

# Introduction to Business Problem: Suicide Rate Analysis by Decade

## 1 Overview

Suicide is a sensible topic to study. Many reason are involve when someone decide to take his or her life. In this study, we will analysis the rates of suicide around the world from 1985 to 2016. Our objective is to find for which countries the rate of suicides is decreasing/increasing. In addition, we will analysis the suicide rates by country, decade, sex and age.

The target audience of this project is any mental health department who wants to implement a new policy to prevent suicides. This report will provide evidence of countries in which the suicide rates are decreasing. Normally, this decrease might be associate the an effective change in policies by those country. Further, any person or organization planning to study suicide rates will find this report useful as an initial point.

The data set we will be working with was pulled from four other datasets linked by time and place, and was built to find signals correlated to increased suicide rates among different cohorts globally, across the socio-economic spectrum.

## 2 Data

The data which we will working on is a Suicide Rates Overview 1985 to 2016. It consist on 12 features/columns which are:

1. country
2. year
3. sex
4. age
5. suicides no
6. population
7. suicides/100k pop
8. country-year
9. HDI for year
10. gdp for year (\$)
11. gdp per capita (\$)
12. generation

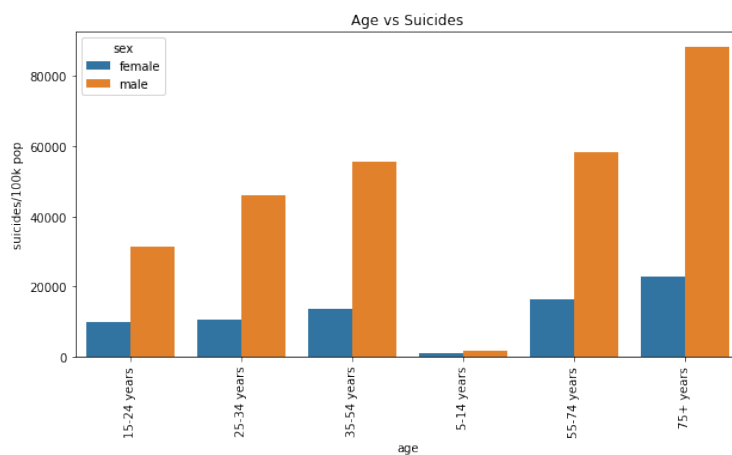
For this study we have 27,800 different samples. Therefore our data will be represented in a dataframe of size  $27800 \times 12$ .

For our study and due to the big range on years. We will group the data by decades. After that we will analysis the rate of suicide by age, sex and population. We will also, study the overall count of suicide by country. Finally we will visualize the countries with an increasing rate of suicide and the countries with a decreasing rate of suicide.

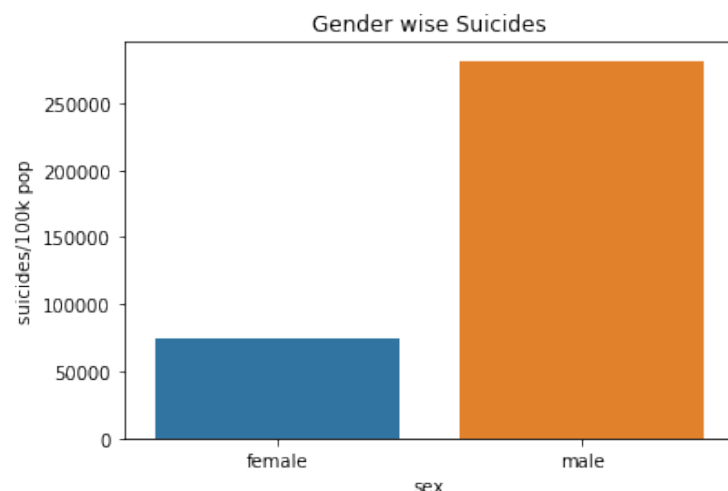
### 3 Analysis of the Data

First as mention before, we decide to group the data by decades to have a better understanding of the analysis and in that way we can try to understand suicide rates by generations.

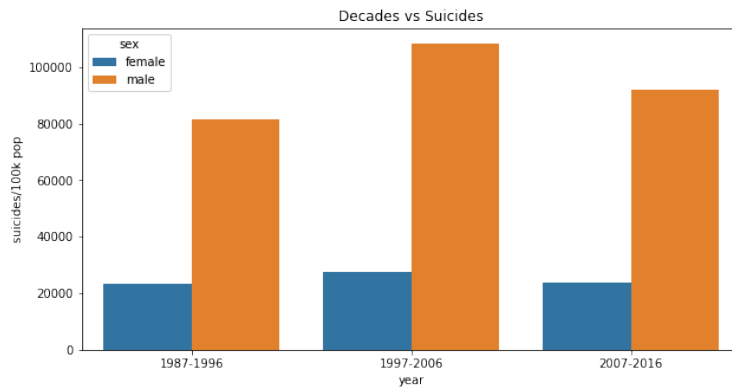
As seen in the graph below we can see that as the age increases, suicide rates is increasing irrespective of Gender.



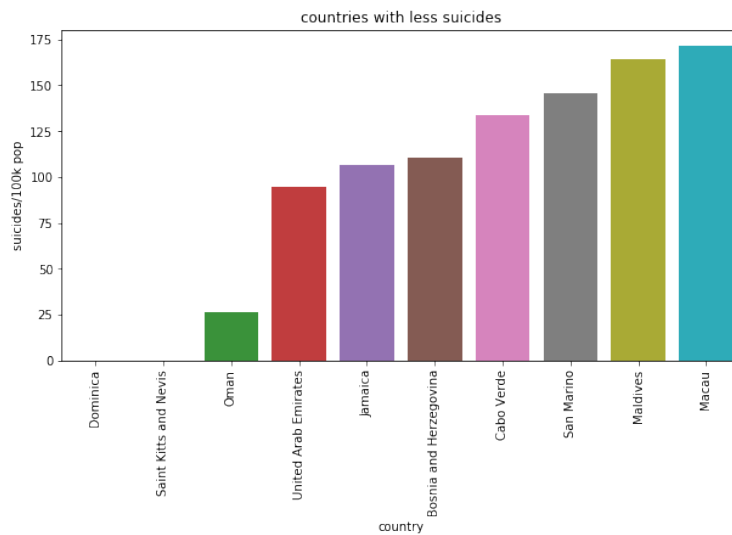
As one could expect at the age of 5-12 we see by far the lowest number of suicide. Next in our analysis we could like to know if gender affect the rates of suicide. In indeed, male suicides are higher than female suicides as it can be seen in the graph below.

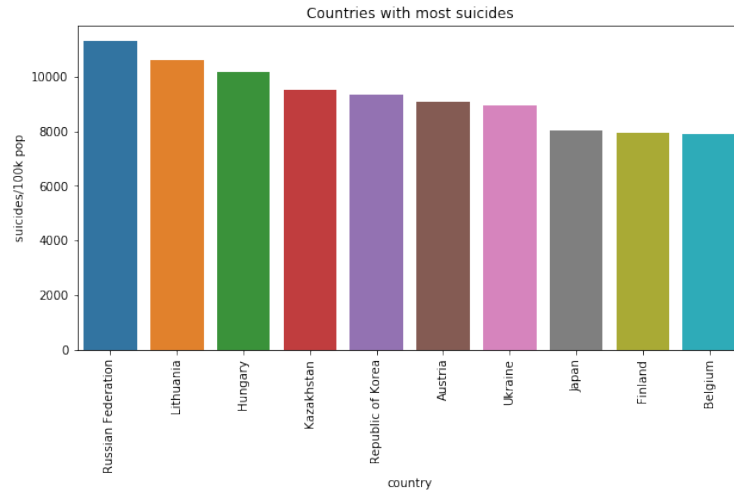


Now in a way of normalization, we would like to know if the rates of suicide change dramatically each decade. In fact, "1997 - 2006" decade has seen more deaths(suicides) but overall we could say that the suicide rates are fairly stable over time as it can be interpreted by the graph below.



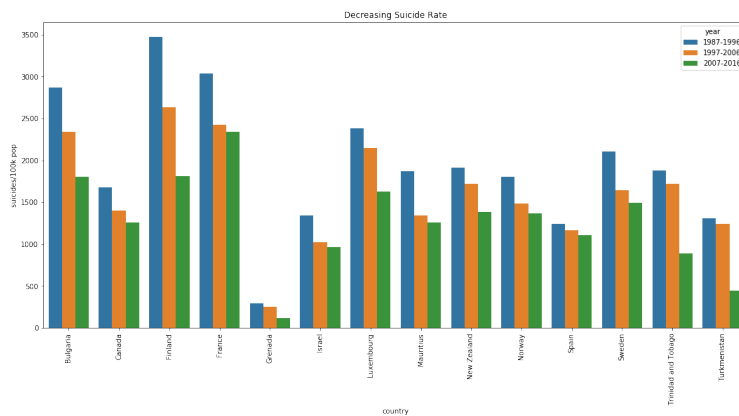
Now let's answer the fundamental question for us. Which countries have the lowest count of suicides? and Which countries have the largest count of suicides?



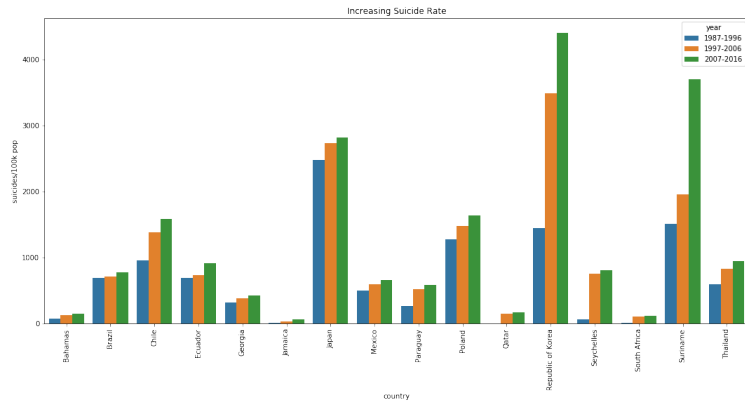


We have to be careful about the previous two graphs since a low or large count of suicides is directly relative to the size of the country. For this reason, it is more relevant to study the increase or decrease of the rate of suicides. To have a better reference of this situation let's graph the change in the rates of suicides. We can see this in the below graphs

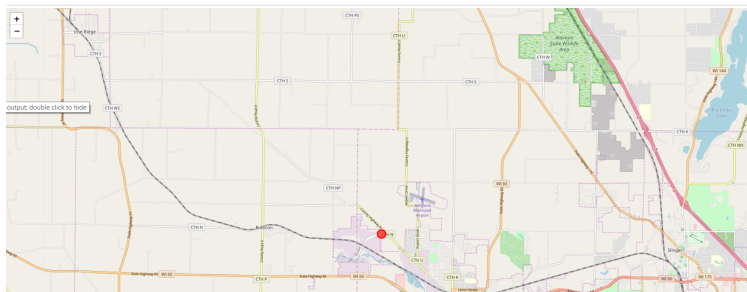
Suicides are decreasing in above nations. Especially, Finland which has a greater suicide decreasing rate.



Suicides are increasing in above nations. Especially, Republic of Korea and Suriname countries have a greater suicide increasing rate.



To finalize this report and as a reference below is the location on a map of the Health Department of the United States of America.



## 4 Reference

1. United Nations Development Program. (2018). Human development index (HDI). Retrieved from  
*[http : //hdr.undp.org/en/indicators/137506](http://hdr.undp.org/en/indicators/137506)*
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*[http : //databank.worldbank.org/data/source/world-development-indicators](http://databank.worldbank.org/data/source/world-development-indicators)*
3. Szamil (2017). Suicide in the Twenty-First Century [dataset]. Retrieved from  
*[https : //www.kaggle.com/szamil/suicide-in-the-twenty-first-century/notebook](https://www.kaggle.com/szamil/suicide-in-the-twenty-first-century/notebook)*
4. World Health Organization (2018). Suicide prevention. Retrieved from  
*[http : //www.who.int/mental\\_health/suicide-prevention/en](http://www.who.int/mental_health/suicide-prevention/en)*
5. I link of the raw data can be found in the link below  
*[https : //raw.githubusercontent.com/sitronco/Capstone/master/master.csv](https://raw.githubusercontent.com/sitronco/Capstone/master/master.csv)*