

Investigating on the effect of recreational facilities on public health and satisfaction

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Abstract

In this study we looked at the different recreational facilities in New York City and its effect on public health and satisfaction. We chose art galleries, movie theaters and museums as our recreational facilities samples. The amount of facilities was compared to the number of 311 complaints in each zip code for the whole New York City area. We investigated the correlation of the amount of each recreational facility variable and the number of complaints and found out the number of galleries, museums and in overall recreational facilities can have a negative correlation with number of complains in each zip code. Also we compared the amount of each recreational facility variables to the number of patient days in the hospitals for each borough. The correlation found to be positive. This could be due to the fact that boroughs with higher recreational facilities tend to have more hospital and higher capacity for patients. Therefore increase in recreational facilities may result in increase in number of patient days in that specific borough.

there is a string, and well known, engagement bias int he 311 data: whealthier citizens tend to call 311 more, because they are aware of it, care about their neighbourhood, and feel more entitled to services. failing to account for that skews this analysis.on the other end it is difficult to account for it

Data

The locations for each recreational facility extracted from NYC OpenData website. This data included the geographical location of the facility, its city, address and zipcode. [1-3] Also we got the zip code definitions of New York City neighborhoods from New York State's Department of Health Website. [4] This data shows the zip codes, the neighborhoods and the boroughs which they are assigned to. Our satisfaction indicator was number of 311 call made after December 31st 2014 and it was available also on NYC OpenData website. [5] The last dataset that we used in this research was reachable through American Hospital Directory website and it showed each hospital in New York state, the city in which the hospital is, the number of staffed beds, total discharges and patient days for each hospital. [6]

Methodology

We sorted our facilities data based on their zip codes and boroughs. In the next step we calculated the number of each facility for different zip code and borough in New York City. Same cleaning process was done for 311 calls for year 2015. Due to lack of information about location of hospitals they have only been sorted based on their boroughs. After this stage we created a linear regression model for the amount of each of these facilities and the number of 311 complaints calls.

Results

Figures 1, 2 and 3 show the scatter plot for each facility variable and number of complaints. Based on our model each art gallery would decrease the annual number of complains by 24 numbers. Same wise one unit increase in number of museums would decrease the complains 203 units for the whole year. The number of theaters showed positive correlation with number of complains. The slope of our linear model in this case was almost 86. All these regression models have a very low R^2 values of less than 0.05. We also looked at the overall number of recreational facilities in different zip codes and it also showed a negative correlation with number of complains (Figure 4). Finally as a our last public satisfaction analysis we generated a linear model considering all facility variables. Table 1 shows a summary of our model. Based on our model number of art galleries is the only variable with negative impact on number of complains, while the number of movie theaters and museums showed a positive impact on complaints number. We also looked at the patient days of each borough and compared it with our facility variables. As it is shown in Figures 5 and 6 all facilities showed positive correlation with patient days number of each borough. This could be due to the fact that boroughs with more recreational facilities happen to have more hospitals and other health facilities. However this is only our hypothesis and there is no proof for that.

probably the engagement bias
theaters showed positive correlation with number of complains.
including median income here may help reduce the bias
actually there could be. just do the same regression using the variables you think are in fact the leading factors and see if the regression is the same. then you have a strong explanatory variable (as strong?) which is more closely relate to the effect you are measuring.

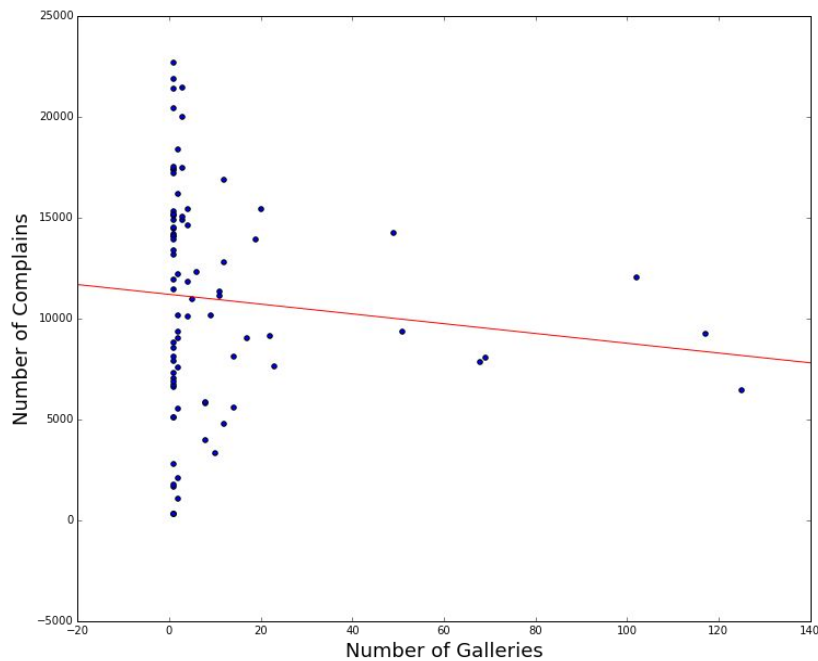


Figure 1- Scatter Plot of Number of Complains vs. Number of Galleries per Zip Code

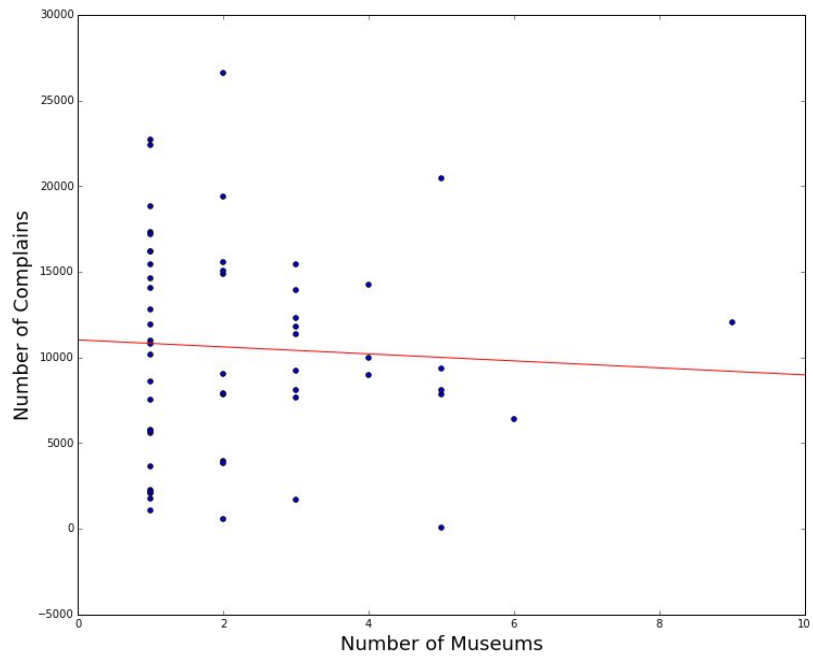
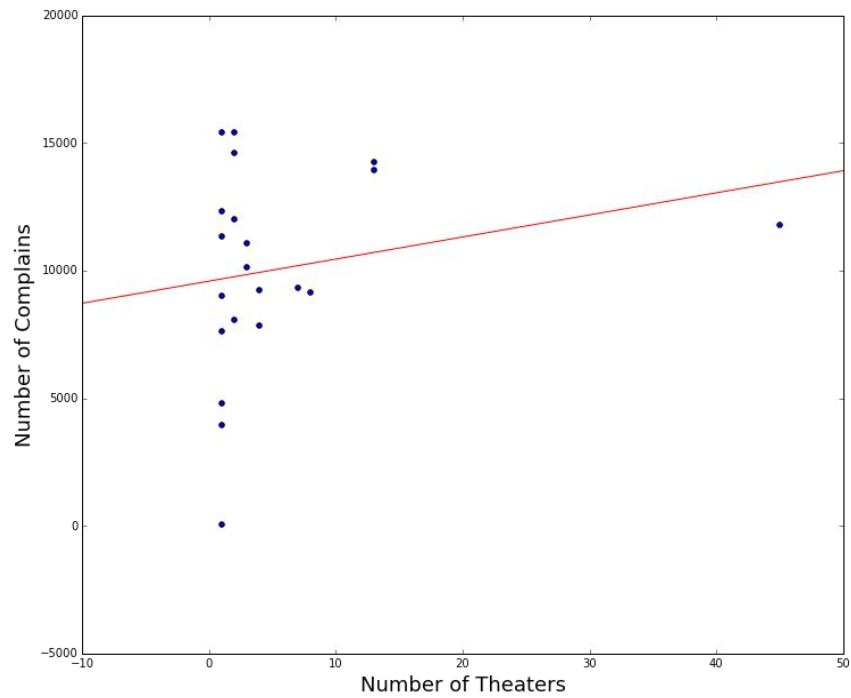


Figure 2- Scatter Plot of Number of Complains vs. Number of Museums per Zip Code



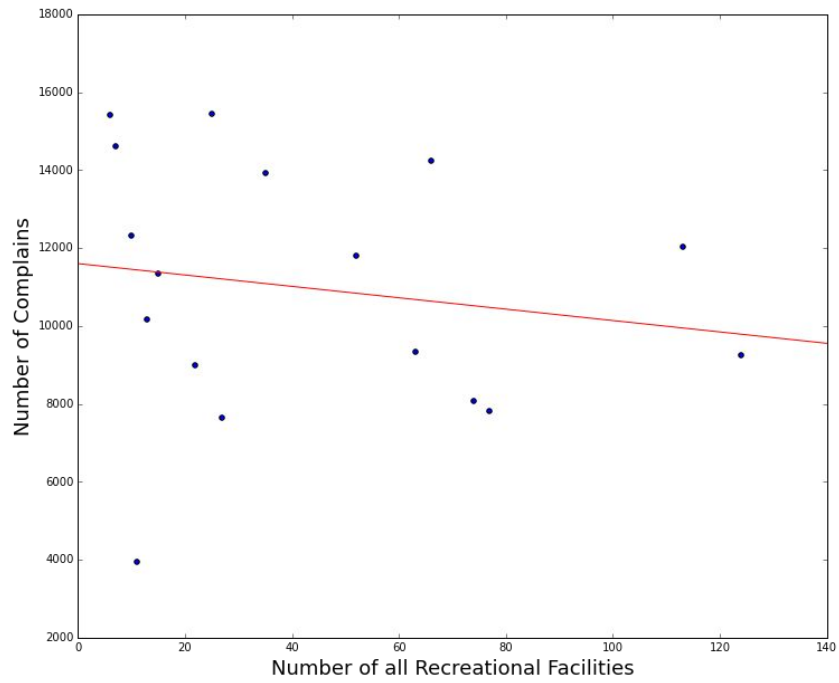


Figure 4- Scatter Plot of Number of Complains vs. Number of all Facilities per Zip Code

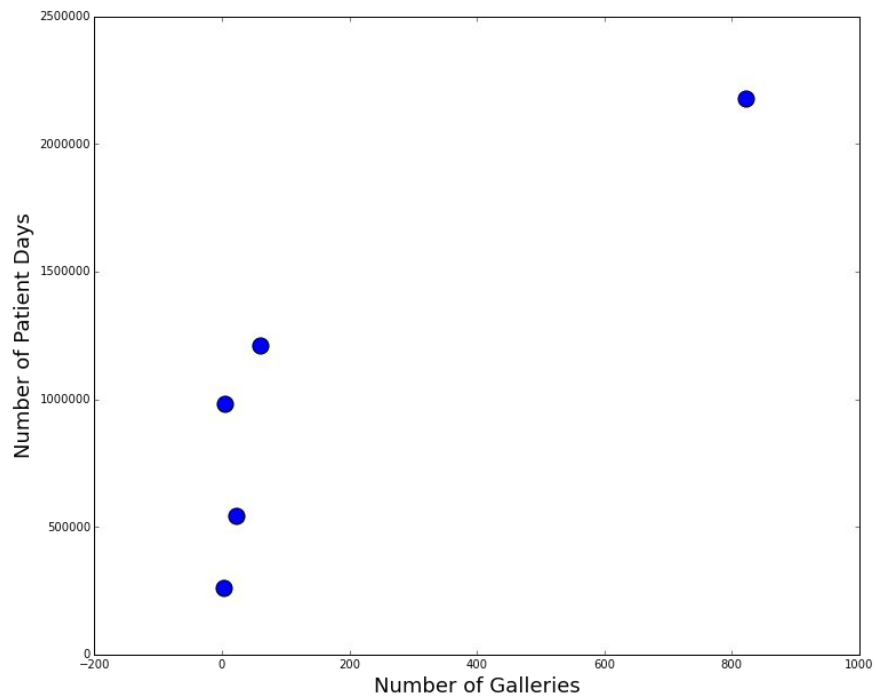


Figure 4- Scatter Plot of Number of Patient Days vs. Number Galleries per Borough

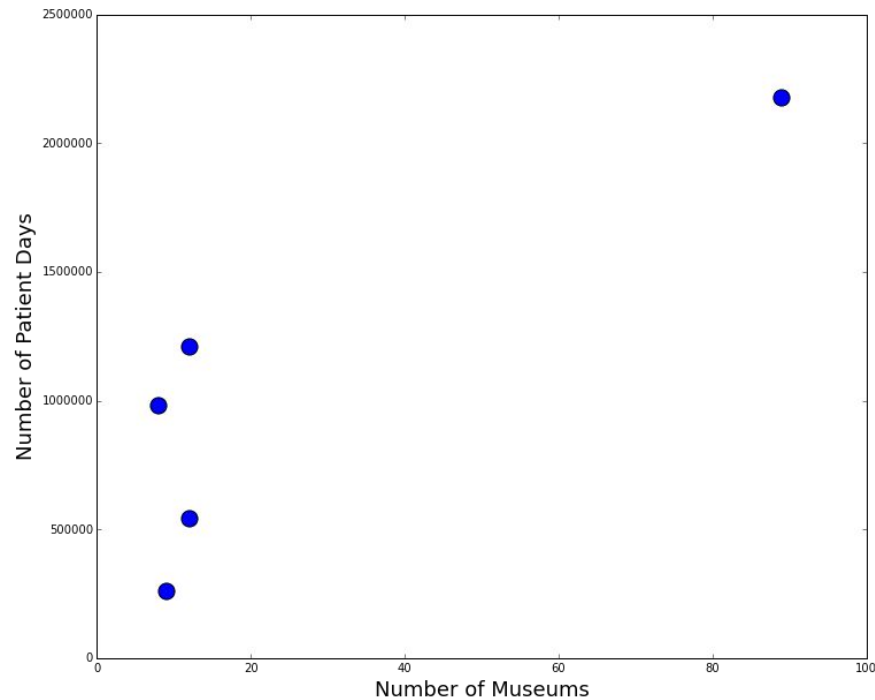


Table 1 - Linear Regression model of Number of 311 calls based on number of art galleries, number of museums and number of movie theaters

Future Work

In this research we only looked at limited number of recreational facilities. It is suggested to add other public facilities such as public parks and public football/soccer fields to this analysis. Also the analysis can be done in different scales from neighborhoods to boroughs. Our health data was very limited. In future work by having access to more enhanced data we can study the effect of these facilities on public health in more details and bring up more accurate models.

References:

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