4. Analyze

In this phase of the project, we will focus on uncovering insights and trends from the cleaned and prepared datasets. By examining key metrics like birth rates, GDP, health expenditure, and education levels, we aim to identify patterns and correlations that can explain the decline in birth rates across Europe over the past 20 years. Through data exploration, visualizations, and statistical analysis, we will strive to answer the core research questions and provide actionable insights for stakeholders.

1 METHODS AND TOOLS:

1.1 Tools Used: TABLEAU DESKTOP: PUBLIC EDITION.

1.2 TECHNIQUES:

- Time-series analysis
- Correlation analysis
- Geospatial analysis (choropleth maps)
- Scatter plots with trend lines
- Side by side charts and bubble charts
- Heatmaps for categorical comparisons

2 KEY ANALYSES CONDUCTED:

2.1 TRENDS AND PATTERNS:

Goal: To analyze general and regional trends in birth rates across Europe from 2000 to 2024.

Approach:

- Created a time-series line chart with "Year" on the X-axis and "Birth Rate" on the Y-axis.
- Differentiated regions (North, South, East, West) using color.
- Filtered the data to focus on the period between 2000 and 2024.
- Designed a Side by side chart to compare birth rates across regions over time.

2.2 REGIONAL CLASSIFICATIONS AND WEATHER CHARACTERISTICS:

Goal: To explore how climatic conditions affect birth rates across regions.

Approach:

- Analyzed regional differences by classifying countries into regions (e.g., North, South, East, West) and attributing each region with a general weather characteristic.
- Observed that cooler regions tend to have higher birth rates compared to warmer regions.

2.3 SOCIOECONOMIC CORRELATIONS:

Goal: To explore how variables such as GDP per capita, unemployment rates, and average salaries influence birth rates.

Approach:

- Created scatter plots for each socioeconomic variable:
  - "Birth Rate" was placed on the X-axis, while GDP per Capita, Unemployment Rate, or Average Salary were used on the Y-axis.
  - Regions were distinguished by color, and trend lines were added for better interpretation.
- Developed heatmaps to identify countries with the highest and lowest birth rates:
  - Axes: "Country" (Rows) and "Year" (Columns).
  - Measures: "Birth Rate," color-coded to show highest and lowest values.

2.4 DEMOGRAPHIC AND SOCIAL FACTORS:

Goal: To evaluate the impact of education and average marriage age on birth rates.

Approach:

- Designed a side by side bar charts to analyze "Women's Avg Married Age" and its relationship with "Birth Rate."
- Repeated the analysis using "High Education (Women)" as the categorical variable to assess the role of women's education levels in birth rates.
- No significant gap was identified between women's higher education levels and birth rates, suggesting a neutral relationship in this analysis.

2.5 URBANIZATION AND POPULATION:

Goal: To identify the relationship between urbanization and birth rates.

Approach:

- Created choropleth maps to show urban and rural population distributions by country.
- Developed bubble maps:
- "Urban Population" and "Rural Population" were visualized with bubble sizes representing the total population.
- Used color gradients to emphasize birth rate variations.

2.6 HEALTH INDICATORS:

Goal: To analyze the relationship between health-related factors and birth rates.

Approach:

- Created bubble charts:
  - Displayed "Infant Mortality" and "Birth Rate," with bubble sizes indicating health expenditure levels.
  - Incidence of the % of GDP dedicated to healthcare.
- Designed comparative visuals by region to emphasize disparities.

3 KEY FINDINGS:

- Significant decline in birth rates across all regions, with notable differences between countries in Northern and Southern Europe.
- Strong correlations between GDP per capita and birth rates, indicating economic stability's role in population trends.
- No negative correlation exists between women's higher education levels and birth rates, highlighting the social impact of education on demographic trends.
- Urbanization shows a complex relationship with birth rates, with urban population trends influencing results differently by country.
- Lower infant mortality rates are generally associated with higher birth rates, especially in countries with higher health expenditures.
- Cooler regions tend to have higher birth rates, suggesting that climatic conditions may influence demographic patterns.