COVID-19 Cases and Deaths, Metropolitan and Nonmetropolitan Counties Over Time *(update)*

Fred Ullrich, BA; and Keith Mueller, PhD

Purpose
This data brief compares 7-day moving average COVID-19 incidence and mortality rates between metropolitan, micropolitan, and noncore counties in the United States. It contains a table, plots, and maps depicting metropolitan and nonmetropolitan incidence and mortality rates as of March 9, 2023.

Data
Data on confirmed COVID-19 cases and deaths were obtained from the Johns Hopkins University COVID-19 Data Repository[1]. Daily case and death counts in counties were calculated using a 7-day rolling average and total population data, obtained from the 2018 American Community Survey 5-year estimates[2], were used to calculate rates. Counties (or equivalents) in the 50 states and the District of Columbia were classified as metropolitan, nonmetropolitan, or noncore based on Urban Influence Codes[3]. Metropolitan counties are those with one or more urban areas with 50,000 or more people; or outlying counties economically tied to core counites as measured by labor-force commuting. All other counties are considered nonmetropolitan which may further be divided into "micropolitan" counties (those nonmetropolitan counties with an urban area with 10,000-49,999 people and economically-tied outlying counties) and "noncore" counties (those with no urban area of 10,000 or more people and not economically tied to metropolitan or micropolitan counties).[4]

Results
The earliest surge in the pandemic (Spring 2020) largely took place in metropolitan areas (both incidence and mortality). The second surge (Summer 2020) saw increases in incidence and mortality in both metropolitan and nonmetropolitan areas. However, it was at that time that nonmetropolitan incidence and mortality rates surpassed those in metropolitan areas. Both rates were higher in nonmetropolitan areas during the third surge until its peak in January 2021. Following that peak, metropolitan and nonmetropolitan rates declined in similar fashion with incidence rates (for both geographies) levelling off in the spring and then declining until July 2021. At that time incidence rates started rising sharply with mortality rates following suit in August. That surge peaked in late September, with incidence and mortality rates remaining much higher in nonmetropolitan counties than those in metropolitan counties. Winter 2021-2022 saw another abrupt surge with metropolitan county case and mortality rates, and nonmetropolitan county case rates at their highest level ever. All rates started a sharp decline in mid-January ending with another brief case surge from April to August 2022. Currently, cumulative and 7-day case rates are higher in metropolitan counties, while cumulative mortality rates are higher in nonmetropolitan counties. The 7-day mortality rates are roughly similar in the two county types.

Table 1: Cumulative and 7-day incidence and mortality rates[*], metropolitan/nonmetropolitan

Period Ending...	Metropolitan				Nonmetropolitan			
	Cases		Deaths		Cases		Deaths	
	Cumul.	7-day	Cumul.	7-day	Cumul.	7-day	Cumul.	7-day
04/01/2020	76.78	7.62	2.15	0.25	17.40	1.82	0.42	0.05
06/01/2020	599.31	6.43	36.41	0.32	292.19	5.30	11.16	0.17
08/01/2020	1,484.87	19.29	51.88	0.34	967.06	17.11	22.43	0.36
10/01/2020	2,276.77	11.68	66.87	0.20	1,946.91	17.97	43.09	0.34
11/01/2020	2,828.61	23.92	73.19	0.23	2,814.35	35.75	56.61	0.51
12/01/2020	4,166.40	49.63	84.07	0.44	4,646.51	60.52	80.05	0.88
01/01/2021	6,153.34	63.38	106.10	0.74	6,675.32	60.20	117.19	1.08
02/01/2021	8,047.23	45.52	134.09	0.93	8,343.80	41.32	153.86	1.16
03/01/2021	8,776.74	21.13	153.62	0.62	8,967.42	17.80	175.49	0.65
04/01/2021	9,380.56	21.20	164.84	0.27	9,433.32	14.18	186.82	0.25
05/01/2021	9,968.53	15.65	171.85	0.22	9,866.35	13.17	194.85	0.22
06/01/2021	10,242.66	5.26	177.25	0.18	10,131.20	5.38	200.89	0.26
07/01/2021	10,358.78	3.92	179.94	0.07	10,272.10	5.12	204.74	0.10
08/01/2021	10,773.20	24.94	182.05	0.10	10,666.47	23.80	207.93	0.13
09/01/2021	12,062.66	48.15	188.63	0.32	12,282.59	66.81	220.33	0.59
10/01/2021	13,247.70	32.33	201.24	0.44	14,134.53	54.51	246.70	0.93
11/01/2021	13,942.46	20.72	212.44	0.31	15,267.49	33.08	270.54	0.68
12/01/2021	14,685.07	25.13	220.87	0.24	16,392.18	34.62	288.97	0.55
12/15/2021	15,183.66	35.44	225.92	0.34	17,011.51	42.20	301.21	0.67
01/01/2022	16,681.41	132.64	232.26	0.37	17,778.16	59.75	313.08	0.60
01/15/2022	20,026.96	252.77	248.33	1.82	19,975.82	184.04	326.13	1.12
02/01/2022	22,982.06	130.67	259.66	0.72	23,134.63	161.62	339.17	0.90
02/14/2022	23,752.70	46.75	269.08	0.75	24,158.39	59.81	351.25	0.97
03/01/2022	24,076.07	17.72	276.69	0.52	24,640.21	25.96	363.91	0.89
03/15/2022	24,224.25	9.34	281.96	0.43	24,845.06	11.11	372.05	0.60
04/01/2022	24,390.53	8.64	286.39	0.25	24,978.88	6.54	380.38	0.52
04/15/2022	24,545.18	10.79	288.11	0.13	25,062.57	6.13	383.11	0.22
05/01/2022	24,775.99	16.74	289.58	0.09	25,186.82	10.24	385.29	0.15
05/15/2022	25,118.23	26.30	291.09	0.09	25,357.65	14.35	387.83	0.14
06/01/2022	25,717.71	29.28	292.84	0.08	25,682.06	17.12	390.30	0.12
06/15/2022	26,177.50	28.18	294.26	0.09	25,978.39	21.18	391.91	0.10
07/01/2022	26,760.68	38.71	295.89	0.13	26,365.22	26.31	393.74	0.13
07/15/2022	27,266.63	42.17	297.14	0.10	26,788.97	33.18	395.46	0.15
08/01/2022	27,880.34	42.09	298.76	0.11	27,342.05	35.24	397.87	0.14
08/15/2022	28,346.74	35.45	301.26	0.14	27,831.72	33.54	400.50	0.17
09/01/2022	28,810.48	27.39	303.75	0.18	28,412.38	31.20	404.10	0.25
09/15/2022	29,080.79	20.33	305.54	0.13	28,730.18	21.42	406.42	0.19
10/01/2022	29,316.97	13.59	307.08	0.11	28,979.67	14.91	409.40	0.23
10/15/2022	29,482.18	10.68	308.43	0.09	29,149.49	11.71	411.67	0.13
11/01/2022	29,673.47	11.95	310.89	0.23	29,342.18	13.35	415.24	0.34
11/15/2022	29,844.12	12.86	312.24	0.12	29,507.66	12.57	417.21	0.15
12/01/2022	30,083.49	15.47	313.94	0.11	29,721.29	14.00	419.44	0.14
12/15/2022	30,368.50	19.37	315.75	0.15	29,955.33	16.74	421.90	0.21
01/01/2023	30,649.36	15.70	317.33	0.10	30,186.59	14.22	423.54	0.09
01/15/2023	30,928.20	16.51	319.75	0.23	30,438.06	16.49	426.10	0.26
02/01/2023	31,180.59	12.37	322.43	0.14	30,689.74	12.94	429.35	0.17
02/14/2023	31,315.82	10.81	323.62	0.11	30,820.71	11.87	431.21	0.16
03/01/2023	31,497.60	9.70	325.84	0.15	31,009.57	11.35	433.47	0.14
03/09/2023	31,579.28	9.84	326.58	0.08	31,085.82	9.18	434.35	0.12

* All rates are reported per 100,000 population.
All data in this brief are based on county-level counts to facilitate metropolitan/nonmetropolitan reporting. Cases and deaths that could not be attributed to a county are excluded. This means that national figures are undercounts.

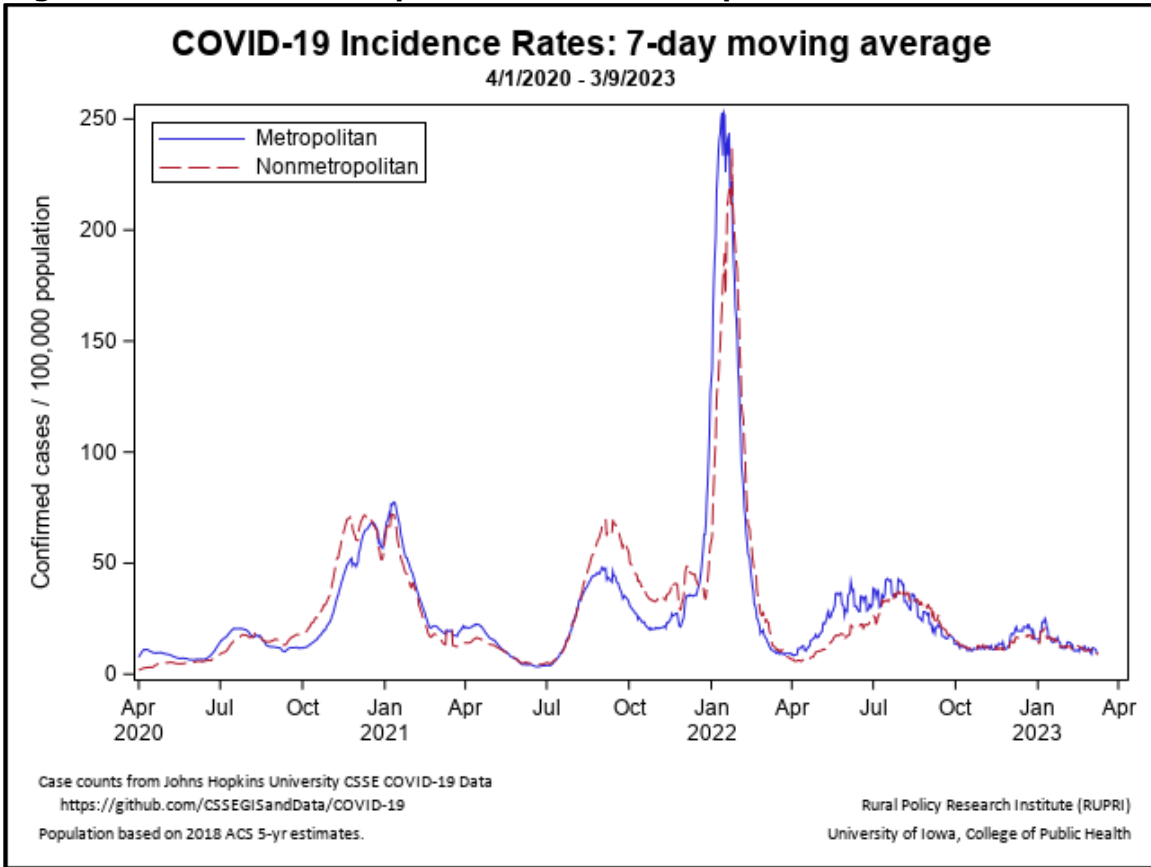**Figure 1. COVID-19 Metropolitan and Nonmetropolitan Incidence Rates**

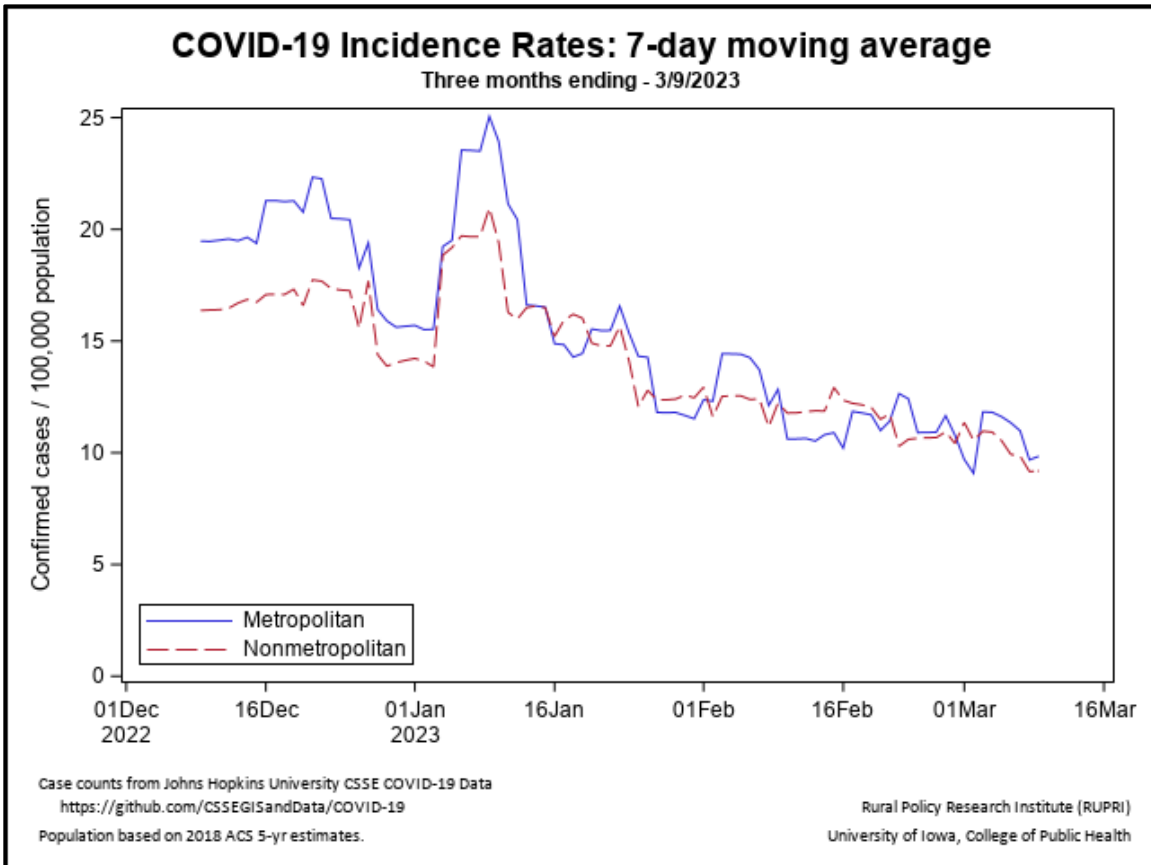**Figure 1b. COVID-19 Metropolitan and Nonmetropolitan Incidence Rates, Last Three Months**

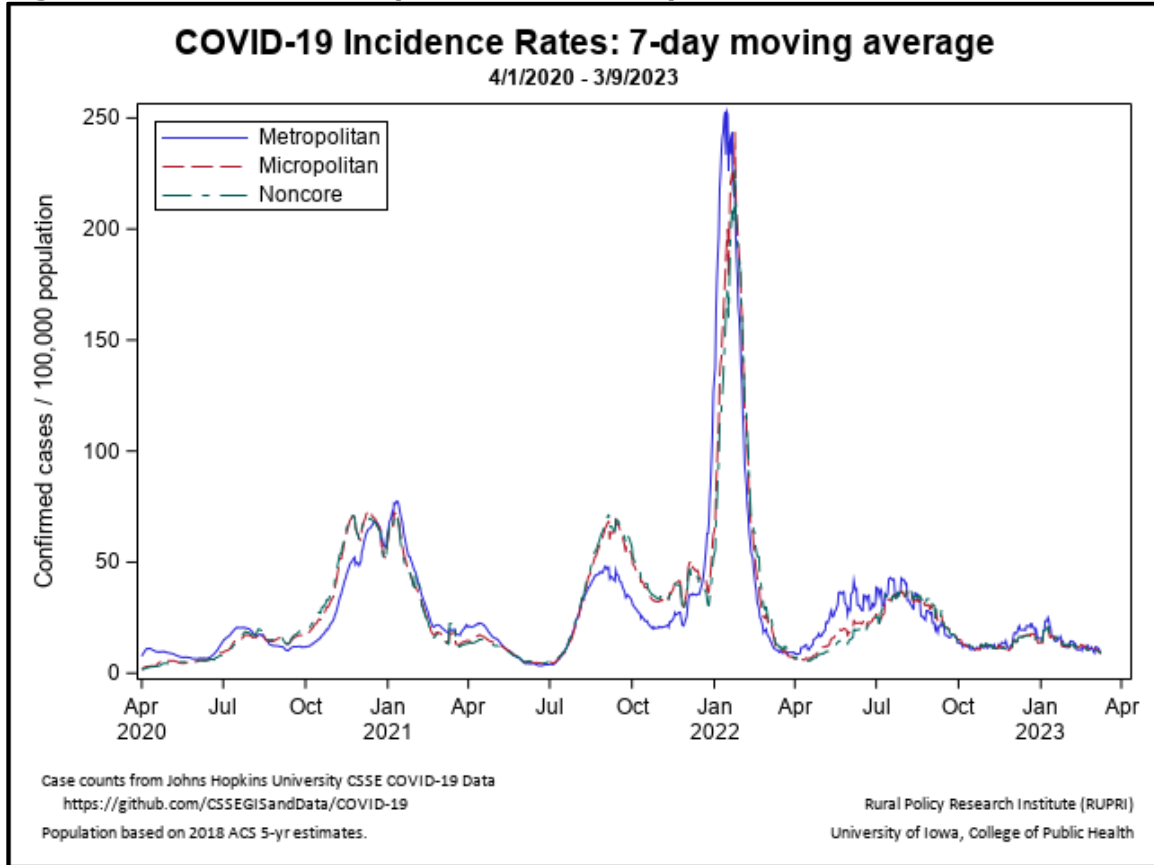**Figure 2. COVID-19 Metropolitan, Nonmetropolitan, and Noncore Incidence Rates**

COVID-19 Incidence Rates: 7-day moving average
4/1/2020 - 3/9/2023

Case counts from Johns Hopkins University CSSE COVID-19 Data
https://github.com/CSSEGISandData/COVID-19
Population based on 2018 ACS 5-yr estimates.

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Figure 3. COVID-19 Metropolitan and Nonmetropolitan Mortality Rates

COVID-19 Mortality Rates: 7-day moving average
4/1/2020 - 3/9/2023

Death counts from Johns Hopkins University CSSE COVID-19 Data
https://github.com/CSSEGISandData/COVID-19
Population based on 2018 ACS 5-yr estimates.

Rural Policy Research Institute (RUPRI)
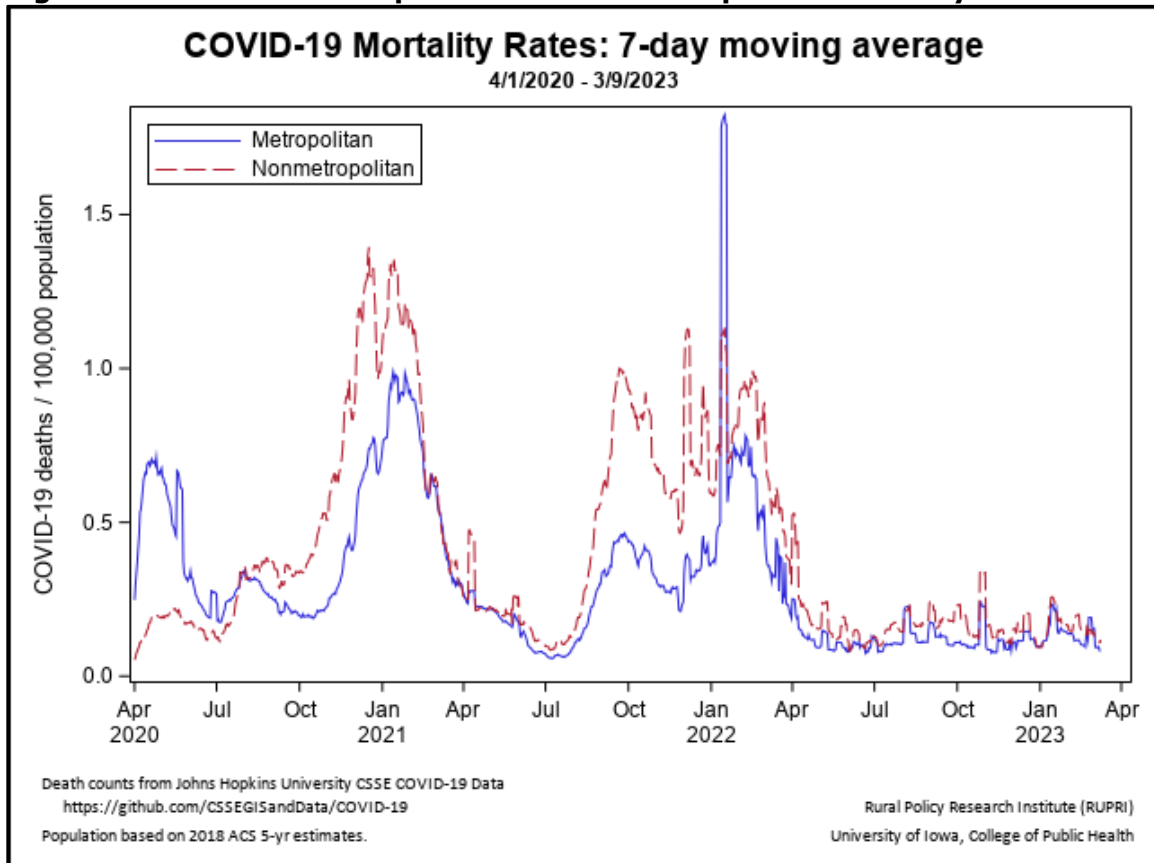University of Iowa, College of Public Health

Figure 3b. COVID-19 Metropolitan and Nonmetropolitan Mortality Rates, Last Three Months
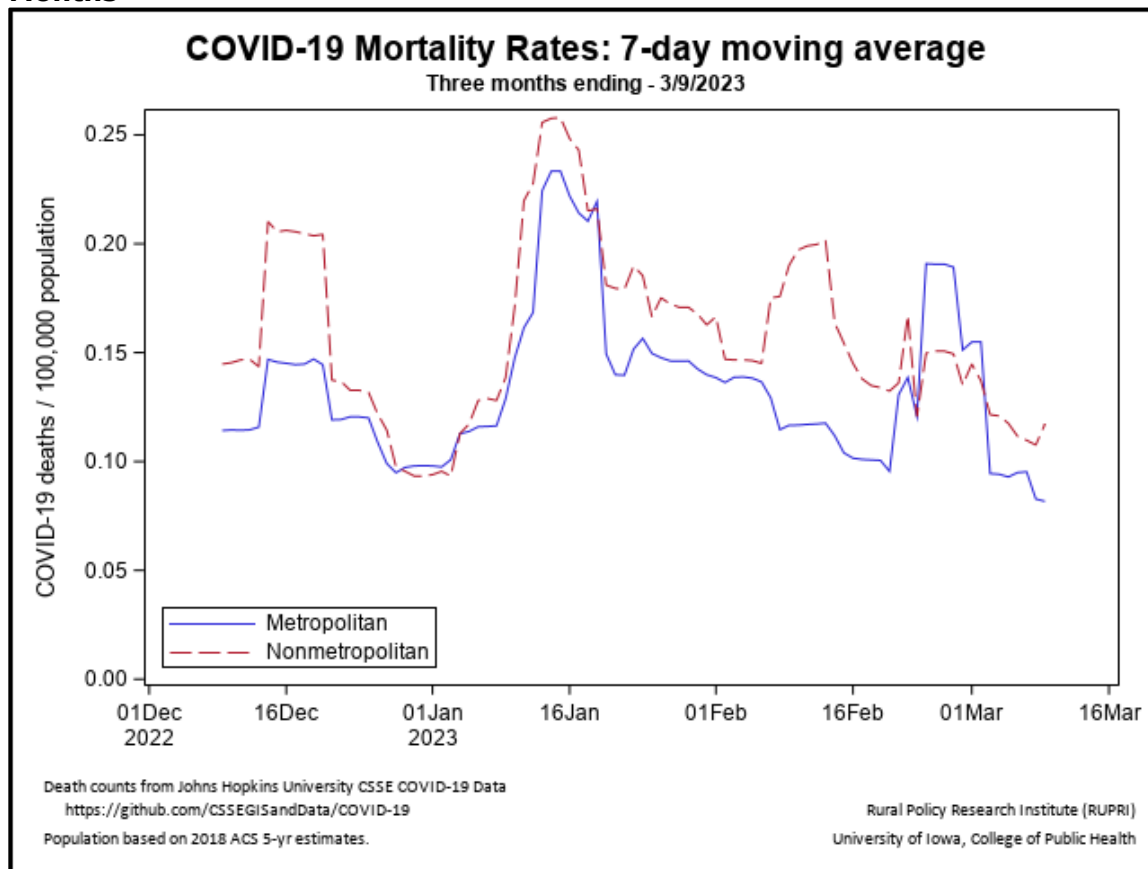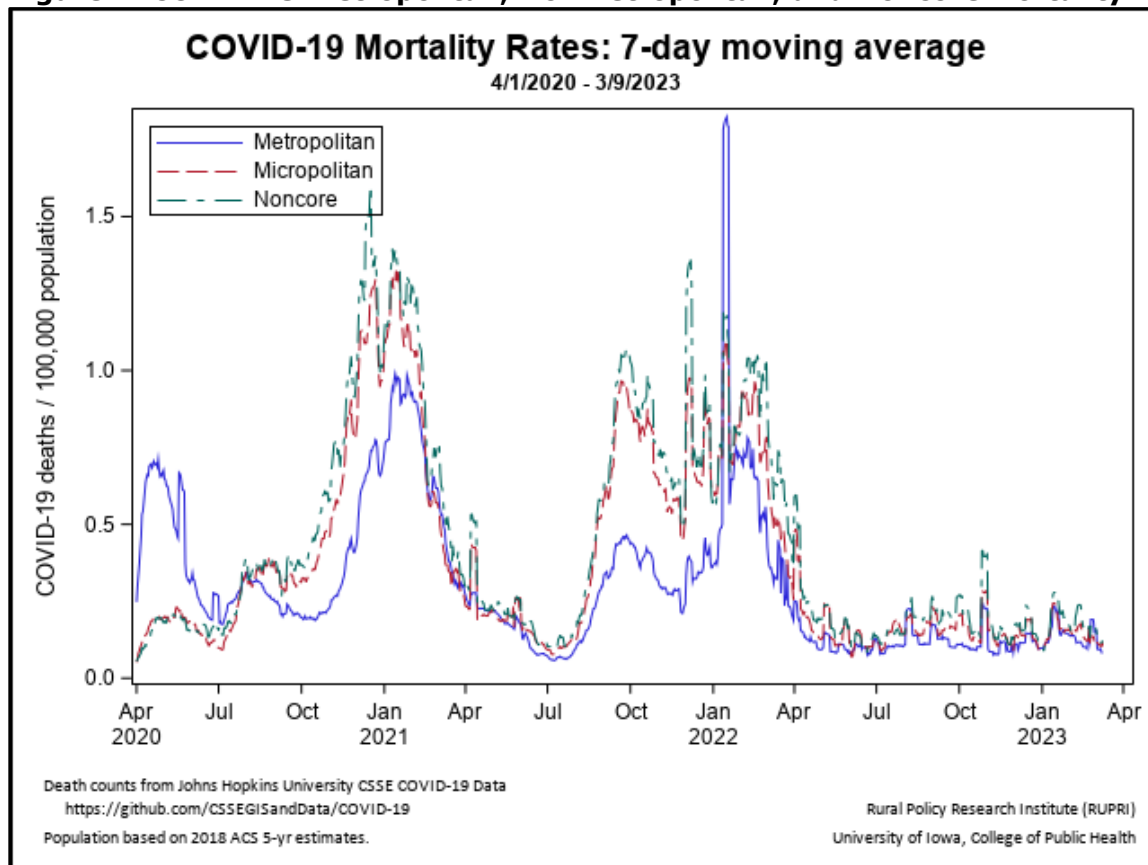

Figure 4. COVID-19 Metropolitan, Nonmetropolitan, and Noncore Mortality Rates

Data for this ongoing report has been sourced – since August 2020 – from the Johns Hopkins Coronavirus Resource Center. Citing consistent declines in public reporting of pandemic data from U.S. states, Johns Hopkins announced that it would cease data collection and reporting activities on March 10, 2023. We too have observed increasingly inconsistent data reporting and support that decision. The loss of this valuable data resource, coupled with the impending expiration of the public health emergency (currently set to expire May 11, 2023) has led to our decision to conclude regular reporting of COVID-19 incidence and mortality with this issue.

References

1. COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University. https://github.com/CSSEGISandData/COVID-19.

2. United States Census Bureau. American Community Survey (ACS). https://www.census.gov/programs-surveys/acs.

3. 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/.

4. U.S. Department of Agriculture, Economic Research Service (2019). "What is Rural?". Retrieved May 20, 2020 from https://www.ers.usda.gov/topics/rural-economy-population/rural-classifications/what-is-rural/.

Metropolitan and Nonmetropolitan COVID-19 Incidence Rates

Rolling 7-day Averages
3-Month Period Ending: 3/9/2023
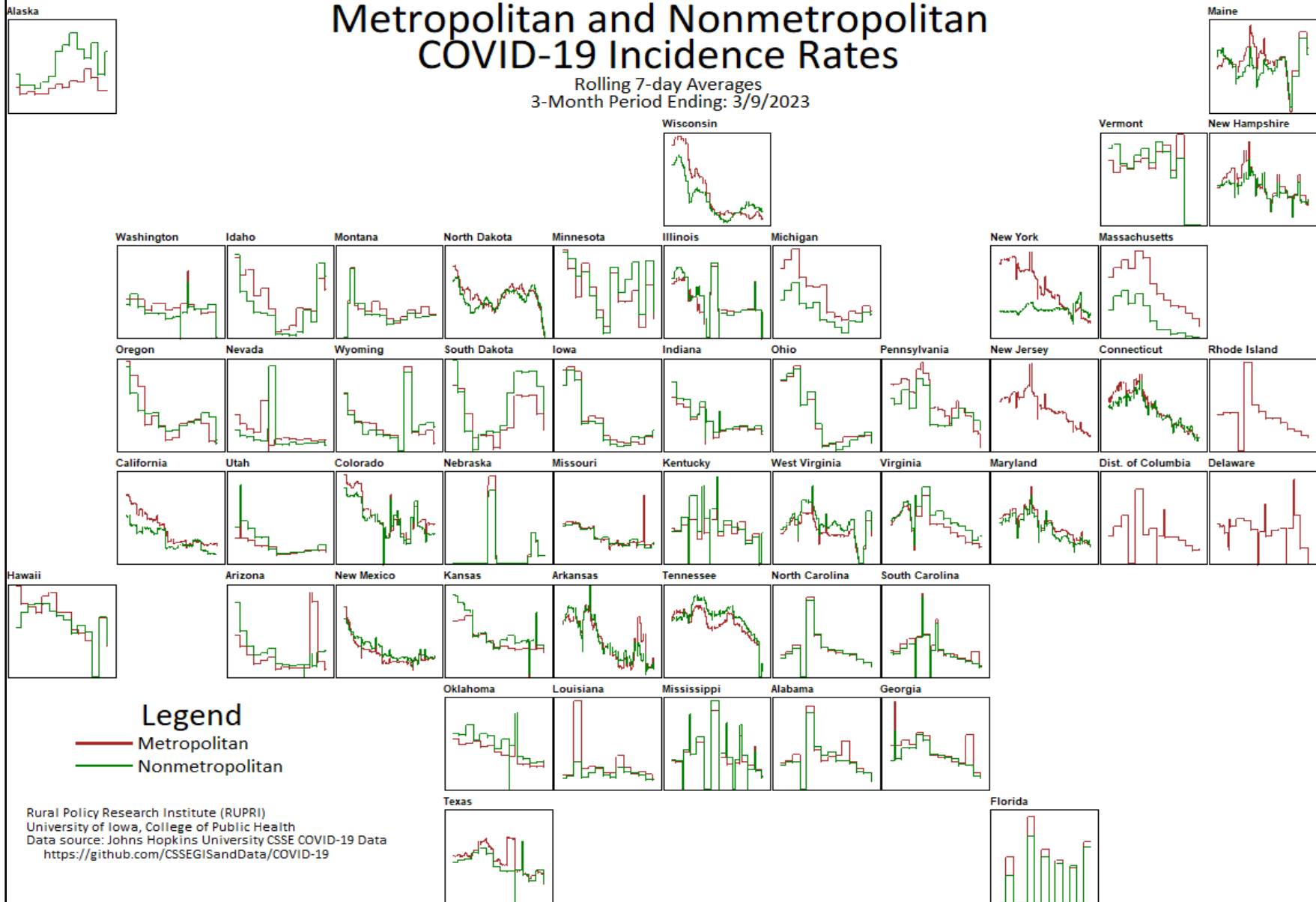
Legend
— Metropolitan
— Nonmetropolitan

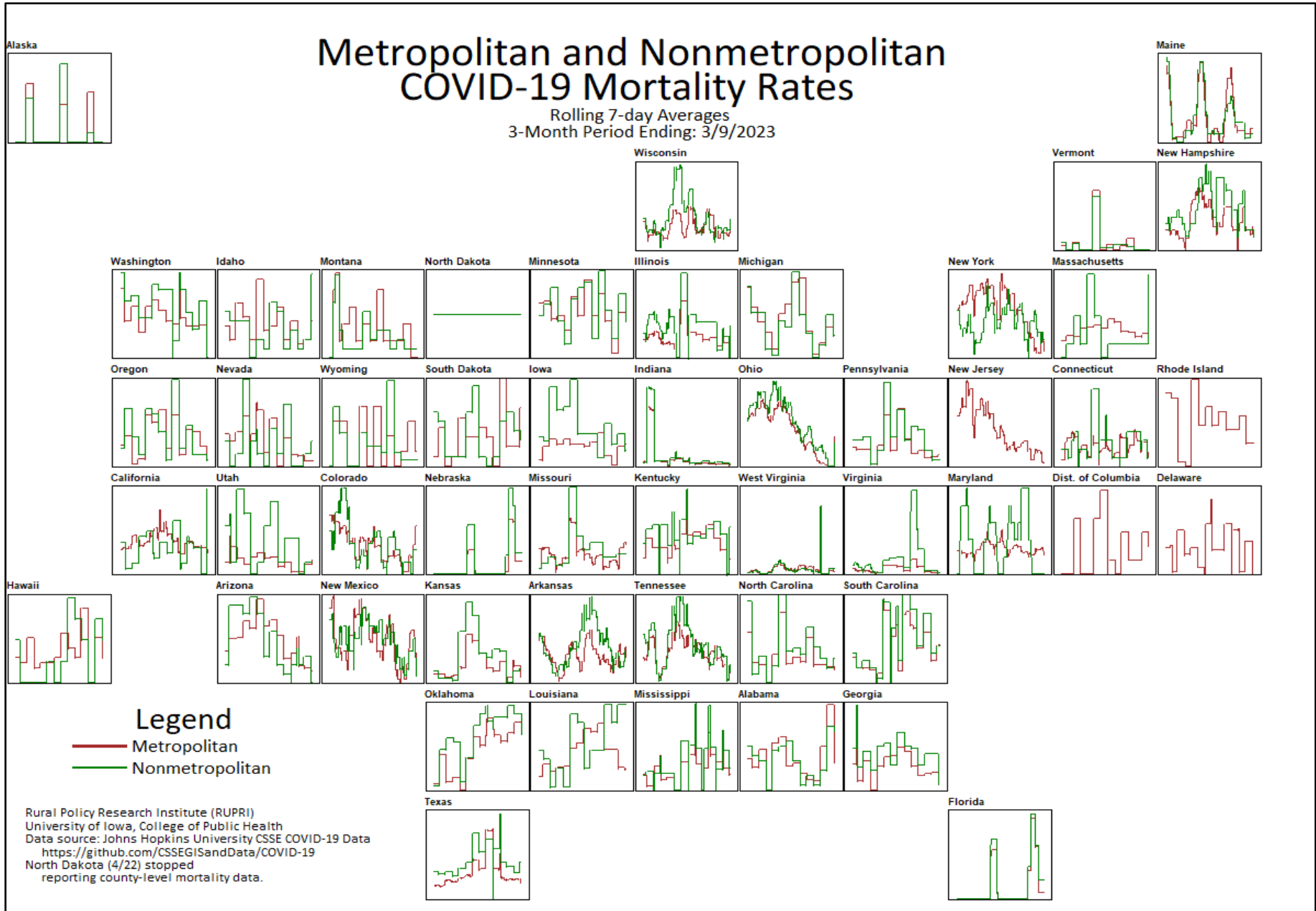Rural Policy Research Institute (RUPRI)
University of Iowa, College of Public Health
Data source: Johns Hopkins University CSSE COVID-19 Data
https://github.com/CSSEGISandData/COVID-19

Notes: 1. 'Y' scales vary between states. Graphic is not intended for comparison of absolute rates between states, but is intended to show general trend directions.
2. Delaware, District of Columbia, New Jersey, and Rhode Island have no nonmetropolitan counties.
3. Plots for states with relatively low counts or irregular reporting schedules will appear blocky.

Metropolitan and Nonmetropolitan COVID-19 Mortality Rates

Rolling 7-day Averages
3-Month Period Ending: 3/9/2023

Legend
— Metropolitan
— Nonmetropolitan

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Data source: Johns Hopkins University CSSE COVID-19 Data
    https://github.com/CSSEGISandData/COVID-19
North Dakota (4/22) stopped
    reporting county-level mortality data.

Notes: 1. 'Y' scales vary between states. Graphic is not intended for comparison of absolute rates between states, but is intended to show general trend directions.

2. Delaware, District of Columbia, New Jersey, and Rhode Island have no nonmetropolitan counties.

3. Plots for states with relatively low counts or irregular reporting schedules will appear blocky. Also, many states have stopped regular and/or frequent reporting of county-level mortality data. Total deaths for metropolitan and nonmetropolitan counts are likely undercounts.

4. North Dakota has not updated county-level mortality data.