

## **STAT-S 670: Exploratory Data Analysis**

### **Final Project: Global Suicide Rate Analysis**

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The World Health Organization reports that close to 800,000 people die by committing suicide every year, which is almost 1 person every 40 seconds. This is very disturbing as it is a preventable health problem, but still a leading cause of death worldwide. We aim to analyze the global suicide trends over time, across countries, age, gender, and with respect to the GDP per capita, to understand what factors affect suicide.

Our data was the Suicide Rates Overview Dataset from Kaggle and contained a total of 12 variables and 27,821 observations.

For ease of analysis, we asked the following three research questions:

1. How does the suicide rate vary across age and gender over time?
2. How does the suicide rate change across continents and countries, over time?
3. What is the relationship between GDP and suicide rate overall, and in particular, during recession periods?

On conducting an exploratory data analysis, we found that GDP per capita, gender, and age have effects on the suicide rate, though the causal relationship is not very strong.

From our analysis, we noticed that there is a general trend of decline in suicide rates over time.

The suicide rate is highly correlated with gender. We observed that men have a very high rate of suicide over time, consistently surpassing women by at least 2.83 times. This could either be due to a significant underreporting of suicide rates among women, less collection of their data for this particular dataset, or other social factors that negatively affect men. As people get older, we observed that the rates of suicide are increasing, i.e., the suicide rate increases with age. This is true for both the genders and people aged more than 75 years are particularly vulnerable.

The most dangerous countries for deaths by suicide are Russia in Europe, the US in the Americas, Australia in Oceania, and Japan in Asia, according to this dataset, with Europe ranking as the deadliest continent for the same. Moreover, we observed spikes in the number of suicides committed in Japan, Australia and the US during both the recession periods.

The relationship between GDP per capita for each continent and the suicides per 100k differs across continents. While Europe and Asia show a decline in suicide rates with increasing GDP, both the Americas and Oceania show a positive relationship. Overall, there is a weak relationship between a country's GDP per capita, age, gender, and the suicide rate. However, there is not enough information to establish a causal relationship between these variables and the suicide rate.