Project 1: World Development Statistics

Global Analysis on Tuberculosis Death Rate

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Problem Statement

The problem statement for this project is to investigate trends in tuberculosis incidence and mortality rates across different countries and regions over time. By analyzing comprehensive datasets encompassing population demographics, healthcare infrastructure, and TB-related statistics, the project seeks to uncover insights that could inform targeted interventions and policy decisions to reduce TB burden worldwide. The objective of this project is to gain a deeper understanding of the complex dynamics underlying TB epidemiology and to provide actionable insights for public health authorities and policymakers to improve TB control efforts.

Procedure

1 - Data importation

- population.csv - Population by Country over time
- life_expectancy.csv - Life expectancy by country over time
- Tuberculosis_death_rates.csv - Global tuberculosis death rate over time

2 - Cleaning.

3 - Exploratory Data Analysis

4 - Data Visualization

Data Cleaning

1. Dropped some columns from the datasets (population.csv and life_expectancy.csv) to use 29 years interval(1990 to 2019)
2. Changed dataframe column names
3. Fixed incorrect data types
4. Dropped missing data and used mode to fill categorical missing data
5. Merged datasets and Saved them

Exploratory Data Analysis

1. Got a Summary Statistics of the merged dataset
2. Applied customized standard deviation function from Part 1
3. Answered questions like;
   - **What country had the highest death rate due to Tuberculosis from 1990 to 2019?:** Central African Republic with a death rate of 336.76
   - **What country had the lowest death rate due to Tuberculosis from 1990 to 2019?:** Malta with a death rate of 0.13
   - **What are the smaller populated countries with highest death rates in 2005?:** Marshall Islands with a death rate of 32.76
   - **What are the larger populated countries with higher death rates in 2005? :** Pakistan with death rate of 87.94

Data Visualization

- The heatmap shows a negative correlation

    Between Tuberculosis Death rate and the

    Data of all countries (Life Expectancy and

    population) in 2005. Meaning increase in Lif

    Expectancy or population in any country in 2

    Leads to a decrease in TB death rate.

Correlation Heatmap 2005 data and Tuberculosis Death rate
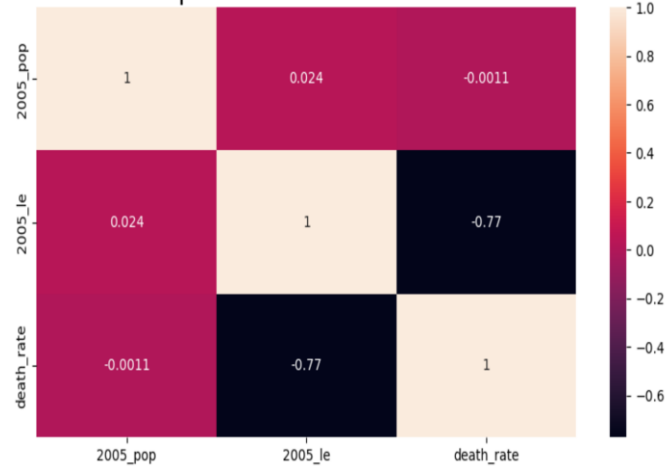
Data Visualization

- The scatter plot between population distribution of all

  Countries in 2005 and Death rate shows that mo
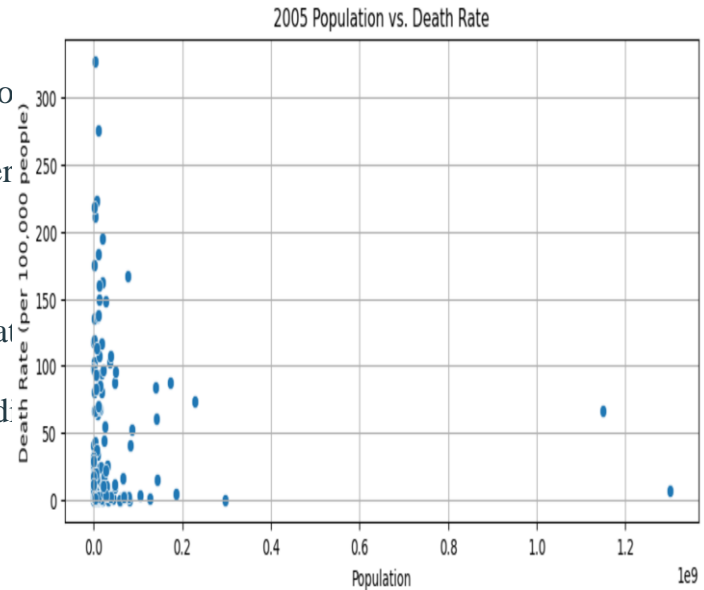
  Countries with smaller population have a higher

  Death rate. The outliers detected at the right of

  The plot shows countries with very high popula

  And low death rate which from our analysis ind

  That this country is China.

2005 Population vs. Death Rate

Conclusion

- Some countries have experienced significant population growth, while others have remained relatively stable or declined.

- Outliers in population data suggest exceptional cases of population growth or decline, which may call for further investigation.

- While there might be a relationship between population size and Tuberculosis death rate, it's not a straightforward linear correlation.

- Correlation analysis reveals negative correlations between population, life expectancy, and Tuberculosis death rate. This indicates that an increase in population and life expectancy over times leads to a decrease in death rate. We have modern medicine to thank for this improvements

Recommendations

1 - Conduct further statistical analysis to explore the factors influencing Tuberculosis mortality rates, considering variables beyond population size.

2 - Investigate socio-economic, healthcare, and environmental factors that may contribute to differences in life expectancy and disease prevalence among countries.

3 - Implement targeted interventions and public health strategies to address Tuberculosis burden in regions with high mortality rates.

4 - Continuously monitor population trends, health indicators, and disease outcomes to assess the effectiveness of interventions and inform future policies.

Thank you for your keen attention.