

COVID-19 Impact Analysis on New York City

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Abstract

In this paper, I will present data and analyses related to the economic and societal impact that Covid-19 had on New York City. I provide context as to the global impact of Covid-19, and introduce the general impact it had on New York City's economy. I elaborate on the approach I have taken to conduct the analyses presented, and describe the analytical tools and processes used to develop the dashboard that is paired with this paper. The findings of this project will demonstrate that New York City suffered dramatically during the first few months of the pandemic, but the economy was quick to recover, much like the rest of the world. However, as I will demonstrate, the short term policies put in place to protect those who experienced financial hardships simply delayed the inevitable, and resulted in a drastic rise of the homeless population in New York City.

Introduction

The Covid-19 pandemic is the most devastating pandemic the world has seen since the Spanish Flu of 1918, accounting for over 6.9 million deaths in less than four years (World Health Organization, n.d.). Throughout the world, we felt the drastic impacts of the pandemic in our everyday lives. Restaurants shut down over night, school and work transitioned to the from home model, every stock market crashed within days, and families who lived in different cities stayed separated for the better part of a year.

Having lived in New York City through the Covid-19 pandemic, I witnessed first-hand one of the most densely populated cities in the world become what felt like a ghost town overnight. As a result, I followed the progression of the pandemic very closely, and especially as it related to New York. The economic impacts on the city were obvious and tangible. Tourists no longer visited the city, unemployment skyrocketed, and rents dropped drastically. While there were policies put in place to

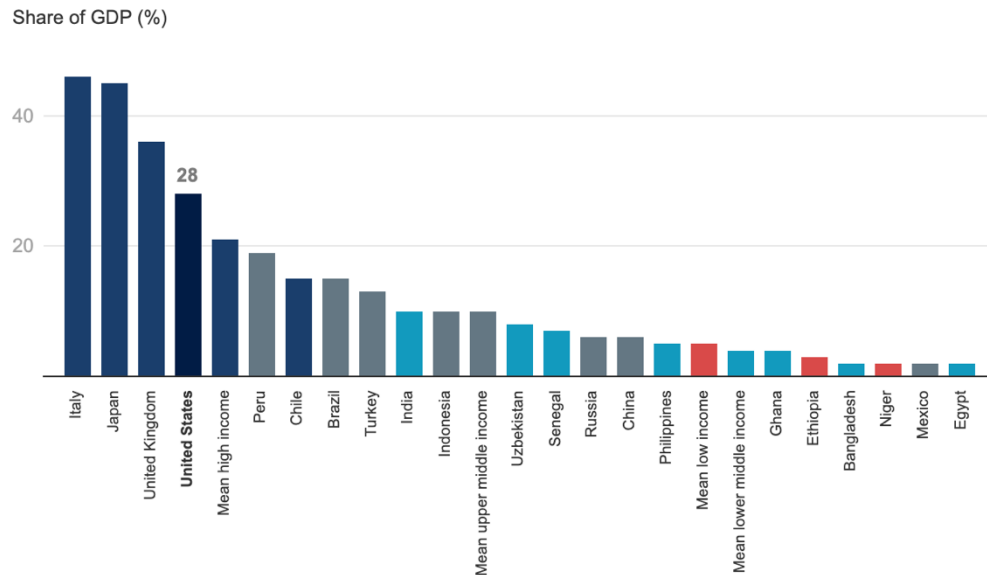
protect the people from financial hardships, such as stimuli and the Tenant Safe Harbor Act, these only mitigated short term risks (New York State, n.d.).

In this paper, I will be examining the economic impacts of the pandemic in New York City. I start by analyzing pandemic data in the five boroughs to get a better understanding of the scale of the pandemic in the city. I then dive into the economic impacts of Covid-19 in New York City, focusing on unemployment and rent prices. Finally, I draw conclusions about the long term economic impacts the pandemic and related policies had on the city's homeless population. There are more long term impacts than those related to displaced people, but as I present in this paper, I believe that a rise in unemployment rates, shocks to the housing market, and short-term tenant protection policies ultimately led an unprecedented rise in homelessness.

Background

Prior to investigating the data, it is essential to study existing literature and gather context about the economic impact of the pandemic. The Covid-19 pandemic triggered the largest global economic crises in over a century, and led to a dramatic increase in inequality across the world (World Bank, 2022). As a result, governments worldwide reacted with unprecedented fiscal policy to ensure that the world economy stay afloat while adjusting to the consequences brought on by the pandemic. Consequently, this led to inequality in how countries could support their people through the pandemic, with the size of the response being uniformly large in high-income countries and uniformly small or nonexistent in low-income countries (World Bank, 2022). The share of countries' GDP that these fiscal responses made up ranged from 2% in Egypt, to 46% in Italy, with the U.S. spending about 28% of their GDP on fiscal stimuli (World Bank, 2022).

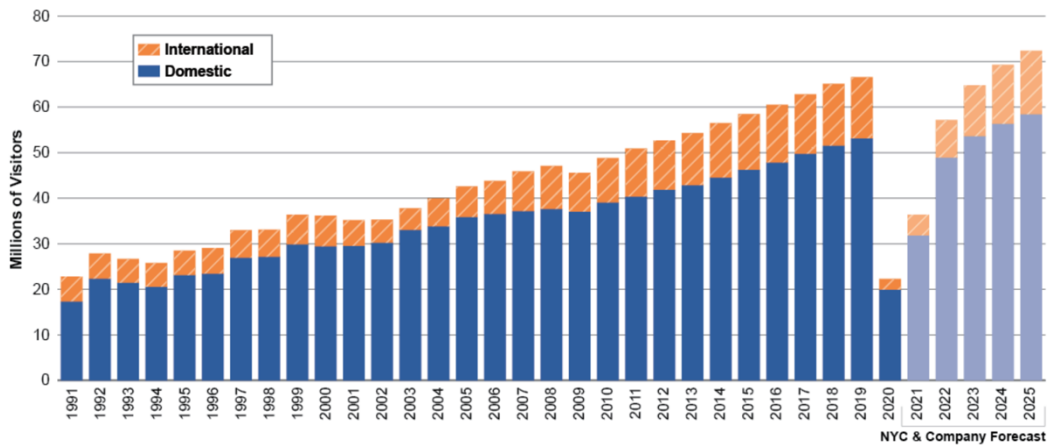
Fig 1 (World Bank, 2022)



The economic impacts of the pandemic in New York city itself seemed to touch all major industries, and resulted in record high unemployment levels. In less than 2 months at the start of the pandemic, the unemployment rate in New York skyrocketed from 4.5% in March of 2020, to 21.4% in May of 2020 (Bhat & Welch, 2023). The worst industries to be impacted by unemployment were Entertainment, Manufacturing, and Retail falling 17%, 16%, and 14% in employment respectively by July of 2020 compared to the same period the year prior (Bhat & Welch, 2023).

The drastic decline in tourism was perhaps one of the largest drivers in the fall of these sectors. Hotel demand fell by nearly 75% in July of 2020 compared to the same month the year prior (Bhat & Welch, 2023). In 2019, New York City hosted approximately 67 million visitors. In 2020, this number dropped to about 22 million, accounting for a 67% decrease in overall visitors (State Comptroller, 2021). The total visitor spending in 2019 made up about \$48 billion, which contributed greatly to the revenue generated by entertainment, retail, and food services.

Fig 2 (State Comptroller, 2021)



Another sector in New York City that took a huge hit during the pandemic was real estate. Apart from the prices themselves, which fell rapidly, it was difficult to operate in the real estate business as it is primarily in-person interaction. Restrictions were immediately put in place that limited frequency and duration, and preregistrations were required in most buildings while some outright banned non-residents (Kaufman, 2020). In addition to a drop in new residents, existing residents whose leases were ending also faced the same difficulties during their search, leading many of them to move away from the city in search of less densely populated areas (Kaufman, 2020).

Policies were put in place to protect city residents who suffered financial hardships as a result of the pandemic, but as I will present in the findings section, those policies only offered short-term solutions, and may have resulted in a delayed homeless crises in New York City.

Approach

The purpose of this project is to gain an understanding of the pandemic experience in New York City, its general economic impacts, and its potential role in the rise of the New York City homeless population. To do so, I have analyzed Covid-19 health data published by the city that is segmented by the five boroughs. I then draw conclusions and connections between the timeline of the pandemic and

economic factors in the city. Lastly, after understanding what economic impacts the pandemic, I take a look at how these economic factors contributed to the homeless population in New York City.

The data and analyses is presented through interactive visualizations on a dashboard created using Streamlit. This dashboard is intended to be interacted with in order for the user to draw their own conclusions about the impact of the pandemic on New York City. Throughout the dashboard, the most important filter will be the time period selector. The slider allows the user to select the range in time to view the data. The Mapping Color Variable and Charting Variable allow the user to view the visualizations using different dimensions, which shed light on different aspects of the pandemic.

The dashboard consists of three pages: Overview of Covid-19, Economic Impact of Covid-19, and Homelessness Impact of Covid-19. The first two pages include temporal and geographic visualization that summarize cases, deaths, hospitalizations, unemployment, and rent. The purpose of these pages is to use the mapping tool to understand the actual impacts to each borough during the selected time period, and the charting tools to identify temporal cause-effect patterns between Covid and the economy.

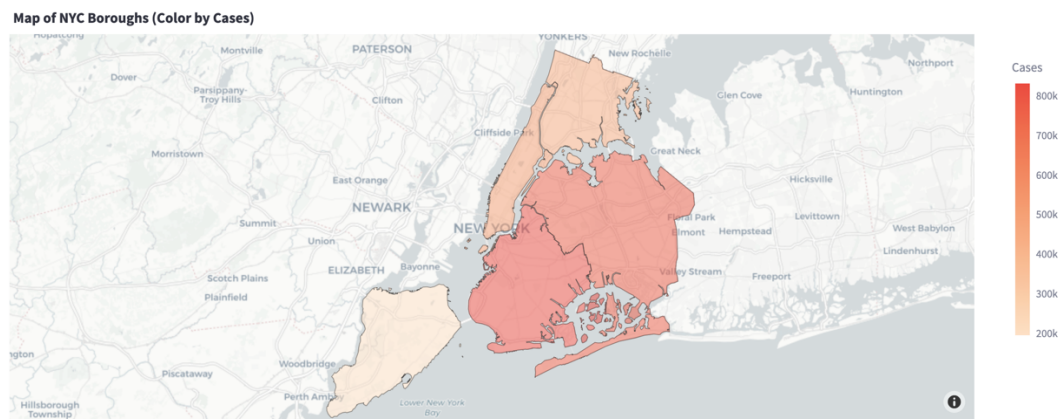
The final page focuses on the economic analyses developed in the second page, with the assumption that the user has understood the cause-effect relationship between Covid and the economy. New data is presented that sheds light on the homeless population and how the bounce-back in the economy resulted in an unprecedented rise in homelessness. The context and reasoning behind this conclusion is presented in the next section. Therefore, the dashboard should be viewed alongside the Results section of this paper.

Results

The first page of the dashboard, Overview of Covid-19, provides us with a lot of insight into the nature of the Covid-19 pandemic in New York City, and how it impacted each area differently. The very first visualization that the user experiences is the map of the five boroughs, which shows us that

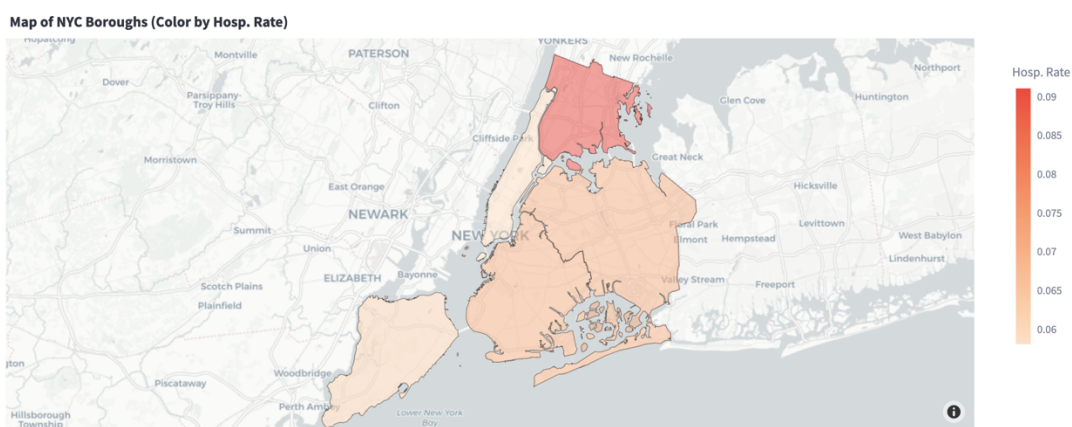
Brooklyn and Queens were more severely impacted in terms of the raw case count than Staten Island, Manhattan, and Bronx.

Fig 3



Although, by other metrics, such as hospitalization rate, which can be selected using the Map Color Variable select box, it is apparent that the Bronx actually may have suffered the most. This metric is a little more insightful than the raw number of cases since it that number could be arbitrarily higher due to a larger population in the area.

Fig 4

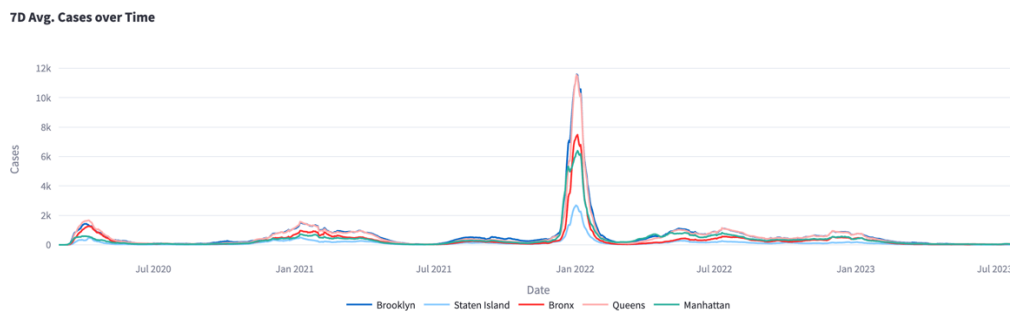


The map is also reactive to the date selector, which allows us to isolate specific periods in time and analyze the impact on each borough. The key findings from this map are that Brooklyn and Queens were more heavily impacted by the raw number of cases, hospitalizations, and deaths. However, The

severity of cases in the Bronx seemed to be the worst of the five boroughs. The death rate also indicates that the Bronx was hit the hardest, followed by Queens. Manhattan seems to have experienced the lowest impact of all, but still high relative to other cities in the US.

The charting tools on this page, driven by the Charting Variable selector, allow us to analyze the data in other ways that enable pattern detection. The line chart over time shows us the activity of Covid over the past three years. We see that there were a few peaks in 2021 during the start of the pandemic, but the most cases experienced was actually during January of 2022.

Fig 5



However, by this time it would seem that we had a handle on the pandemic and vaccinations had been widely administered as the numbers for hospitalizations and deaths are heavily front focused.

Fig 6

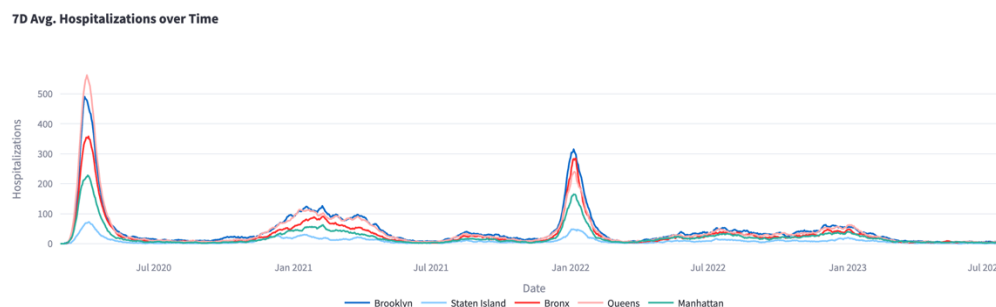
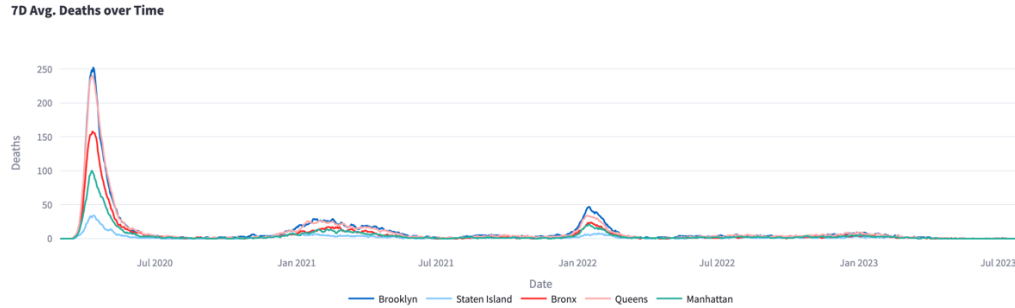
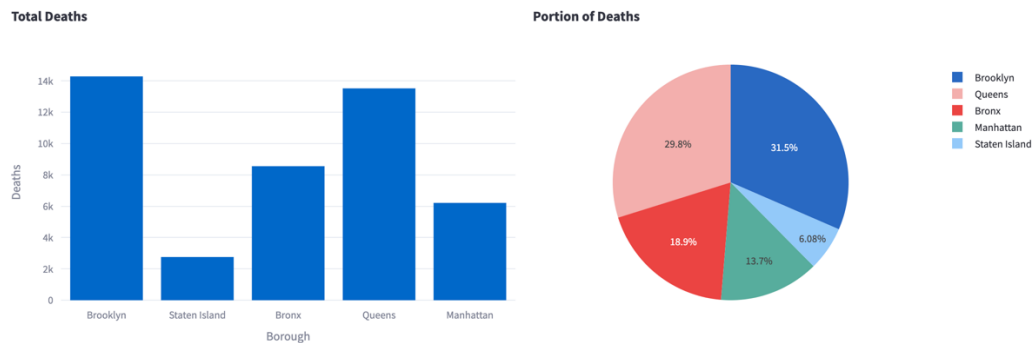


Fig 7



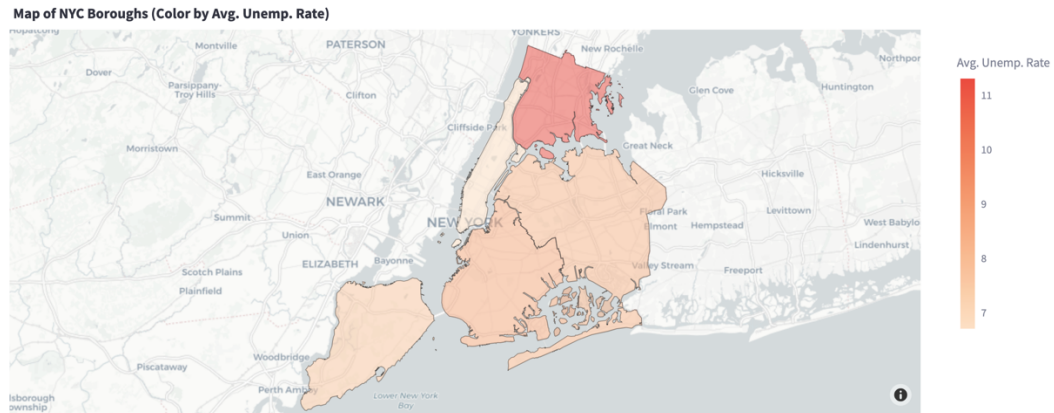
This speaks to the swift reaction New York authorities exhibited towards Covid-19 and their implementation of policies to curb its spread. The final two charts on this page visualize and compare the breakdown of total numbers during the period selected. They supplement both the line chart and the map, allowing users to identify detailed comparisons between the boroughs.

Fig 8



The second page of the dashboard, Economic Impact of Covid-19, presents economic data alongside Covid data in order to expose the impact the pandemic had on the local economy. The map visualization on this page can be viewed using the average unemployment rate over the time period. It is apparent that the Bronx was most impacted by this measure.

Fig 9



The cases by time line chart is also included on this page to allow the viewer the opportunity to compare the trends in cases with the trends of unemployment and rent over time. We see a drastic increase in unemployment across all boroughs during May of 2020, with the Bronx suffering the most at an unemployment rate of over 25%. We also see a direct correlation between spikes in unemployment and cases over the next few years. Average rent is also impacted at the same time Covid hits, with Manhattan and Brooklyn prices falling the hardest. These metrics exemplify the economic hardships faced by New York City during the Pandemic.

Fig 10

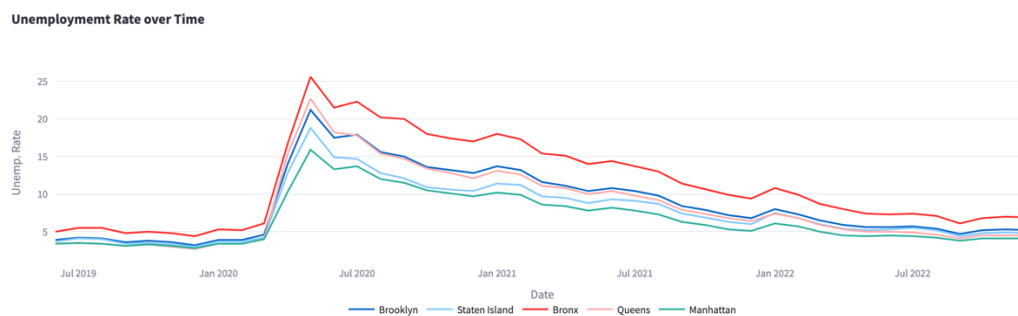
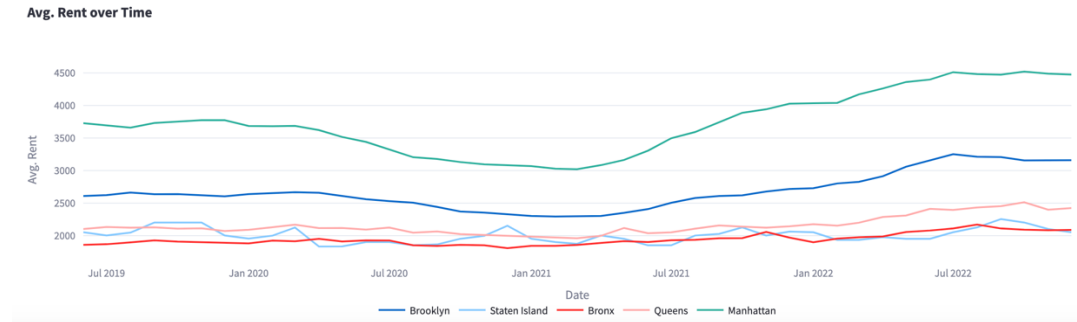


Fig 11

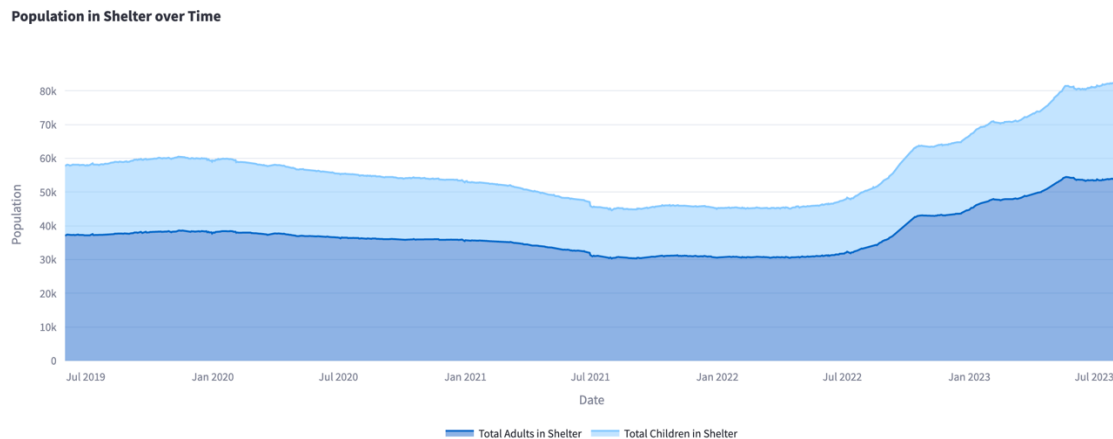


With the understanding of the impact on the local economy, we can move over to the third page, Homelessness Impact of Covid-19, where we develop our final conclusion about the societal impact of the pandemic. On this page, we see the overall unemployment rate plotted along with the labor force population, and the second chart displays the overall average rent price over time. These charts would seem to indicate that the economy crashed at the beginning of the pandemic, but has mostly recovered. The unemployment rate is on par with pre-covid times, while the average rent has surpassed that of pre-covid. However, we also notice that although unemployment has stabilized at close to pre-covid levels, the labor force population never fully recovered and is still significantly lower than what is once was. This is partly due to the emigration away from the city during Covid (Kaufman, 2020), but also indicates that there were individuals that were permanently displaced from the labor force.

The Tenant Safe Harbor Act put forth by the local authorities during Covid protected these displaced people by ensuring that their rent was not raised and they were not evicted during Covid as a result of financial hardships from March of 2020 through January of 2022 (New York State, n.d.). However, once this act had been lifted, the economy had already recovered and rent prices were higher than ever, as seen from the above charts. This means that these people were no longer protected from rent hikes and evictions, and would soon face a drastic change in their cost of living for which they were

not prepared. I believe that this led to an unprecedented increase in the homeless population in New York City, as can be seen in the very last chart in the dashboard.

Fig 12



The chart above also supports the argument I have presented. After the Tenant Safe Harbor Act was put into effect in March of 2020, the population living in shelters actually experienced a decrease, this is likely because there were no evictions due to financial hardships, and therefore a lot fewer people needed to resort to shelters for that reason. Then, once it had been lifted in January of 2020, and rents were at an all-time high, people began experiencing more evictions and the steep increase in the shelter population coincides with the summer months when New York City leases renew. Therefore, these policies, while beneficial short term, resulted in an artificial protection from a recovering economy for those people who likely could not afford the cost of living.

Conclusion

The story of “A Covid-19 New York” is one that is quite common across the world. We experienced a societal, economic, and health crisis overnight, but things returned to a new-normal within a year. However, this is the story from the perspective of working professionals, who could afford some period of financial hardship. Once we look a little deeper, we are able to uncover a much darker

picture, and one that is not given as much attention as it likely deserves in news and mainstream media.

The true story is that the pandemic impacted society inequitably. The fact of the matter is that Covid impacted the economically disadvantaged in a much more devastating fashion than it did others, with case and death rates higher than what are regularly reported (Coalition for the Homeless, 2020). The pandemic was more than just an inconvenience to these people, and they needed more time to recover from pandemic-induced losses of income and livelihoods, but were not given the opportunity to do so (World Bank, 2022). The protection policies, although beneficial in the short term, did not account for the much needed recovery period that would have benefited these individuals, and resulted in a higher level of displacement than we saw prior to the pandemic.

NOTE

The deployment instructions are included in the palit_final_project folder within a document titled "palit_final_project_deployment.pdf".

Works Cited

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Data

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 - <https://github.com/nychealth/coronavirus-data/blob/master/trends/cases-by-day.csv>
- NYC Unemployment and Labour Force Data
 - <https://dol.ny.gov/labor-statistics-new-york-city-region>
- NYC Rent and Sales Data
 - <https://streeteasy.com/blog/data-dashboard/>
- NYC Homeless Population Data
 - <https://data.cityofnewyork.us/Social-Services/DHS-Daily-Report/k46n-sa2m>
- NYC Borough Geojson
 - https://github.com/codeforgermany/click_that_hood/blob/main/public/data/new-york-city-boroughs.geojson