1. The first chart shows a clear increase in traffic on the day of the 18th, followed by continual fluctuations that both peak higher and drop lower than the preceding months. I would have expected to see shopping [patterns follow more closely with days of the week](https://info.ncsolutions.com/blog/thanks-to-covid-19-sunday-is-no-longer-the-number-one-grocery-shopping-day-for-now), but the spike is not pronounced enough here to be too far out of the realm of normal patterns

Chart, line chart

Description automatically generated

1. The following chart incorporates COVID case data from the [New York Times](https://github.com/nytimes/covid-19-data). I used the mean of the 7 day rolling average cases per 100,000 across each state for the month of May and divided into quintiles to create the following chart. Most notably, the states with the lowest numbers had the broadest range of traffic. However, COVID case data did not prove as probative as it might during other time periods given that around the country, per capita increases in cases were relatively low in May 2021

Chart, scatter chart

Description automatically generated

1. The first regression tells us that on average, 3.52 more people were in stores after the mandate was repealed than before. Before the mandate was repealed, the model tells us that the average was around 162.2 people per day. This finding is statistically significant at the 1% level.

Table

Description automatically generated

To deepen my understanding of these results, I wanted to look at data grouped by week, accounting for different shopping behaviors. I ran two-sided T-Tests on the following:

*Average Daily Visitors Two Weeks Before and 1 Week Before the Repeal (Testing primarily whether people tried to wait out the 14th-18th to avoid mask wearing).*

The T-Statistic of -2.609 suggests that they are statistically different, but the means of 161.0 and 162.9 are still close together.

*Average Daily Visitors One Week Before and One Week After the Repeal*

The T-Statistic of -4.04 clearly indicates these are significantly different, with averages of 162.9 and 166.0

*Average Daily Visitors One Week After and Two Weeks After (Primarily to see if the change was sustained or a direct response to the mandate repeal*

With a T-Statistic of 0.68, the two averages are not significantly different, at 166.02 and 165.46. I’d be extremely interested to see whether and how long the traffic increase was sustained.

1. The second regression tells us that before the mandate was repealed, a county with zero vaccine hesitancy and zero percent votes for the GOP could expect an average of 155.47 daily visitors. After the repeal, we would expect that average to go up by 5.30, but after the repeal that would decrease by 0.0329 for every additional percentage point of GOP voters. Importantly, because our percentage statistics are listed as decimals, we have to divide our coefficients by 100 to make the interpretation make sense. When we think of the percent going up by one, our variable is actually increasing by 0.01. Regardless of date, for every additional percentage point of people in the county who are vaccine hesitant, the average daily traffic would go up by 0.75; for every percentage who votes GOP, it will go down by 0.12.

Table

Description automatically generated

To see daily traffic negatively correlate with GOP voting doesn’t make sense given clear political divides in restrictions, perception of COVID, and behaviors. That brings me to one of the key challenges of this study: daily traffic is going to be heavily correlated with population, and we also know that the GOP is consistently favored in rural areas while it tends to be less popular in urban regions. Bringing in population data would further confound the study because more densely populated regions would have more stores that people could choose from. Moreover, the decision to go to Walmart versus another store is not exogenous, so that could further skew the data. What I chose to do instead is run separate regressions not on daily traffic over the month, but on the difference between daily traffic on the 17th and the 18th.

In a regression using only the precent of GOP voters and the difference, I found an estimated increase of 0.08 for every percent GOP voter, significant at a 5% level. A second regression that included SVI and CVAC showed a coefficient of 7.69, also significant at the 5% level, but the SVI and CVAC did not have statistically significant coefficients.

1. In the final regression, the interaction term of vaccine hesitance with the “post” indicator variable has a negative coefficient despite the much stronger positive relationship between vaccine hesitancy and traffic. Although this is relying on some major causal leaps, what this might suggest is that many of the vaccine hesitant are so because they don’t feel endangered by COVID. That small negative interaction might represent those who see COVID as a risk but are concerned enough about vaccine side effects that they still choose not to get it, and instead take more precautions as the rest of the world takes less. An interesting area for potential future study.

Table

Description automatically generated

1. Further visualizations overlaying the weekly traffic change with vaccine hesitancy data can be found in the “geospatial\_plots” file