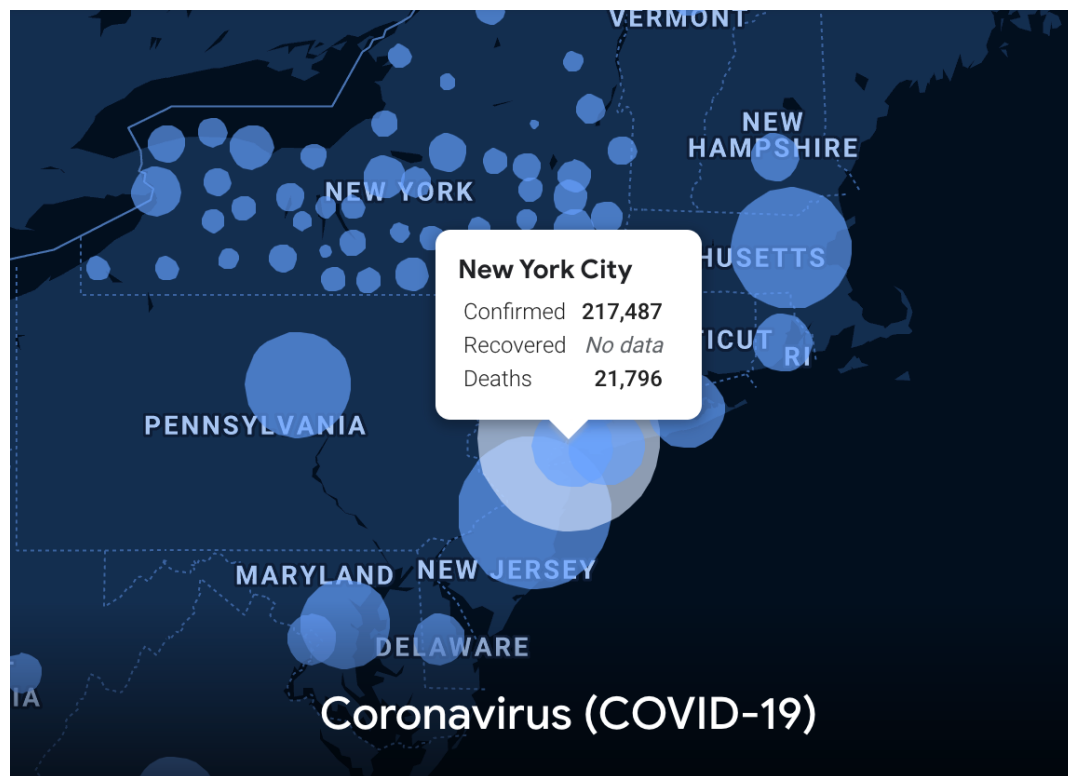


NYC under Covid-19: An analysis on consumer and retail trends

What is it like for New York as the hardest hit?



(screenshot from Google News NYC Covid-19 page)

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Introduction

2020 so far to this point has been a year full of twists and uncertainty. It all started with the COVID-19 outbreak early this year; then the situation escalated rapidly, impacting lives of many. As important life aspects, economic condition and daily expenses were witnessed with much transformation. In this paper, I intend to offer a glimpse into the impact of COVID-19 on the consumer spending and shopping retail industries from a local angle (NYC), by combining data visualization/analysis and evidence support from other credible sources.

What I'll Cover in This White Paper

Specifically, I lay my emphasis on New York city (also touch a little bit upon the NY state, in second section 1st subpoint) which I'll explain later in the first section with some data visualization. I'll walk the readers through NYC's particularity and why I pick it as the final investigation. Then, in the second section, I'll dive into the real meaty part, about the New Yorkers' spending status-quo, looking at different retail brands or industries. Basically, here's the layout:

- Why NYC to research---Data reasoning behind it
- New Yorker's spending and NYC retail performance under COVID landscape

Methodology

To compose this report, I went from mining datasets by performing web scraping, doing data analysis and visualization on acquired data sources, to researching a variety of relatable articles on this topic over the web. The main tool I used is Python the programming language, but I've also used a slight of Excel just to produce more convenient and visually pleasing graphs. The three main data sources I used for my data analysis are nytimes real-time data for US cases and deaths (Fig.1.- Fig.4.), LocateAI retail data (Fig.5., Fig.7.- Fig.10.), Google Trends search data (Fig.6., Fig.11.) [references at the end]

Why NYC to research---Data reasoning behind it

1. NY state with most cases and deaths nationally

I've heard a lot from the news before embarking on this project that New York is the hardest hit around the country; Indeed, from Fig.1., New York state far outweighs the rest 9 states regarding both cases and deaths. This contrast is even more noticeable in Fig.2. and Fig.3. where I plot the cases and deaths change over time for the top 5 states. Even for the 2nd place New Jersey, its data trend pales into insignificance.

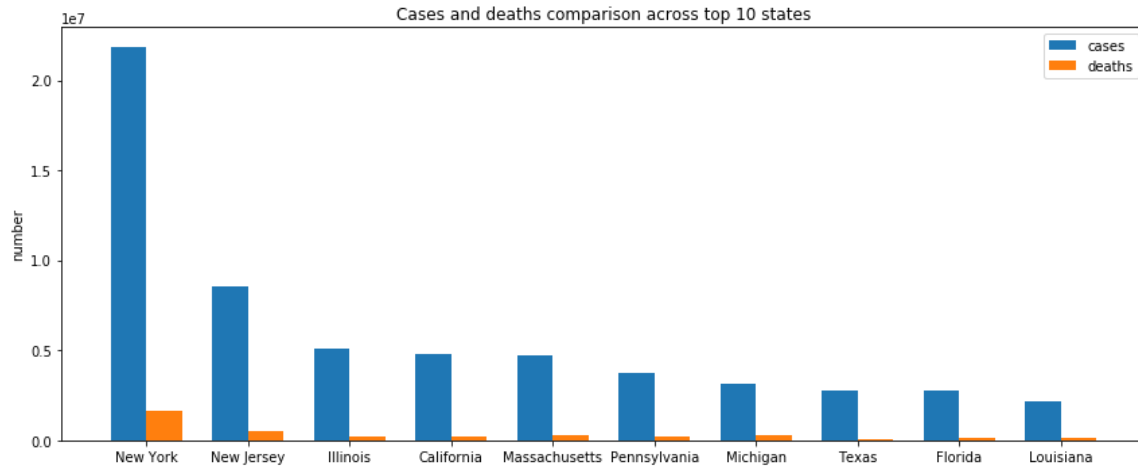


Figure 1

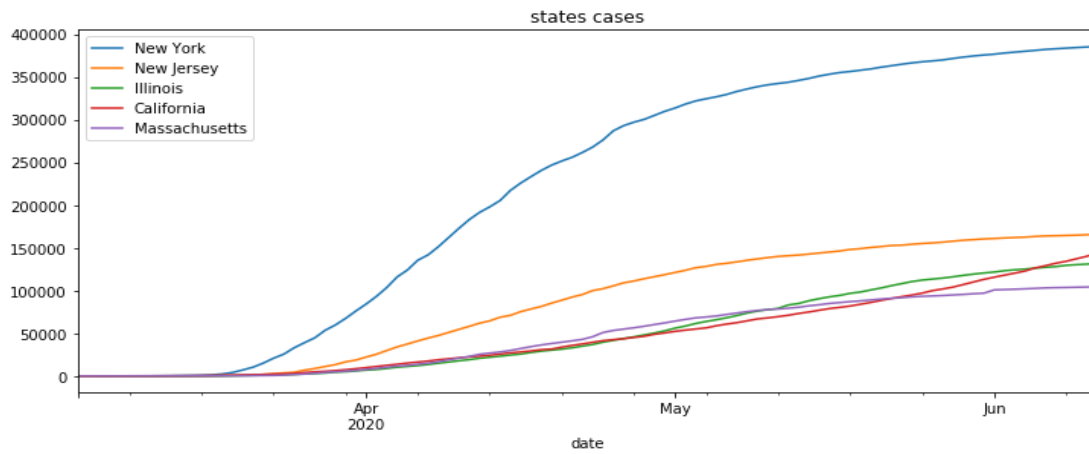


Figure 2

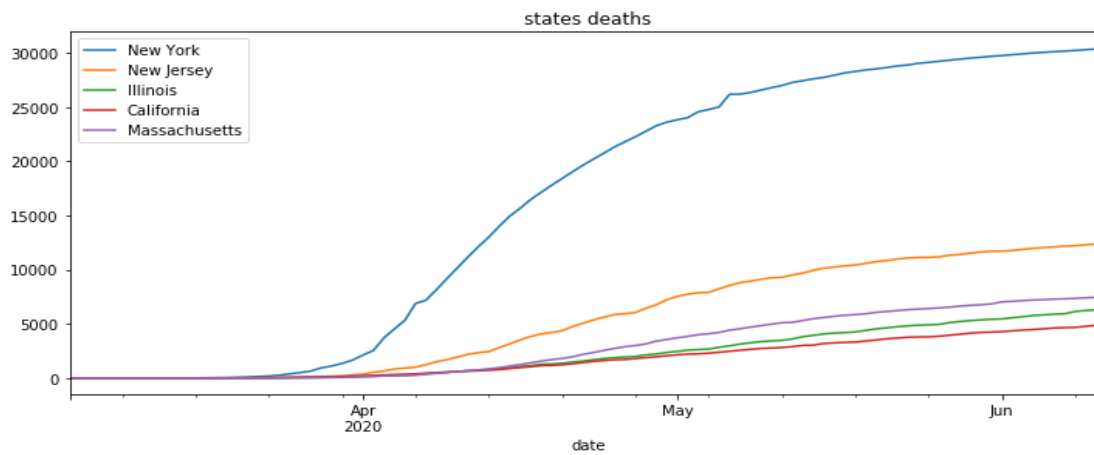


Figure 3

2. NYC ---the hardest hit in New York state

Once locating New York state as my target state, I then look at the situation of individual counties. Among all of them, New York City experienced the most deaths in a much higher rate relatively (Fig.4.) Because of how striking the plain number is, I thus emerged the thought of investigating further and unfolding normal people's lives under COVID-19 in New York state and New York city. I'm specifically interested in knowing more about how their consumption has been affected since consumption is a big part of one's life and makes up a huge chunk of economic activity. Meanwhile, consumption closely impacts how certain industries perform. Inferences are made alongside.

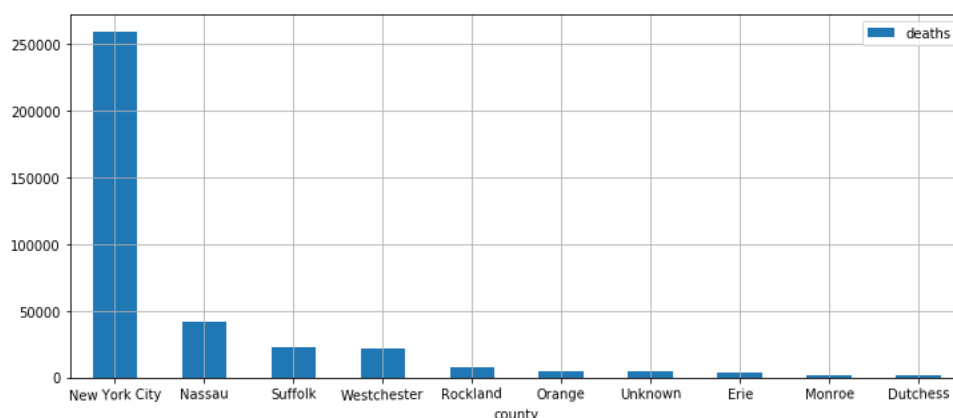


Figure 4

New Yorker's spending and NYC retail performance under COVID landscape

1. NY state in smooth recovery (the broader picture)

It would be worthy to mention a little bit about the NY state, the backdrop for NYC. Overall, the New York state retail traffic trend is consistent with that of the 4 other top states (Fig.5.) Because the economic impact of Covid-19 is nation-wide and even world-wide, it's reasonable that the retail trends bear some similarities. The recovery of New York as a seriously impacted state turns out to be smooth and on the right track based on Fig.6., It started to reopen on May 15th (Elassar, 2020)¹, which was the 2nd earliest state to reopen among all the top five impacted states, and the data trend has corresponded to this fact.

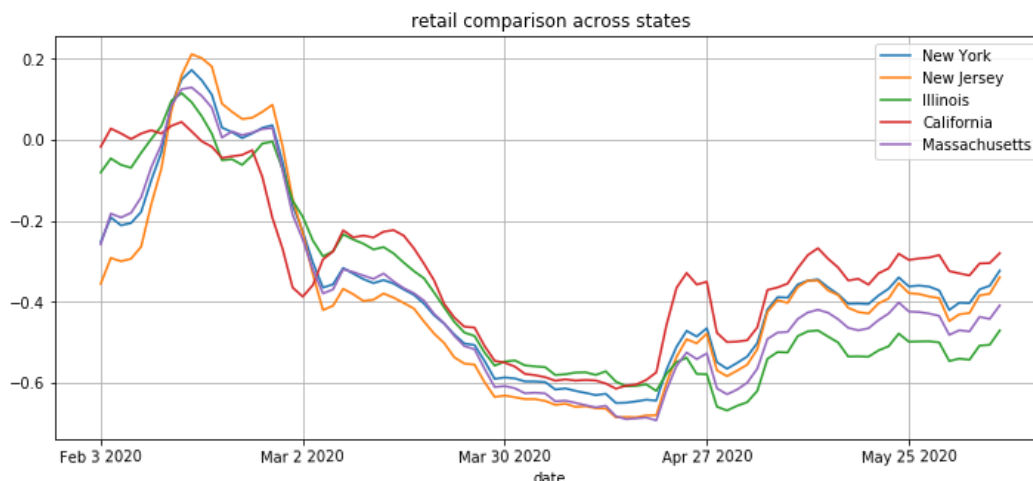


Figure 5

2. The hardest hit, but not in terms of retail index by city

New York is the hardest hit in terms of cases confirmed and deaths toll, so I expect its economy to be equally damaged in terms of severity. However, when I look at the average retail traffic index from early Feb to early June, New York wasn't the city that experienced the largest drop. It even wasn't counted into the top 5 with largest drop. According to Fig.5., New York underwent a 38.1% drop in average in retail traffic since Feb, which wasn't as nearly bad as I expected. As I then looked up the possible reasons on the Internet, I came up with two inferences: 1) New York is the most populous and most densely populated city in the US, so even if it is the hardest hit by the COVID, the baseline for consumption demand is still well above most other cities. 2) As the economic center of the country, New York must be a city with strong vitality, so in response to such crisis, it has many more experiences and capital as backup. What I mean by this is that the economic situation may be severe when singled out, but it may very well be the case for so many other places, so inference on local data lacks the globality and ignores the broader picture.

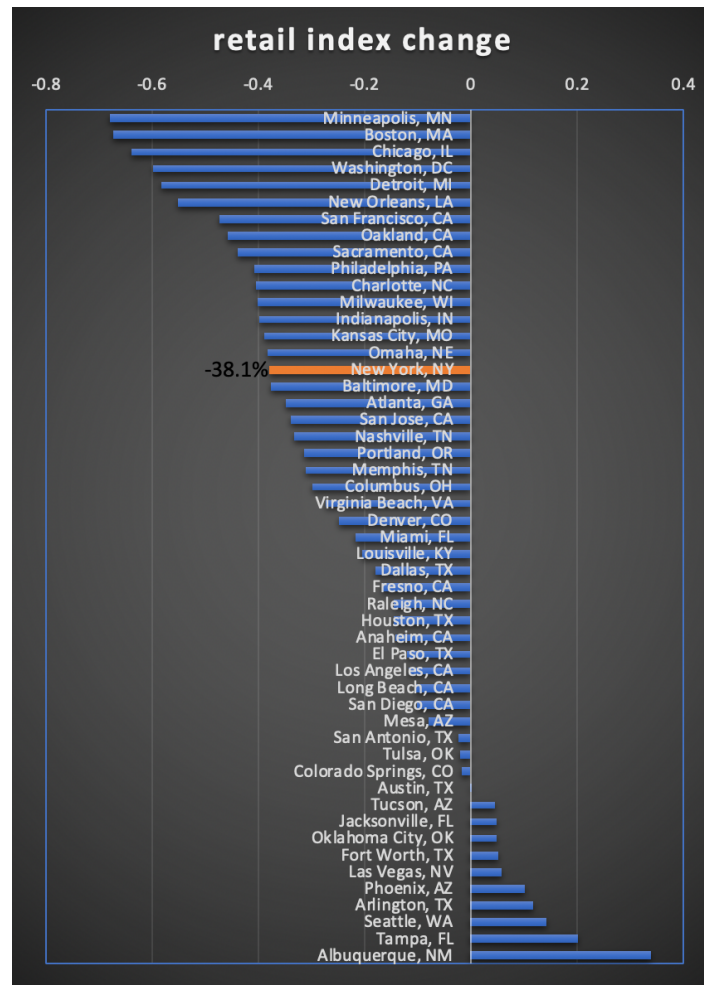


Figure 6

3. Groceries & Pharmacies win the first half then Furniture catches up

The below 4 graphs yield some interesting results and leave space for various interpretations.

- 1) In Fig.7., RiteAid the pharmaceutical company demonstrated an overwhelming trend than several other brands. In Fig.8., RiteAid is also the only brand with positive retail index change. It had several spikes in early&mid-March and mid-April, which corresponds to Fig.9. when the Pharmacies & Drug category has also spiked. At first, I didn't understand why RiteAid was so popular in NYC. Later on as I was doing my research online, I think it probably had to do with my misconception that RiteAid only sells drugs. In terms of why RiteAid was seen with so much higher retail traffic in Fig.7. than the samely drugstore CVS, a possible explanation I could find is that RiteAid has more groceries to offer than CVS (Tyler, 2018.)² Groceries was a big rising spending category during COVID period, based on Fig.9. and Fig.10.

- 2) WellsFargo the bank experienced, in comparison, an overwhelmingly stark visiting rate. Indeed, WellsFargo has been hit hard with profits crashing down. In Fig.7, it has dropped to its lowest point around late March and early April, which corresponded to the timing of NY COVID cases take-off (seen in Fig.2.) The rising concern for defaults from both consumers and businesses from the bank's perspective forced the bank to set aside fund in order to hedge against the elevating risk (Weinstein, 2020.)³
- 3) Another noticeable brand besides RiteAid in Fig.7. is 7-11, the convenience store, which is the also the category with the third biggest retail index in Fig.9. It's surprising how it manages to have relatively fewer loss. Possible explanation could be that restaurants closedown leaves convenience store to be an alternative for food acquisition or in 7-11 is where people can also get groceries, which is the category with largest positive retail index (Fig.10.)
- 4) Fig.9. and Fig.10. show that fitness&Gyms and Resturants have been hit hard while groceries and furniture are winning. The rising demand for groceries makes sense because of the "stay-at-home" order: "The 'New York State on PAUSE' order limits outdoor activity to the essentials, like grocery shopping and getting medication." (Kaufman, 2020)⁴ The popularity of furniture is somewhat surprising and unexpected to me, but as I researched it online, it all makes sense that because people stayed at home so their demand for comfortable furniture rose significantly (Lee, 2020.)⁵
- 5) It's interesting how pharmacies are seen with rising demand throughout the whole process but still experience negative retail index in Fig.10.

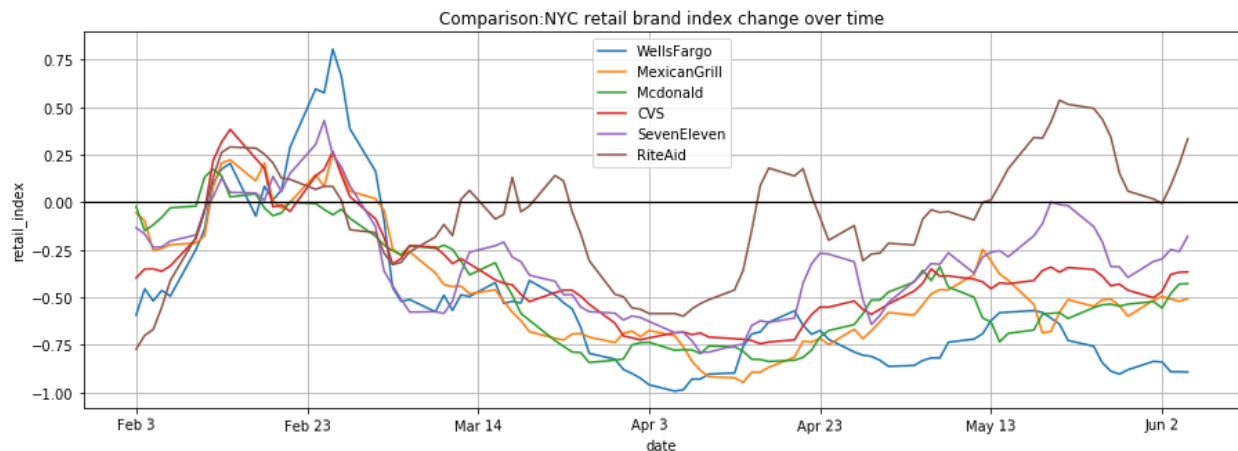


Figure 7

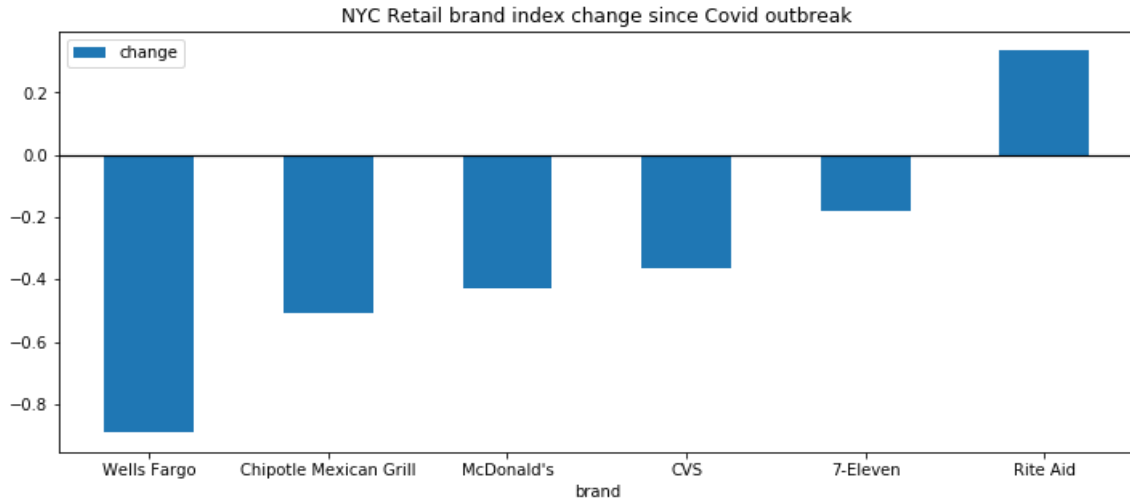


Figure 8

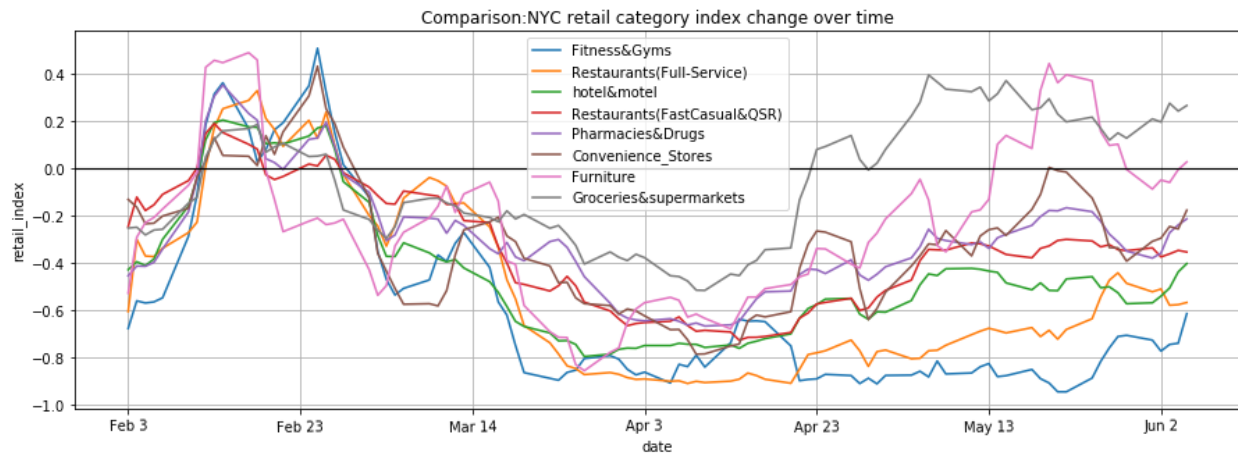


Figure 9

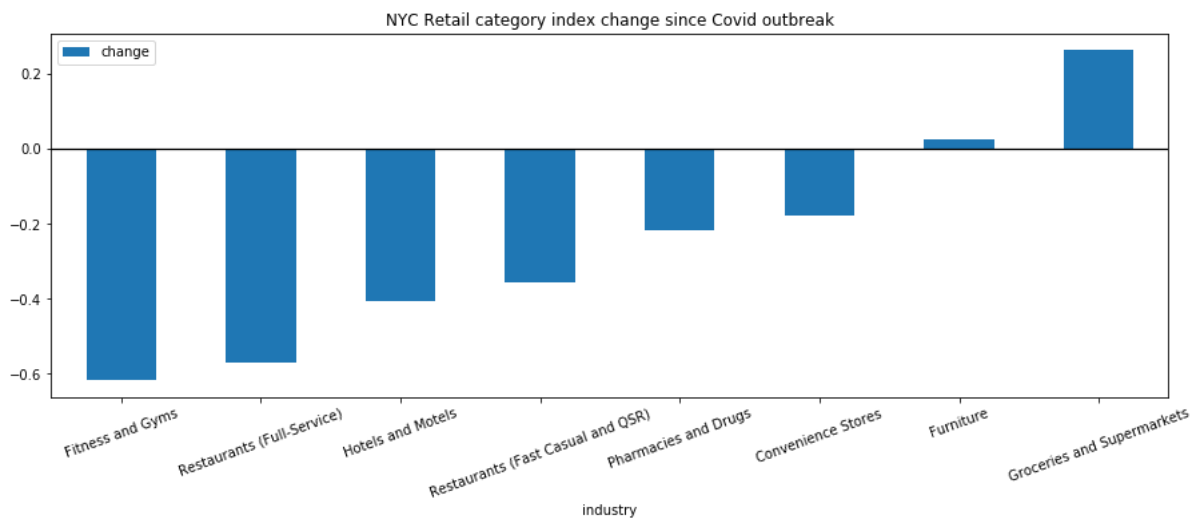


Figure 10

4. Inferences on spending situation based on Google searches

The searches that I highlight in orange are what I intend to draw connections to my points:

1) **Online shopping takes the lead, along with home cooking**

My criterion is the search “Amazon.com” and “sales”. It may not be that obvious when looking at the search trend in past 90 days or even the ranking of the two searches. But once I pull up the corresponding search index, the rising index over time for “Amazon.com” (19-25-31) and “sales” (21-25-29) still show a difference which conforms to the overall rising preference for online shopping during COVID.

Home cooking also becomes the trend during this period. I have not just come to this conclusion based on personal experiences. In fact, the search “Recipe” appeared only in top search list past 90 days but not past 12 months or 5 years.

2) **“Hotel” and “Restaurant” search has disappeared from recent 90 days Google searching**

This is consistent with the impact brought by quarantine policy. And the plummeted “restaurant” search also corresponds to the plummeted restaurant retail index in Fig.9.

3) **“Stock” and “Unemployment” added to recent 90 days Google searching**

It provides additional evidence that economy isn’t doing well and people are closely monitoring the market trend by looking at stocks.



Figure 11

Conclusion

To conclude, the purpose of my paper is to explore and showcase the consumer trends and retail performance in New York city as the hardest hit by COVID-19 in the US. There are certain discoveries that are within my expectation that follows the general pattern country-wide, like by categories, how groceries and pharmacies are in a rising trend, but some are not, seemingly more

regional, like RiteAid turns out to be more popular than CVS in NYC as suggested by the data. Limitations do exist as each subpoint is worthy to explore more in depth; for example, more could be explored about those certain brands' trends in varying geographical locations beyond just New York city. Aspects I could potentially do better include to merge more datasets together instead of just analyzing them individually.

References

¹ U Elassar, A. (2020, April 26). This is where all 50 states stand on reopening. Retrieved June 23, 2020, from <https://www.cnn.com/interactive/2020/us/states-reopen-coronavirus-trnd/>

² Tyler, J. (2018, July 24). We shopped at CVS and Rite Aid to see which was a better drugstore, and one had a clear advantage over the other. Retrieved June 22, 2020, from <https://www.businessinsider.com/cvs-or-rite-aid-best-drugstore-2018-7>

³ Weinstein, A. (2020, April 14). Wells Fargo profits collapse as it sets aside \$3 billion to weather coronavirus crisis. Retrieved June 23, 2020, from <https://www.charlotteobserver.com/news/business/banking/article241985471.html>

⁴ Kaufman, M. (2020, March 23). New York's Stay-At-Home Order Goes Into Effect. Retrieved June 24, 2020, from <https://patch.com/new-york/new-york-city/new-yorks-stay-home-order-goes-effect>

⁵ Lee, J. (2020, April 13). How Furniture Brands Win in the Age of COVID-19. Retrieved June 24, 2020, from <https://www.adroll.com/blog/marketing/how-furniture-brands-win-in-the-age-of-covid-19>

Datasets Used:

[Covid-19-data “us-counties.csv”]. Retrieved June 10, 2020, from <https://github.com/nytimes/covid-19-data> (Fig.1., Fig.2., Fig.3., Fig.4.)

[LocateAI retail traffic data]. Retrieved June 14, 2020, from <https://locate.ai/retail-tracker#brand> (Fig.5., Fig.7.- Fig.10.)

[GoogleTrends ‘Search topics’ data]. Retrieved June 18, 2020, from <https://trends.google.com/trends/explore?date=today%205-y&geo=US> (Fig.11.)

Image Used in cover page:

Screenshot Retrieved June 24, 2020, from https://news.google.com/covid19/map?hl=en-US&mid=%2Fm%2F02_286&gl=US&ceid=US%3Aen