AIR QUALITY ANALYSIS: *NYC*

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OVERVIEW

Our team was hired by the New York City Department of Health and Environment to analyze the cities air quality index (AQI) in direct relation to asthma and respiratory health concerns.

- With a population of approx. 8.3 million people, NYC is both the most populous city in the United States, and the most densely populated. (cite)
- The city is divided into five different boroughs: Manhattan, Queens, Brooklyn, the Bronx, and Staten Island.
- Many factors contribute to the cities air quality, primarily: traffic volume and density.
- Possible mitigating factors include the volume and diversity of trees found throughout the city.

OUR OBJECTIVE

To use multiple sources on the composition of the cities air quality, truck routes, and tree locations, to visualize a comprehensive image of NYC as it relates to a risk of asthma.

01

BACKGROUND

Relevant project terms.

02

CODING APPROACH

Quick demo, and look into our sources.

03

ANALYSIS

What do our findings mean?

04

CONCLUSION

Closing remarks.

01

BACKGROUND

What pollutants are we looking at?

PM2.5 

Fine particulate matter, less than 2.5 microns in diameter, are a dangerous and widespread pollutant in NYC which pose a great danger to human health.

PM2.5 is small enough to enter the lungs and inevitably the bloodstream, leading to possible heart disease and in some cases, death.

Relevant common causes:

- Fuel combustion in vehicles
- Construction equipment
- Boilers in buildings

NOx

Nitrogen oxides (particularly NO2) are a group of pollutants directly linked to an increase in respiratory conditions and visits to the emergency room by those exposed.

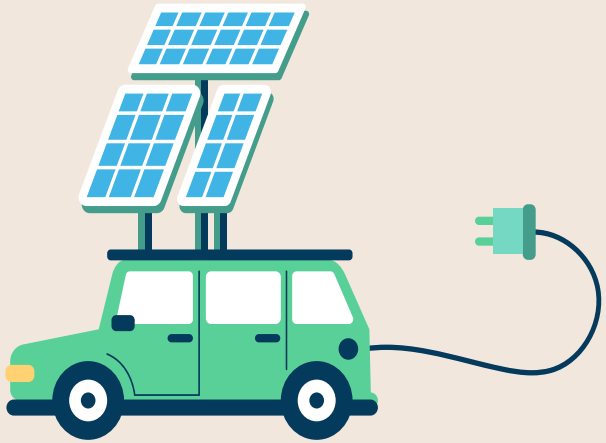
Relevant common causes:

- Motor vehicles
- Construction equipment

03

Ozone or O3, when a ground-level is formed when NOx combines with sunlight or other airborne pollutants. High levels of O3 are also implicated in respiratory related symptoms (coughing, chest tightness, worsening of asthma).

Commonly found in areas away from dense traffic, thus downwind from areas high in NOx levels.



Units of measurement:

- The concentration of PM2.5 air pollutants are provided in micrograms per cubic meter of air (mcg/m3).
- NOx and O3 are measured in units of parts per billion (ppb).
- Cases of asthma found throughout the city vary in their units of measurement from percentage to annual rate per 10,000 to 100,000 adults.

02

CODING APPROACH

OUR STRATEGY

- Collected data from multiple sources:
  - NYC Air Quality data
  - Truck route data
  - Tree census data from 2005 and 2015
  - NYC Asthma prevalence data
- Analyze the data using maps, charts and other visualizations

NYC OpenData

OUR SITE

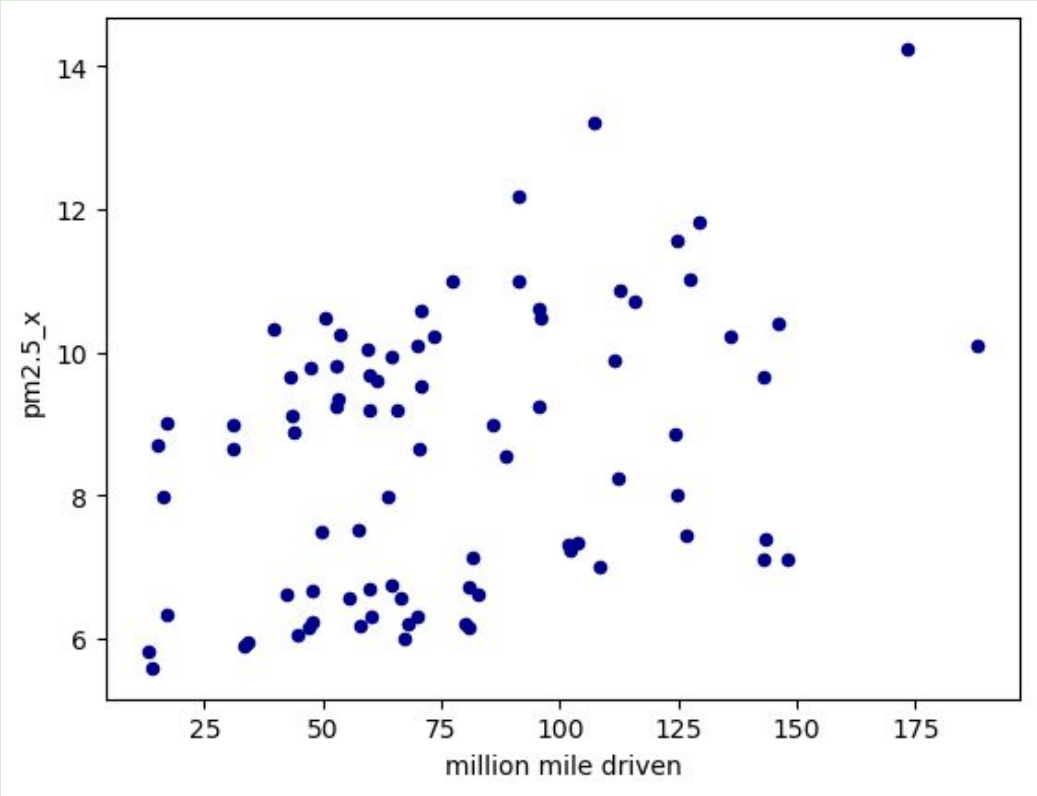
http://apple1.myds.me:5000/

Time for a quick demo!

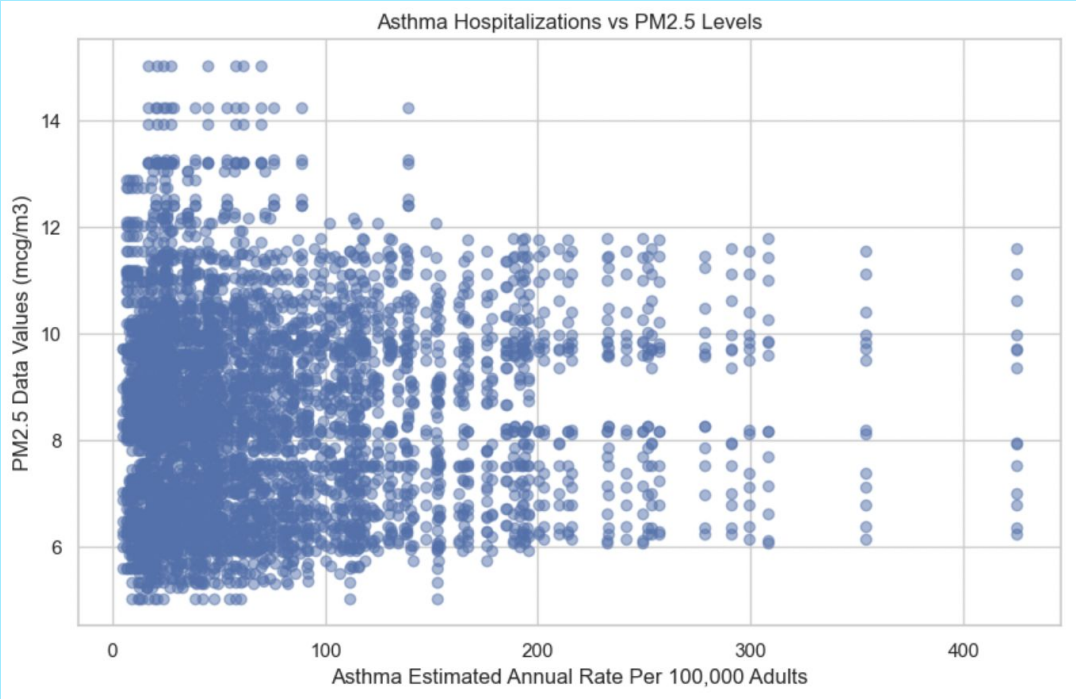
03

ANALYSIS

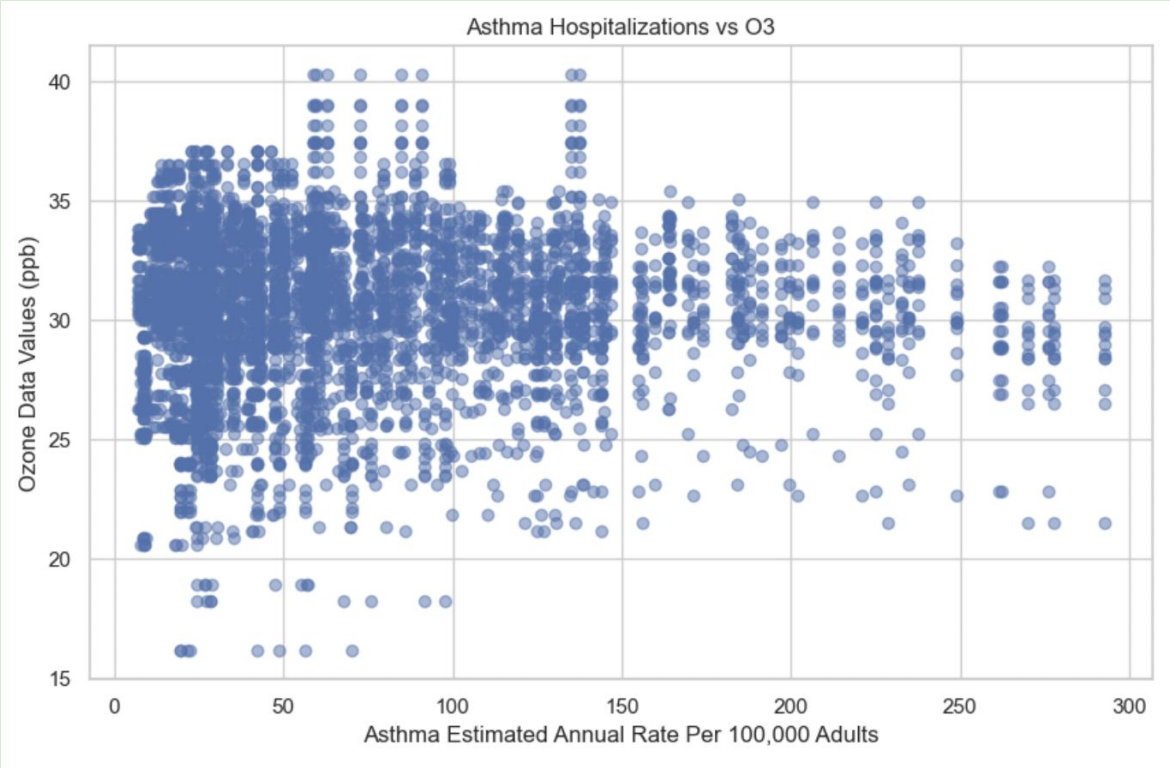
PM 2.5 vs Annual Vehicle Miles Traveled



The R value is 0.38. PM2.5 value is positively affected by annual vehicle mileage.



No relationship between the hospitalizations due to Asthma and PM2.5 levels.



Similarly, no relationship between the hospitalizations due to Asthma and Ozone levels.

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CONCLUSIONS

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Thanks!

Do you have any questions?

Additional sources:

https://a816-dohbesp.nyc.gov/IndicatorPublic/key-topics/airquality/nyccas/
https://nyccas.cityofnewyork.us/nyccas2021v9/report/2#Sites