

# RUPRI Center for Rural Health Policy Analysis

## Rural Data Brief

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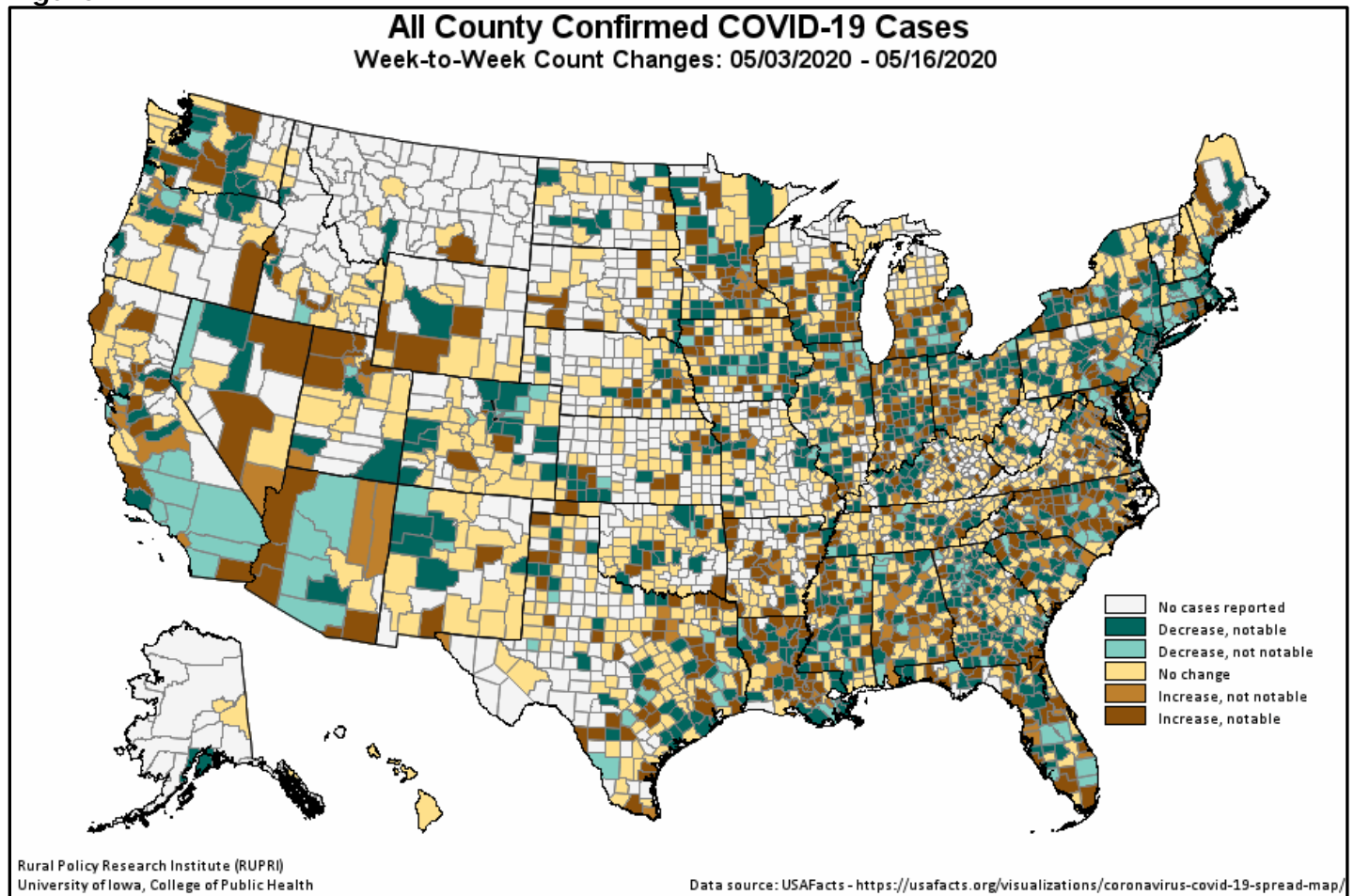
### County-Level 14-Day COVID-19 Case Trajectories

Fred Ullrich, BA; and Keith Mueller, PhD

#### Background

As government and health officials evaluate preparedness for reducing community-level COVID-19 mitigation measures, one of the key “gating” indicators cited by the Centers for Disease Control and Prevention is the “downward trajectory (or near-zero incidence) of documented cases over a 14-day period.<sup>1</sup>” This data brief looks at the new case counts in every US county (n = 3,142) between May 3, 2020, and May 16, 2020, to quantitatively evaluate 14-day trends in metropolitan, nonmetropolitan, and noncore counties.

Figure 1.



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RUPRI Center for Rural Health Policy Analysis,  
University of Iowa College of Public Health, Department of Health Management and Policy, 145 Riverside Dr., Iowa City, IA 52242-2007, (319) 384-3830  
<http://www.public-health.uiowa.edu/rupri>  
E-mail: [cph-rupri-inquiries@uiowa.edu](mailto:cph-rupri-inquiries@uiowa.edu)

## Data Methods

Although it is easy to imagine what a downward trajectory of cases would look like, county-level data rarely provide such clear-cut evidence of trend. Especially in counties with a smaller number of cases (nonmetropolitan and noncore counties in particular), the 14-day distribution of new daily cases shows multiple peaks and valleys where a trend may be difficult to discern. A statistical approach examining a trend can be employed, but because the analysis involves 3,142 tests (i.e., one for each county) the results are open to criticism for performing “multiple comparisons” where erroneous inferences are more likely to occur because of the large number of inferences made. This report employs a simpler approach to assessing 14-day trends by comparing the number of new cases in the first week of the period with the number of new cases in the second week. This method helps smooth some of the daily peaks and valleys that make trend determination troublesome.

Data on confirmed COVID-19 cases were obtained from USAFacts.org<sup>2</sup>. The number of cases in each county was aggregated for each week in the two-week period, and the totals for each week were compared. To minimize the impact of counties with very minor real variation in weekly counts, those with a change in case count of two or fewer (either increase or decrease) were coded as “Same number, both weeks.” Counties that saw more than a 25 percent increase or decrease in number of cases between the weeks were labelled “notable” (including counties that went from 3 or more to none [notable decrease] and counties that went from none to 3 or more [notable increase]). Counties in the 50 states and the District of Columbia were classified as metropolitan, nonmetropolitan, or noncore based on Urban Influence Codes<sup>3</sup>.

## Findings

Table 1 shows that for the 2-week period the trend percentages were different for all 3 types of counties, but that the general trend directions were somewhat similar for all: the plurality of counties showed increases or decreases (in roughly equal proportions) in the number of new cases from week 1 to week 2. Counties with absolute changes of two or fewer in case counts were considered to have the same number of cases in both weeks, and such counties *may* be in a plateau. The differences in magnitude of percentages are attributed to the larger number of nonmetropolitan and noncore counties with no or few cases.

**Table 1. 14-day trends<sup>a</sup> in newly confirmed COVID-19 cases, by county geography**

	<b>Metropolitan (n = 1,166)</b>	<b>Nonmetropolitan (n = 641)</b>	<b>Noncore (n = 1,335)</b>
No cases reported	58 (5.0%)	79 (12.3%)	516 (38.6%)
Decreasing, notable <sup>b</sup>	312 (26.8%)	154 (24.0%)	152 (11.4%)
Decreasing, not notable	123 (10.5%)	16 (2.5%)	13 (1.0%)
Same number, both weeks <sup>c</sup>	303 (26.0%)	265 (41.3%)	500 (37.4%)
Increasing, not notable	79 (6.8%)	10 (1.6%)	9 (0.7%)
Increasing, notable	291 (25.0%)	117 (18.3%)	145 (10.9%)

<sup>a</sup>Comparison of number of new cases in first week of 14-day period with number of new cases in second week.

<sup>b</sup>“Notable” trends indicate weekly changes in new cases exceeding (either increasing or decreasing) 25 percent.

<sup>c</sup>Includes counties with an absolute change in count of two or fewer.

Table 2 shows changes in confirmed case counts, limited to counties with any days with new cases during the 14-day period. Many more nonmetropolitan and noncore counties are shown in the “Same number...” row, but that distribution is likely driven in part by the lower number of cases in the lower population counties. Higher proportions of both nonmetropolitan and noncore counties showed increases in confirmed cases of 100 percent or more.

**Table 2. 14-day trends<sup>a</sup> in newly confirmed COVID-19 cases, in counties with any cases, by county geography**

	<b>Metropolitan (n = 1,108 of 1,166)</b>	<b>Nonmetropolitan (n = 562 of 641)</b>	<b>Noncore (n = 819 of 1,335)</b>
<i>Any decrease</i>	435 (39.3%)	170 (30.2%)	165 (20.2%)
Notable decrease <sup>b</sup>	312 (28.2%)	154 (27.4%)	152 (18.6%)
Same number, both weeks <sup>c</sup>	303 (27.3%)	265 (47.1%)	500 (61.1%)
<i>Any increase</i>	370 (33.4%)	127 (22.6%)	154 (18.8%)
Notable increase <sup>b</sup>	291 (26.3%)	117 (20.8%)	145 (17.7%)
Increase of 100% or more	147 (13.3%)	97 (17.3%)	129 (15.8%)

<sup>a</sup>Comparison of number of new cases in first week of 14-day period with new cases in second week.

<sup>b</sup>“Notable” trends indicate weekly changes in new cases exceeding (either increasing or decreasing) 25 percent.

<sup>c</sup>Includes counties with an absolute change in count of two or fewer.

## Summary

For the 14-day period ending May 16, 2020, the proportion of counties seeing any decreases or notable decreases in the number of COVID-19 cases exceeds the proportion seeing any or notable increases. But 20.1 percent of all counties saw an increase in the number of reported cases. Of potentially larger concern is that 22.2 percent of counties with any cases during the period saw a notable increase (25 percent or more) in the number of cases. A further concern is the number of counties where the count of confirmed COVID-19 cases increased 100 percent or more (15.0 percent of all counties). Note that some of these dramatic percentage increases can be driven by relatively low changes in the number of new cases (e.g., in counties with a relatively small number of cases during the first week of the period).

The distribution of COVID-19 cases across the United States is uneven both within and across county metropolitan/nonmetropolitan categories. A number of potential vectors for spread of the disease – including nursing homes, correctional facilities, food processing facilities, and transportation hubs – have been identified. The impact of outbreaks at any of those facilities can have a profound impact on the disease rate in a less populous county, regardless of whether employees in those facilities live in, or commute to, their place of employment.

There are limitations to the data used in this report. Case reporting is uneven across and within states, with some evidence that reported numbers are undercounts<sup>4</sup>. Further, the number of confirmed COVID-19 cases reported by any geography is likely to be heavily influenced by the amount of testing conducted in that area. Testing practices and patterns vary by state, with wide variations in testing capacity and strategies. Targeted intensive testing in response to isolated outbreaks (such as in correctional facilities or nursing homes) can lead to increased case counts. Data on testing has been difficult to obtain, so the impact that testing has on the findings in this report is unknown.

Updated maps and tables from this document will be produced weekly and posted to:

[https://ruprihealth.org/publications/policybriefs/2020/COVID\\_Projects.html](https://ruprihealth.org/publications/policybriefs/2020/COVID_Projects.html)

The maps on the following pages show the trend directions and strength for metropolitan and nonmetropolitan counties.

Figure 2.

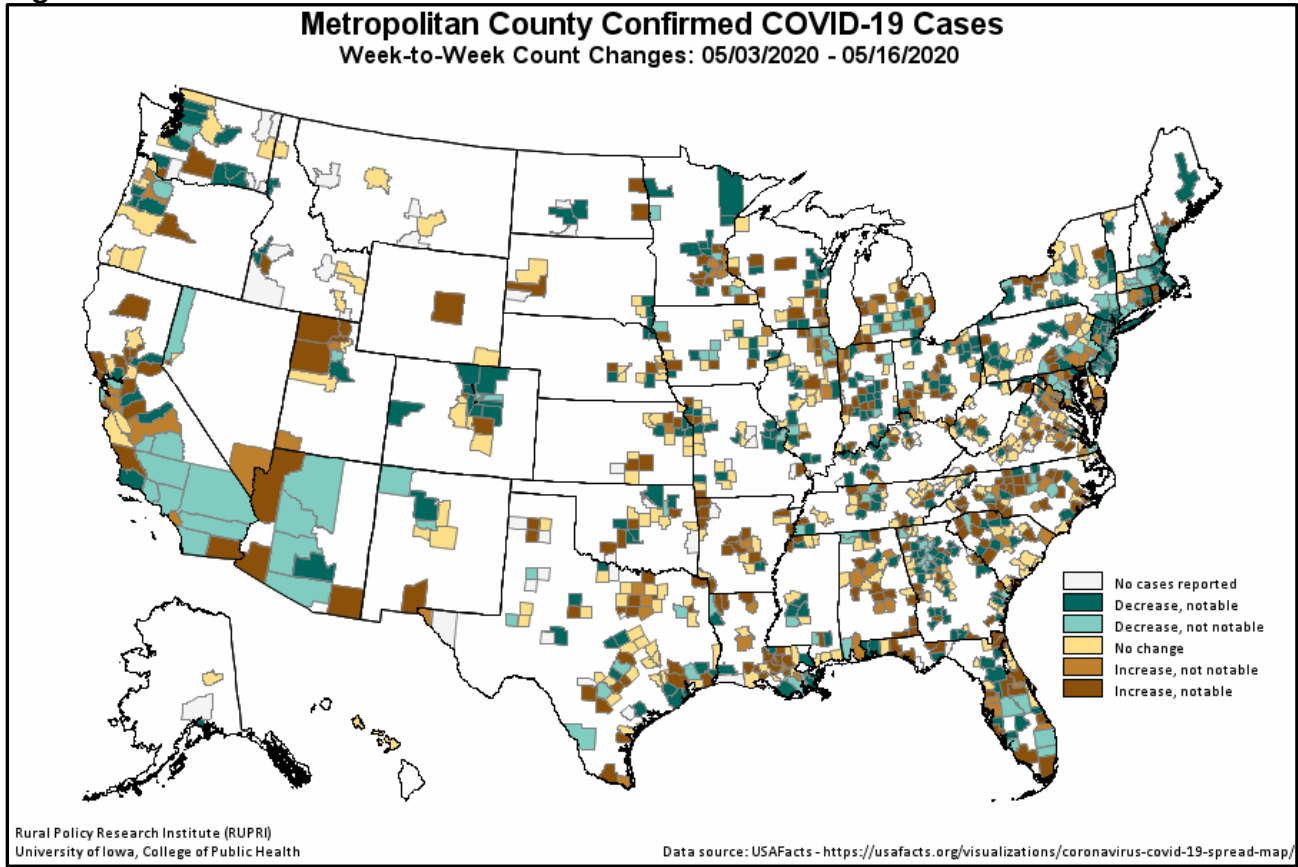


Figure 3.

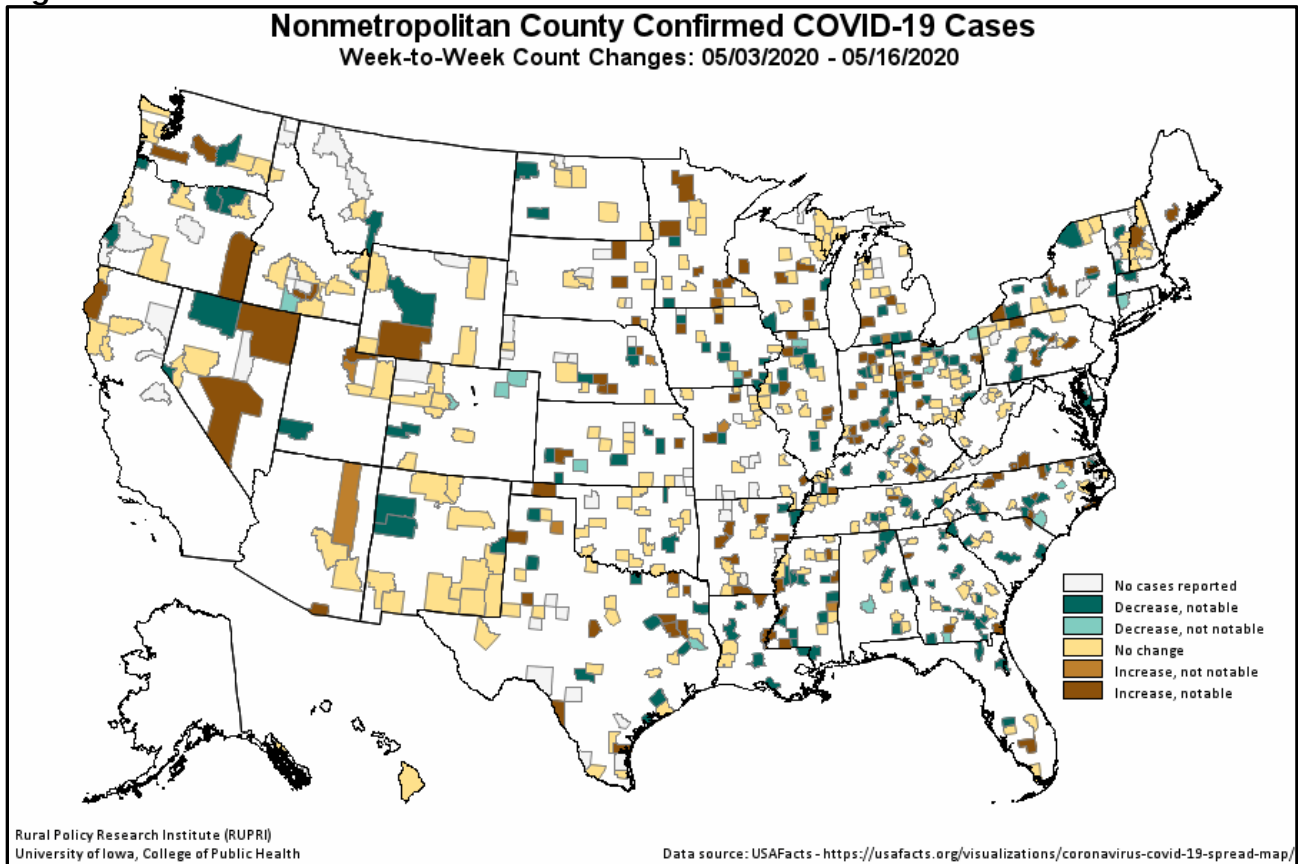
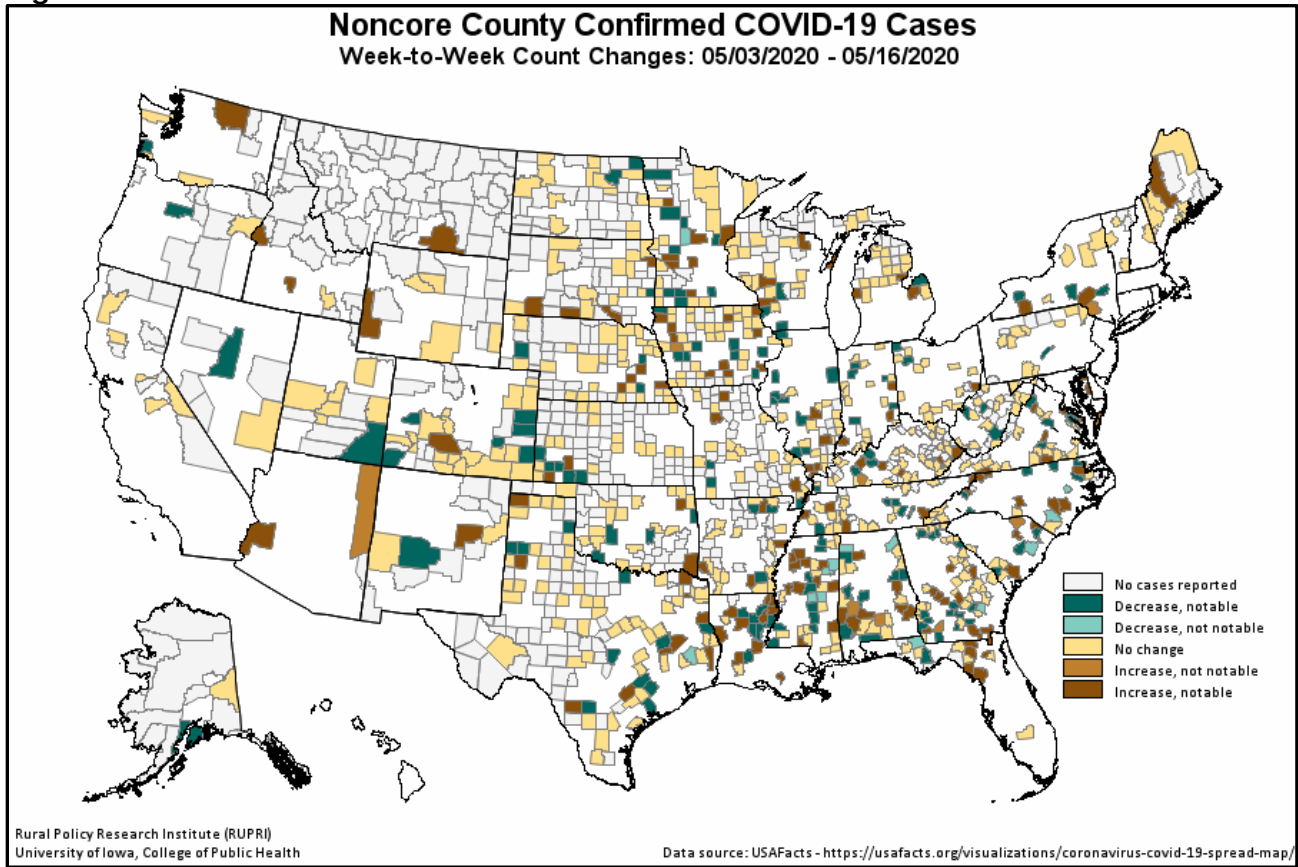


Figure 4.



## Endnotes

- <sup>1</sup> Centers for Disease Control and Prevention (2020). "CDC Activities and Initiatives Supporting the COVID-19 Response and the President's Plan for Opening America Up Again." Retrieved May 20, 2020 from <https://www.cdc.gov/coronavirus/2019-ncov/downloads/php/CDC-Activities-Initiatives-for-COVID-19-Response.pdf>.
- <sup>2</sup> USAFacts.org (2020). "Coronavirus Locations: COVID-19 Map by County and State." Data retrieved from <https://usafacts.org/visualizations/coronavirus-covid-19-spread-map/>.
- <sup>3</sup> U.S. Department of Agriculture, Economic Research Service (2019). "Urban Influence Codes." Retrieved May 20, 2020 from <https://www.ers.usda.gov/data-products/urban-influence-codes/>.
- <sup>4</sup> The New York Times (2020). "U.S. Coronavirus Death Toll Is Far Higher Than Reported, C.D.C. Data Suggests." Retrieved May 20, 2020 from <https://www.nytimes.com/interactive/2020/04/28/us/coronavirus-death-toll-total.html>.