

# District Data Brief

## Does Spending Slide When COVID-19 Surges?

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In his press conference after the July 2021 Federal Open Market Committee meeting, Federal Reserve Chair Jerome Powell stated that “[W]ith successive waves of COVID...there has tended to be...less in the way of economic implications from each wave. And we will see whether that is the case with the delta variety” (Board of Governors of the Federal Reserve System, 2021). In this *District Data Brief*, we show that state-level data suggest that, indeed, economic implications from the latest wave have been less than those from the fall 2020 wave. While there has been some consumer response to the delta-variant-driven COVID-19 surge, it has been weaker than the response to the fall 2020 COVID-19 surge.

The COVID-19 surge in the United States during the summer of 2021 has been attributed to the delta variant and is the largest and most widespread surge since the surge during November and December 2020. COVID-19-related hospitalizations rose in all states and the District of Columbia between July 25, 2021, and August 22, 2021. During these four weeks, the COVID-19 hospitalization rate in the United States rose by 18.2 hospitalizations per 100,000 residents, with the largest increases in the Southeast. Based on their hospitalization rates, two states in the Fourth Federal Reserve District,<sup>1</sup> Kentucky and West Virginia, have had especially strong delta-related surges. In fact, Kentucky had the fifth largest increase in hospitalization rate among states across the nation.

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<sup>1</sup> The Fourth Federal Reserve District encompasses all of Ohio, western Pennsylvania, eastern Kentucky, and the northern panhandle of West Virginia.

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**Table 1. COVID-19 Hospitalization Rates on July 25, 2021, and August 22, 2021**

	COVID-19 hospitalizations per 100,000 residents		
	July 25, 2021	August 22, 2021	Change
Kentucky	11.3	44.6	33.2
Ohio	7.1	19.5	12.3
Pennsylvania	4.7	13.7	9.0
West Virginia	7.8	29.0	21.1
United States	11.6	29.8	18.2

Sources: Authors' calculations with data from the Bureau of Economic Analysis (BEA) and Department of Health and Human Services (HHS).

To see how consumer activity has responded to the delta surge and to make comparisons with consumer activity during the fall 2020 surge, we look at the relationship between state-level changes in consumer activity and COVID-19 hospitalization rates during two four-week periods: November 8, 2020, to December 6, 2020, and July 25, 2021, to August 22, 2021. For convenience, we call these periods the fall surge and the delta surge, respectively. We measure the severity of states' surges with the four-week change in COVID-19 hospitalization rates. As a measure of surges, hospitalization rate is preferable to case rate because the measurement of cases depends on the extent of COVID-19 testing, which has varied across states and across time. Throughout the pandemic, testing has been widespread for patients who are hospitalized with COVID-19. Therefore, the measurement of hospitalizations has been more consistent across states and across time than the measurement of new COVID-19 cases.

Our measures of consumer activity are drawn from high-frequency data. Weekly card spending data come from Fiserv, Inc., and measure the dollar value of credit and debit card purchases at businesses within each state that uses Fiserv, Inc., to process card transactions (Fiserv, Inc., multiple years). We look at two types of seasonally adjusted card spending: bar and restaurant spending and overall retail spending (which includes spending at bars, restaurants, and bricks-and-mortar retail stores).<sup>2</sup> Google's Mobility Index gives a measure of how much time people are spending at home (Google LLC, multiple years). For the purposes of this brief, we're taking time at home to reflect the extent to which people are social distancing; time at home tends to rise if people are increasing their social distancing.<sup>3</sup>

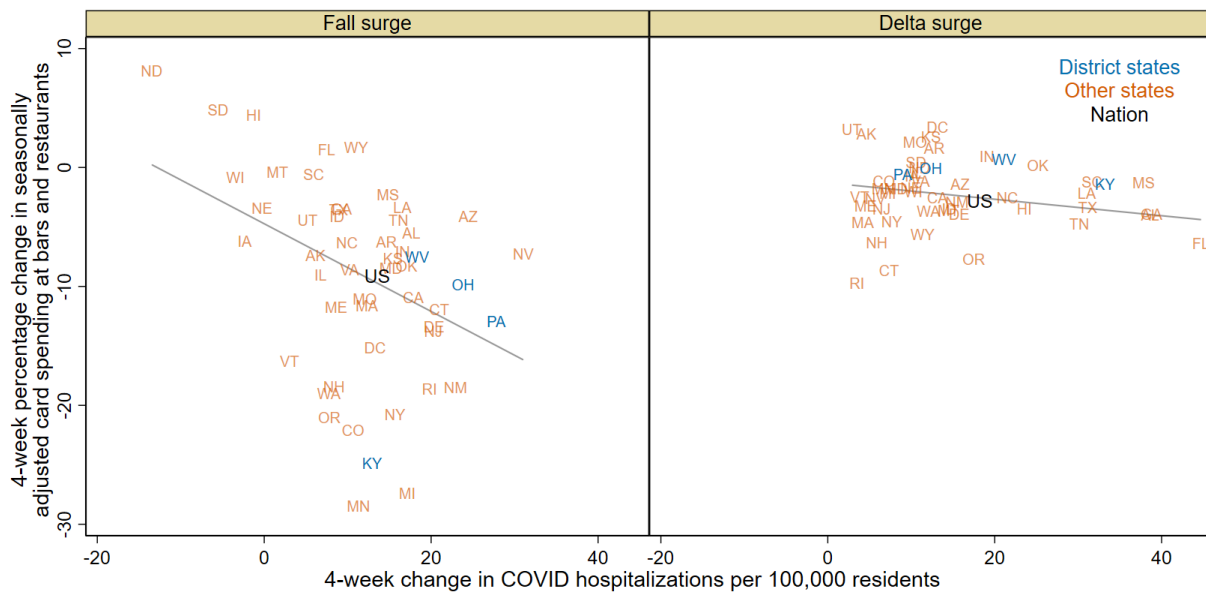
Figure 1 shows the four-week change in COVID-19 hospitalization rates on the horizontal axis and the four-week change in bar and restaurant spending on the vertical axis, with data for the fall surge in the left

<sup>2</sup> Bar and restaurant spending is card spending at businesses that are assigned North American Industry Classification System (NAICS) code 722. Overall retail spending is card spending at businesses assigned to any of the following NAICS codes: 4413, 442, 443, 445, 446, 448, 451, 452, 453, and 722.

<sup>3</sup> Neither time spent at home nor COVID-19 hospitalization rates are seasonally adjusted.

panel and data for the delta surge in the right panel. The gray line in each panel summarizes the relationship between the change in hospitalizations and the change in spending. These lines are drawn from the regressions discussed below.<sup>4</sup> These plots show that states with larger increases in COVID-19 hospitalization rates had larger declines in bar and restaurant spending than other states during both surges. However, the slope of the regression line is less steep during the delta surge than it was during the fall surge, a situation which shows that the drop in spending associated with a given increase in hospitalization rate has been smaller during the delta surge than it was during the fall surge.

**Figure 1. Four-week Changes in Bar and Restaurant Spending and COVID-19 Hospitalization Rates**

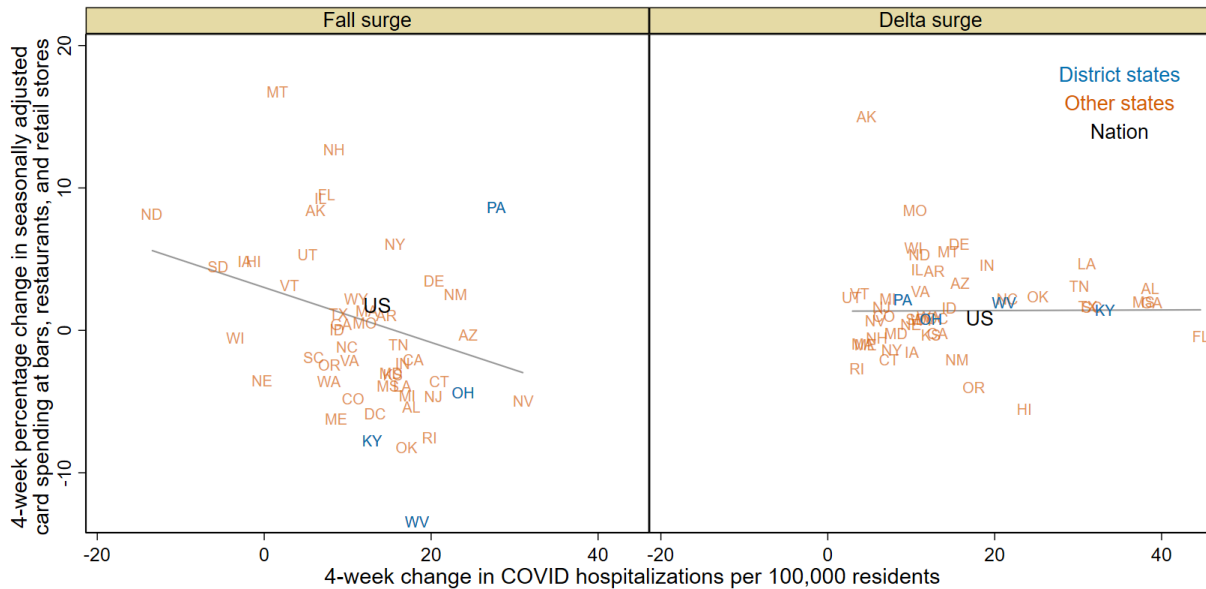


Sources: Authors' calculations with data from the BEA; the COVID Tracking Project at *The Atlantic*; Fiserv, Inc.; and the HHS.

<sup>4</sup> When estimating the regressions, we weighted the state-level data by the square root of state population to account for the fact that the changes are less precisely estimated for smaller states.

Figure 2 shows a similar set of plots for overall retail spending. During the fall surge, the states that had large increases in hospitalization rates tended to have relatively large declines in overall retail spending, but during the delta surge, there was no relationship between the severity of the surge and the change in overall retail spending.

**Figure 2. Four-week Changes in Overall Retail Spending and COVID-19 Hospitalization Rates**

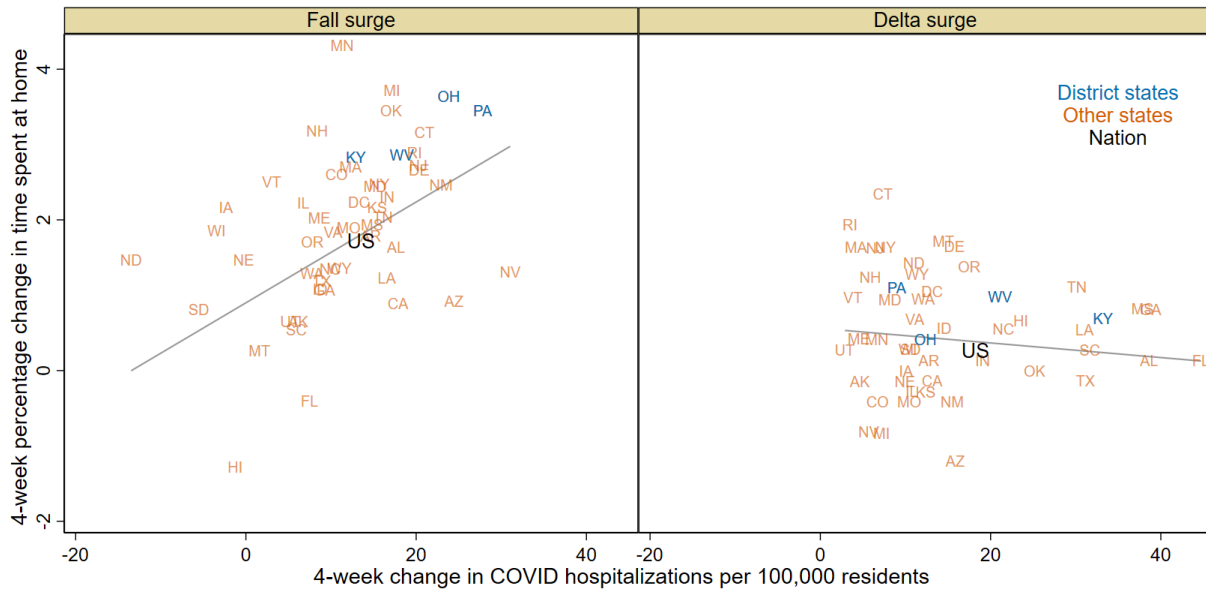


Note: Minnesota is excluded from these plots because it was an outlier during the fall surge, with a 33 percent increase in overall retail spending and a COVID-19 hospitalization rate rising by 11.3 hospitalizations per 100,000 residents.

Sources: Authors' calculations with data from the BEA; the COVID Tracking Project at *The Atlantic*; Fiserv, Inc.; and the HHS.

The last set of these plots, Figure 3, shows the change in time spent at home. In the fall surge, states that experienced larger increases in COVID-19 hospitalization rates also tended to have larger increases in time spent at home. However, during the delta surge, there is essentially no relationship between changes in COVID-19 hospitalization rates and changes in time spent at home. This should not be surprising: COVID-19 vaccinations have reduced the perceived need for social distancing, and the weather was more conducive to outdoor gatherings during the delta surge, which occurred over the warmer summer months, than during the fall surge.

**Figure 3. Four-week Changes in Time Spent at Home and COVID-19 Hospitalization Rates**



Sources: Authors' calculations with data from the BEA, the COVID Tracking Project at *The Atlantic*, Google, and the HHS.

The regression results in Table 2 provide a more concise way to look at how consumer activity responded to the fall and delta surges. These results show the slope coefficients from the regression lines in the figures above, their standard errors, and the R-squared (a measure of how well the model fits the data) of the regressions. We learn two things from the regression results that the above plots cannot tell us. First, during the delta surge we cannot reject the hypothesis that there is no relationship between the change in COVID-19 hospitalization rates and overall retail spending or time spent at home. We know this because the slope coefficients from these two regressions are statistically insignificant. Second, while the association between the change in hospitalization rates and the decline in bar and restaurant spending is statistically significant during both surges, the drop in spending associated with a given increase in hospitalization rates was five times greater during the fall surge than during the delta surge.

**Table 2. Regressions of State-level Changes in Card Spending and Time Spent at Home on Changes in COVID-19 Hospitalizations per 100,000 Residents**

Dependent variable		
Four-week percentage change in	Fall surge	Delta surge
Bar and restaurant spending	-0.369**	-0.069***
	(0.147)	(0.025)
	<i>R</i> <sup>2</sup> =0.114	<i>0.137</i>
Overall retail spending	-0.193*	0.002
	(0.101)	(0.027)
	<i>R</i> <sup>2</sup> =0.071	<i>0.000</i>
Time spent at home	0.067***	-0.010
	(0.021)	(0.009)
	<i>R</i> <sup>2</sup> =0.172	<i>0.025</i>

Notes: The table reports coefficients for four-week changes in hospitalization rates from six separate bivariate regressions. Standard errors are in parentheses and *R*<sup>2</sup> in italics. States weighted by square root of population. Minnesota was excluded from the overall retail spending regressions because it was an outlier in the fall surge regression. \*\*\* = *p*<0.01, \*\* = *p*<0.05, \* = *p*<0.1. Sources: The BEA; the COVID Tracking Project at *The Atlantic*; Fiserv, Inc.; Google; and the HHS.

## Conclusion

Overall, our analysis supports the view that changes in consumer activity have responded less to the delta surge than to the earlier fall surge. During the delta surge, bar and restaurant spending fell modestly in states with the most severe surges, but changes in overall retail spending and time spent at home were uncorrelated with the severity of the surge.

## References

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