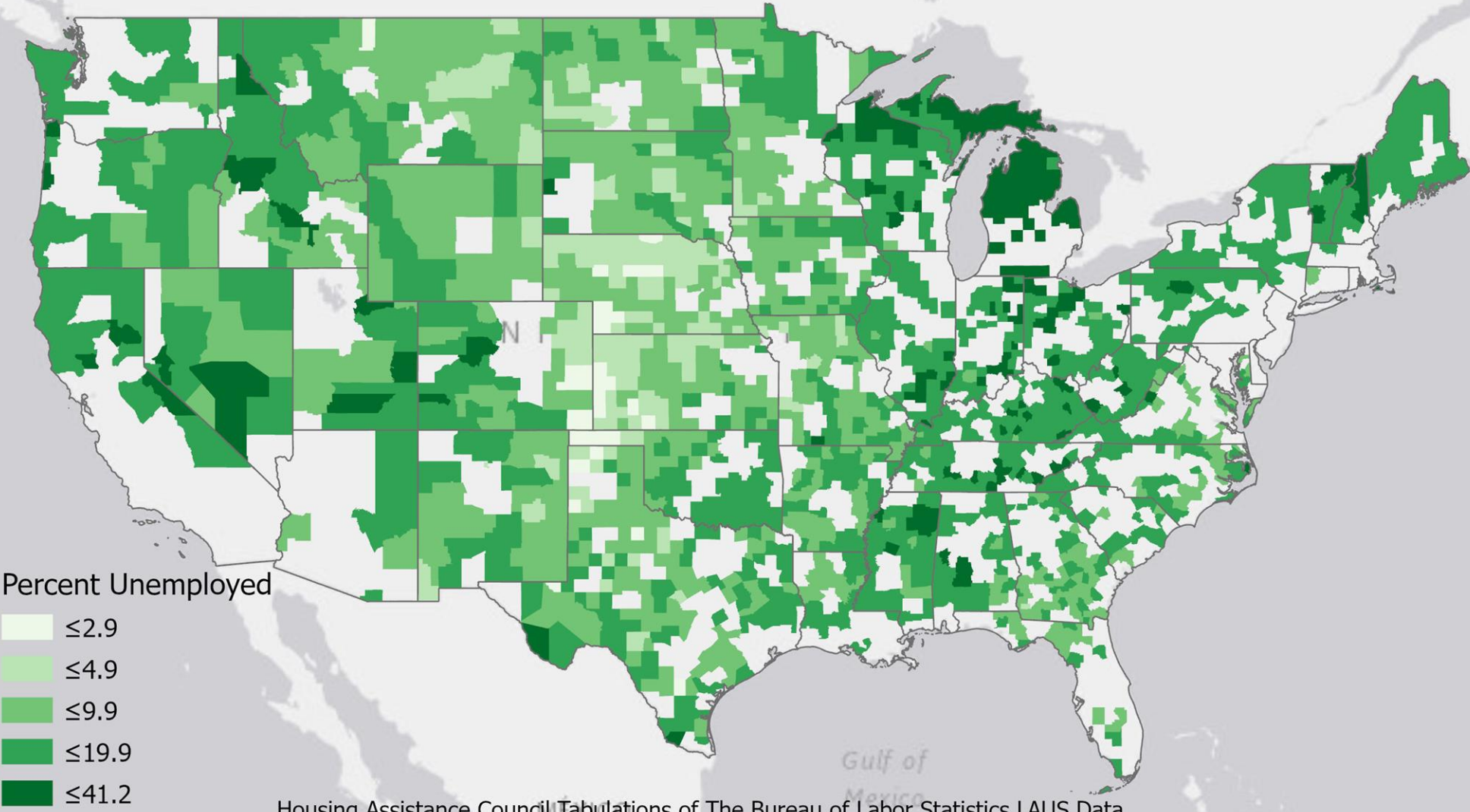
UNEMPLOYMENT RATE OUTSIDE METROPOLITAN AREAS— 2019-2020

(not seasonally adjusted)



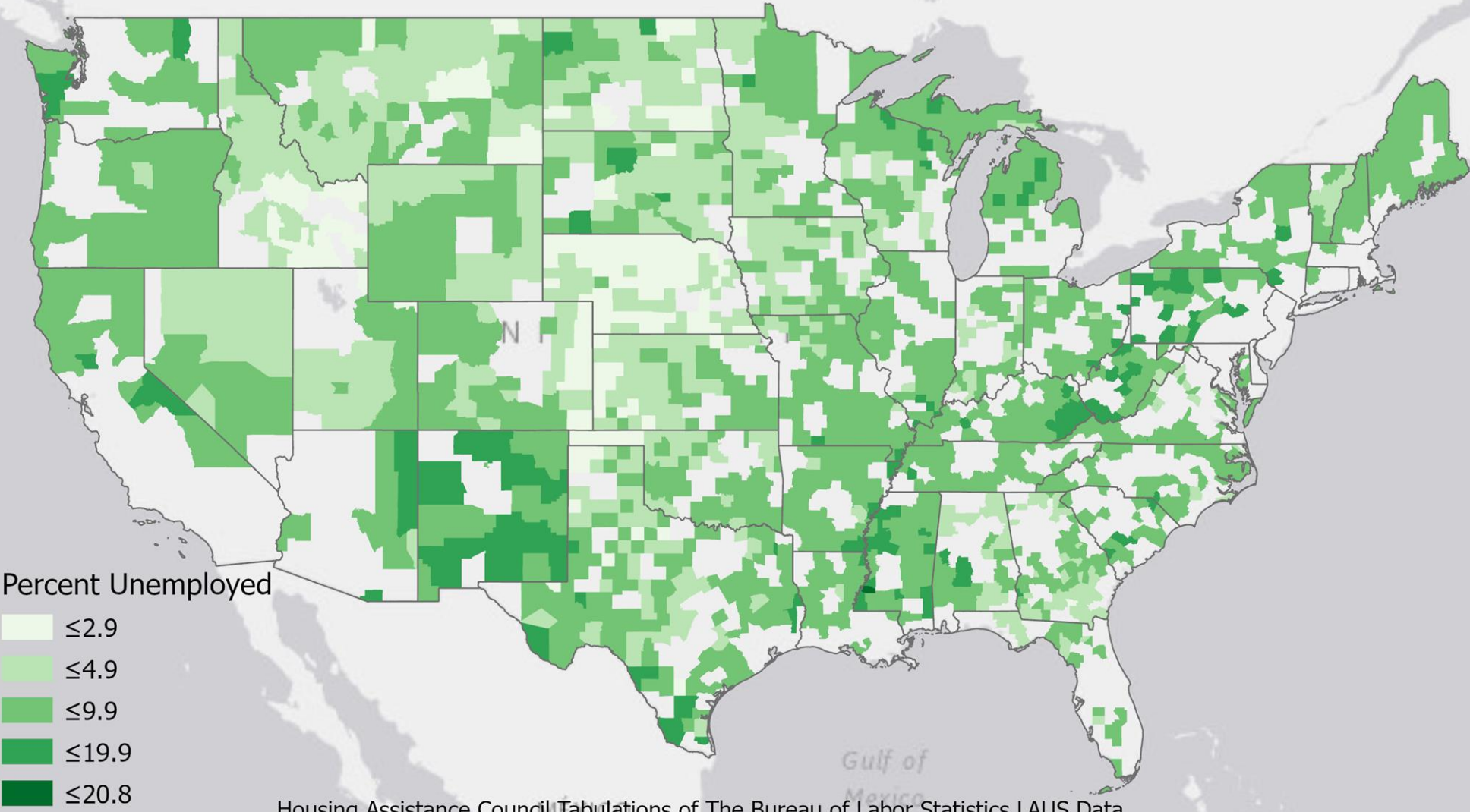
Source: HAC Tabulations of Bureau of Labor Statistics Data

Unemployment Outside of Metropolitan Areas, April 2020



Housing Assistance Council Tabulations of The Bureau of Labor Statistics LAUS Data

Unemployment Outside of Metropolitan Areas, August 2020



Housing Assistance Council Tabulations of The Bureau of Labor Statistics LAUS Data

3. An uneven landscape

vehicles: _____
Make: _____
Make: _____
Make: _____
Description of any other vehicles (boat, trailer, etc.) _____

Prior written permission separate from this application must be obtained for any vehicle other than a car.

CREDIT AND BACKGROUND HISTORY
(ANSWER ALL QUESTIONS FOR YOURSELF AND FOR ANYONE WHO HAS EVER LIVED WITH YOU)

Have you ever been evicted? ☐ Yes ☐ No

Has a notice of eviction ever been filed against you? ☐ Yes ☐ No

Have you ever declared bankruptcy? ☐ Yes ☐ No

Have you had two or more late rental payments in the past 12 months? ☐ Yes ☐ No

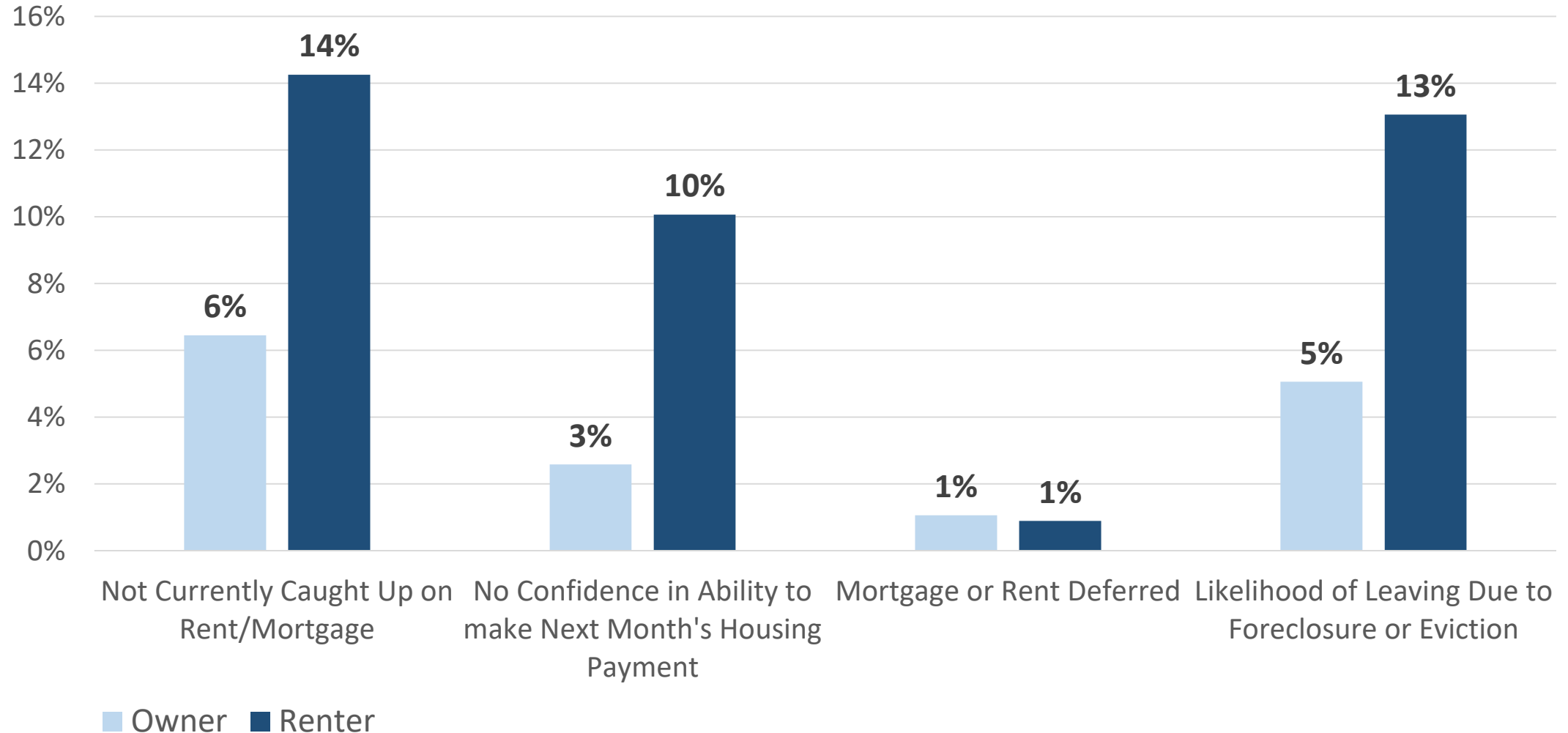
Have you ever willfully or intentionally refused to pay rent? ☐ Yes ☐ No

Do you owe any monies to an apartment community? ☐ Yes ☐ No

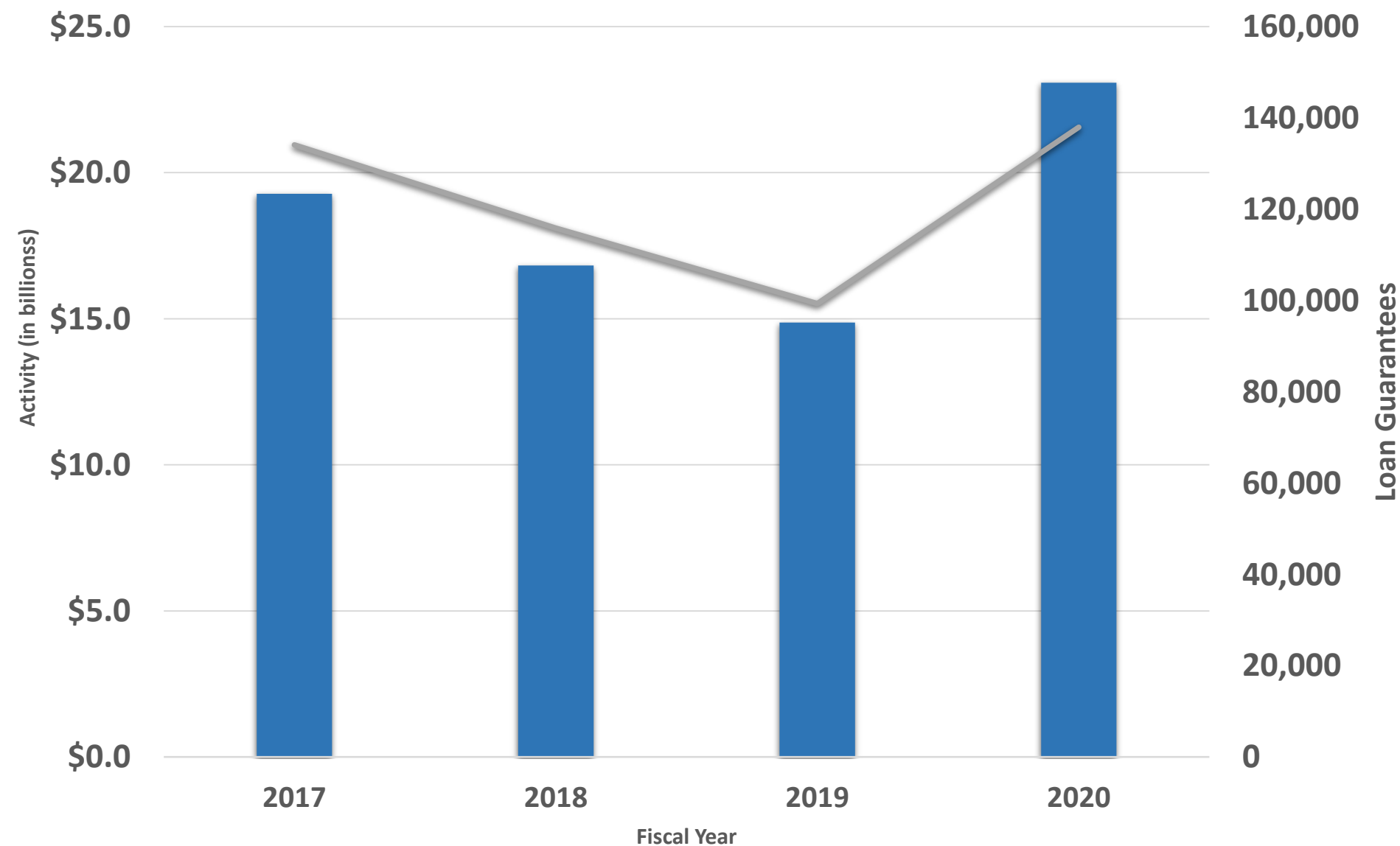
Have you ever been charged with a crime involving the contribution or sale of illegal substances? ☐ Yes ☐ No

How People's Housing has been Impacted by COVID-19

U.S. Census Bureau PULSE Survey September 16-28, 2020



USDA Section 502 Single Family Housing Loan Guarantees, 2017-2020

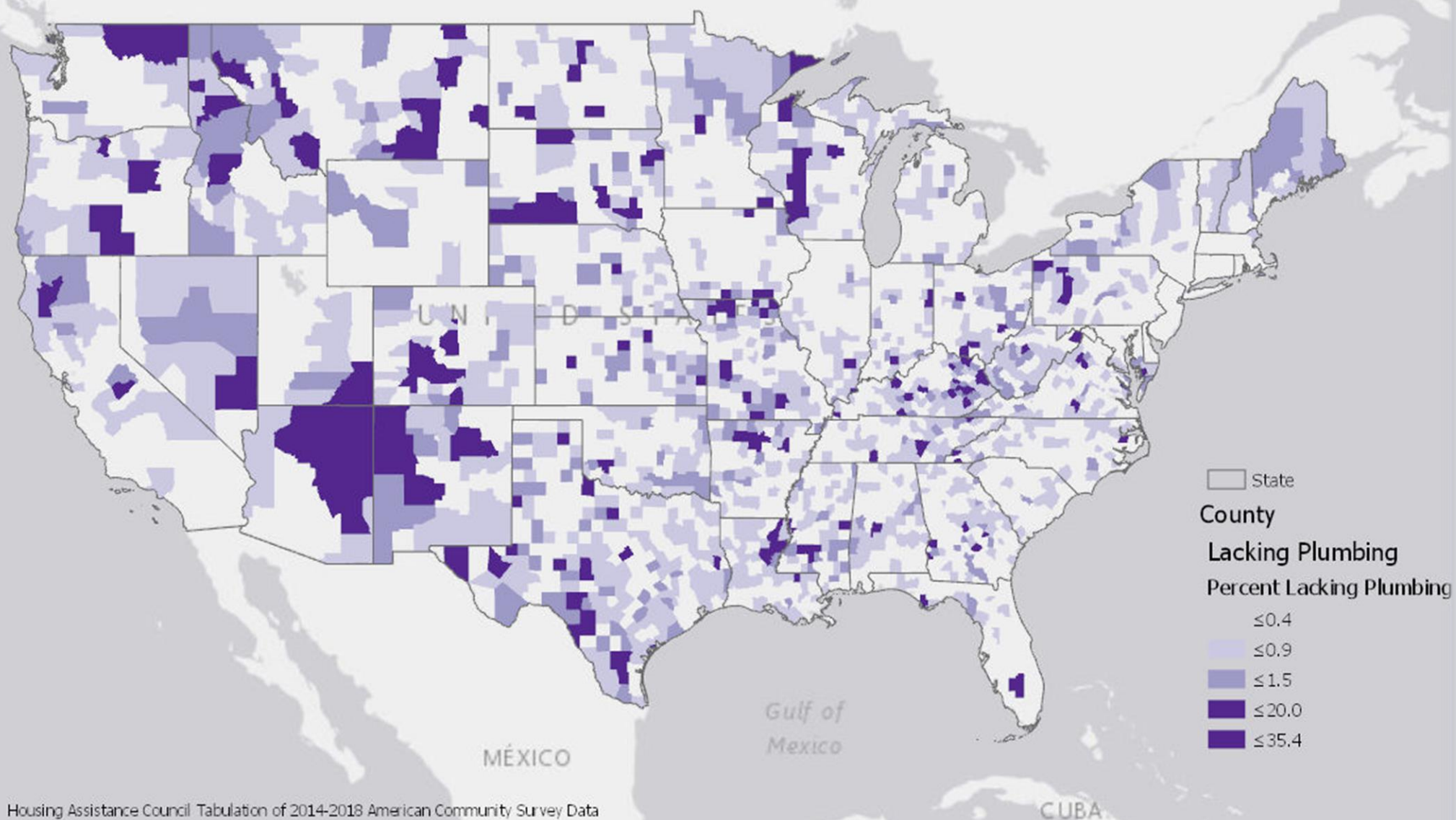


Source: HAC Tabulations of USDA Data

A close-up photograph of a severely corroded and rusted metal water tap. The tap is dark brown and textured with rust. A single, clear drop of water is hanging from the spout. The background is a plain, light-colored wall. A semi-transparent grey banner is overlaid across the middle of the image, containing white text.

4. A lack of basic amenities is
compounding the problem

Housing Units Lacking Plumbing, 2018

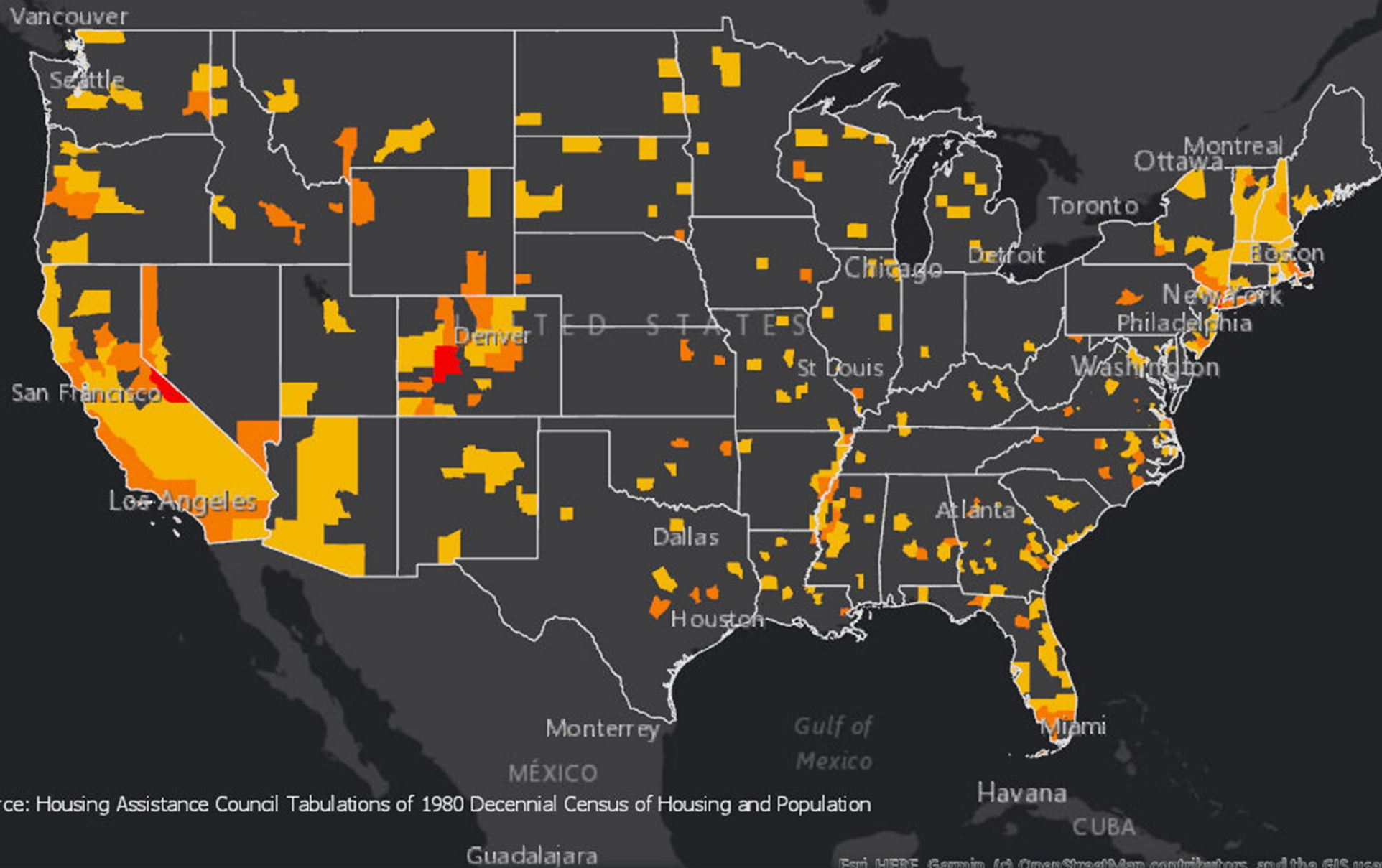


Housing Assistance Council Tabulation of 2014-2018 American Community Survey Data

A photograph of three mailboxes mounted on a wooden post in a rural setting. The mailbox on the left is black with a red flag and the words "U.S. MAIL" embossed on it. The middle mailbox is silver with the number "192" on it. The mailbox on the right is black with the number "195" and the words "U.S. MAIL" on it. The background shows green trees and grass. A semi-transparent dark grey box is overlaid on the image, containing the text.

5. Affordability is the largest housing challenge in rural America.

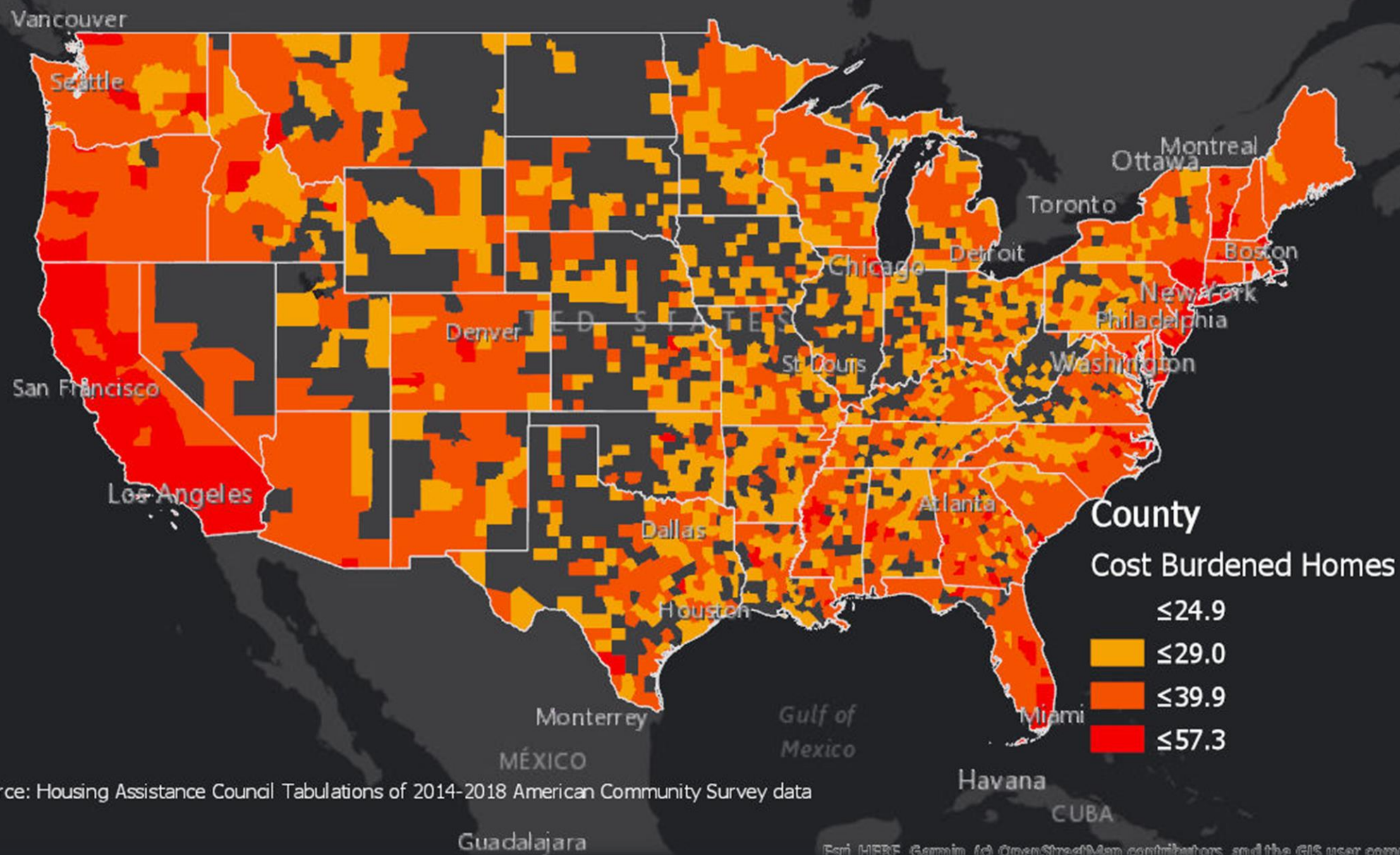
Housing Affordability Problems, 1980



Source: Housing Assistance Council Tabulations of 1980 Decennial Census of Housing and Population

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

Housing Affordability Problems, 2018



www.ruralhome.org

The Housing Assistance Council



Rural Texas Pre- and Post COVID-19 house market trend

Deepayan Debnath

Food and Agricultural Policy Research Institute, University of Missouri

College of Applied Arts, Texas State University

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“

In Real Estate **price** isn't always the **problem**, but it's always the **solution**.

- Home Ryte Solutions, [Pinterest](#)

Overview

01

Motivation &
key questions

04

Methodology

02

Data &
study region

05

Rural home sales price
and demand estimation

03

Home price, and
demand comparison

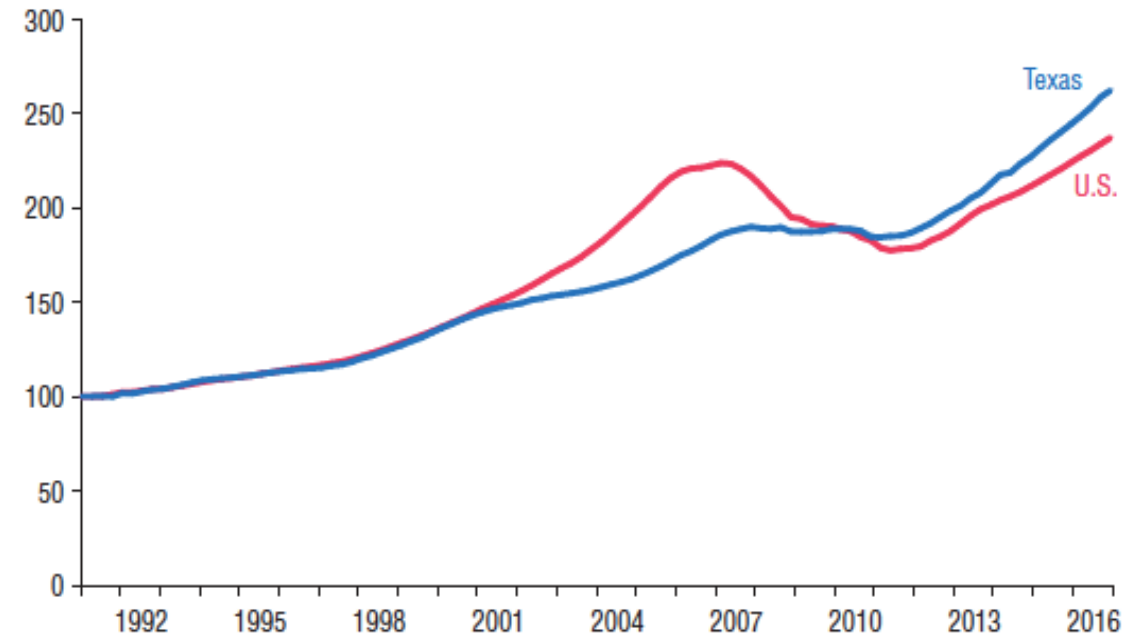
06

Key findings

Motivation

- In Texas 'affordable housing' was key to its long-term economic and population growth -not any more
- Rural Texas are not any exception
- While higher demand and lower supply of new homes may lead to a sudden spike in the rural Texas house price, the impact of the COVID-19 pandemic is uncertain
- Consequence of COVID-19 is unique
- Due to less employment-related moves, the supply of old houses is moderate, while the shortage of labor restrained builders from bringing new homes to the market

Index, first quarter 1991 = 100, seasonally adjusted



SOURCE: Federal Housing Finance Agency House Price Index, Purchase Only.

Since 2011, Texas house price outpaced the U.S. national average



Key questions

- Does the COVID-19 impact the Rural Texas home price and demand?

Study objectives

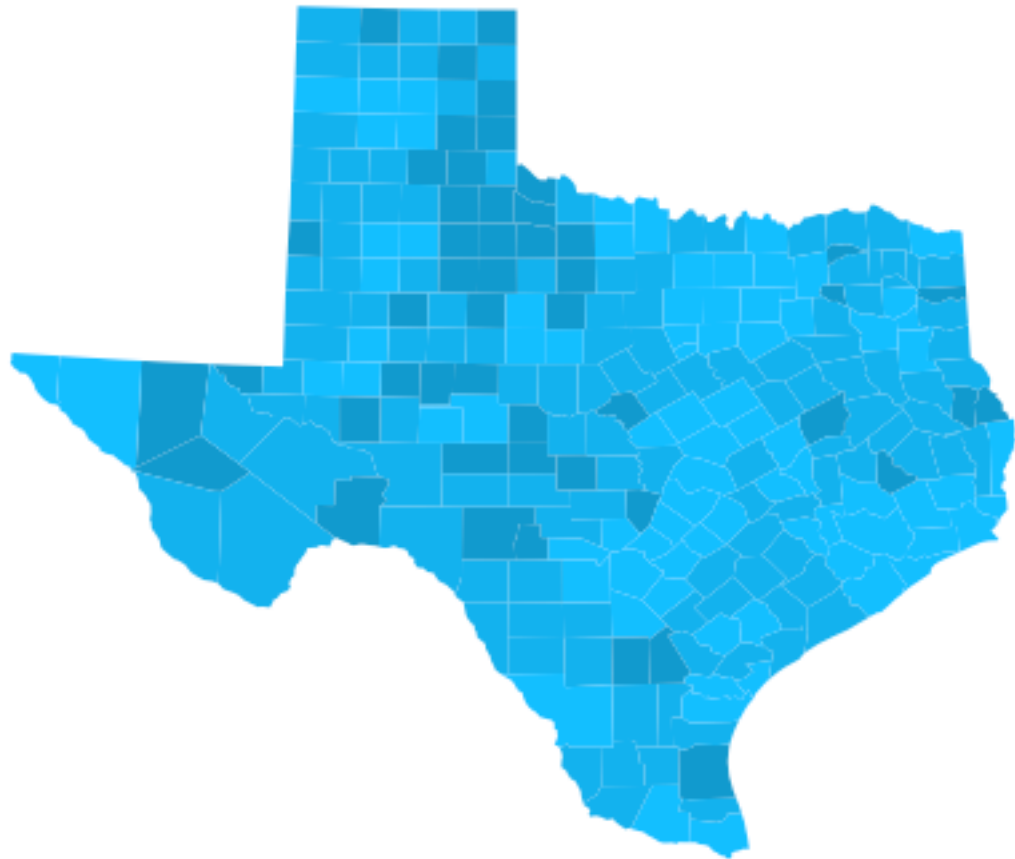
- Sheds some light on the effect of the pandemic on the rural Texas housing market
- Determine the impact of COVID-19 on the rural Texas house price and demand and compare it with the non-metro and metro counties

Data

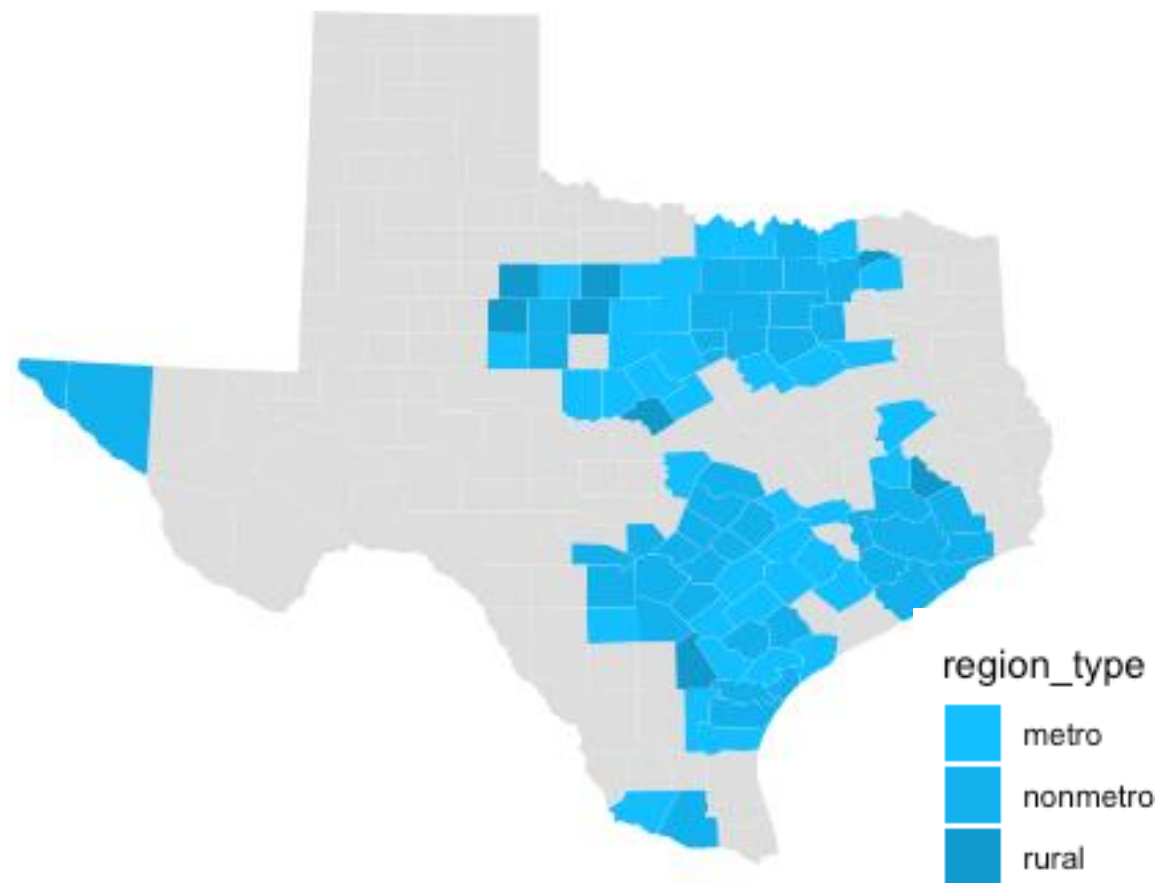
- Weekly home price, sold, listings, inventory, sqft: **Redfin**
<https://www.redfin.com/blog/data-center/>
- 30-years monthly mortgage interest rates: **Freddie Mac**
<http://www.freddie.mac.com/pmms/pmms15.html>
- Yearly demographic indicators: **U.S. Census**
<https://www.census.gov/data/tables/time-series/demo/popest/2010s-counties-detail.html>
- Rural-Urban continuum codes: **USDA**
<https://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx>

Study region

Texas county map



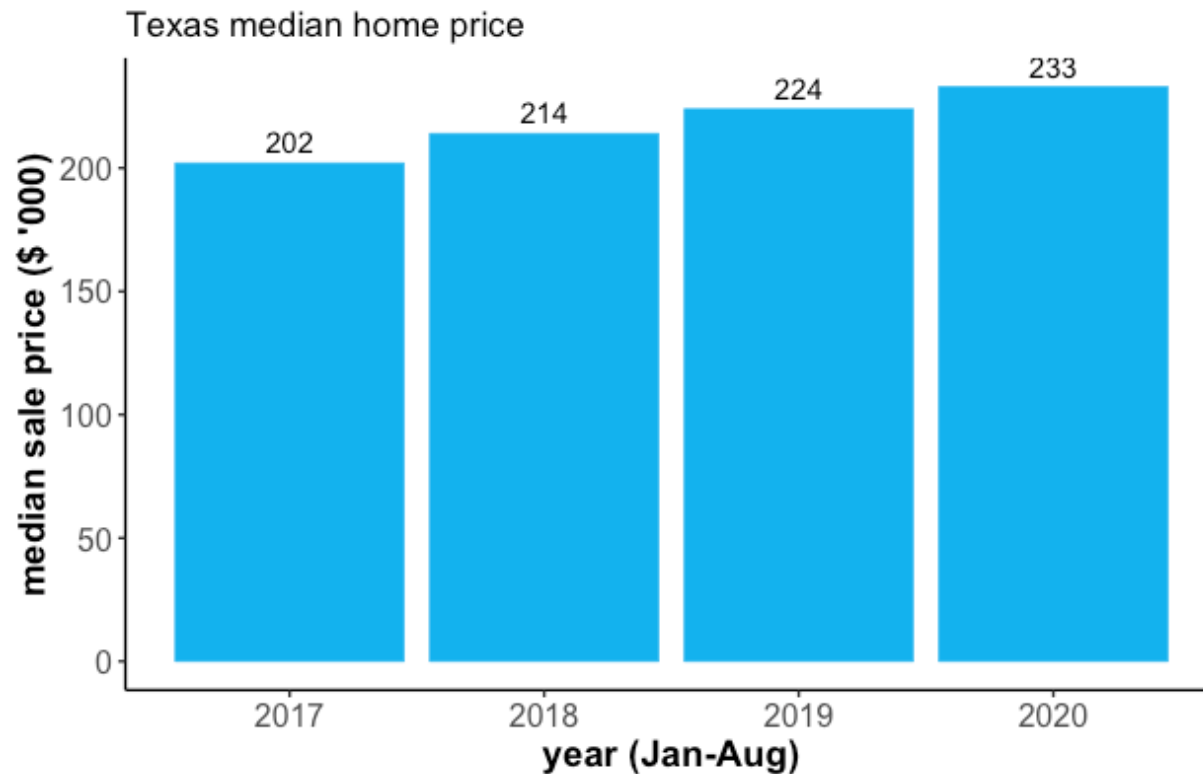
Study region



Based on USDA 2013 Rural-urban continuum codes

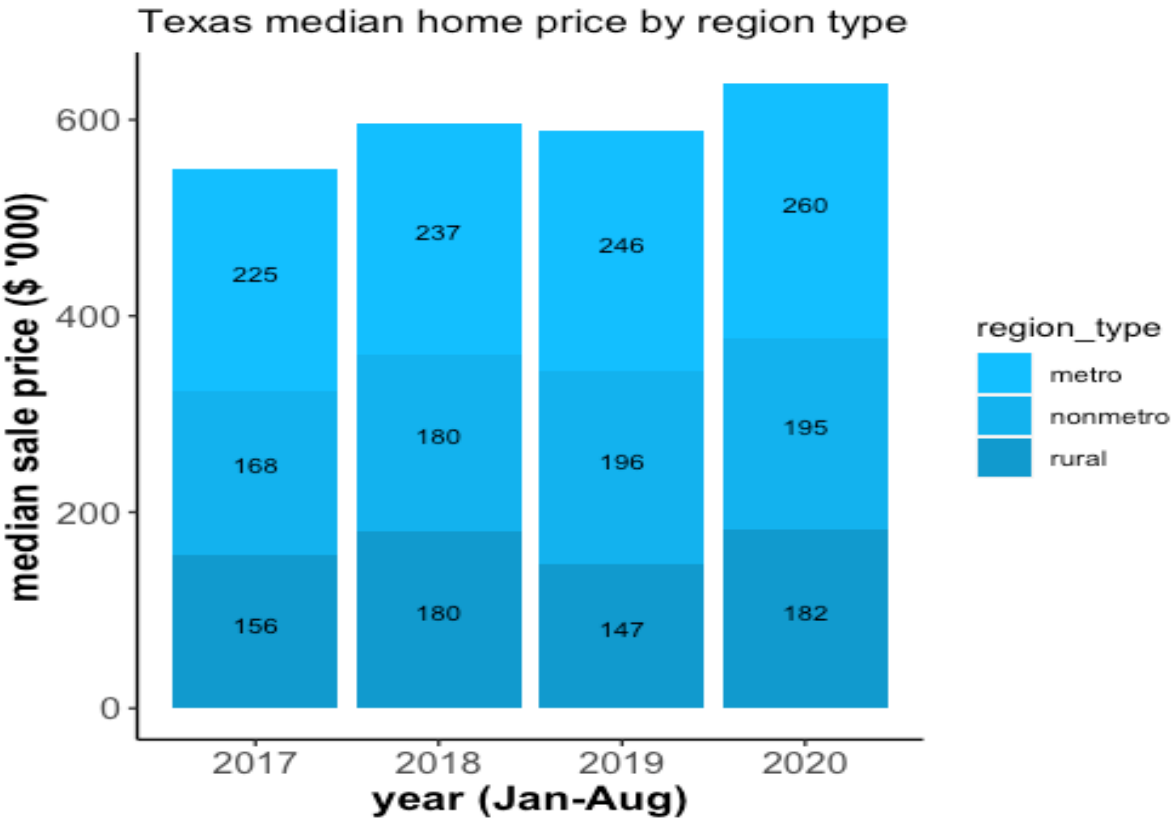
Comparison b/w pre- and post COVID Texas home price

Does this tell the true story?



Year	Home price (\$ '000)	Abs change (\$ '000)	Percent change
2017	202		
2018	214	12	5.94%
2019	224	10	4.67%
2020	233	9	4.02%

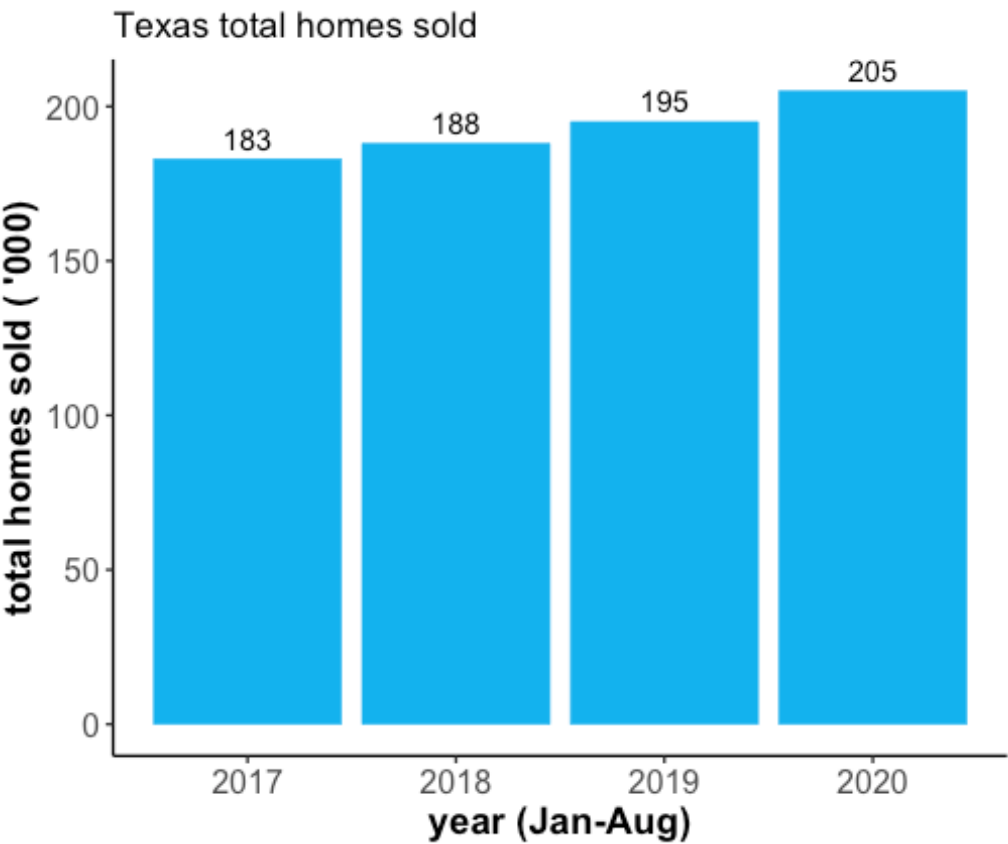
Comparison b/w rural, nonmetro, and metro weekly avg. home price



Year	Rural	Nonmetro	Metro
	Percent change		
2018	15.4%	7.1%	5.3%
2019	-18.3%	8.9%	3.8%
2020	23.8%	-0.5%	5.7%

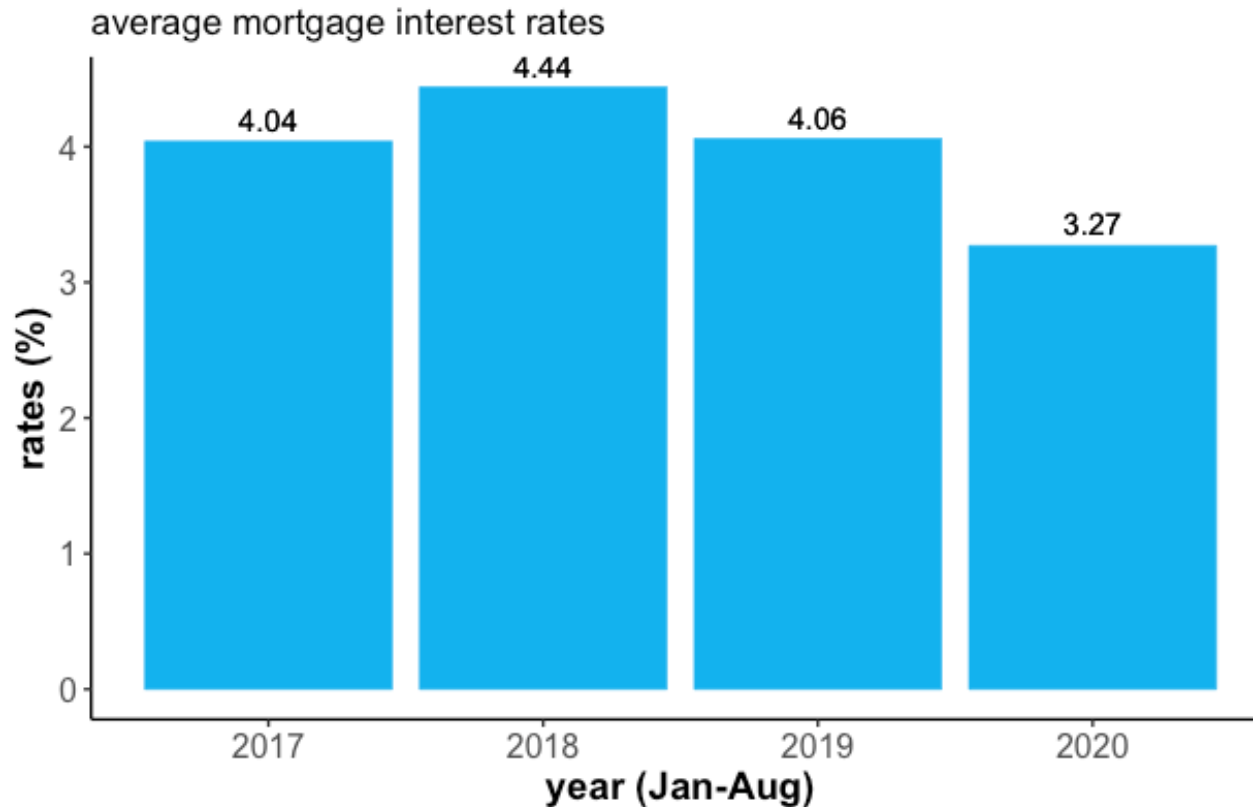
Comparison b/w pre- and post COVID Texas homes sold

What caused such an increase in house demand?



Year	Home price (\$ '000)	Abs change (\$ '000)	Percent change
2017	183		
2018	188	5	2.7%
2019	195	7	3.7%
2020	205	10	5.1%

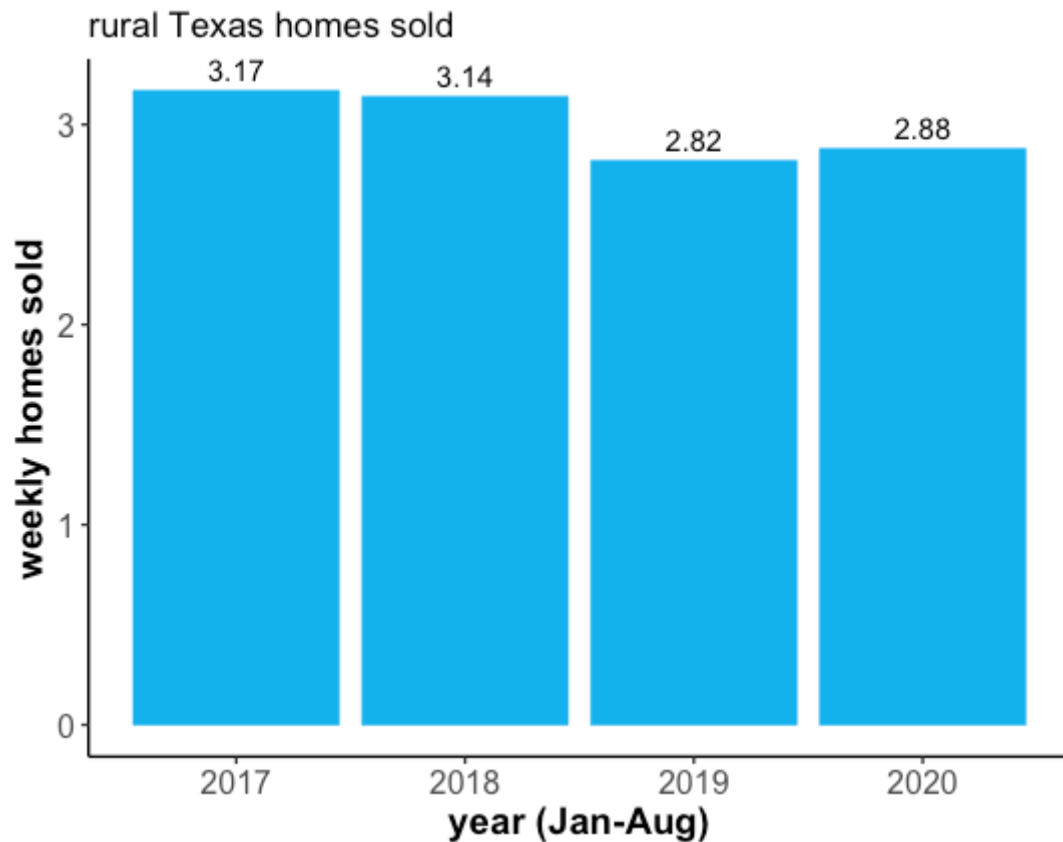
Mortgage interest rates



The Federal reserve bank took many steps to protect the economy from COVID-19 pandemic related damages:

- Lower interest rates on mortgages and home equity lines of credit
- Mortgage rates started falling even before Fed release its first rate cut in early March 2020

Rural Texas weekly avg. homes sold

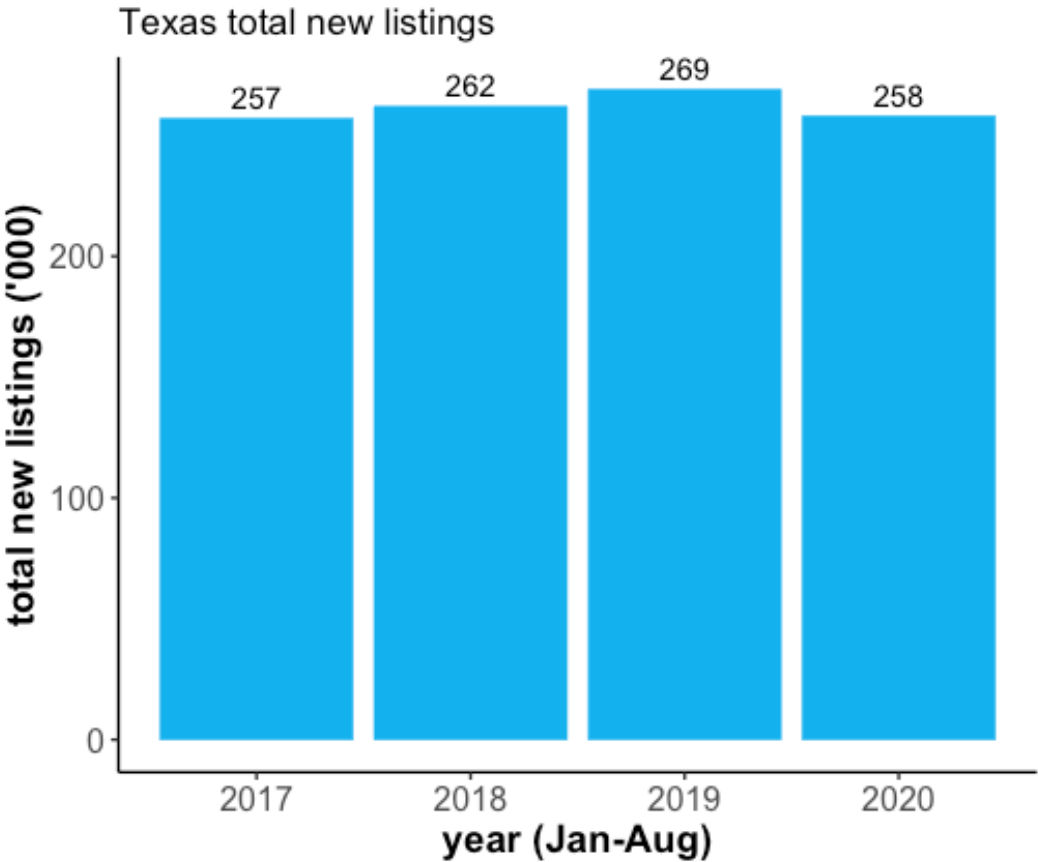


Comparison b/w rural, nonmetro, and metro weekly avg. homes sold

Year	Rural	Nonmetro	Metro
	Percent change		
2018	-0.9%	2.2%	2.0%
2019	-10.2%	-0.4%	2.7%
2020	2.1%	8.8%	0.1%

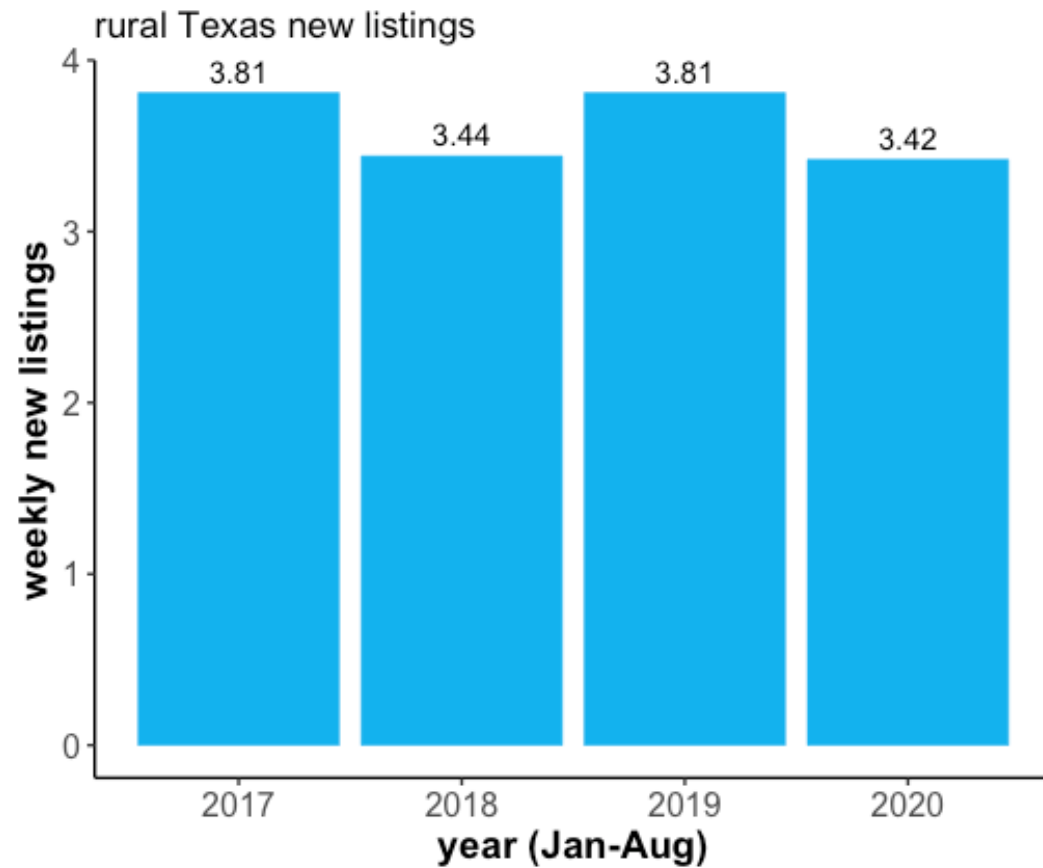
Comparison b/w pre- and post COVID Texas total new listings

New listings fall sharply, why?



Year	Home price (\$ '000)	Abs change (\$ '000)	Percent change
2017	257		
2018	262	5	1.9%
2019	269	7	2.6%
2020	258	-9	-3.3%

Rural Texas weekly avg. new listings

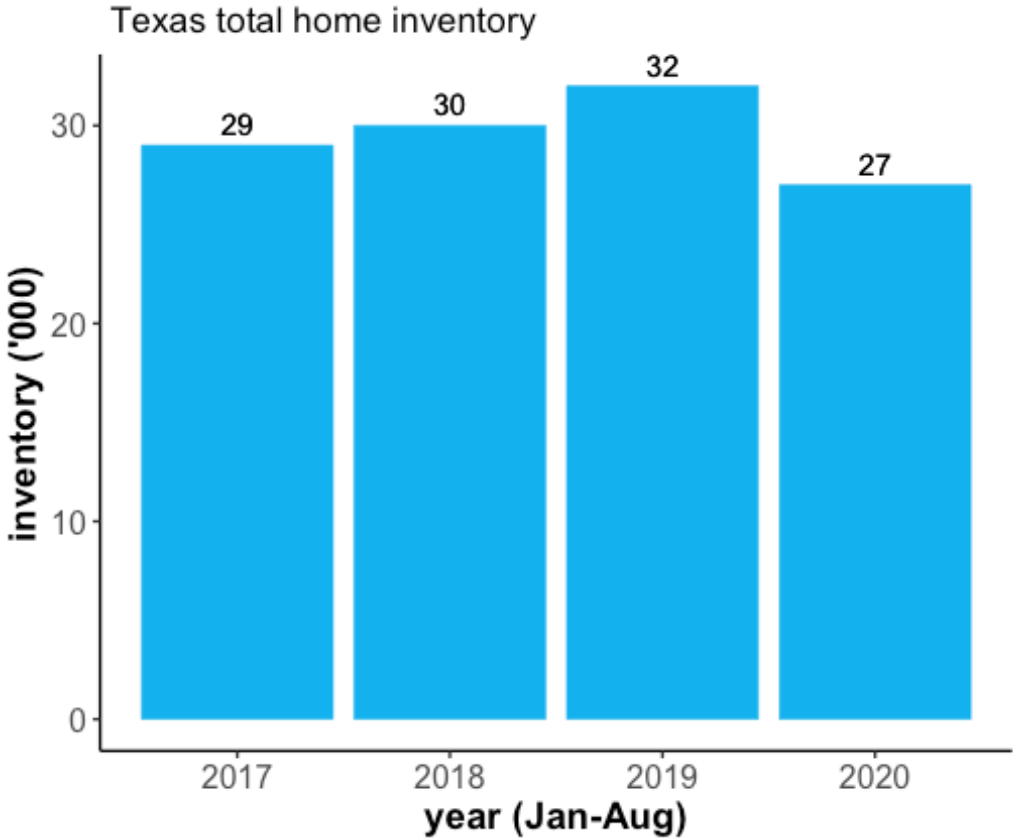


Comparison b/w rural, nonmetro, and metro weekly avg. new listings

Year	Rural	Nonmetro	Metro
	Percent change		
2018	-9.7%	-1.8%	2.1%
2019	10.8%	2.2%	2.1%
2020	-10.2%	-4.8%	-5.9%

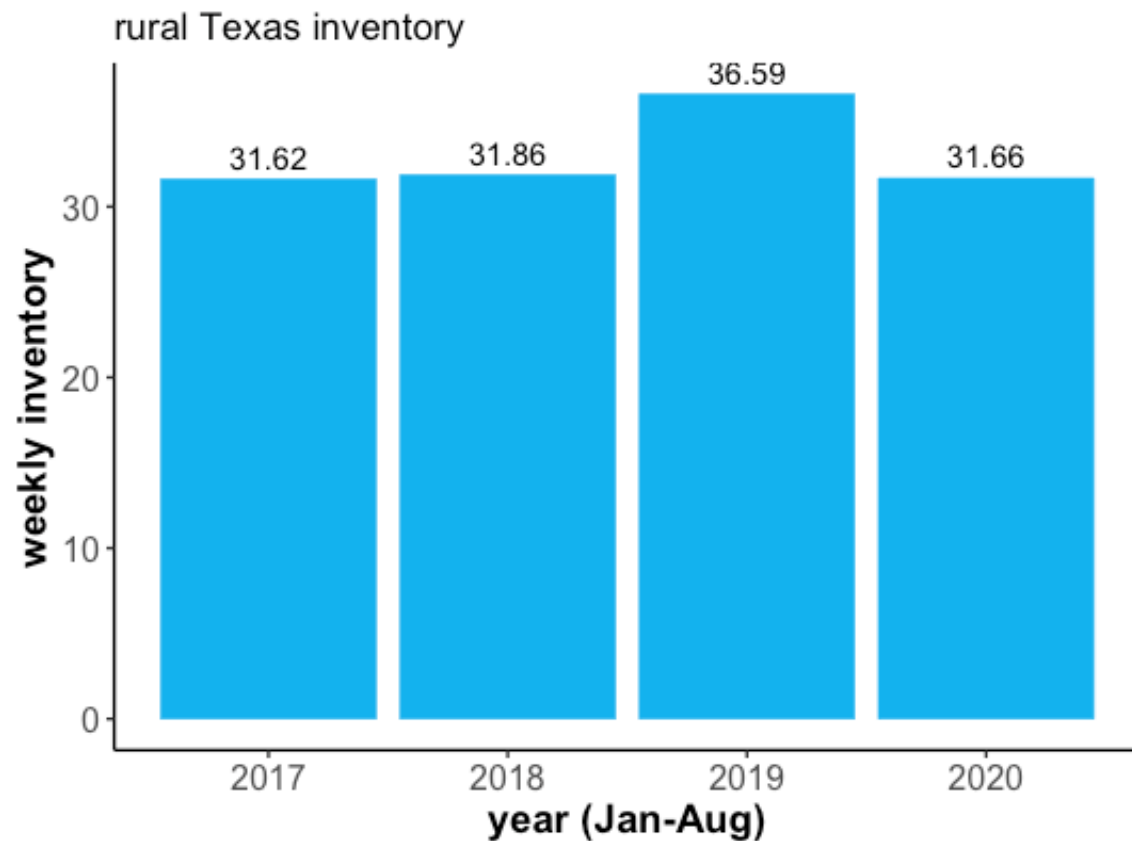
Comparison b/w pre- and post COVID Texas annual inventory

Is COVID-19 leading to declining home supply?



Year	Home inventory (\$ '000)	Abs change (\$ '000)	Percent change
2017	29		
2018	30	1	3.4%
2019	32	2	6.7%
2020	27	-5	-15.6%

Rural Texas weekly avg. new listings



Comparison b/w rural, nonmetro, and metro weekly avg. inventory

Year	Rural	Nonmetro	Metro
	Percent change		
2018	0.8%	-9.0%	1.2%
2019	14.8%	0.2%	10.3%
2020	-13.5%	-6.8%	-15.8%

- Model 1 is the *restricted* model

$$Home_Price_{c,t} = \alpha_0 + \alpha_1 rates_t + \alpha_2 new_listings_{c,t} + \alpha_3 inventory_{c,t} + \alpha_4 sqft_{c,t} + \alpha_5 RACE_{c,t} + \varepsilon_{c,t}$$

- Model 2 is the *unrestricted* model

$$Home_Price_{c,t} = \alpha_0 + \alpha_1 rates_t + \alpha_2 new_listings_{c,t} + \alpha_3 inventory_{c,t} + \alpha_4 sqft_{c,t} + \alpha_5 RACE_{c,t} + \alpha_6 \mathbf{COVID} + \alpha_7 \mathbf{COVID} * inventory_{c,t} + \varepsilon_{c,t}$$

$c \in (rural, nonmetro, metro)$, $RACE \in (White\ American\ (WA), Black\ American\ (BA), Hispanic\ American\ (HA))$

$COVID = (1\ for\ 2020, else\ 0)$

- We show whether there is any COVID-19 related structural change in the rural Texas real estate market through chow test. The null hypothesis is as follows:

Null hypothesis (H_0): ***No structural change***

Alternative (H_a): ***Otherwise structural change***

Chow Test

$$F = \frac{(RSS_R - RSS_{UR})/k}{(RSS_{UR})/(n_1 + n_2 - 2k)} \sim F_{[k, (n_1 + n_2 - 2k)]}$$

Model: Rural Texas

Structural Change Test

Res.Df	RSS	Df	Sum of Sq	F	Pr(>F)
8568	2.58e+12	NA		NA	NA
8566	2.58e+12	2	7.26e+7	0.12	0.89

Fail to reject null hypothesis. No evidence to claim that COVID has impacted the rural Texas home price.

Dependent variable: Rural home price		
	(1)	(2)
Constant	1047 (1554)	1768 (2370)
rates	-277 (388)	-446 (569)
inventory	-259*** (58)	-261*** (58)
listings	-266 (344)	-250 (347)
sqft	0.49 (2.28)	0.37 (2.31)
WA	78*** (2.05)	78*** (2.08)
BA	-503*** (13.09)	-504*** (13.39)
HA	-85*** (3.23)	-85*** (3.23)
COVID		-266 (699)
COVID*Inventory		-6.48 (23.63)
R-squared	0.7609	0.7609

Model: Non-Metro Texas

Structural Change Test

Res.Df	RSS	Df	Sum of Sq	F	Pr(>F)
8568	6.74e+13	NA		NA	NA
8566	6.11e+11	2	2.74e+11	17.50	<0.00

Reject null hypothesis. There is evidence to claim that COVID has impacted the nonmetro Texas home price.

Dependent variable: Nonmetro home price		
	(1)	(2)
Constant	35160*** (7992)	24473** (12118)
rates	-7144*** (1982)	-4227 (2896)
inventory	258*** (41.62)	281*** (41.92)
listings	-628 (395)	-872** (397)
sqft	69.57*** (1.65)	69.35*** (1.65)
WA	1.09*** (0.32)	0.90*** (0.25)
BA	-0.30 (0.45)	0.20 (0.45)
HA	-0.33 (0.33)	-0.25 (0.33)
COVID		-4828 (3622)
COVID*Inventory		-197*** (34.41)
R-squared	0.5316	0.5335

Model: Metro Texas

Structural Change Test

Res.Df	RSS	Df	Sum of Sq	F	Pr(>F)
8568	1.93e+13	NA		NA	NA
8566	1.93e+13	2	1.49e+10	7.23	0.03708

Reject null hypothesis. There is evidence to claim that COVID has impacted the metro Texas home price.

Dependent variable: Metro home price		
	(1)	(2)
Constant	29990*** (4286)	18180*** (7202)
rates	-6327*** (1064)	-3566** (1552)
inventory	-12.53*** (1.32)	-11.98*** (1.35)
listings	21.74** (10.29)	19.33* (10.29)
sqft	105*** (0.64)	105*** (0.64)
WA	0.33*** (0.01)	0.34*** (0.01)
BA	-0.22*** (0.01)	-0.22*** (0.01)
HA	-0.34*** (0.01)	-0.34*** (0.01)
COVID		4331** (1967)
COVID*Inventory		0.48 (0.63)
R-squared	0.8538	0.8077

Model: Rural Texas house demand

Structural Change Test

Res.Df	RSS	Df	Sum of Sq	F	Pr(>F)
8567	1357.8	NA		NA	NA
8565	1346.0	2	11.759	37.41	<0.00

Reject null hypothesis. There is evidence to claim that COVID has impacted the rural Texas home demand.

Dependent variable: Weekly rural home sold		
	(1)	(2)
Constant	0.097*** (0.036)	0.15*** (0.007)
price	-0.000001*** (0.00)	-0.000001*** (0.00)
rates	-0.024*** (0.009)	-0.0349** (0.01)
inventory	0.007*** (0.001)	0.0072*** (0.00)
listings	0.02 (0.008)	0.0113 (0.01)
sqft	-0.000003*** (0.00)	0.0001 (0.00)
WA	0.001*** (0.00)	0.0005*** (0.00)
BA	-0.003*** (0.00)	-0.0023*** (0.00)
HA	-0.001*** (0.00)	-0.0007*** (0.00)
COVID		-0.0295* (0.02)
COVID*Inventory		0.0046*** (0.00)
R-squared	0.8052	0.8068

Key findings

- Lack of homes results in a significant rise in rural Texas home price
- While the interest rate falls, we find no evidence to claim that it causes an increase in house price in rural Texas
- Race plays a key role in rural house markets
- There is no statistical evidence to claim COVID has impacted the rural Texas home price
- In contrast, we find evidence that in nonmetro and metro counties, the COVID has led to an increase in home price
- However, rural house demand in Texas is impacted by the COVID
- Between 2008 Q3 to 2011 Q1, the Texas house price index (HPI) fell by 4.5%, while COVID-19 led to an increase in HPI by 3.6% from 2019 Q4 to 2020 Q2
- Unlike the 2007 recession, the pandemic-related shock to the Texas housing market led to an increase in home prices as the supply of both old and new houses continues to shrink

Limitations

- Not all Texas counties data were available
- Lack of 2020 income and demographic data availability.
- Age, gender, and income -related data needs to be included in the future model estimations.

Are People Moving to Rural Areas During the Pandemic?

Xian Bak, Economist, Freddie Mac

Contributors: Xian Bak, Jaya Dey, Sijie Li and Kristine Yao

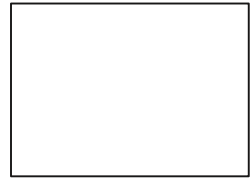
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Agenda



MOTIVATION



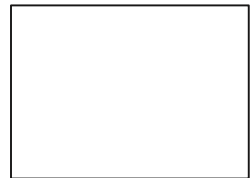
ANALYSIS



RURAL
DEFINITION



CONCLUSION



DATA

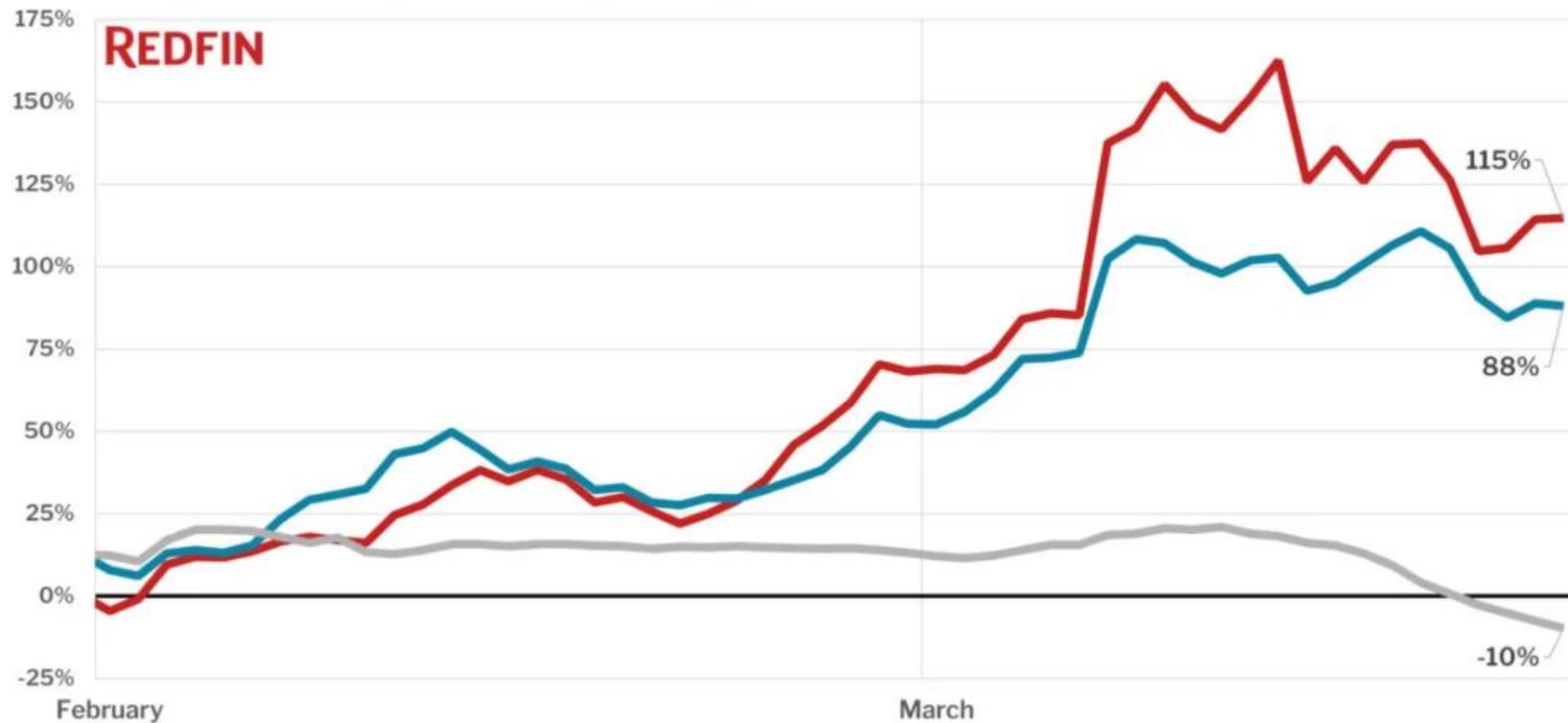
Motivation

More Rural House Searches

Year-Over-Year Change in Pageviews on Redfin.com

seven-day rolling average

— Rural Areas — Small Towns (10,000-50,000 Population) — Urban Metro Areas (1M+ Population)



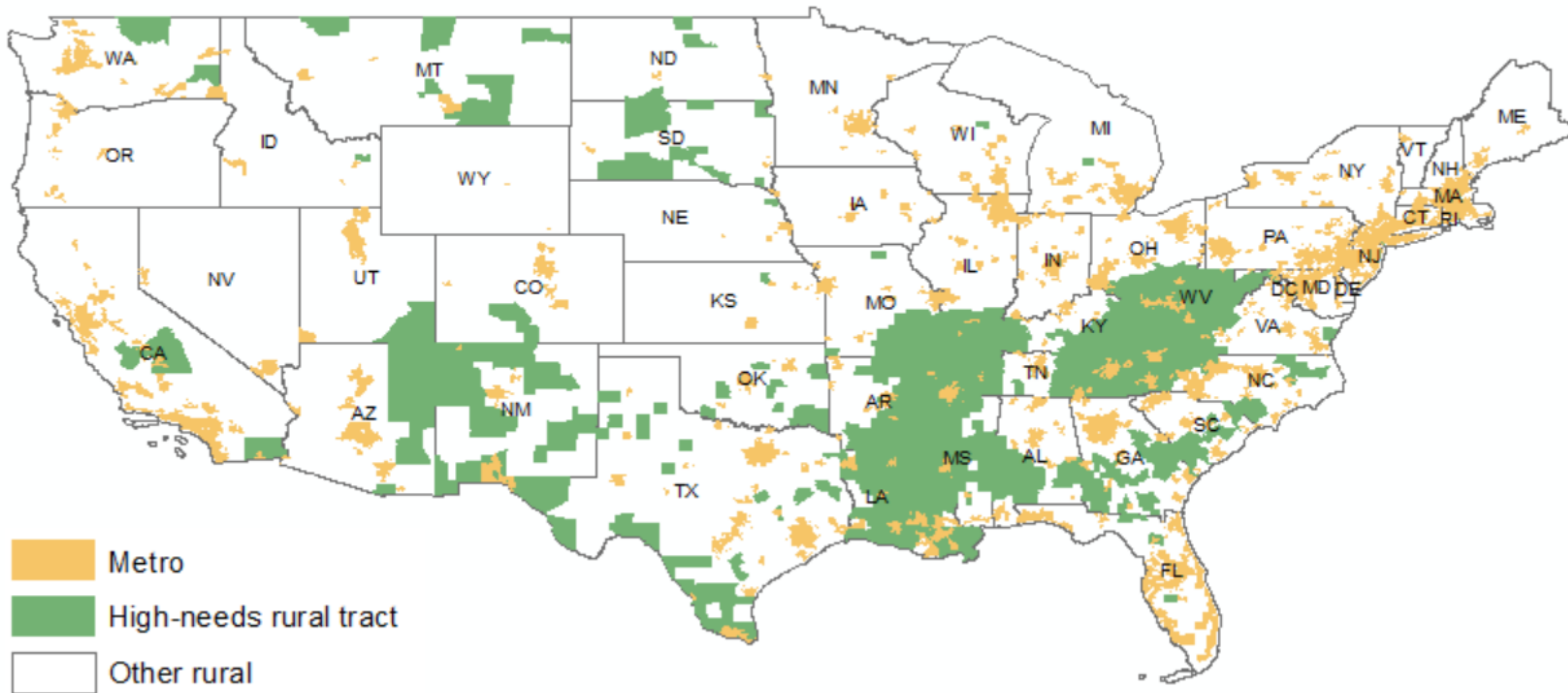


Rural Definition

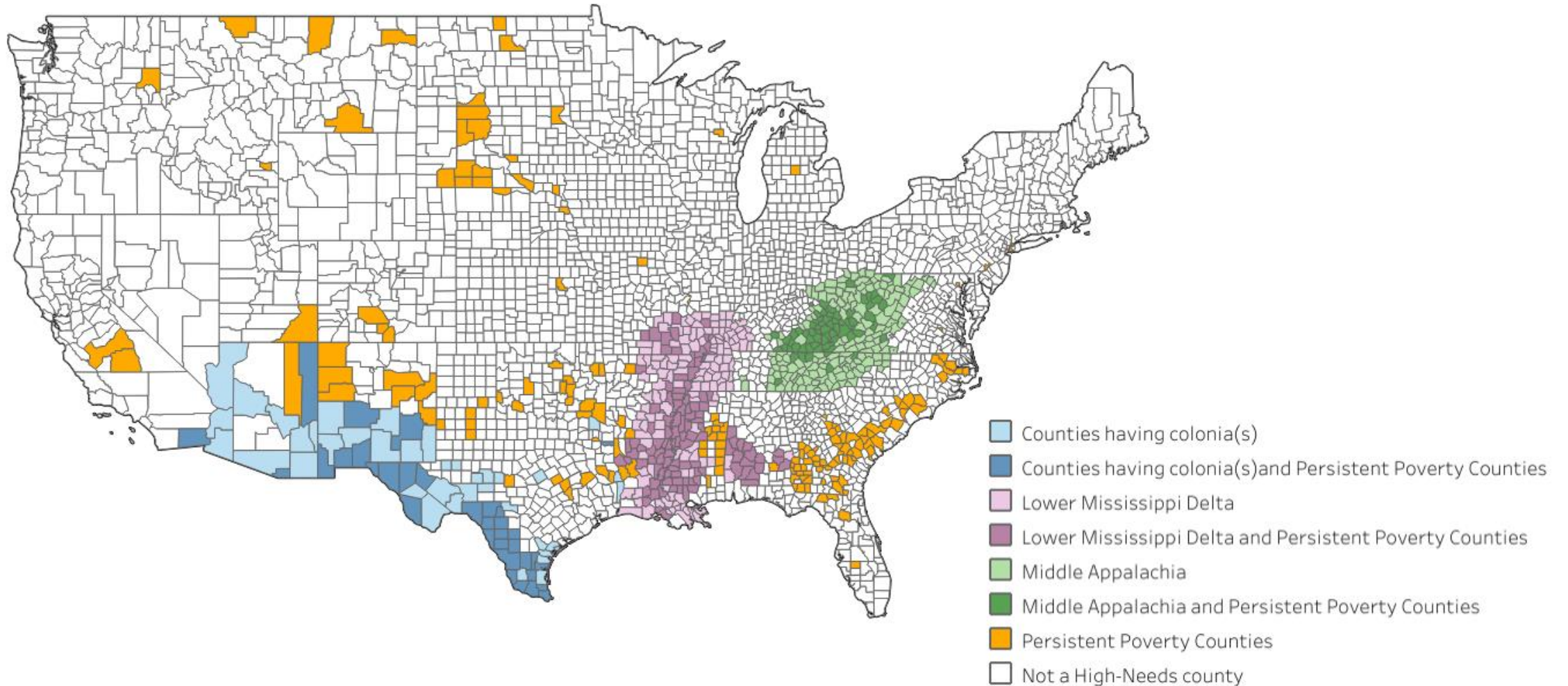
FHFA's Duty to Serve regulation defines "rural area" as a census tract :

- (1) **outside** of a metropolitan statistical area (MSA)
- (2) **in** a MSA, but
 - **outside** of the MSA's **Urbanized Areas** (U.S. Department of Agriculture's Rural-Urban Commuting Area (RUCA) Code #1)
 - **and outside** of tracts with a housing density of over 64 housing units per square mile for (USDA's RUCA Code #2).

Metro vs. Other Rural vs. High-needs Rural

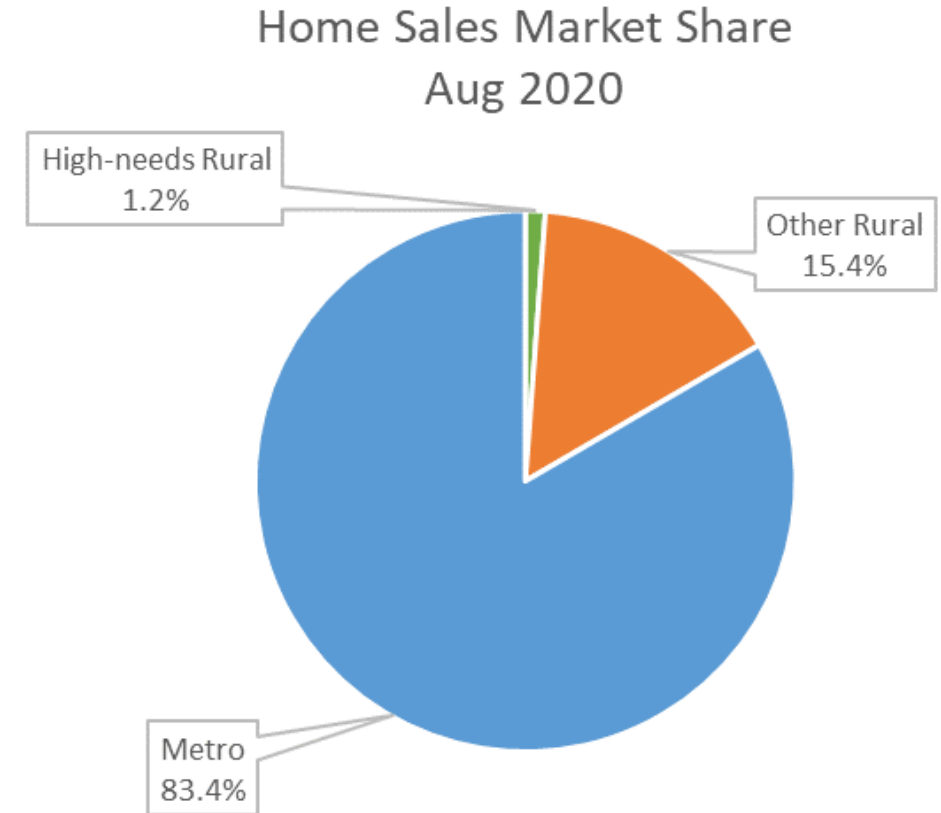


Duty to Serve: High-needs Rural Area



Multiple Listing Service Data

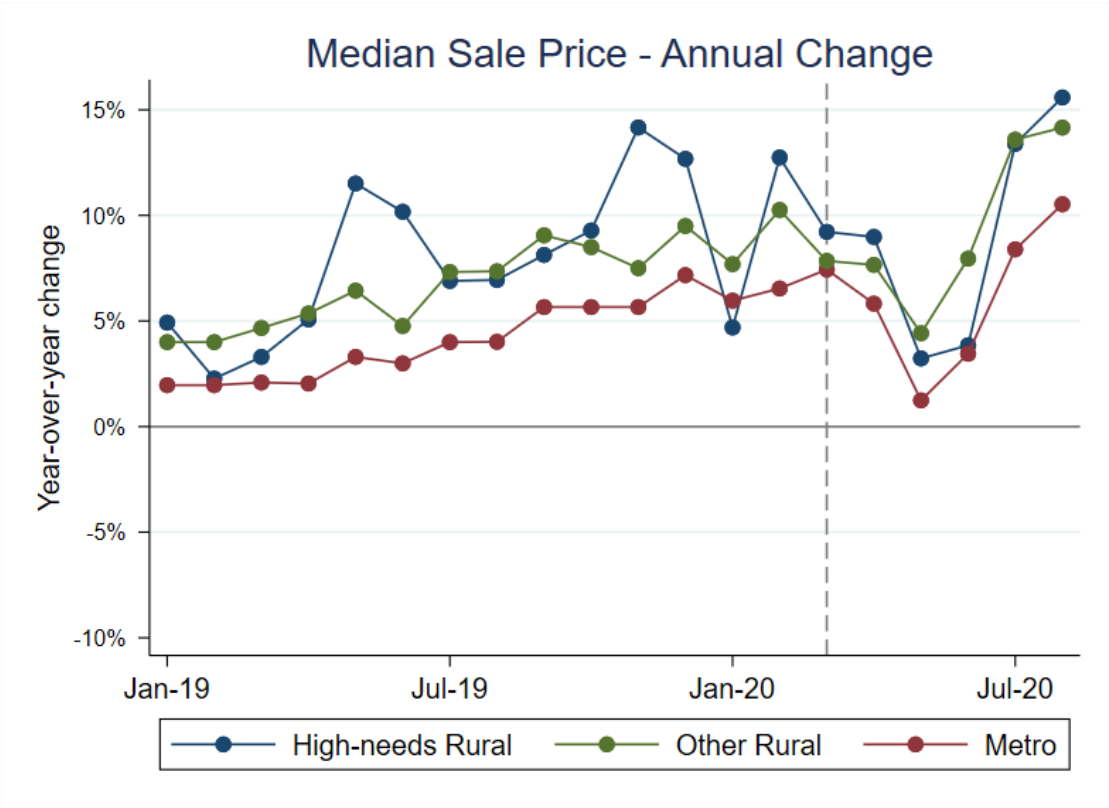
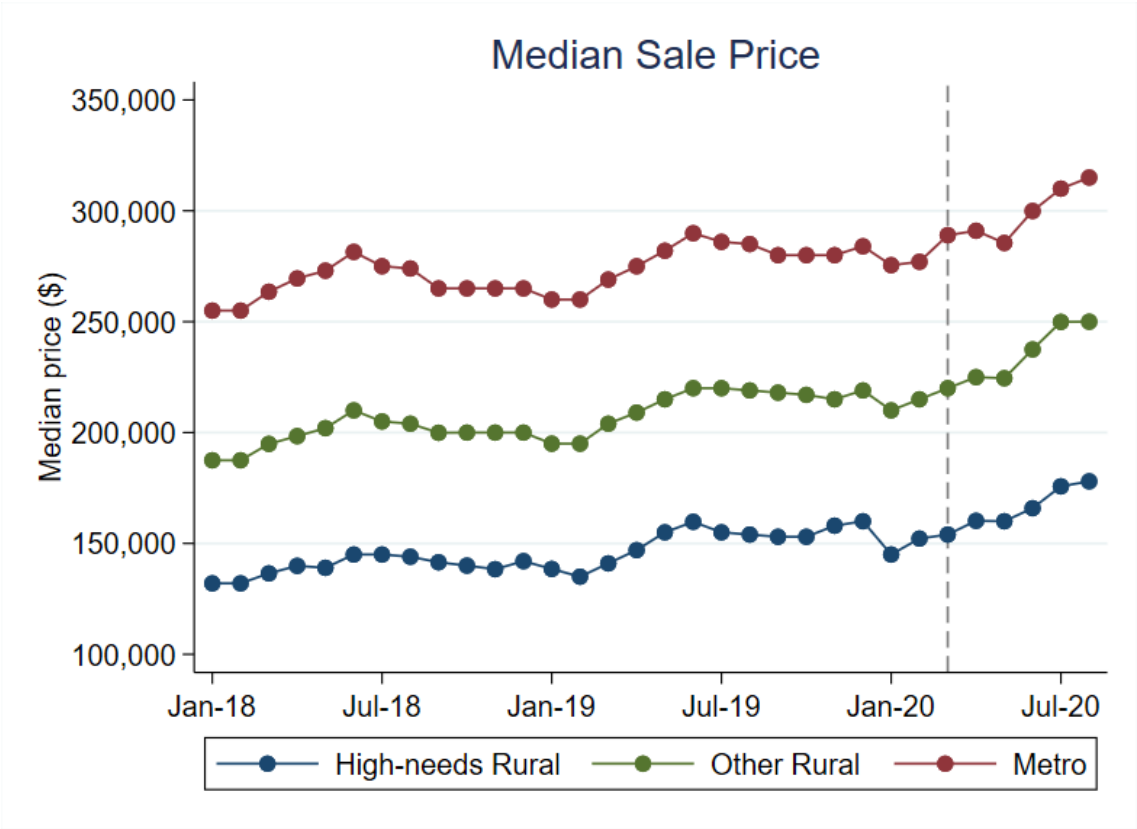
- CoreLogic Multiple Listing Service (MLS)
 - MLS is a database established by cooperating real estate brokers to provide data about properties for sale
- Listing category included: active, new, pending, sold and withdrawn.
- Our sample:
 - For-sale inventory
 - January 2018 - August 2020
 - Single family (1~4 units), including single-family houses, townhomes, condominium, planned unit development, and manufactured housing



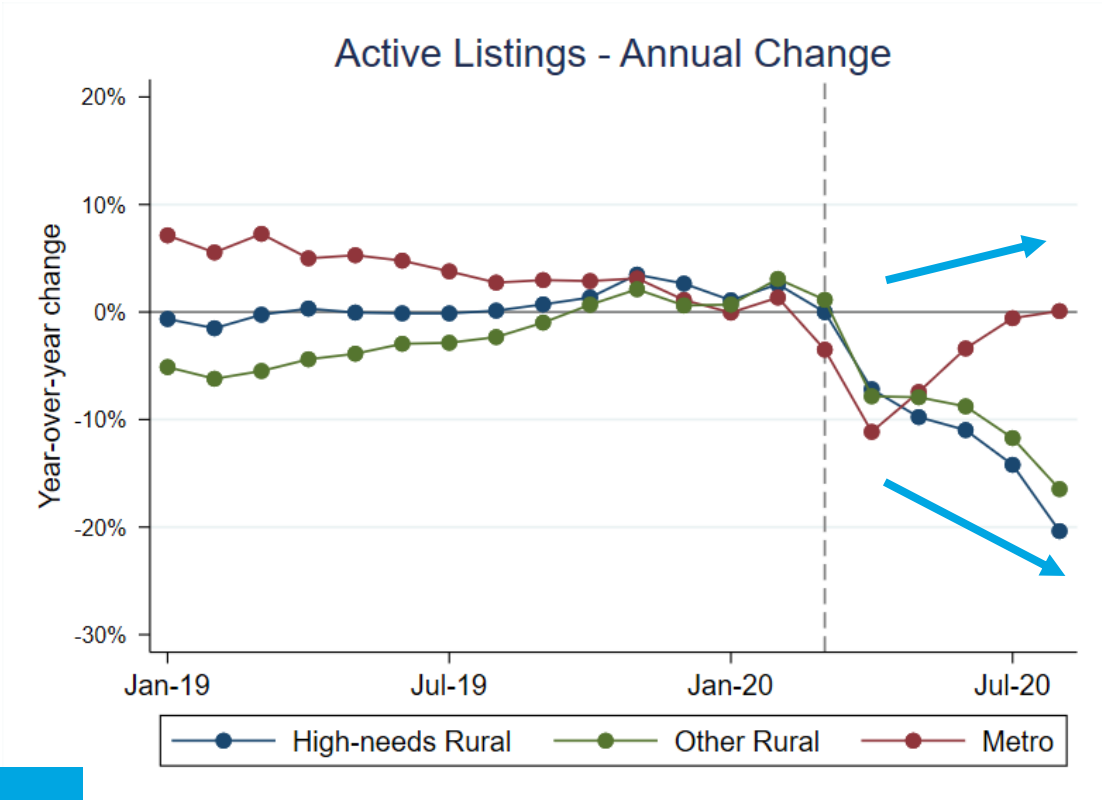
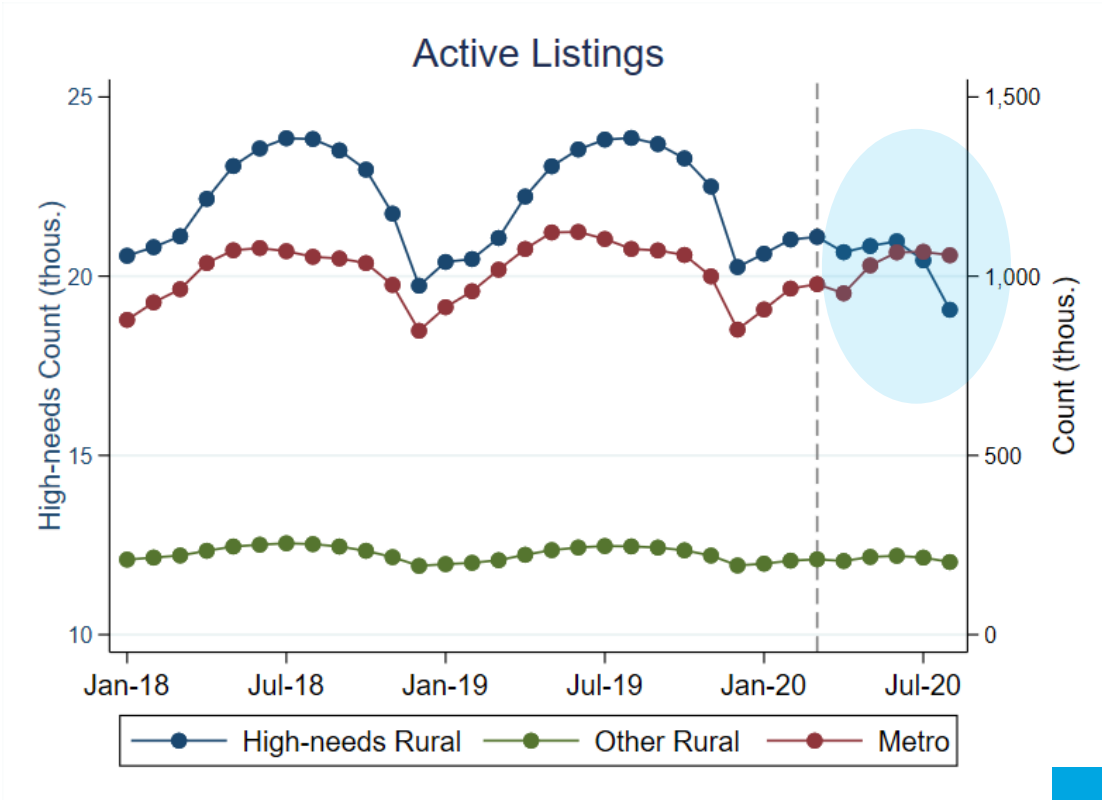


Analysis

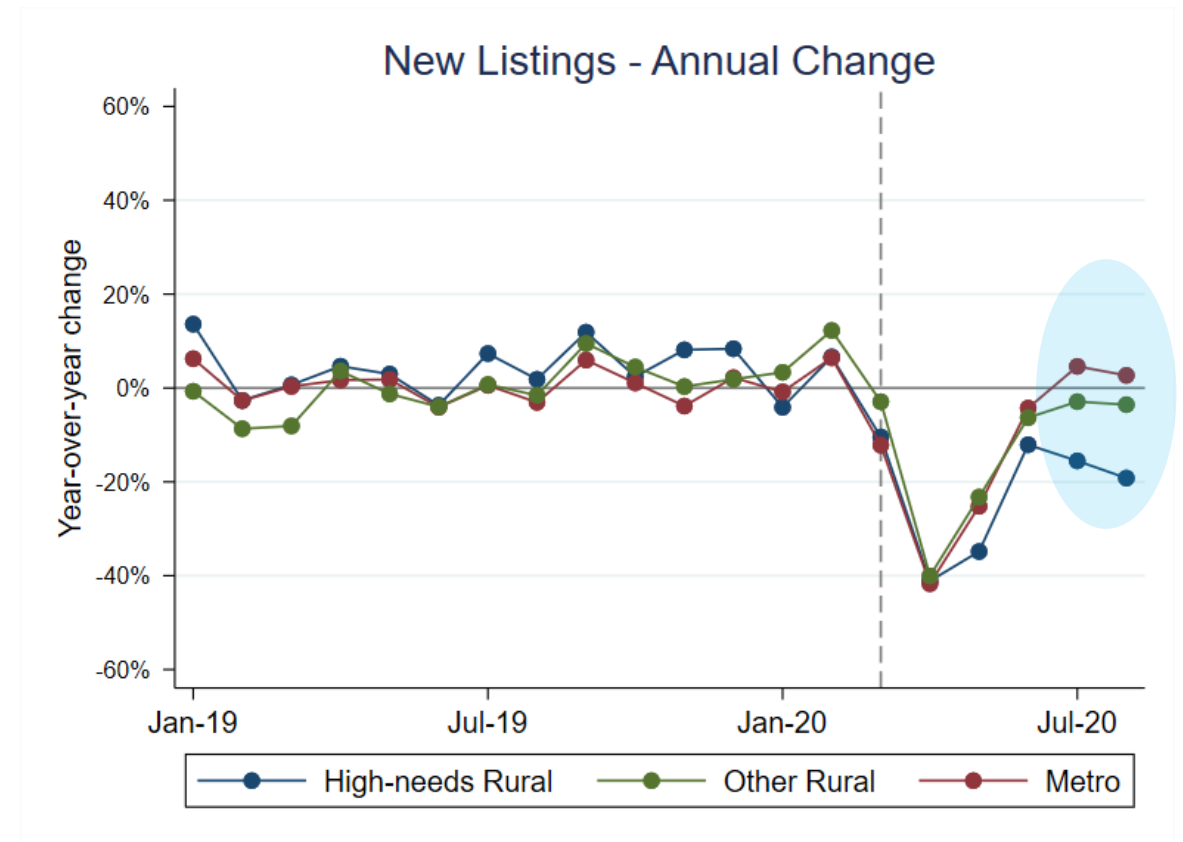
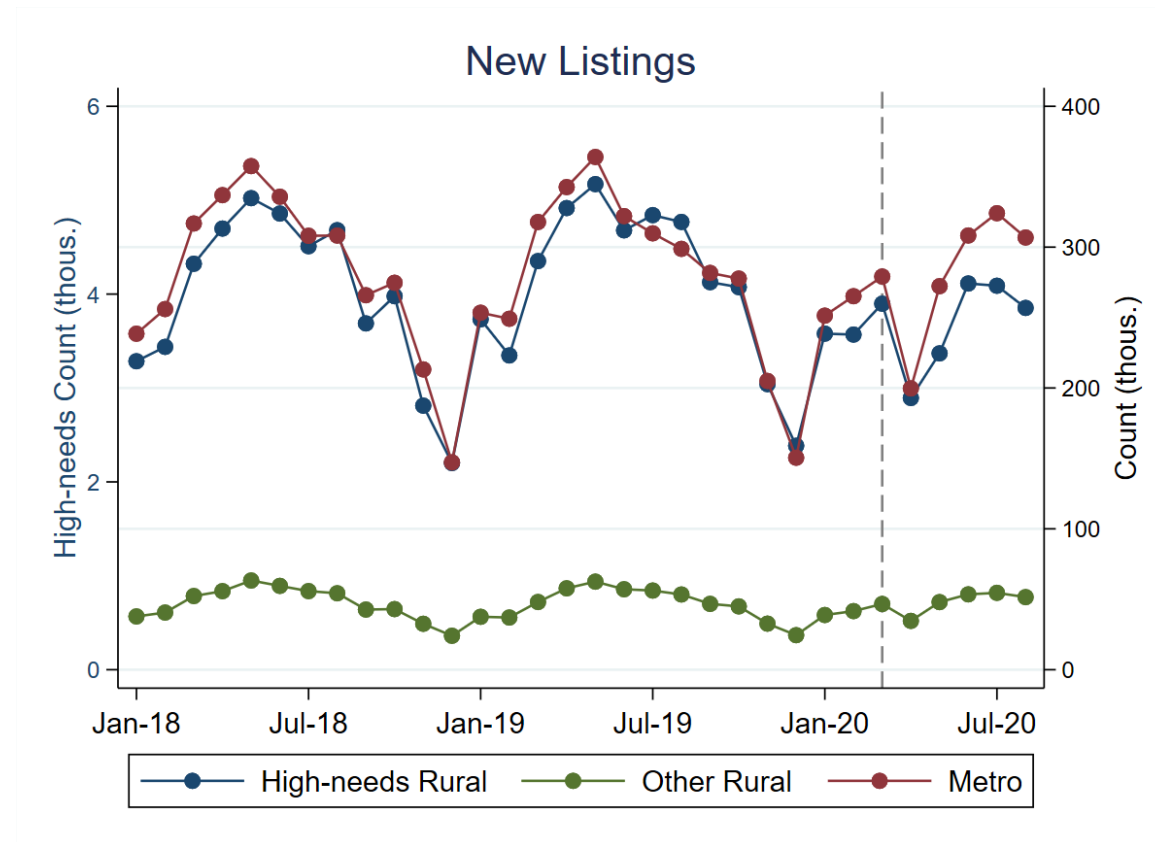
Similar Rebound in Year-over-Year Growth Rate of Median Sale Price in the Rural and Metro



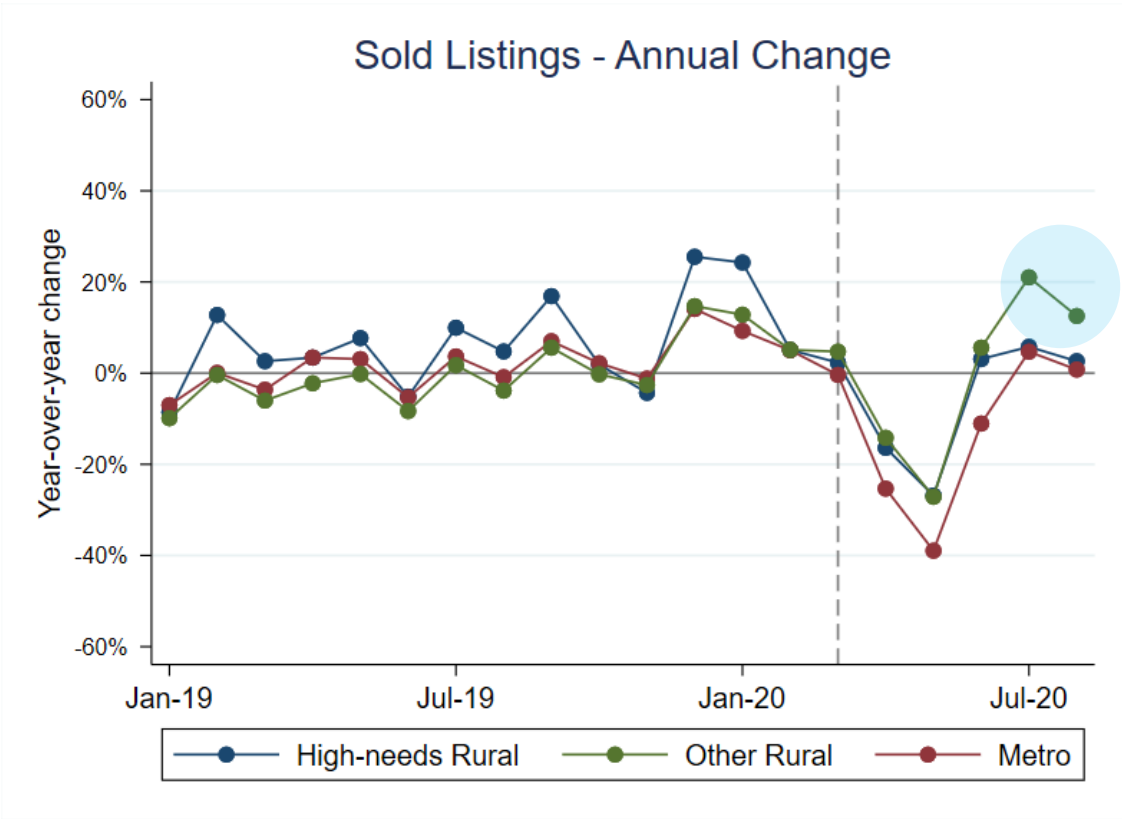
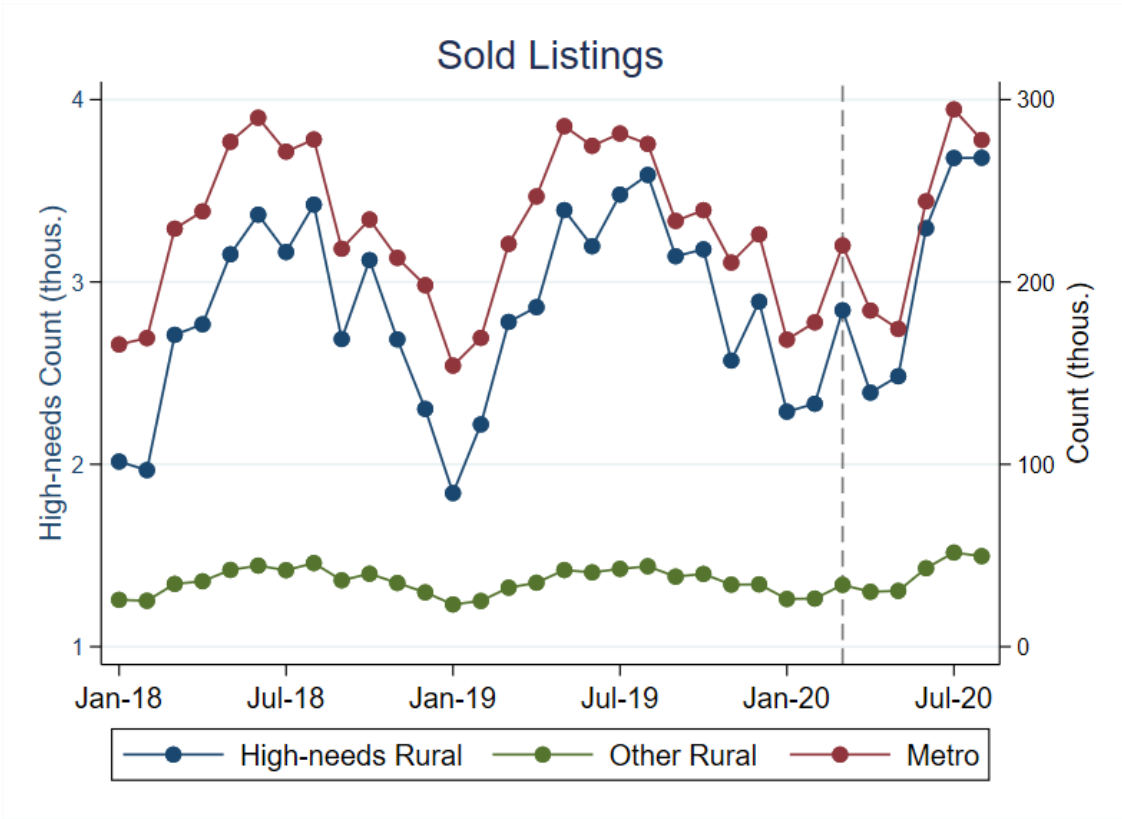
While Inventory Growth Rebound in Metro Areas, it Continues to Decline in Rural Areas



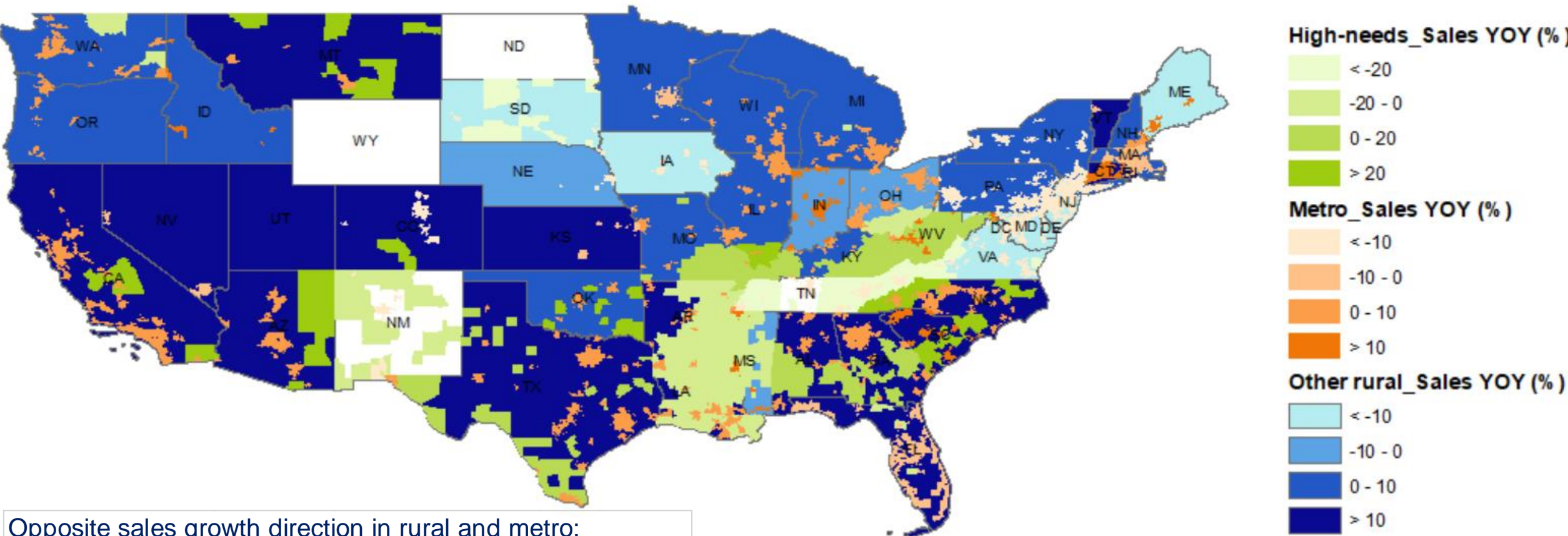
Positive Growth in New Listings in Metro Areas since July



Strongest Annual Growth of Sales in the Other Rural Area in Recent Months



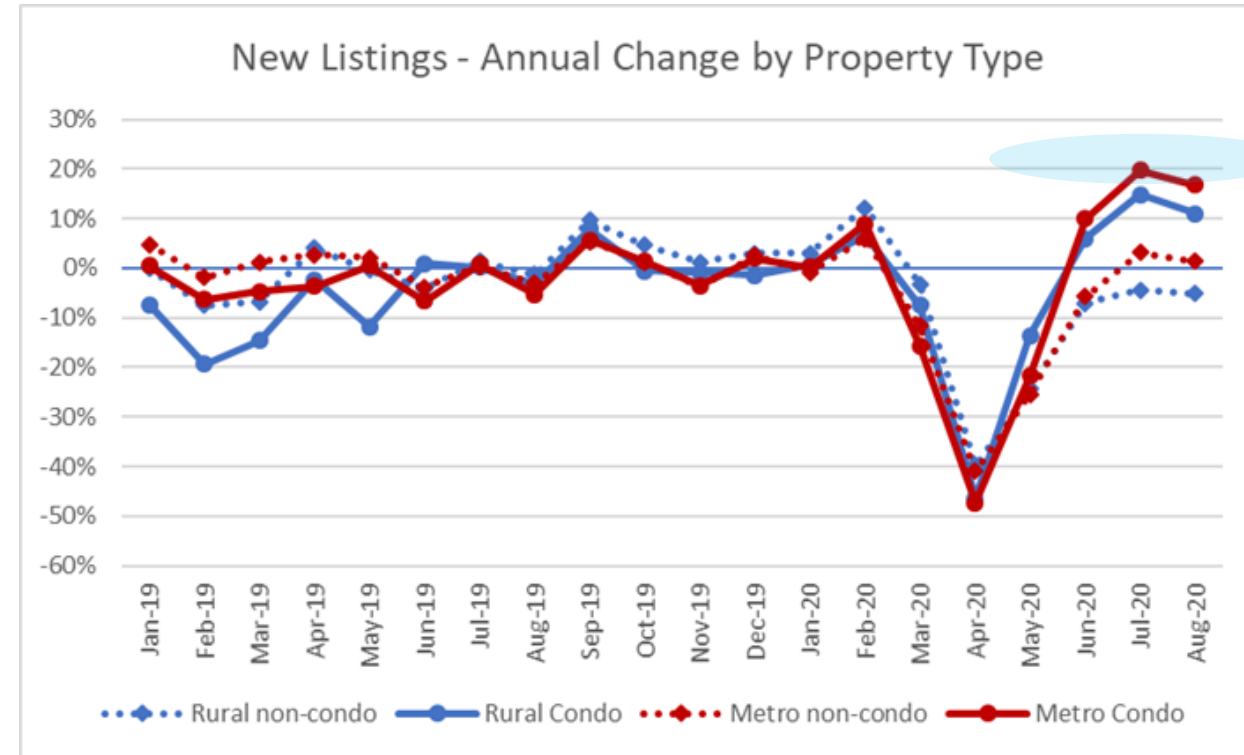
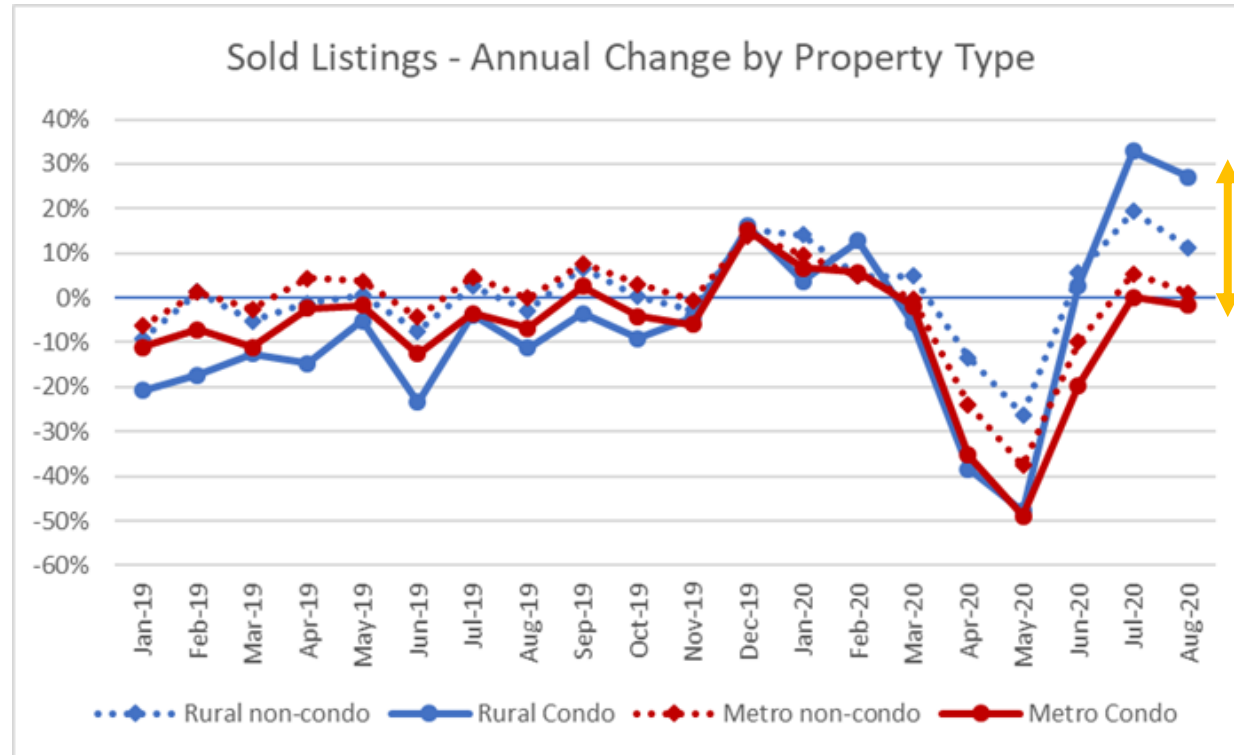
Further, there is a Lot of Heterogeneity in Annual Growth in Sales in Other Rural across the States.



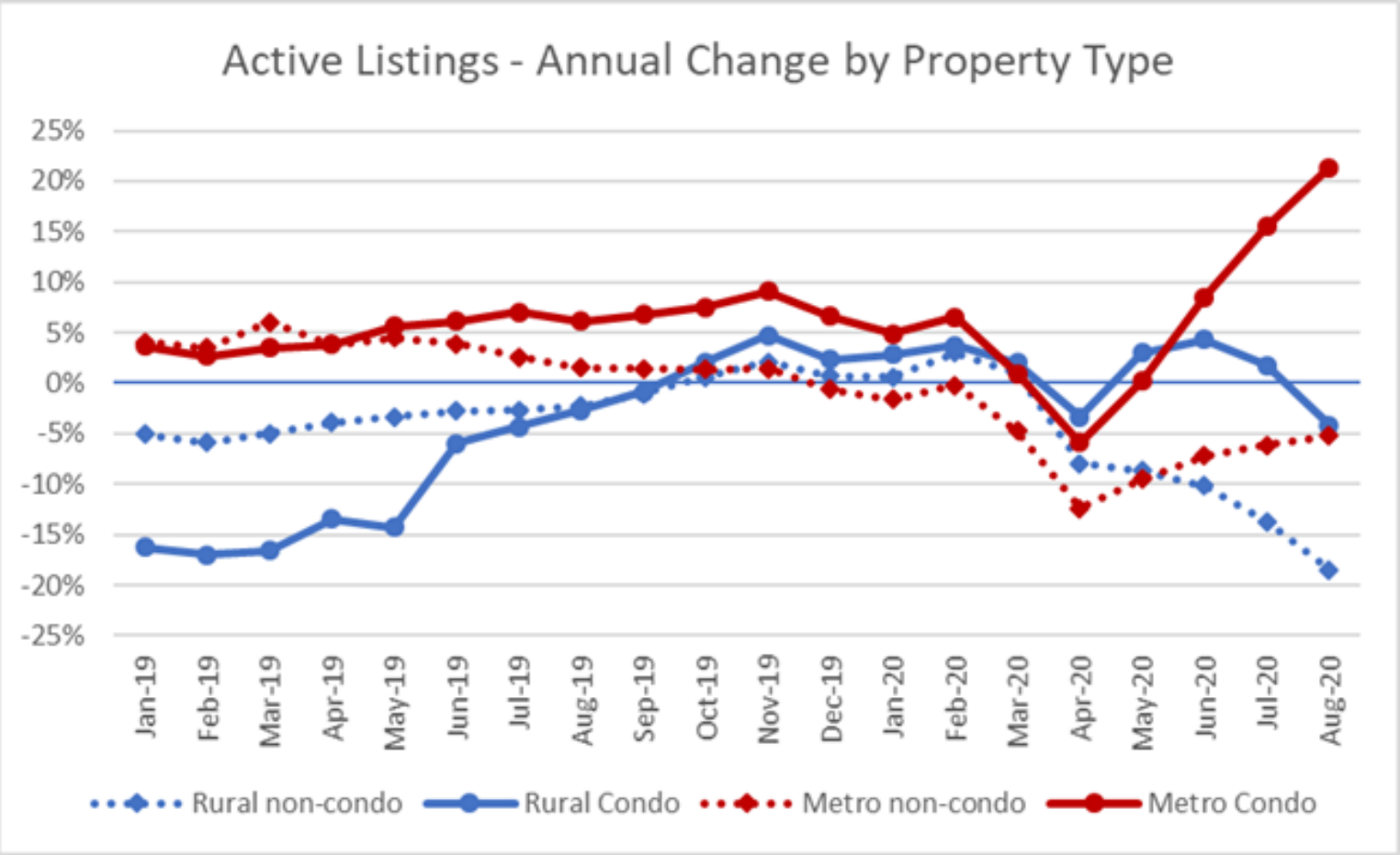
Opposite sales growth direction in rural and metro:

State	HN YOY (%)	Other Rural YOY (%)	Metro YOY (%)
CO	26.7	23.9	-13.5
FL	-19.4	15.7	-7.2
PA		4.6	-33.9

There is Suggestively Lower Demand for Condos in Metro Areas.



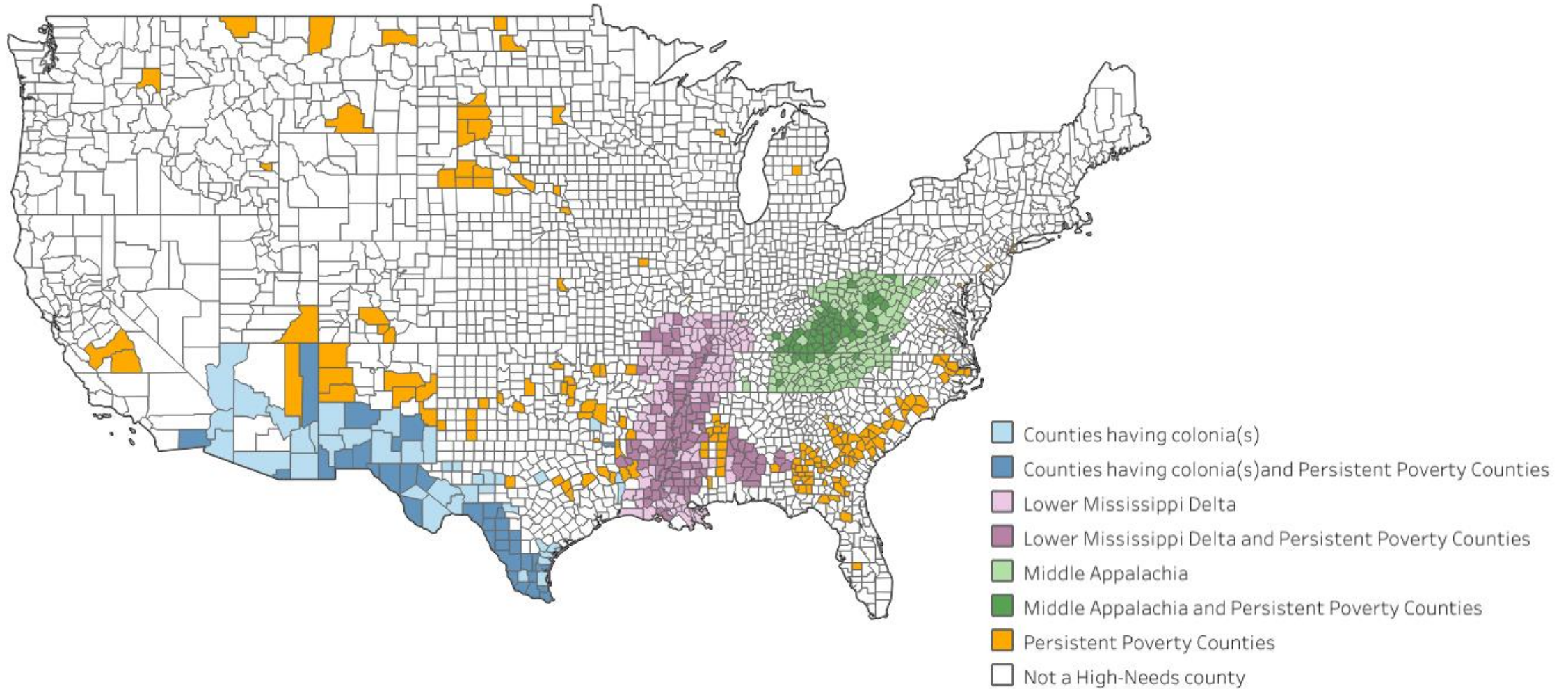
Unlike Most Property Types, Annual Growth in Metro Condo Inventory Spiked by August





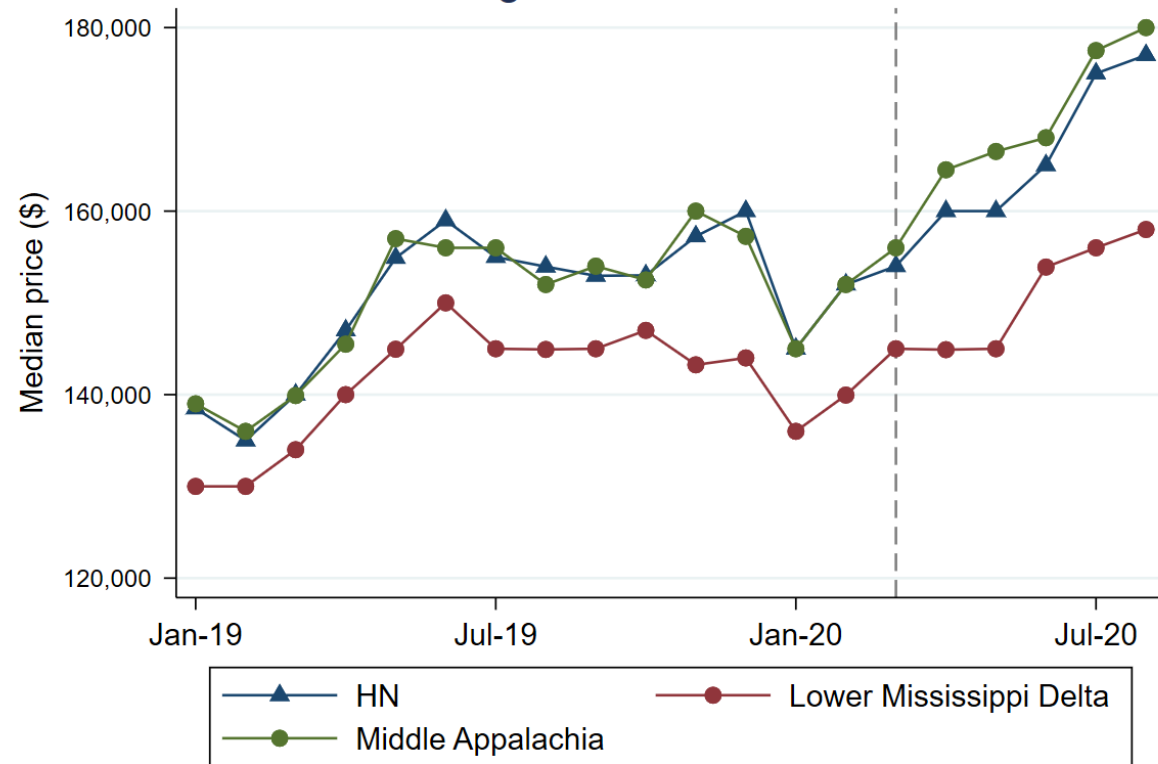
High-Needs Rural

Duty to Serve: High-needs Rural Area

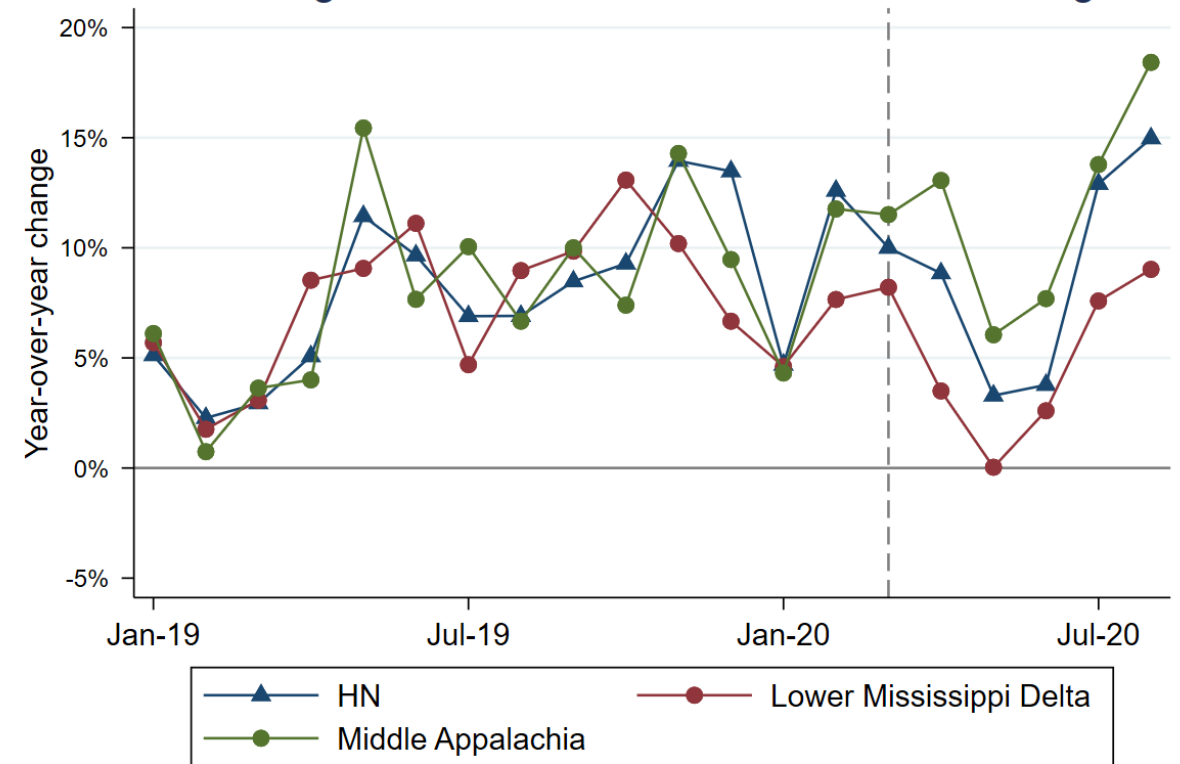


Strong Rebound of Annual Growth for Median Sale Price in Middle Appalachia

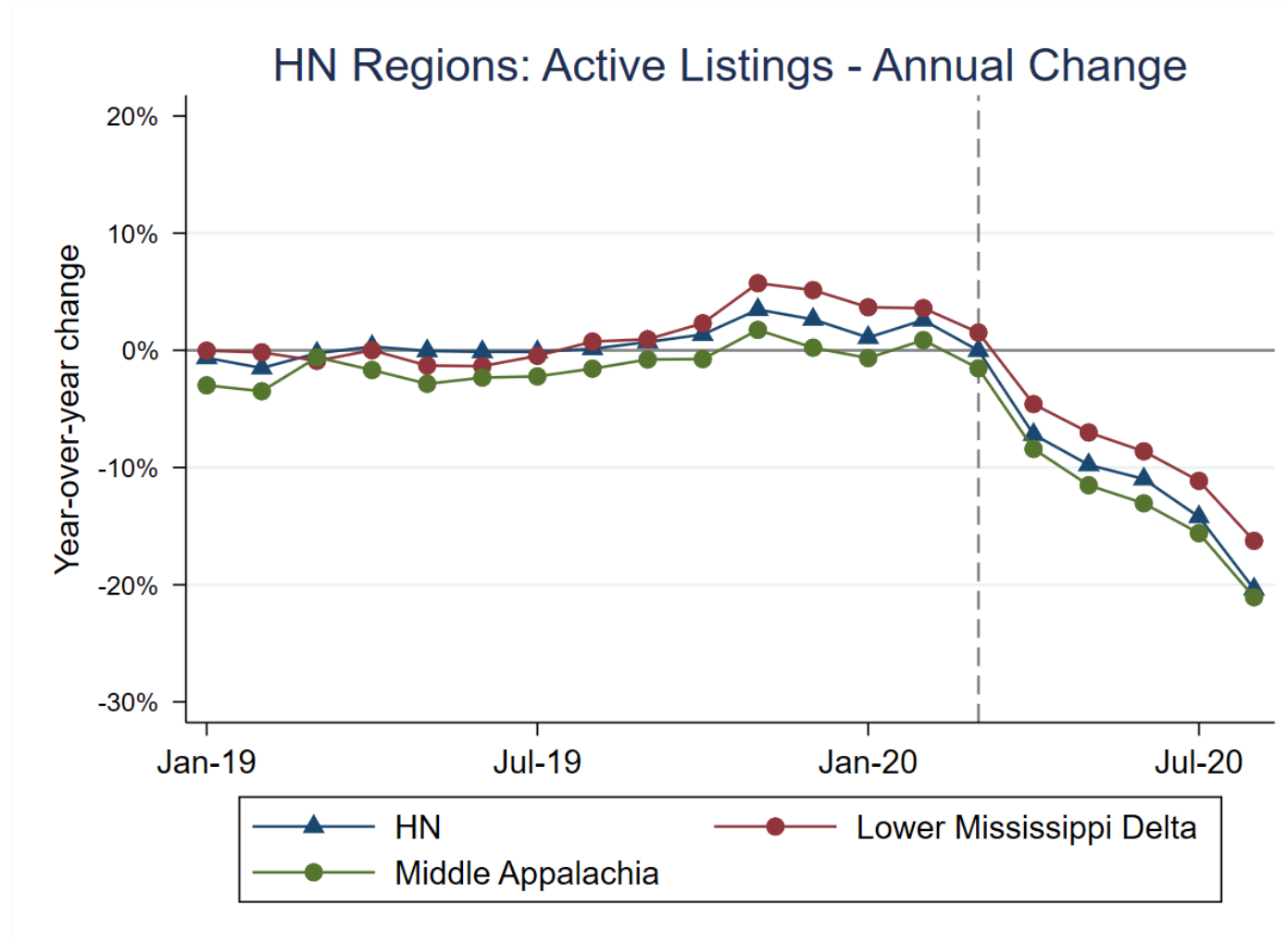
HN Regions: Median Sale Price



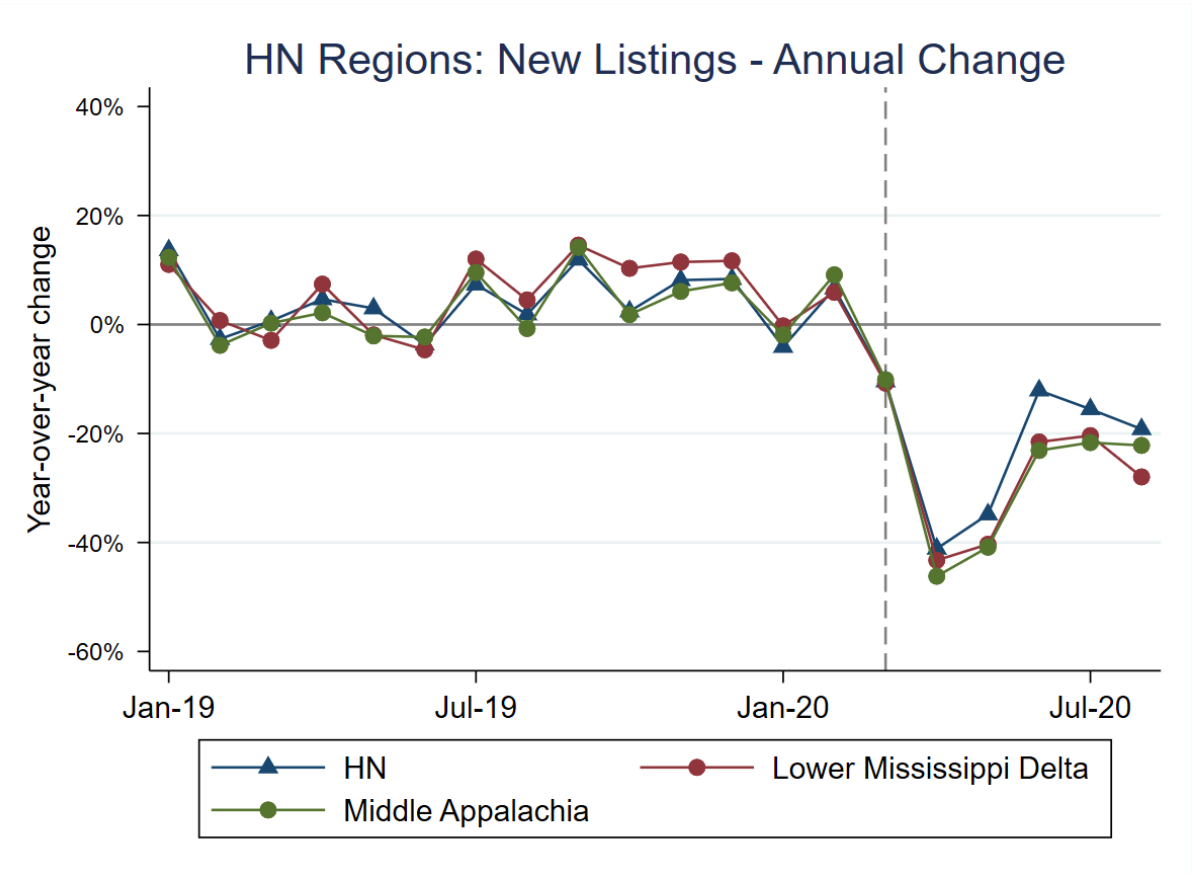
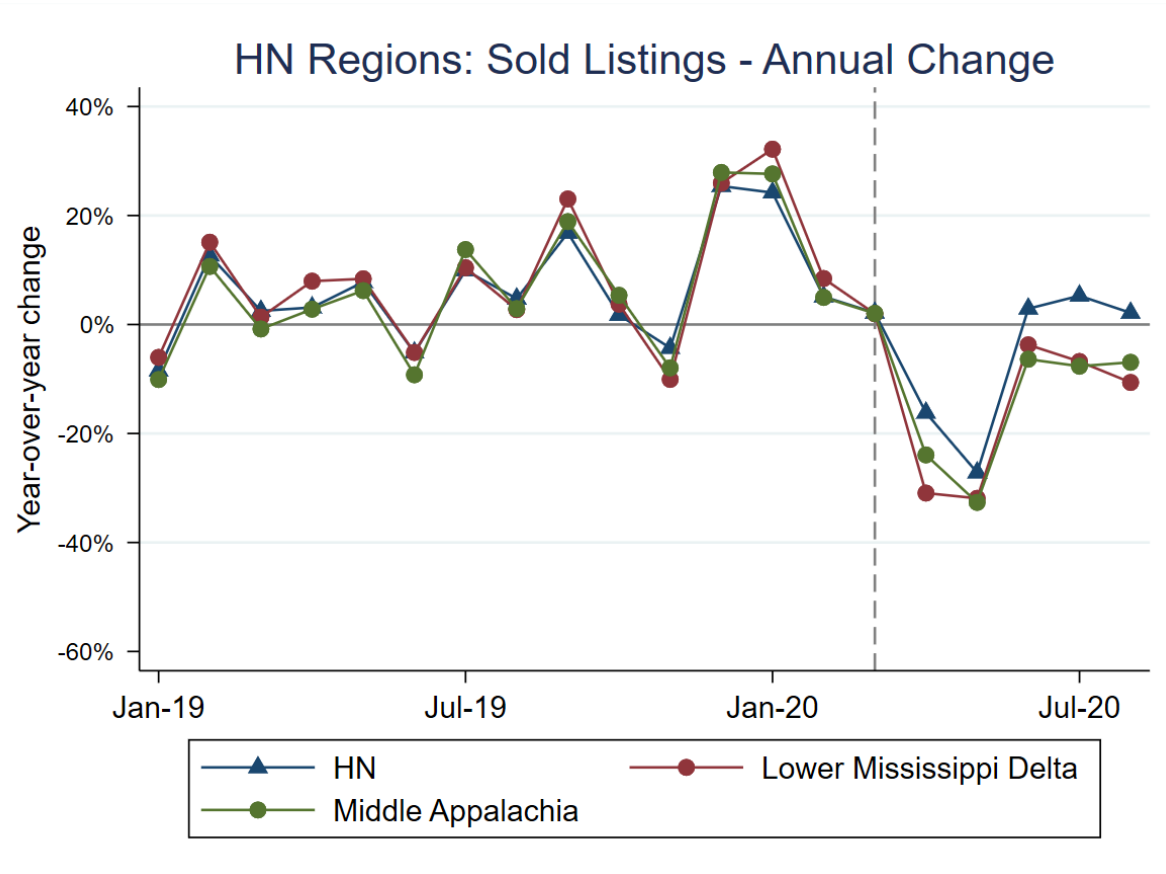
HN Regions: Median Sale Price - Annual Change



All the High-Needs Rural Areas Show Similar Trends in Inventory



Weaker Rebound in Annual Growth for New and Sold Listings in Lower Mississippi Delta and Middle Appalachia than the Overall High-Needs





Conclusion

- After the pandemic hit, median sale price rebounded after initial drop in both metro and rural areas.
- Home sales in the other rural rebounded stronger than high-needs rural and metro areas.
- Annual growth for new listings has not rebounded in the rural areas as in the metro area.
- Housing inventory declined faster in rural areas than metro areas. However, condo inventory in the metro areas increased.
- Local high-needs rural area showed diverse recovery pattern which requires more investigation.



Thank You

Discussant & Q&A

Steve Guggenmos, Vice President, Freddie Mac

RURAL RESEARCH SYMPOSIUM

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