# Data Visualization Summary Report

Title: Comprehensive Data Visualization of Global Tuberculosis (TB) Burden Data

Student: [Your Full Name]

Programme: Master of Science in Data Science

Unit: Data Visualization

Total Marks: 40

## 1. Introduction

This exercise aimed to apply key concepts of data visualization using the TB\_Burden\_Country dataset. The goal was to transform raw TB burden data into clear, insightful visuals that reveal global and regional TB trends, patterns, and relationships. The analysis employed Python libraries including Pandas, Matplotlib, and Seaborn, covering the full visualization workflow — from data preparation to advanced analysis.

## 2. Data Exploration and Preparation

The dataset was loaded and inspected for missing values and data consistency. Key variables identified included Country, Year, Population, Incidence, and Mortality rates. The data was cleaned and grouped to facilitate trend and comparative analysis across years and countries.

## 3. Visualizations Conducted

- Bar Charts: Used to compare TB incidence and mortality rates across countries, identifying regions with the highest TB burden.  
- Line Charts: Illustrated temporal trends in TB incidence and mortality over time, showing whether cases were increasing or decreasing globally.  
- Scatter Plots: Displayed the relationship between population size and TB incidence, revealing how population density correlates with TB burden.  
- Heatmap (Correlation Matrix): Demonstrated relationships among key numeric variables, supporting pattern recognition for analytical decisions.  
- Histogram: Visualized the distribution of TB incidence, highlighting the spread and concentration of cases among countries.

## 4. Key Insights

The visualizations revealed that TB burden remains highest in certain regions such as sub-Saharan Africa and South-East Asia, with notable year-to-year fluctuations. While global TB incidence shows gradual decline trends, mortality rates remain relatively high in countries with limited healthcare access.

## 5. Conclusion

This exercise demonstrated the critical role of visualization in transforming complex datasets into actionable insights. Through visual storytelling, data becomes more accessible to policymakers and public health researchers, promoting informed decision-making in disease control and prevention.