Project 1

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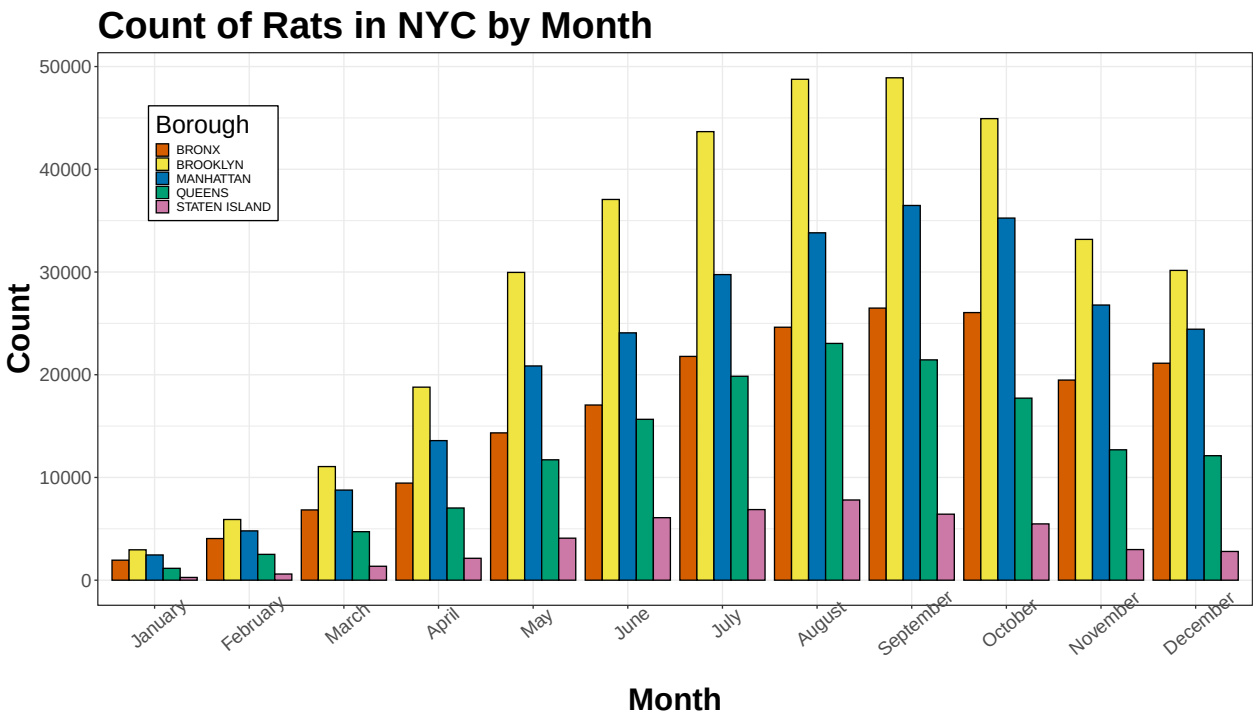
Memo to the Mayor of the City of New York Regarding Rat Sightings

Introduction

Through statistical analysis, we were tasked to investigate past data regarding rat sightings throughout the City of New York in order to find trends that may be of use to city level policy. We found the spread of rat sightings over months to be of interest, as well as segregating the data by borough to allow for efficient allocation of resources to prevent rat populations from growing.

Further, we found the percent change by month for each borough to examine what months we need to allot more resources to defer the rats, and if this may be different by borough.

Rat Sightings Across Boroughs by Month



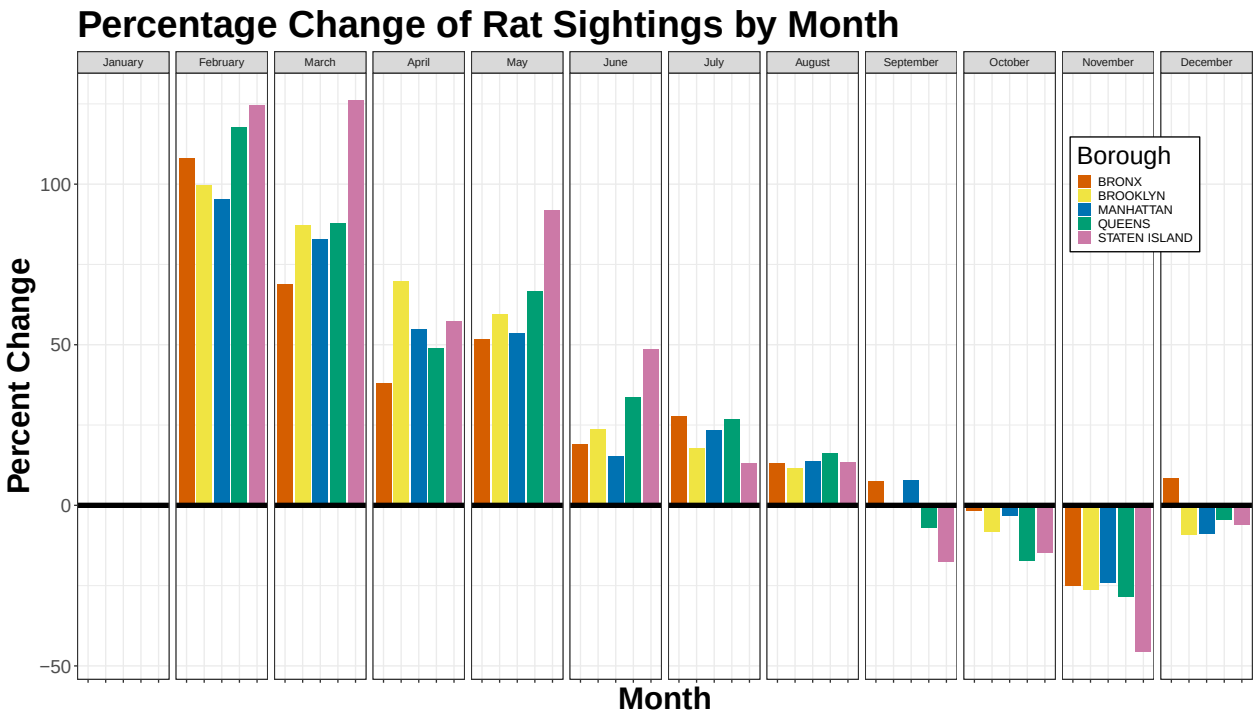
Analysis

The visual above shows that all of the boroughs display similar patterns of rat sightings over the months of the year. Typically, as one burrow sees an increase in rat sightings, so does every other burrow. Rat sightings were higher in the ending summer months (August and September) and lowest in the winter months (January and February). The raw counts of rat sightings for Brooklyn were the highest, but we believe that this can be

explained by the borough having the highest population. We suggest that boroughs with higher rat sightings have more resources to fight the issue.

We further wish to explore whether one borough has significanlty more rat sightings one month compared to the next in their borough. To explore this more, we visualize the percent change of rat sightings for each burrow by month below. By visualizing percent change by month, we can allocate resources not only by total count of rat sightings, but we can prepare better for months where rats increase significantly, especially for boroughs that aren't given a lot of resources to fight the problem. This allows the city to be able to plan for the use of resources better, and devise a plan to eliminate as much rat population as possible before the surge of rat sightings.

Percent Change of Rat Sightings Across Boroughs by Month



Analysis

Above is the visualization for percent change by month sorted by borough. By doing this, we find that while Brooklyn has the highest rat sightings, the percent change for rat sightings follows similar patterns to the rest of the boroughs. Staten Island has the highest percent increase in February and March, but also the lowest percent increase in November. We see the highest percent increase for all boroughs in February and March, and then lower, and negative, increases in the Fall and Winter Months. It is important to note that from our first visualization, the count of rats is lowest in the winter months. Thus, we see really high percentage changes due to the fact that the rat population is nearly doubling for the first few months of the year, since the population started out at its lowest. We predict if we put more resources to the beginning of the year when rat population is low and fight the rats before they have a chance to double in size every month, we could reduce the total number of rats throughout the whole year.

Summary: Our Official Recommendation

We officially recommend the City of New York to allocate resources by borough by total rat sightings. Thus, Brooklyn and Manhattan should be given the most resources to fight the rat population. We further

recommend, by our percentage change visualization, that more resources, for all boroughs (especially Staten Island) be allocated during the first half of the year, as the rat population tends to grow really fast before tapering off during the winter months, and less resources are needed since the rat population remains stagnant, or decreasing, during the second half of the year after the population has reached its peak.

If we tackle the rat population during the winter months, when the sightings are lowest, but the percentage change is the highest (nearly doubling every month), we forsee great mitigation of the population of rats throughout the entire year.