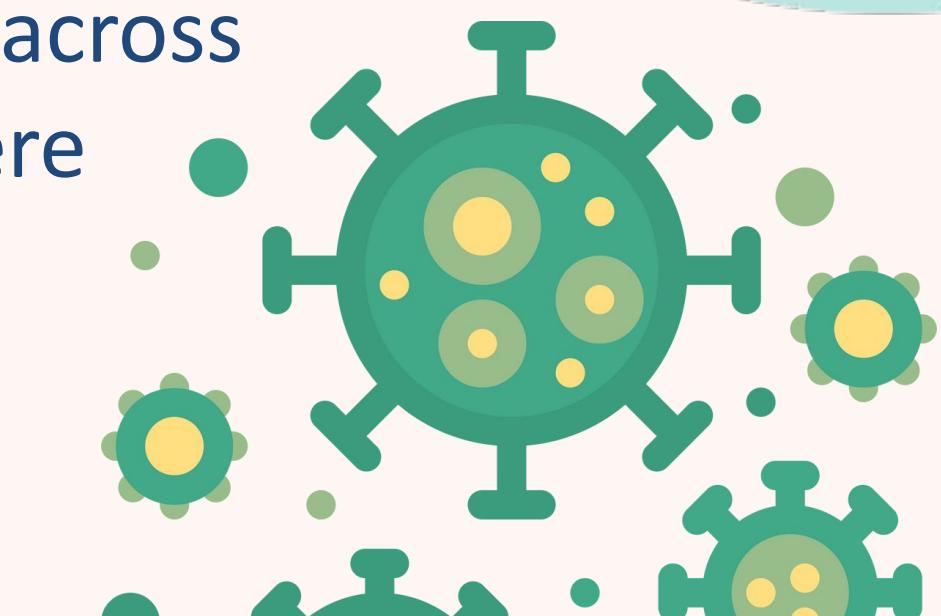
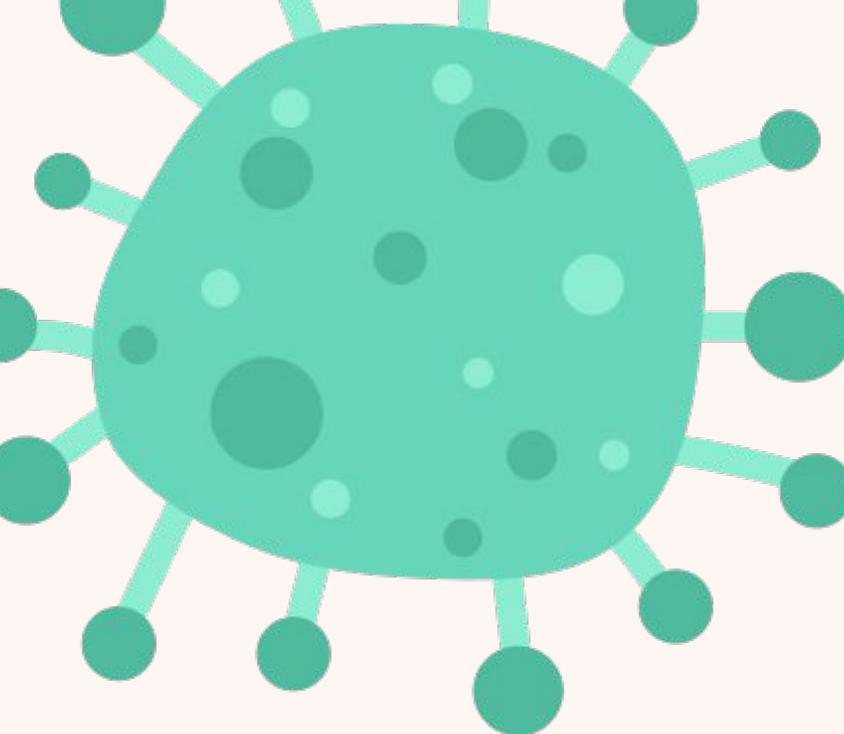


Factors Contributing to Flu Vaccine Rates

By: Cindi Ponce, Daniella Gubskaya,
Raisa Rahman

Introduction / Purpose

- Flu vaccination rates can vary among populations due to factors such as age groups, boroughs, and even race, which can lead to unequal protection against the flu.
- In this project, we will analyze data of flu vaccination rates, and compare and contrast the different factors that can either affect the rates in a positive or negative way.
- Examining these differences is important because vaccines play a critical role in preventing disease spread and protecting public health. The charts we included will compare the trends across populations to identify patterns and visualize areas where vaccination injections should be administered more.



Tools used

- Python was used for data analysis and manipulation.
- Google Colab is used to run the python codes and share results.
- Pandas were used to organize, filter and summarize the dataset.
- Matplotlib was used to create visuals such as pie charts, bar charts and line plots.
- Numpy is a python tool used perform numerical operations and calculate.

Figures 1-2

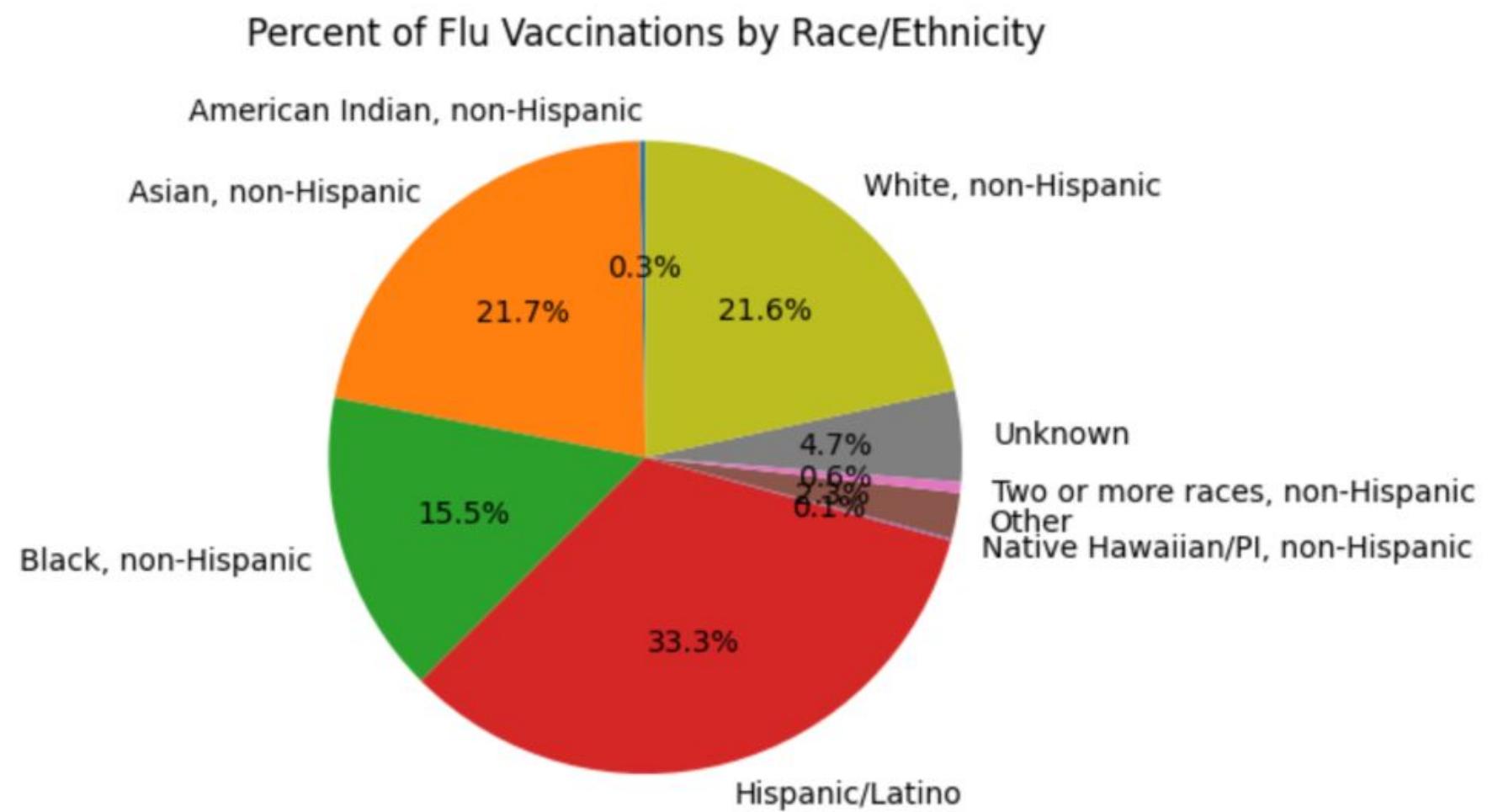


Figure 1. The pie chart above displays the percentage distribution of vaccines among different ethnic groups. Races include, American Indian, White, Asian, Black, e.t.c.

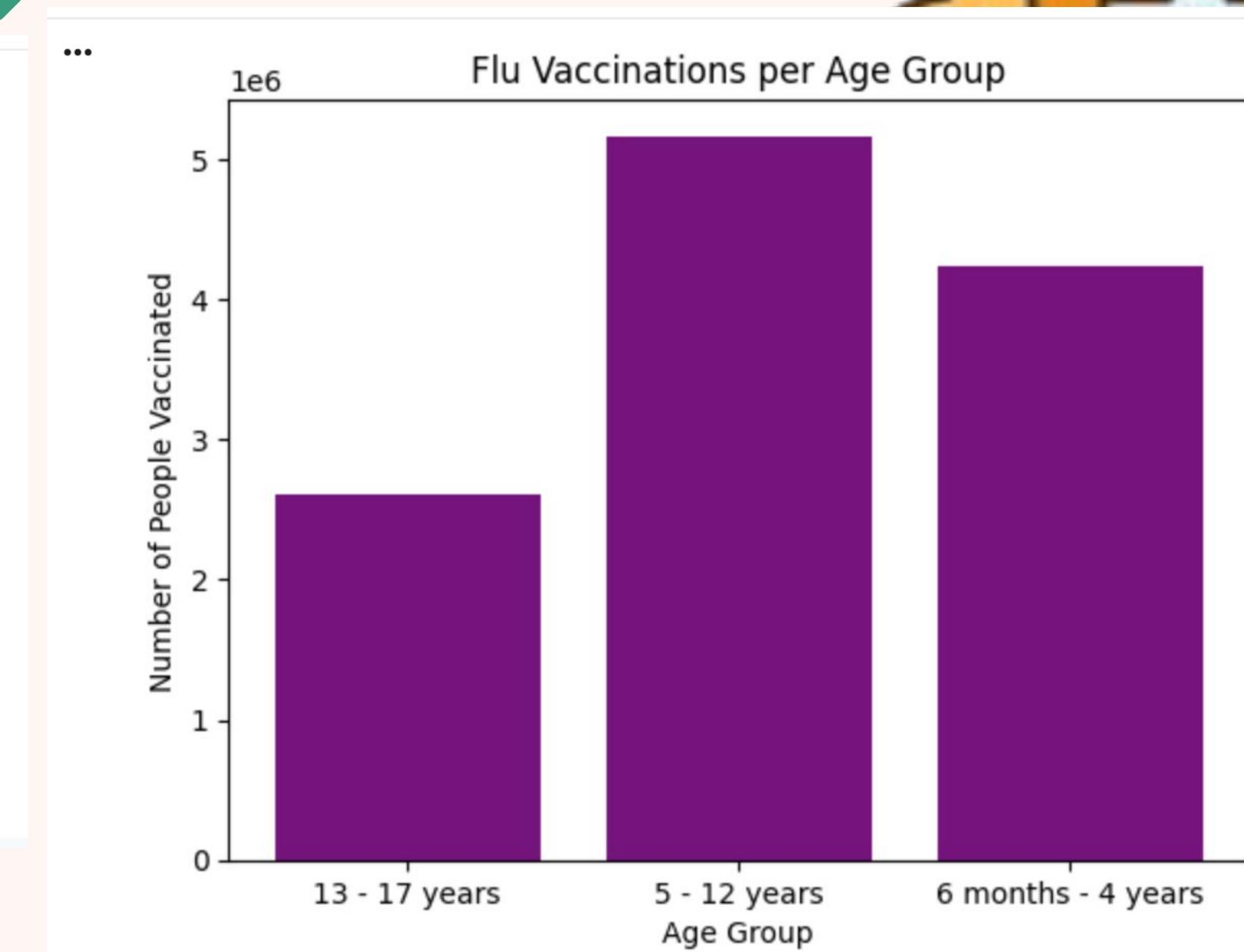


Figure 2. Above, a bar plot is shown, The amount of flu shots administered to various age groups is shown in this bar graph.

Figures 3-4

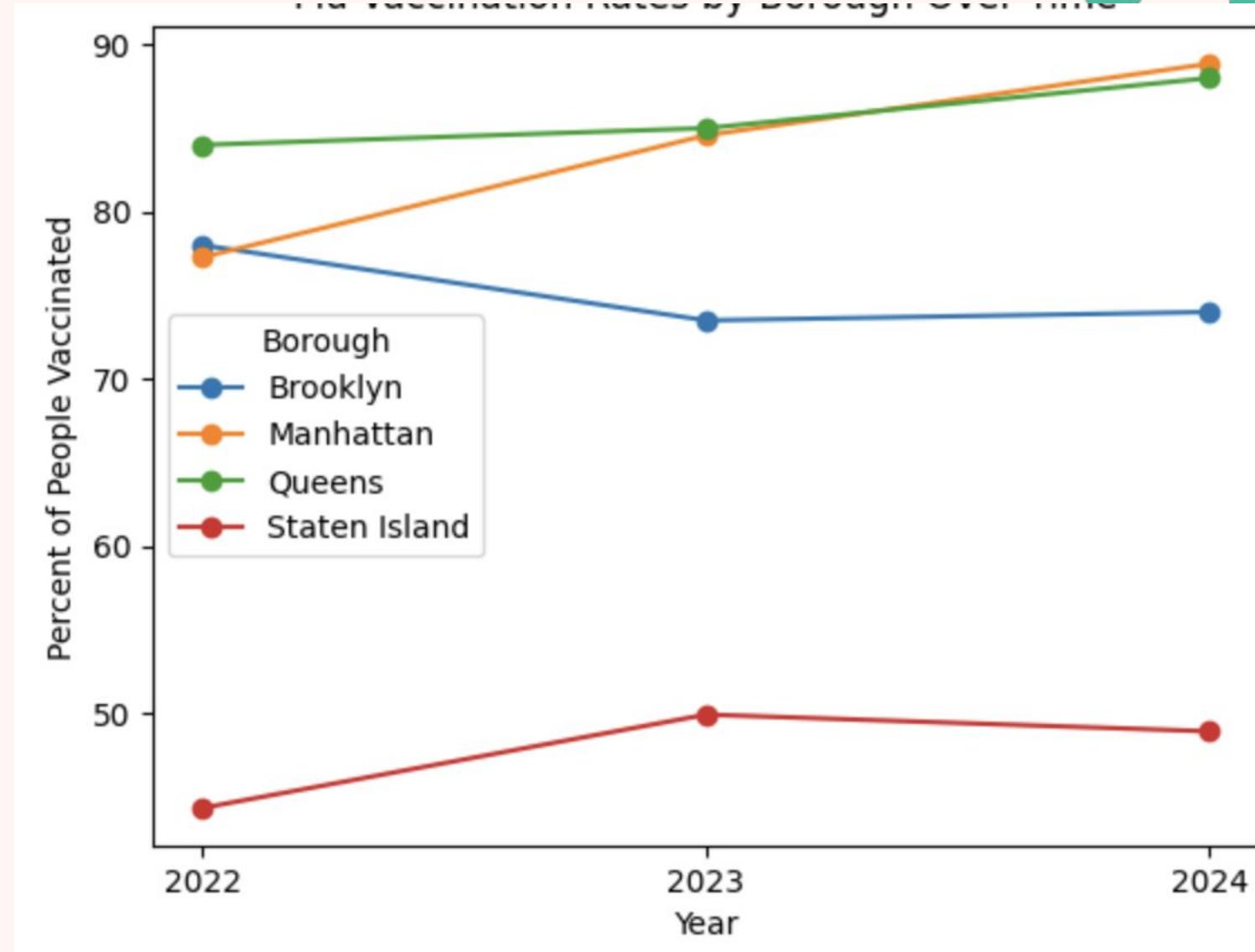


Figure 3. This line plot compares the different percentage of people who have received the flu vaccine in each borough every from 2022 - 2024.

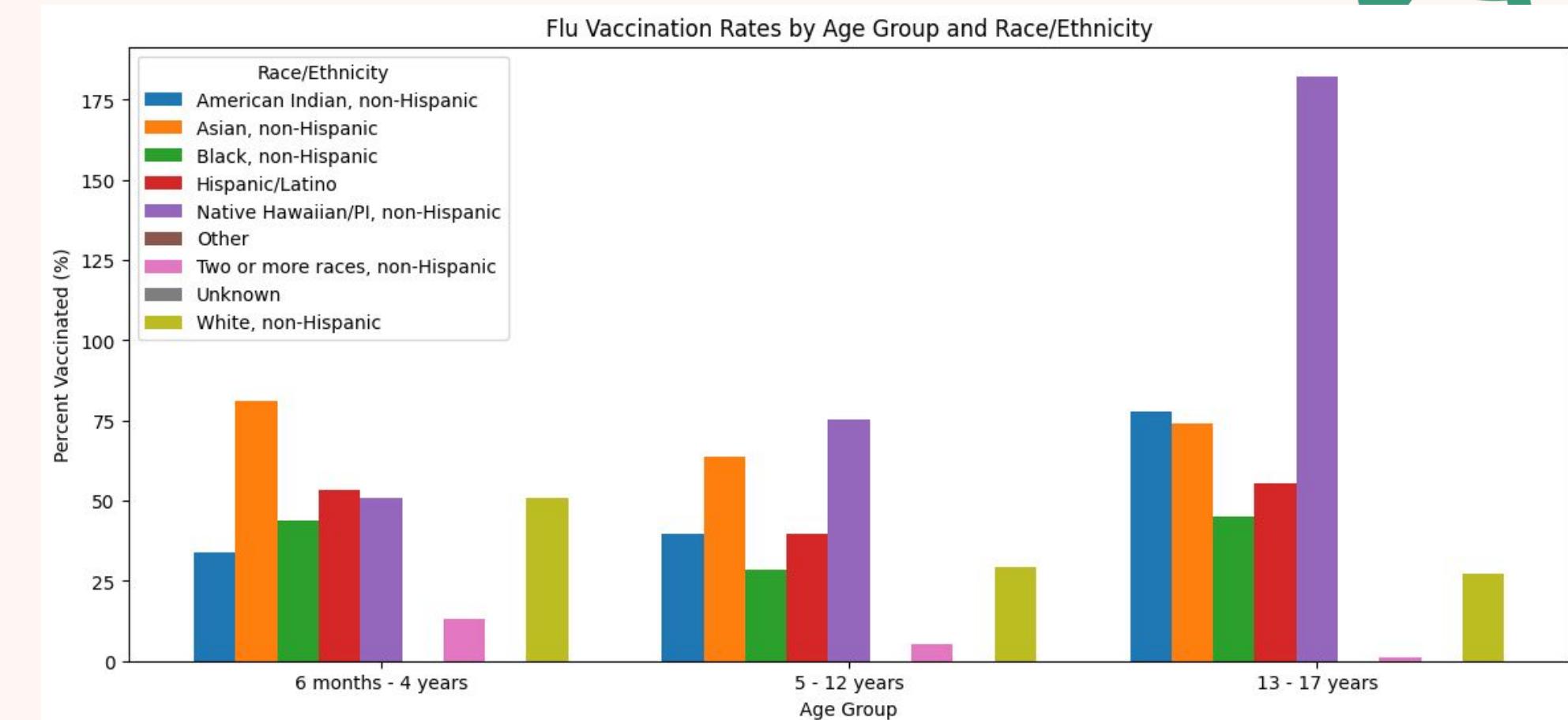


Figure 4. This bar chart compares ethnicities/race with age group. This highlights the disparities among demographic categories.

Figures 5-6

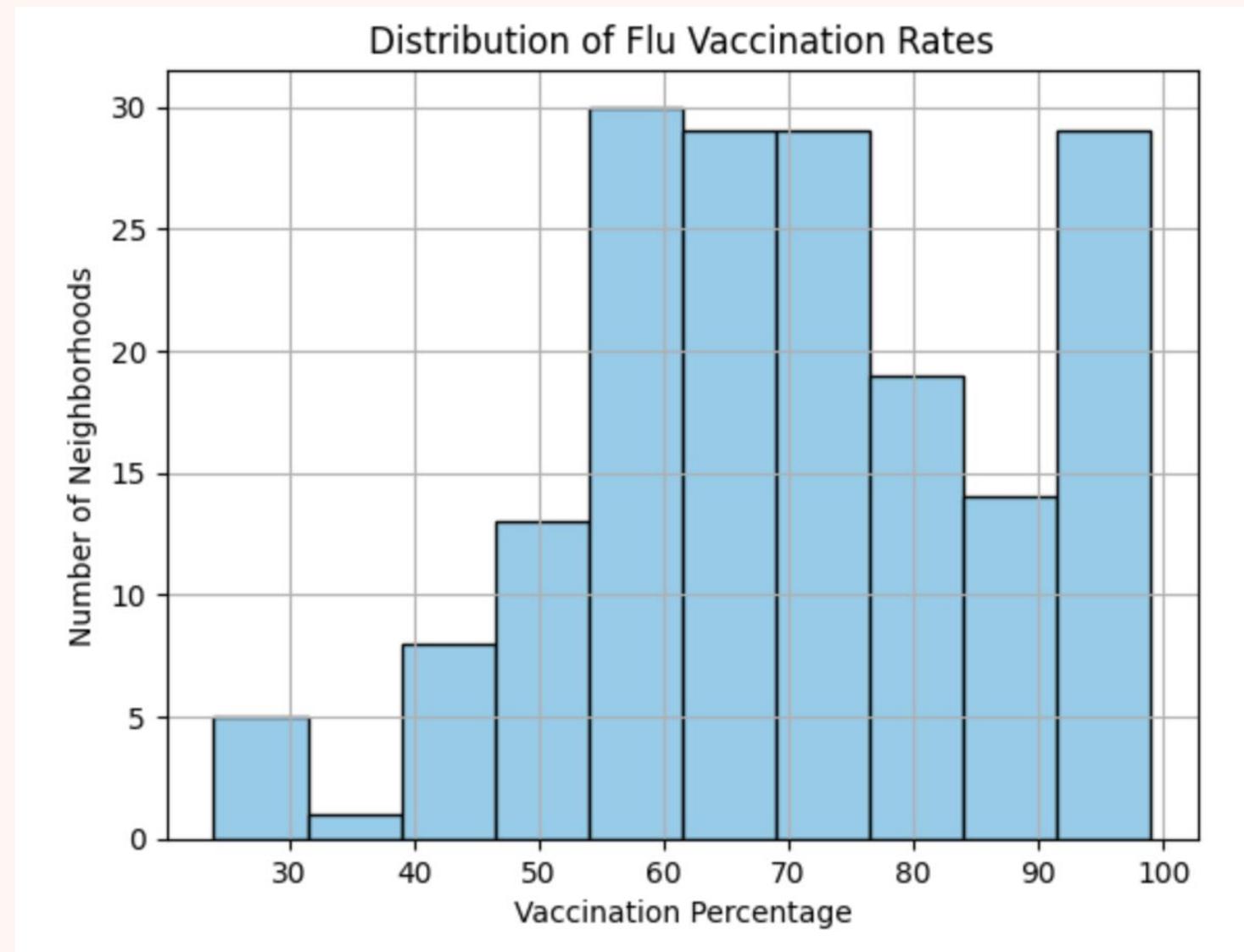


Fig 5. This histogram shows the number of neighborhoods that have a specific flu vaccination rate.

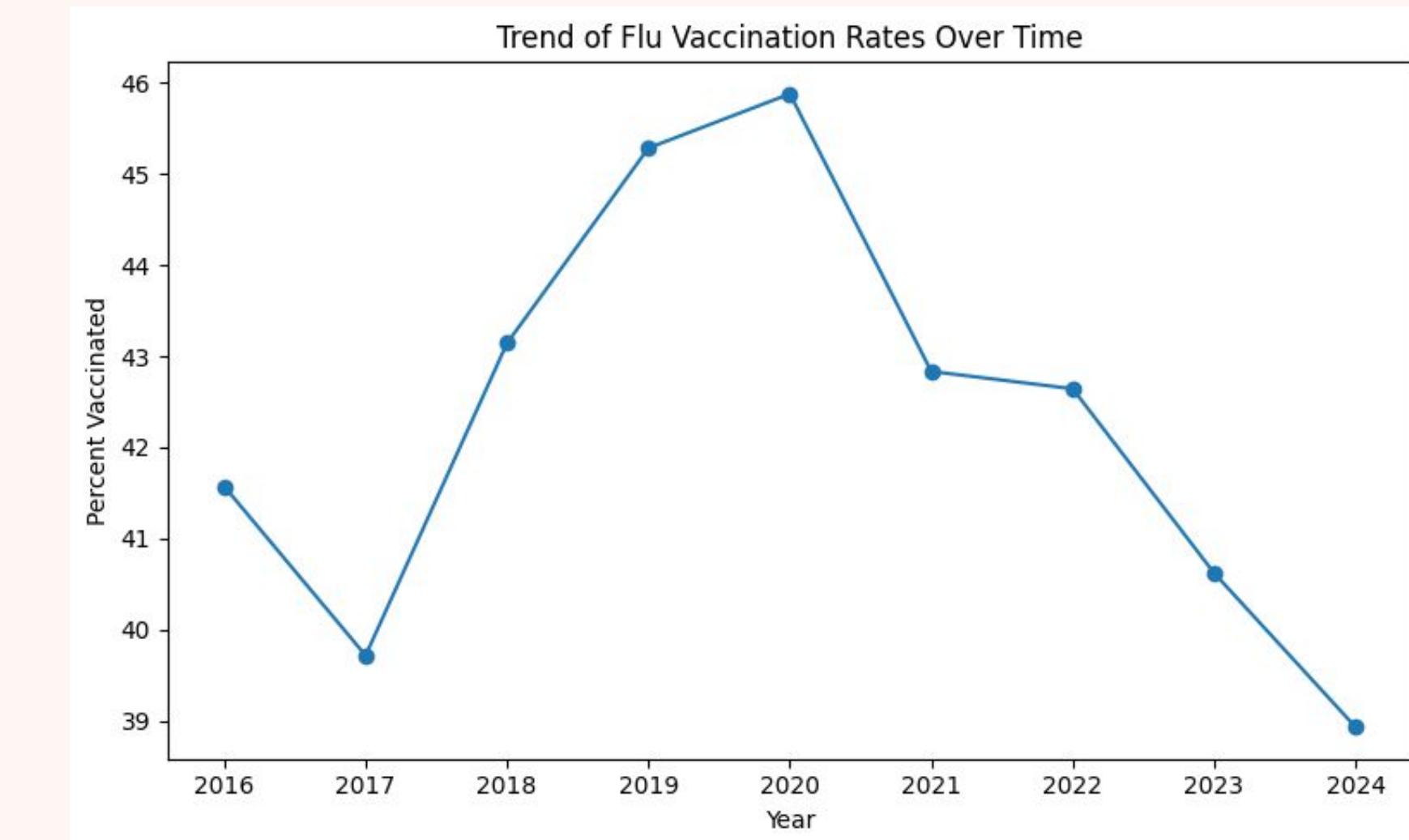
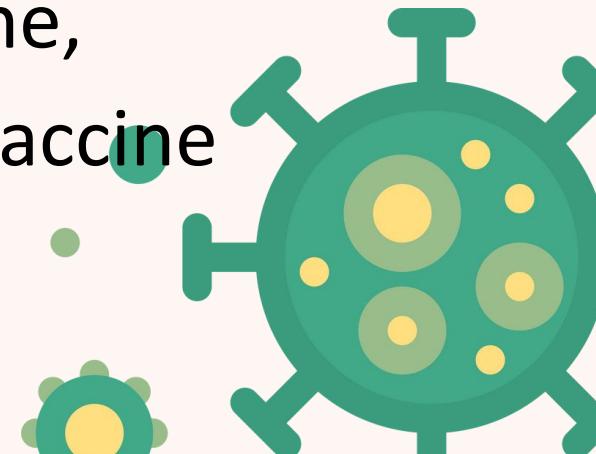
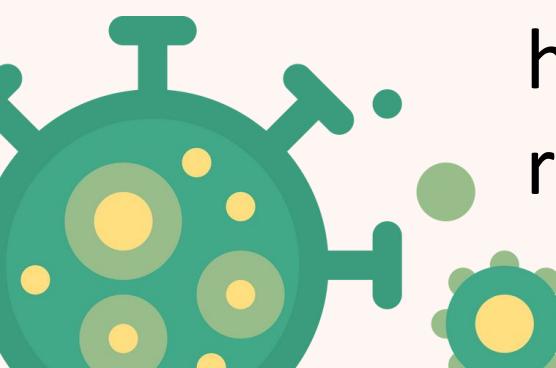


Fig 6. This line graph shows how average flu vaccination rates have changed over time, highlighting trends and fluctuations in vaccine uptake across different years.



Results

- **Race/Ethnicity Pie Chart:** Flu vaccination rates are not evenly distributed across racial and ethnic groups, suggesting disparities that may be linked to differences in access to healthcare and public health outreach.
- **Age Group Bar Plot:** Younger age groups show higher flu vaccination numbers than older groups, likely due to school requirements and more frequent healthcare visits during childhood.
- **Borough Trend Line Graph:** Flu vaccination rates vary by borough over time, with Manhattan and Queens consistently showing higher coverage while Staten Island remains the lowest, indicating geographic inequalities in vaccine up
- **Age Group × Race/Ethnicity Bar Chart:** Flu vaccination rates differ across racial and ethnic groups, with disparities becoming more noticeable in older age groups.
- **Line Graph Takeaway:** Flu vaccination rates change over time, showing noticeable year-to-year variation that may reflect differences in public health efforts and vaccine uptake
- **Histogram Takeaway:** Flu vaccination rates across neighborhoods are mostly concentrated in the mid-range, with fewer areas showing very low or very high vaccination coverage.

Takeaways

- My take away overall for this project, was noticing how yes there are many people who get vaccinated, but at the same time I believe many more should. Overall, flu vaccines have been proven to be effective and it's very interesting to learn and observe how race, age, ethnicity, e.t.c can play a factor into the amount of vaccinations being administered

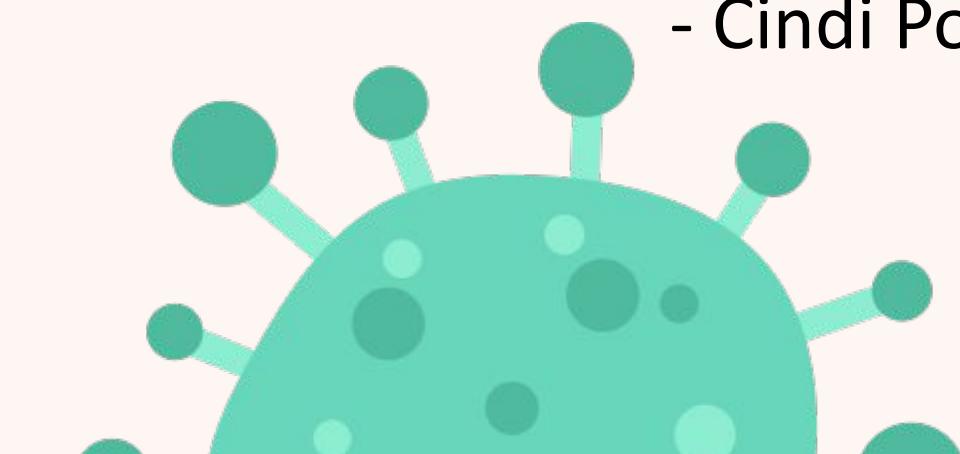
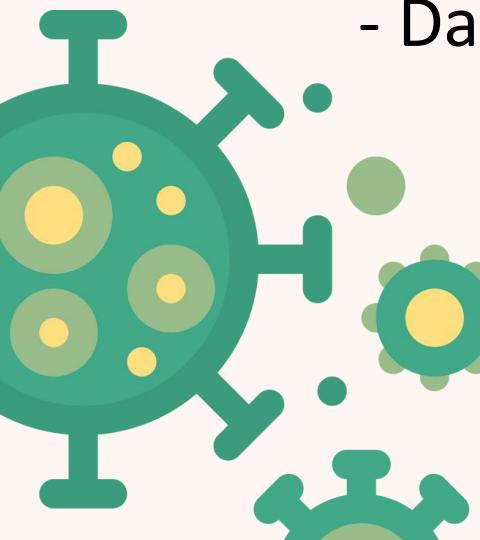
- Daniella Gubskaya

- From this projects I learned about which groups get the most vaccinated and which groups should get targeted to improve vaccination rates in those population. I found it intriguing how we can identify how one factor changes depending on other factors. This provided a much more clear picture on how two factors can correlate with one another.

- Cindi Ponce

- This project showed that flu vaccinations rates vary by age, race, ethnicity, and location, and that some groups may benefit from more targeted outreach. Analyzing how these factors relate to one another helped provide a clearer understanding of vaccination disparities and where improvements can be made.

- Raisa Rahman



References

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- <https://www.nyc.gov/site/doh/about/press/pr2025/nyc-health-department-launches-childhood-vaccination-data-explorer.page>
- https://github.com/nychealth/immunization-data/blob/main/demo/Main_Routine_Vaccine_Demo.csv
- https://github.com/nychealth/immunization-data/blob/main/visualizations/4313314_geo_24_35mo_2022_Q2.csv

Thank You!

