



IRONHACK

# AIR POLLUTION CASE STUDY

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# CONTEXT

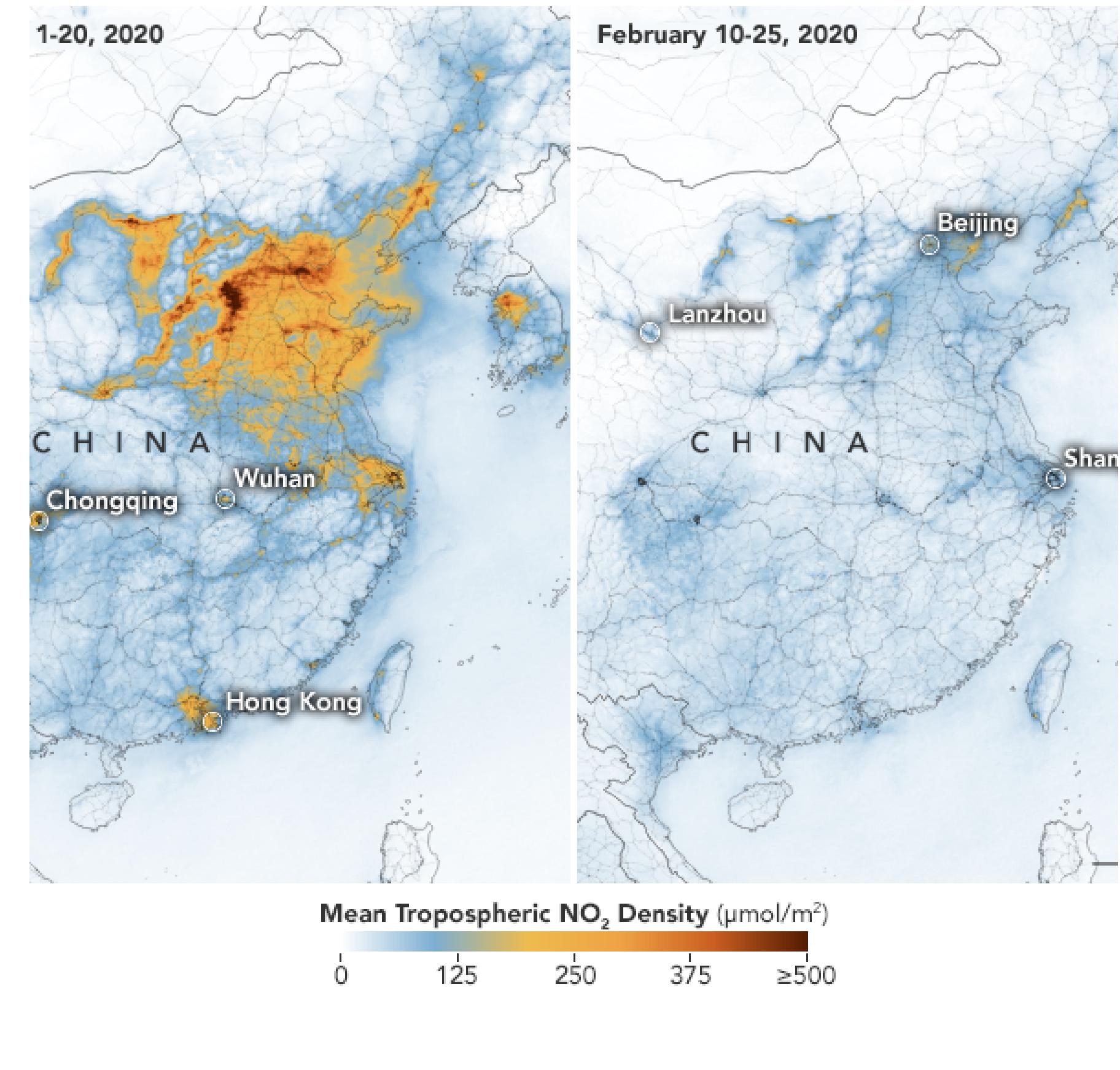
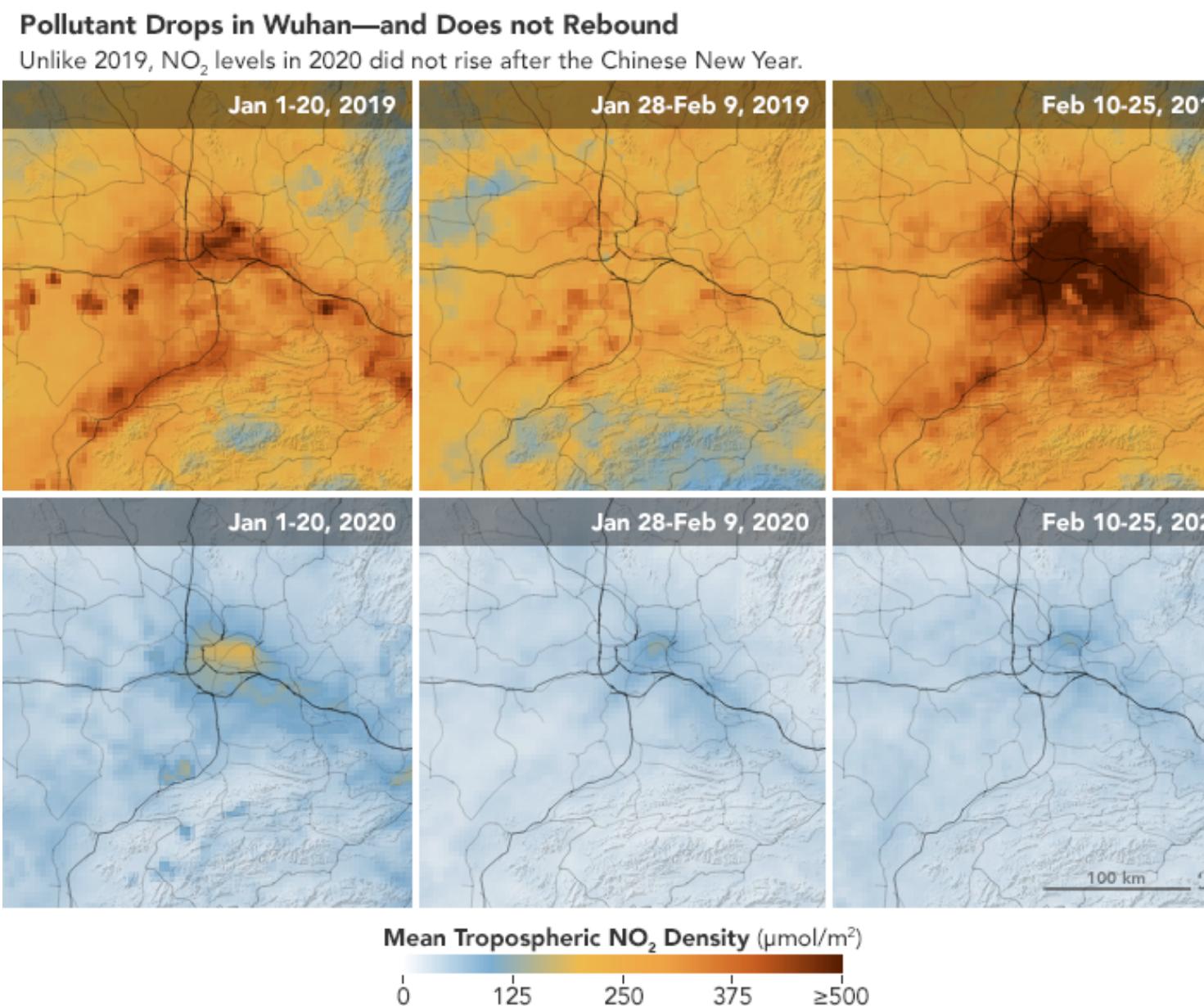
## COVID-19 LOCKDOWN

" The coronavirus pandemic is shutting down industrial activity and temporarily slashing air pollution levels around the world, satellite imagery from the European Space Agency shows. One expert said the sudden shift represented the "largest scale experiment ever" in terms of the reduction of industrial emissions. "

The Guardian, March, 2020

# QUESTION

What is the impact of the reduction in anthropogenic activities due to COVID -19 in other large cities?



# PARAMETERS

# POLLUTANTS

PM 2.5

Microscopic particles of solid or liquid matter suspended in the air.

NO<sub>2</sub>

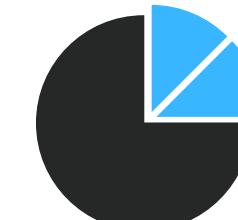
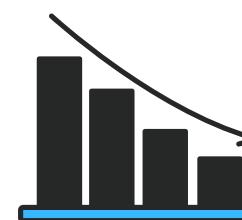
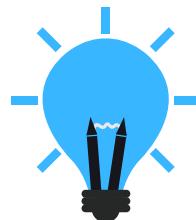
These contaminants are emitted by traffic, combustion installations and the industries.

CO

Emitted from the combustion of fuels in automobiles.

# WORKFLOW

## PROJECT STAGES



### BRAINSTORM

Idea generation and main questions .

### DATA COLLECTION

Data search, API and WEB Scrapping

### DATA CLEANING

to identifying incomplete or irrelevant parts of the data and then replacing

### DATA VISUALIZATION

Visual representation of data. Using Matplotlib and Seaborn.

### RESULTS

Interpretation, conclusions and presentation.

# Data Sources



## WIKIPEDIA

Web Scrapping  
Collection of a table  
with the most  
populated cities in the  
world.



## GOVERNMENT RESPONSE TRACKER

Information on various  
policy responses  
adopted by  
governments, scored  
and aggregated in a  
common rigor index.



## OPENAQ

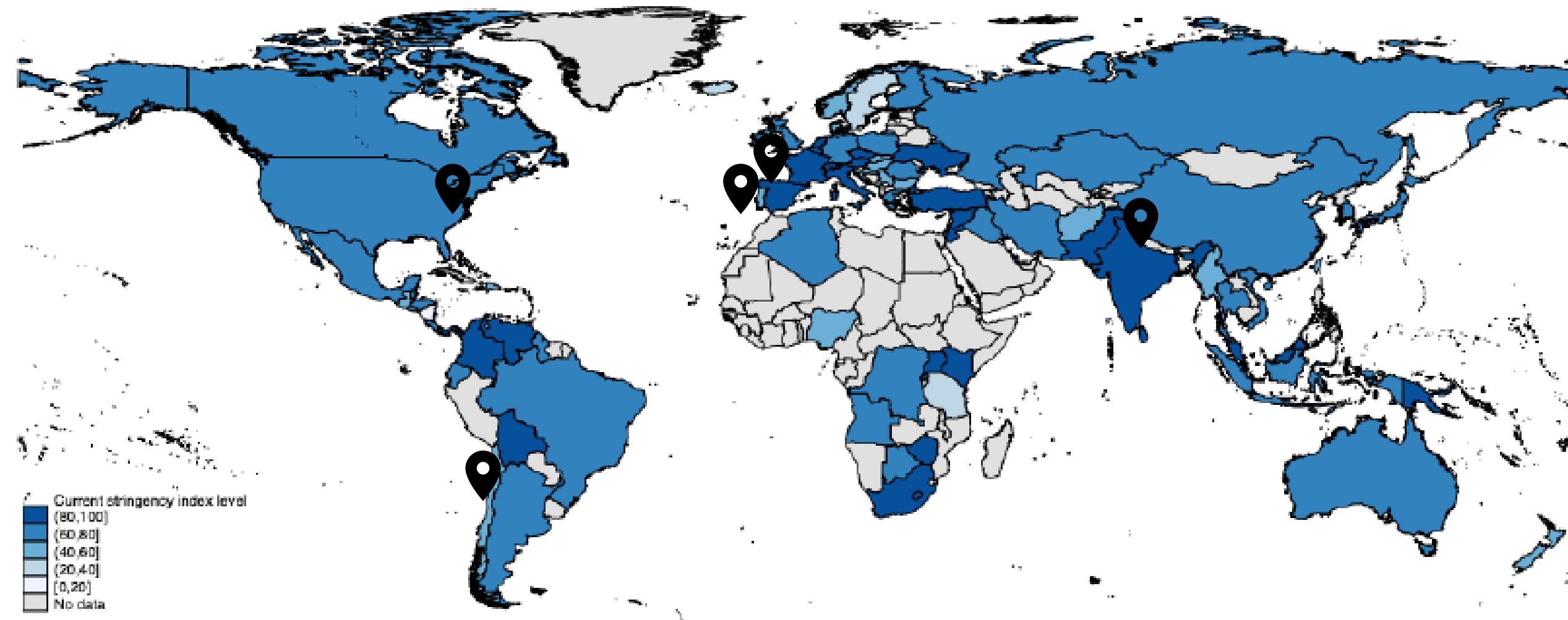
Air pollution  
parameters, aggregated  
from public data  
sources, in real time  
provided by official  
organizations.

kaggle

# STUDY AREA

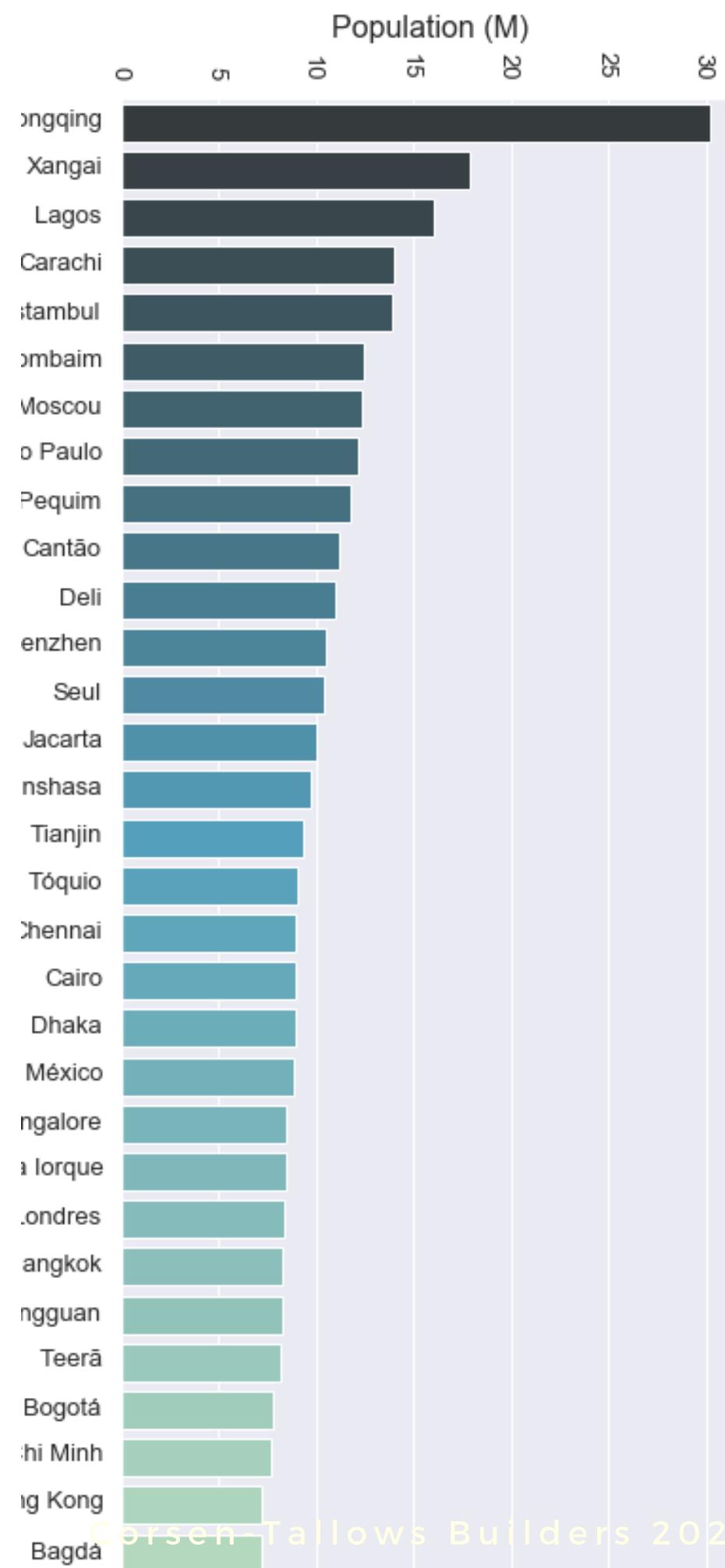
## Geographic

Map of government responses to COVID-19



Data as at 30 March 2020. Individual countries may be several days older.

Source: Oxford COVID-19 Government Response Tracker. More at: [beg.ox.ac.uk/covidtracker](http://beg.ox.ac.uk/covidtracker)



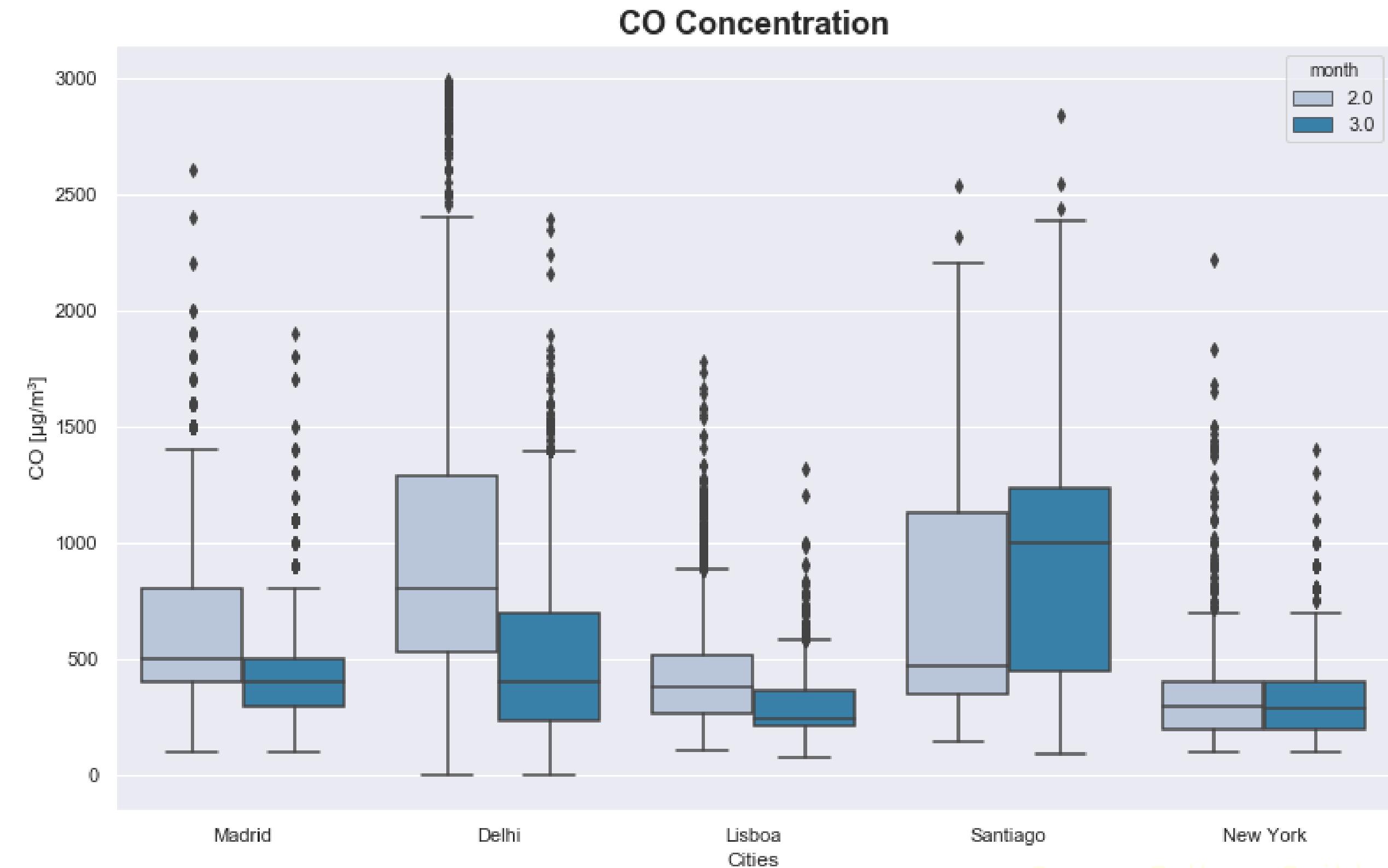


RESULTS

# MAIN INSIGHTS

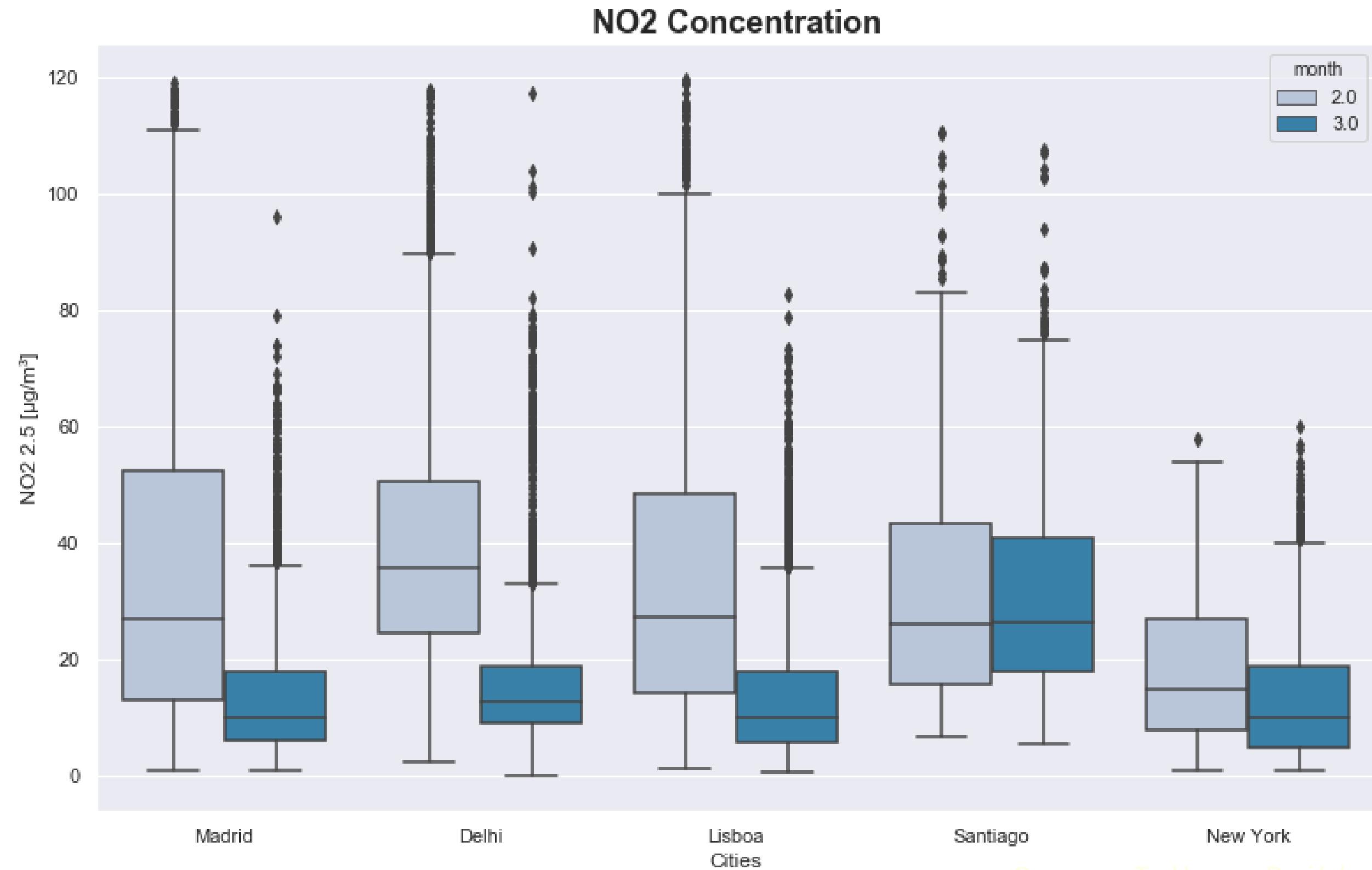
# AIR POLLUTION ANALYSIS

CO



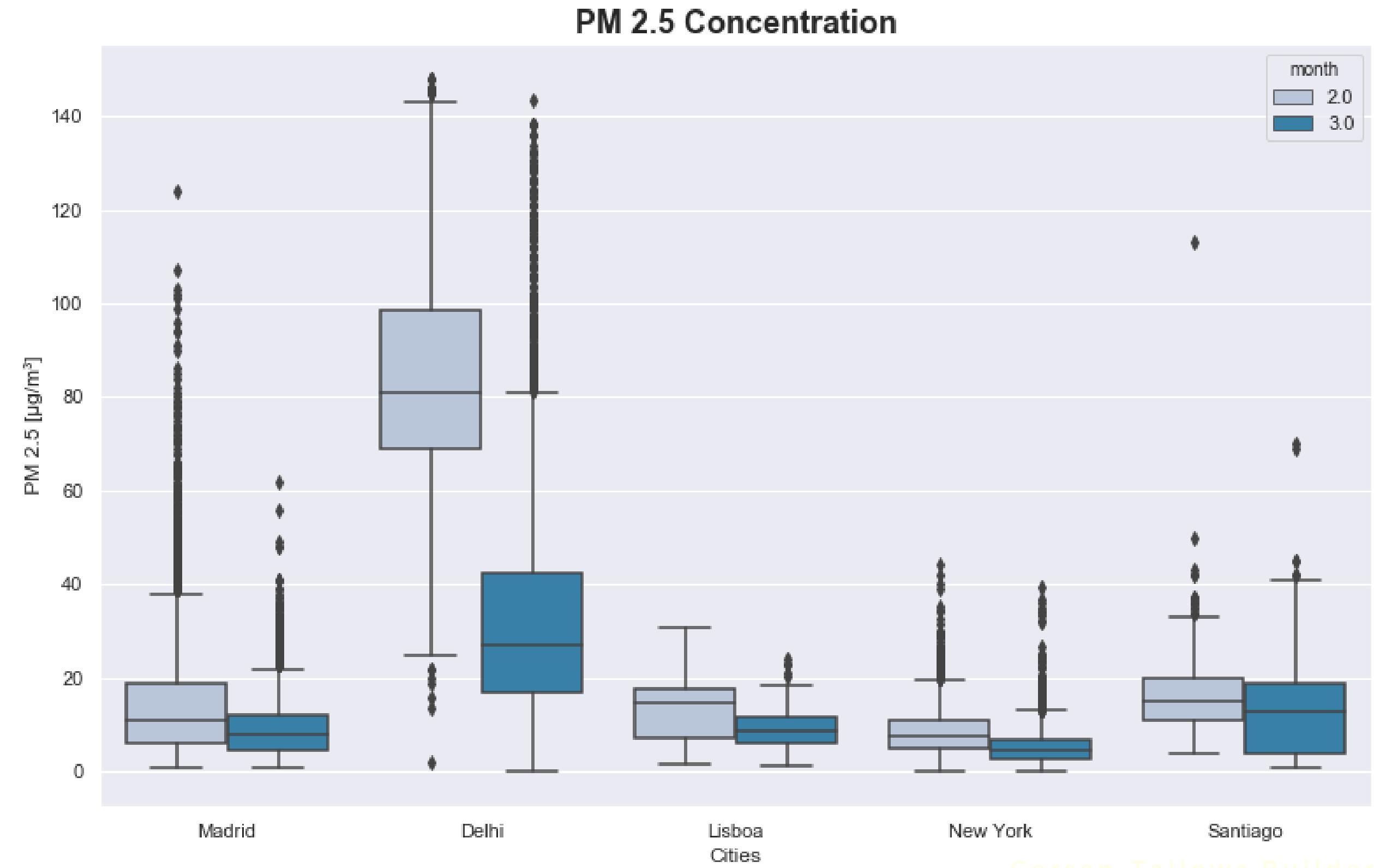
# AIR POLLUTION ANALYSIS

## NO<sub>2</sub>



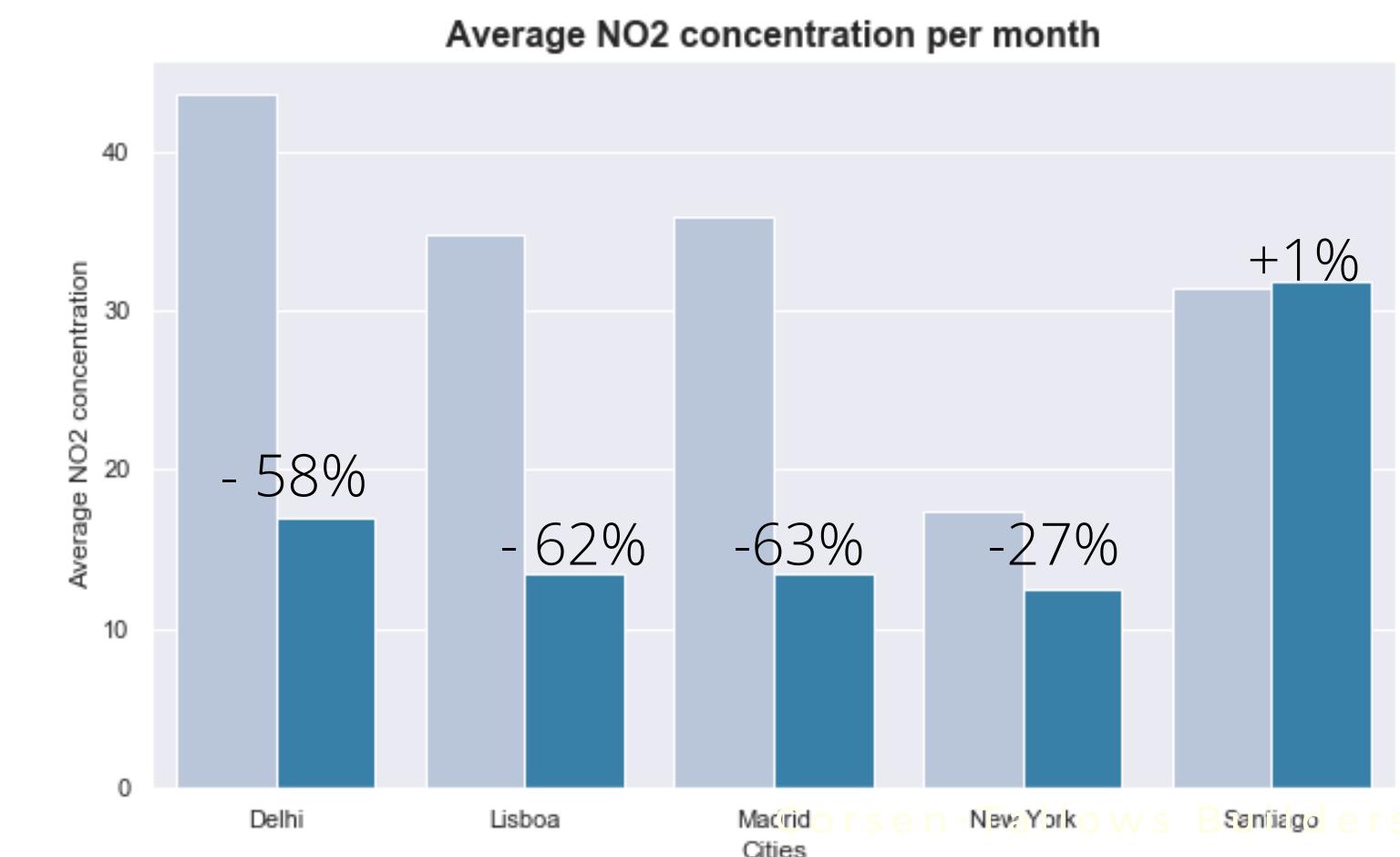
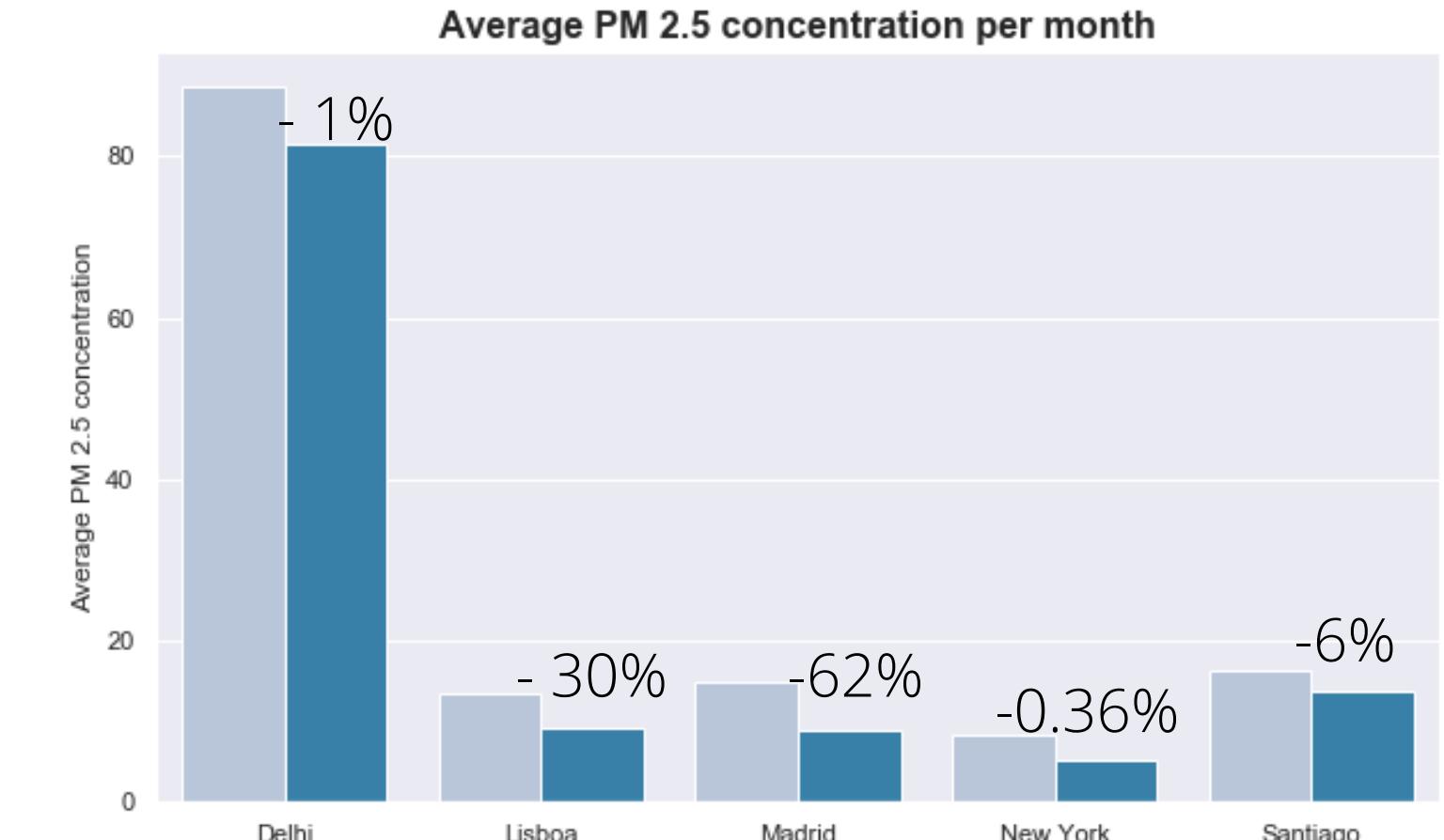
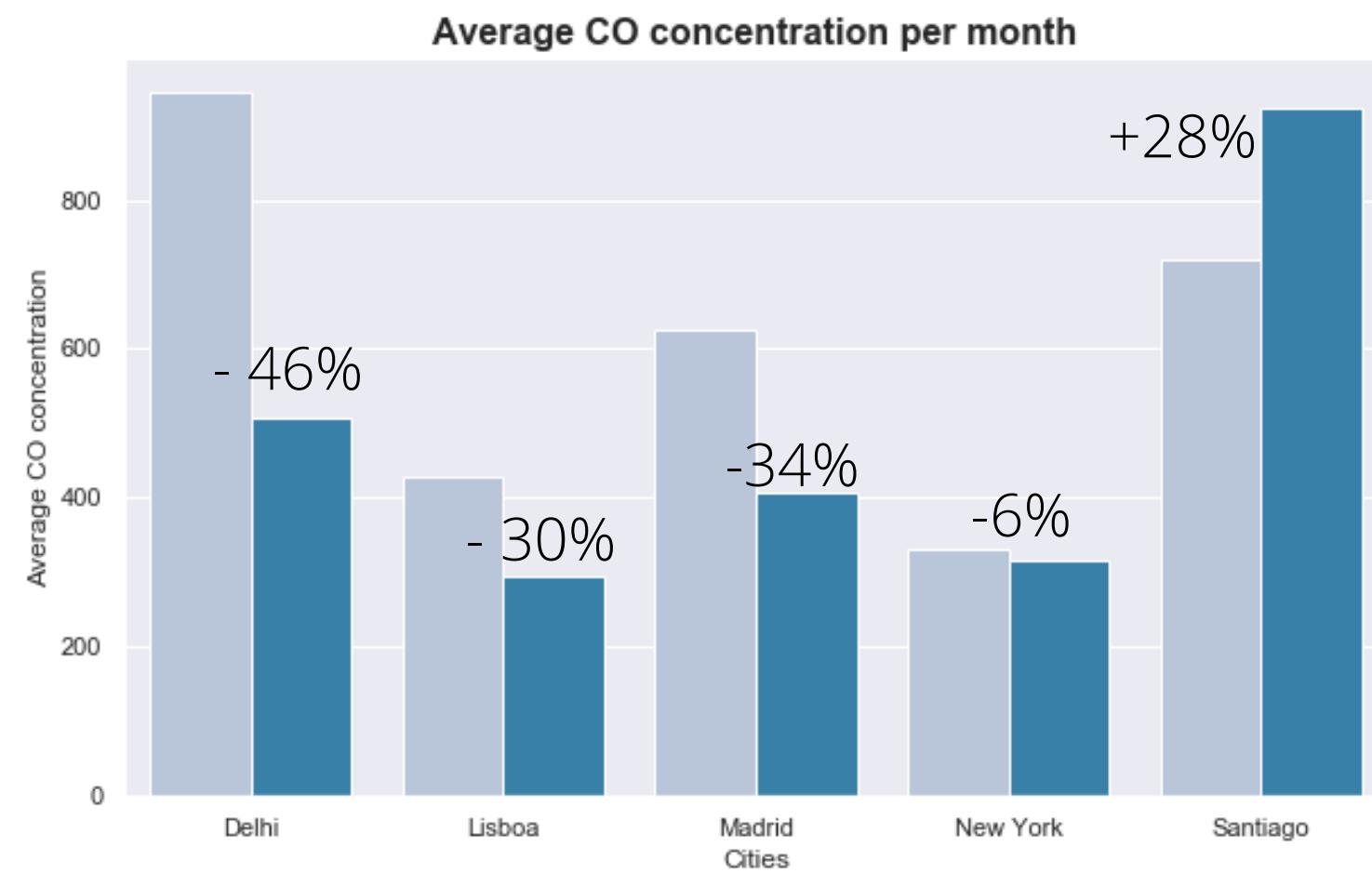
# AIR POLLUTION ANALYSIS

## PM 2.5



# AIR POLLUTION ANALYSIS

## Average concentration



2  
3

2  
3

2  
3

# MAJOR CHALLENGES

## WEB SCRAPPING AND API REQUESTS

Difficulty to extract data, as there were character recognition errors in the table. For the API I had a hard time finding a good one that would return reliable data, and after I had some problems with nested dictionaries,

## DATA CLEANING

Conversion of substance concentration units, conversion of time units and removal of outliers.

## DATA VISUALIZATION

Air quality index and geovisualization.

## FURTHER WORKS

Work a little more with Stringency index data;  
Calculate the air quality index for all parameters,;  
Use remote sensing data and make some maps.