NANDHA ENGINEERING COLLEGE

(Autonomous Institution)

Erode-638 052

TABLEAU - TWO CREDIT COURSE

IV – Semester

B.Tech - Artificial Intelligence and Data Science

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BRANCH : B.TECH-AI & DS

YEAR : II

What is Tableau ?

Tableau is a powerful data visualization and business intelligence tool that enables users to easily connect to various types of data, analyze it, and create interactive, shareable dashboards. It allows people to transform raw data into meaningful insights using simple drag-and-drop features without needing complex programming skills. Tableau supports integration with many data sources like Excel, SQL databases, cloud services, and more. Its visual and interactive capabilities make it easier for businesses and individuals to spot trends, identify patterns, and make data-driven decisions quickly. By turning complex information into clear and visually appealing charts and reports, Tableau empowers users to better understand their data and communicate findings effectively.

Overall purpose :

Air quality plays a crucial role in determining respiratory health across populations. Poor air quality, caused by pollutants such as particulate matter (PM2.5, PM10), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), ozone (O_3), and carbon monoxide (CO), is directly linked to a rise in respiratory diseases like asthma, chronic obstructive pulmonary disease (COPD), bronchitis, and lung infections.

This Tableau project aims to:

- Visualize the relationship between air pollution levels and respiratory disease rates.
- Identify the most affected regions and age groups..
- Highlight the importance of maintaining good air quality for public health.

By understanding these patterns, policymakers, healthcare providers, and communities can take targeted actions to improve air quality and protect respiratory health.

Dashboard:

Fig 1.4 : Dashboard of Total cause by the Global disease datset .

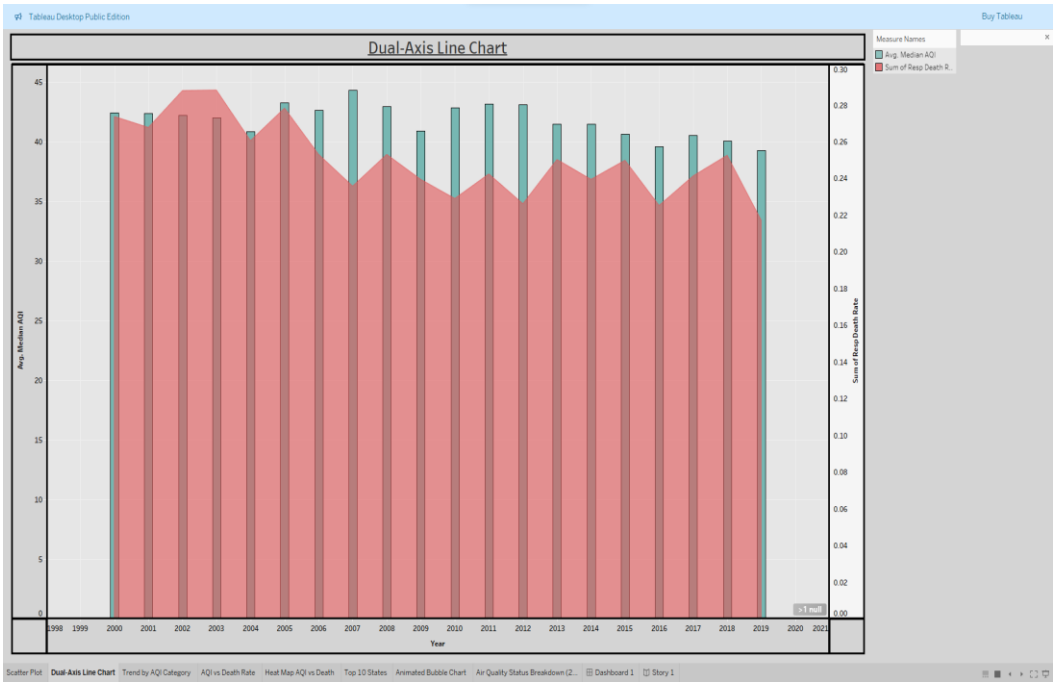
This dashboard, titled **"Air Quality Impact on Respiratory Health,"** explores the link between air pollution levels and respiratory death rates from 2000 to 2020. Using a Dual-Axis Line Chart, it compares the trend of the Average Median AQI and respiratory death rates. The Heat Map highlights how deaths vary across different air quality categories like Good, Moderate, and Unhealthy. The Animated Bubble Chart shows a dynamic relationship between AQI and death rates over the years. The Air Quality Status Breakdown reveals that most of

the recorded air quality falls under the "Moderate" category. The Top 10 States chart identifies the states with the highest average respiratory death rates. Overall, the dashboard shows that worsening air quality significantly impacts respiratory health, especially in specific states.

Key Points:

- **Dual-Axis Line Chart**: Yearly AQI vs respiratory death trends.
- **Heat Map**: Death rates across AQI categories.
- **Animated Bubble Chart**: Dynamic link between AQI and deaths.
- **Donut Chart**: Most air quality is "Moderate."
- **Top 10 States**: States with highest respiratory death rates.

1) Decants vs Air quality

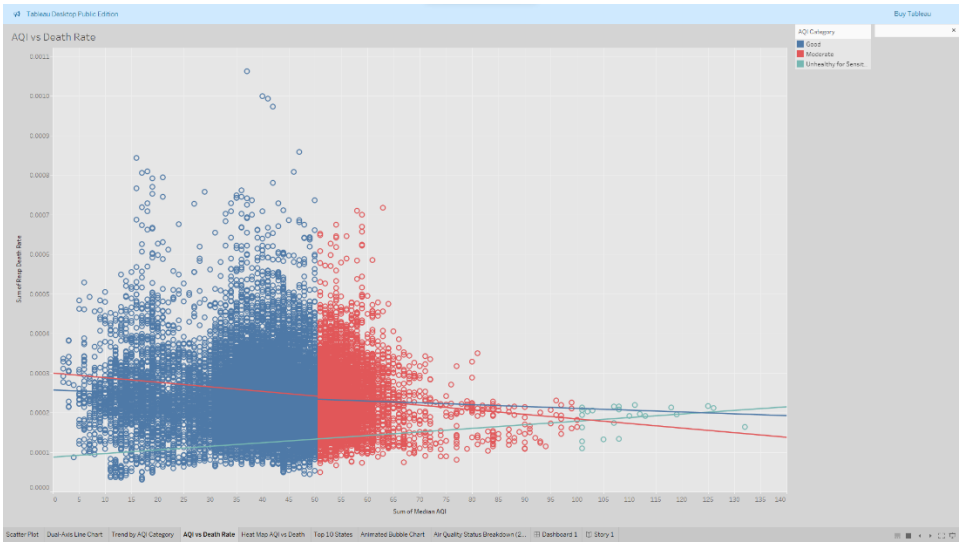


The Dual-Axis Line Chart displays the relationship between *decants* and *Average Median Air Quality* (represented by the Air Quality Index or AQI) from 2000 to 2020. The X-axis shows the years, while the left Y-axis represents the number of decants (people relocating), and the right Y-axis shows the AQI, a measure of air quality.

This visualization underscores the significant impact of environmental health on human movement. It highlights how worsening air quality can lead to higher displacement rates, while improved environmental conditions can stabilize living situations. Ultimately, the chart emphasizes the

interconnectedness of environmental health and human stability, offering valuable insights for urban planning, policy-making, and environmental conservation efforts.

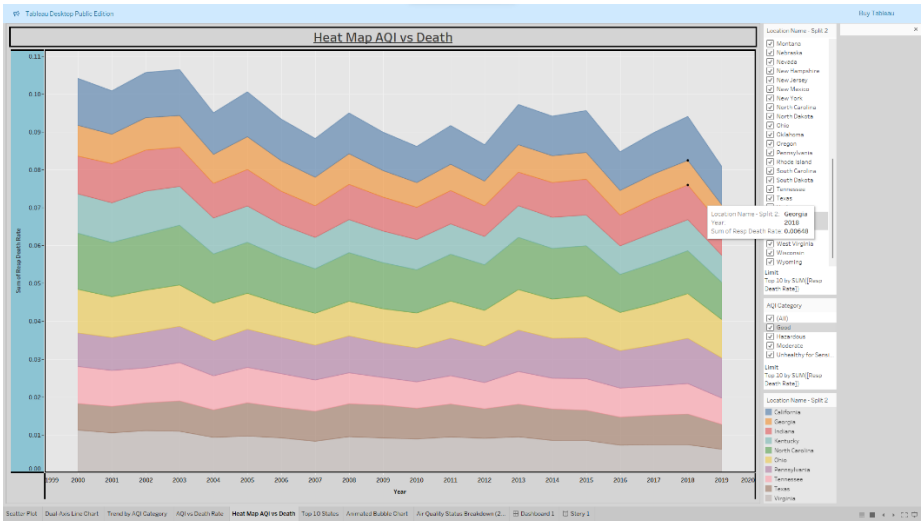
2) Air quality vs Death Rate



The **Air Quality vs Death Rate** analysis examines the relationship between air quality and respiratory death rates across different years and locations. The data includes the **year** of observation, **location names** for regional comparisons, **air quality test results** (often represented by the Air Quality Index or AQI), and the **respiratory death rate**, which is the sum of deaths caused by respiratory diseases in a given year and

location. By filtering the data based on these criteria, one can explore the correlation between worsening air quality and higher respiratory death rates. Typically, regions with poor air quality, indicated by higher AQI values, show an increase in respiratory-related deaths. This analysis provides valuable insights into how deteriorating environmental health, especially poor air quality, can significantly impact public health, highlighting the importance of improving air quality to reduce respiratory diseases and related mortality.

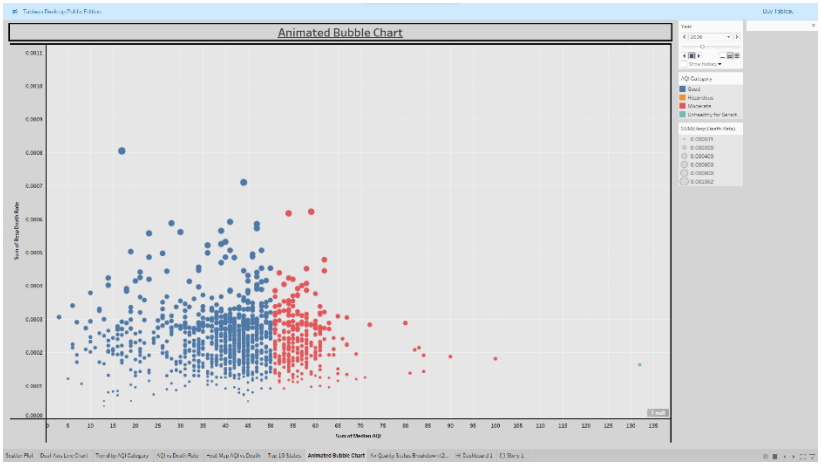
3) Heat map analysis



The **Heat Map Analysis of Air Quality vs Death Rate** visualizes the relationship between air quality and respiratory

death rates over different years and locations. The data includes the **year**, **location names**, **air quality test results** (represented by the Air Quality Index or AQI), and the **respiratory death rate**, which sums up the number of deaths caused by respiratory diseases for each year and location. In the heat map, **color intensity** indicates the severity of the variables, where darker colors represent higher AQI values and higher death rates, while lighter colors indicate better air quality and lower death rates. By filtering this data by **year** and **location**, users can easily identify patterns, such as regions with poor air quality experiencing higher respiratory death rates. This visualization helps highlight the significant impact of deteriorating air quality on public health, showing how areas with worsening air conditions may face increased mortality from respiratory diseases. The heat map provides an intuitive way to assess and compare the severity of air pollution and its effects on health across different regions and time periods.

4) Bubble chart



The **Bubble Chart Analysis of Air Quality vs Death Rate** displays the relationship between air quality (AQI) and respiratory death rates across different years and locations. Each bubble represents a specific year and location, with the **bubble size** indicating the total number of deaths from respiratory diseases, and the **position** of the bubble showing the corresponding AQI value. This allows users to quickly identify regions with high air pollution and elevated death rates. By filtering the data by **year** and **location**, the chart highlights how worsening air quality correlates with higher respiratory death rates, offering a clear view of the public health impact of poor air quality over time.

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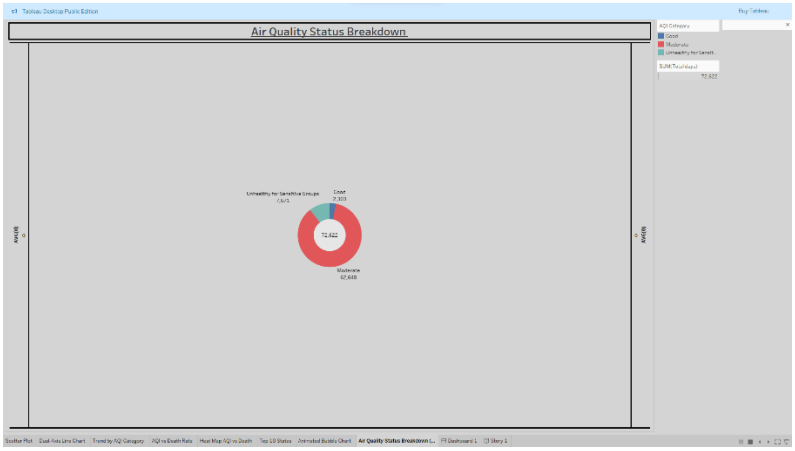
5) Air Quality status Break Down



In the **Air Quality vs Days** analysis, the filter options allow users to segment data based on **categories** (such as location, pollution levels, or health outcomes) and view the results in **days**, providing a time-based breakdown of air quality and its impact. **Days** in text refers to how air quality varies across specific days, indicating whether certain days had better or worse air quality. The **Pie Chart** categorizes the data into different segments, such as **good, moderate, or hazardous air quality**, showing the proportion of days that fall into each category. This visual representation helps to understand the distribution of air quality levels over time and how they affect

the health outcomes measured in the dataset, such as respiratory death rates or hospital admissions. The pie chart offers an intuitive way to see the overall air quality distribution across different categories, helping to identify trends or areas that need attention.

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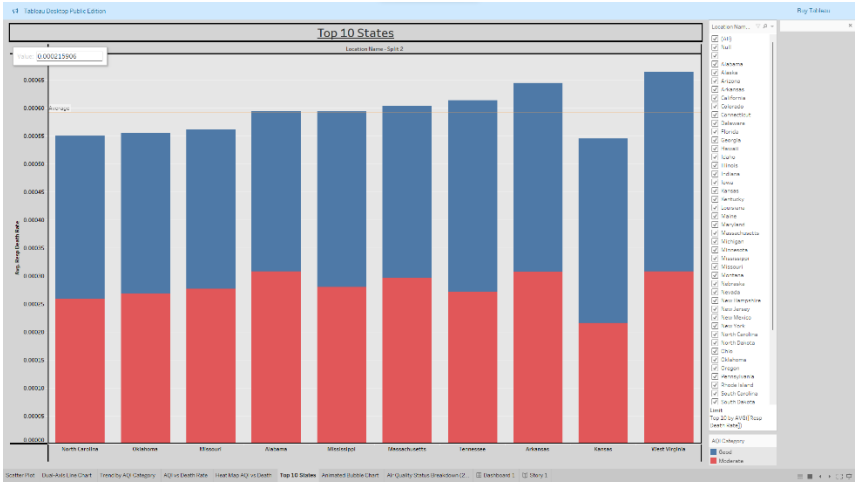
6) States with high death rate



The **Top 10 States with High Respiratory Death Rate** analysis highlights the states with the highest respiratory death rates, filtered by **air quality category** (e.g., good, moderate, hazardous). The data is represented in a **bar chart**, where each bar corresponds to a state, and the bar length indicates the

respiratory death rate. By filtering the chart with air quality categories, you can see how the death rate varies across different air quality levels. This allows for an easy comparison of states with poor air quality and higher respiratory death rates, providing insights into the public health impact of air pollution in specific regions.

Conclusion :

In conclusion, the analysis of **top states with high respiratory death rates**, filtered by **air quality categories**, underscores the critical connection between air pollution and public health. The bar chart clearly illustrates that states with poorer air quality tend to have higher respiratory death rates, highlighting the severe impact of environmental factors on human health. This reinforces the importance of improving air quality through effective policies and interventions, as reducing pollution can significantly mitigate health risks and lower mortality rates associated with respiratory diseases. Such insights are crucial for guiding public health strategies and environmental regulations aimed at enhancing the well-being of affected populations.