

The Exploration of PM2.5 changes over the years???

Ng Wei Herng, Timothy Zoe, Clarence Agcanas, Yeo Song Chen, Lee Ru Yuan (Group 6)

I. ORIGINAL DATA VISUALIZATION IN NEWS MEDIA

The visualization titled “Comparing PM2.5 Concentrations in Capital Cities” created by Pallavi Rao (2023) and published on “The Visual Capitalist”, presents a snapshot of PM2.5 air pollution levels in various capital cities around the world for the year 2022. PM2.5 refers to particulate matter that is less than 2.5 micrometers in diameter, which is small enough to penetrate the lungs and enter the bloodstream, posing significant health risks.

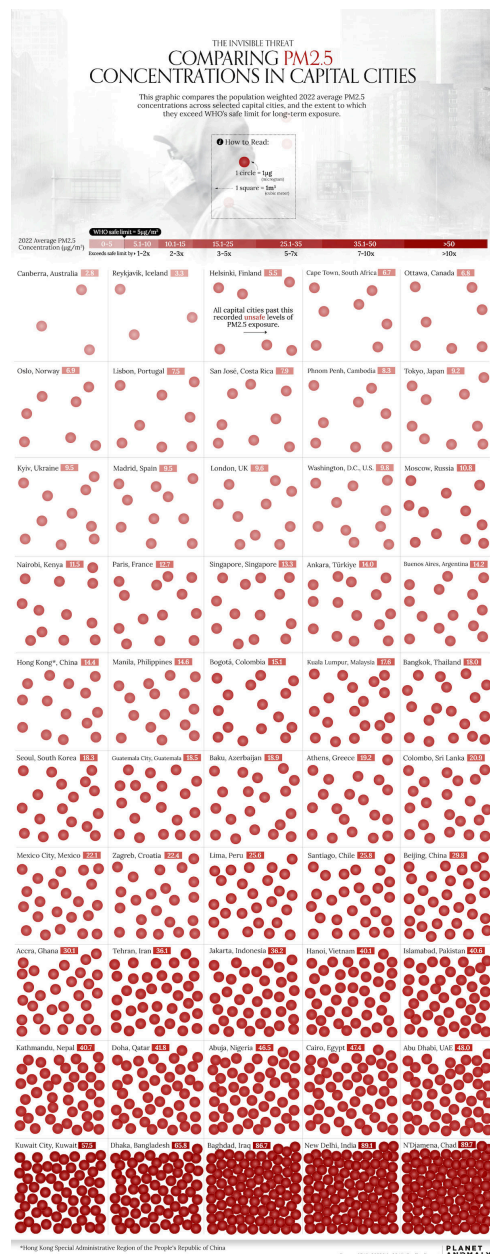


Figure 1: Figure 1: Visualized: Air Quality and Pollution in 50 Capital Cities (IQAir 2022 World Air Quality Report)

This visualization uses a series of red circles to represent the PM2.5 concentrations in each capital city. The number of circles corresponds to the level of PM2.5 concentration that exceeds the World Health Organization’s (WHO) safe limit for PM2.5, which is 5 µg/m³. Any value above this indicates a higher risk for adverse health effects.

II. DATA CLEANING AND PREPARATION

The original data set used for the visualization was sourced from the IQAir World Air Quality Report (2022). While IQAir provides an API for users to obtain their air quality data, the API only gives real-time data instead of data in a time series ranging from the past to recent years. As such, the data set we have chosen to use comes from the World Health Organization (WHO) which provides data on air quality for various countries (2022). The data set contains information on PM2.5 concentrations for different countries and years and is also more precise as WHO has a 60% inclusion requirement whereby the recorded data require annual data availability of at least 60% of the total number of hours in a year to be included. Alongside this data set, we have also chosen to use 3 additional data set for the purposes of enhancing the visualization, as well as to improve on the data engineering and data cleaning aspect of the WHO data set.

- Country Codes (2024)
- Population Data (2024)
- GDP Data (2024)

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III. IMPROVED VISUALISATION.

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i. Choropleth Map

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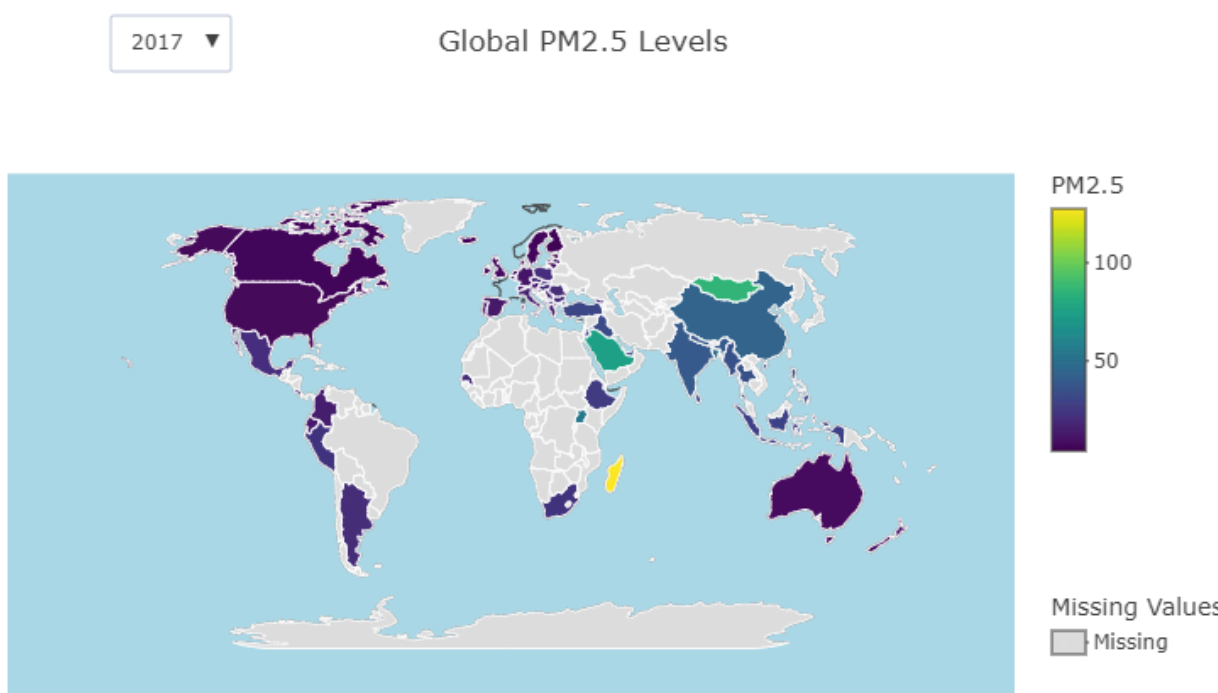


Figure 2: Choropleth Map showing the Global PM2.5 Levels

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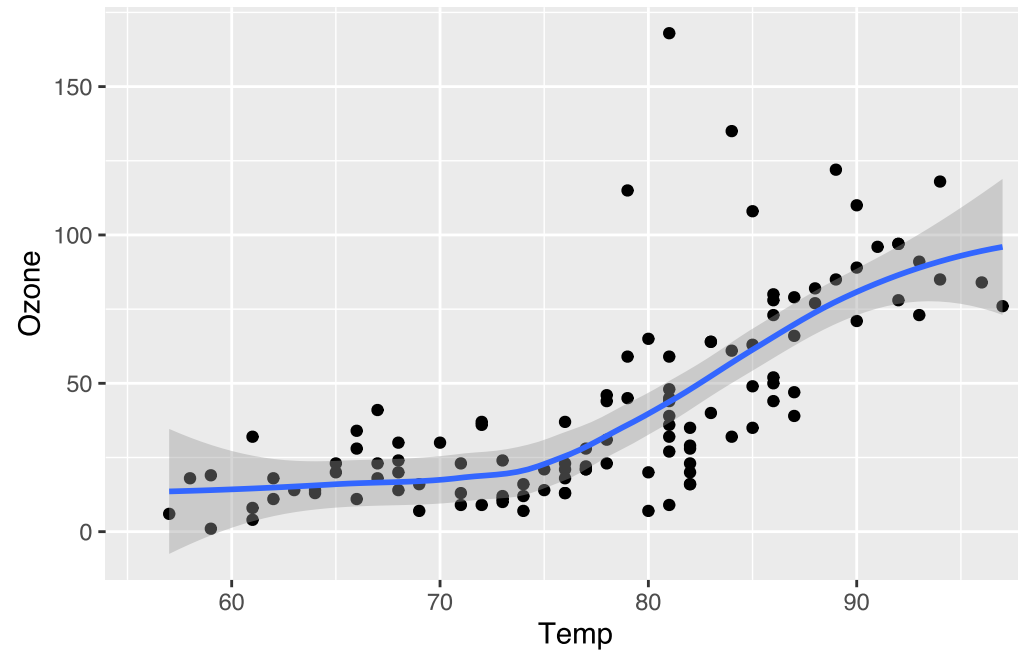


Figure 3: Temperature and ozone level

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