Visualising Data report:

BIG IDEA: AIR POLLUTION LEADS TO LOWER LIFE EXPECTANCY RATES

**Introduction**

Air pollution is one of the biggest net contributors to human health worldwide. This is because Fine particulate matter (PM2.5) is particularly dangerous, as it can penetrate deep into the lungs and bloodstream, leading to severe health outcomes such as respiratory and cardiovascular diseases, and premature deaths. This report will aim to explore the relationship between air pollution levels and life expectancy using real-world data.

**Data Sources and Preprocessing**

To investigate this issue, I utilized two primary datasets:

* **Air Pollution Data**: Sourced from Kaggle
* **Health Outcomes Data**: Sourced from Kaggle

Data cleaning involved:

* Merging datasets on country.
* Handling missing values using listwise deletion.
* Ensuring column names were standardized for analysis.

**Exploratory Data Analysis (EDA)**

Initial visualizations help uncover patterns in the data. The scatter plot linked in the qmd file illustrates the correlation between PM2.5 levels and mortality rates:

**Key Insights:**

* Countries with higher PM2.5 concentrations generally show lower life expectancy.
* Certain regions (e.g., South Asia) are more affected than others.
* A linear regression trend suggests a statistically significant relationship between air pollution and health outcomes.

**Explanatory Visualizations**

To communicate these findings effectively, I created a series of explanatory visualizations:

**1. PM2.5 Trends Over Time**

The following chart displays how PM2.5 levels have changed over the years across different regions.

This highlights regions that are experiencing worsening air quality, such as South and East Asia.

**2. Mortality Rate Trends**

The second visualization tracks mortality rates due to air pollution-related diseases.

This graph confirms that regions with worsening air quality also experience higher mortality rates.

**Interactive Dashboard**

To allow deeper analysis, I developed an interactive dashboard using **Shiny** and **Plotly**. The dashboard enables users to:

* Select a region and observe PM2.5 trends over time.
* View status for all countries.
* Interact with a data table containing the full dataset.

**Static Snapshot of the Dashboard**

A graph on a white background

AI-generated content may be incorrect.

**Conclusion**

My findings suggest that increased PM2.5 exposure correlates lower life expectancy rates. Using this report, policymakers must consider stricter air quality regulations to mitigate the adverse health effects of air pollution.

**Setup Instructions**

Simply open the attached qmd file and run all chunks

**References**

* **Our World in Data**: https://www.kaggle.com/datasets/hasibalmuzdadid/global-air-pollution-dataset
* **IHME Global Burden of Disease**: https://www.kaggle.com/datasets/sahirmaharajj/country-health-trends-dataset