What is the impact of socio-economics factors on suicide rate?

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1. Introduction
   1. Background

Suicide is behavior by individuals who fully understand the fatal consequences of this action and choose conscious self-destructive behavior leading to death. It is a major global public health problem. According to the estimation of WHO (World Health Organization), each year 1 million people died from suicide worldwide, about 10 to 20 million people have attempted suicide. Suicide has become one of the leading causes of death worldwide.

* 1. Issue

Committing suicide could lead to serious consequences. It causes severe damages to each family. High suicide rate could lead to social problems. People are trying to avoid the issues instead of facing and solving them. To decrease the suicide rate, the potential factor causing suicide needs to be figured out. In this project, influence factors from 60 countries from the year of 1990 to 2015 like GDP per capita, human development rate, unemployment rate, globalized event, gender, etc. would be tested to see their correlation with suicide rate.

1. Literature Review
   1. The influence of global economic situation on suicide rate
      1. Positive relation

In the early days, researchers studied that the socioeconomic and suicide rates were positively correlated, that is, the suicide rate increased as the overall economic level increased. Some studies support this, such as the self-killing rate of South Korea in the past decade, it has risen with the rise of economic development level.

* + 1. Negative relation

In recent years, there are many research reports that social economy and suicide are negatively correlated. Quite a few sociologists pointed out that when the social and economic situation was the lowest, the risk of self-killing was the highest. For example, in New York, a sociologist named Nan-di Et Al used simultaneous economic indicators to evaluate the research results and found that the suicide rate was the lowest in the period of the best socioeconomic conditions.

* + 1. No relation
  1. The influence of economic factors on suicide rate
     1. Gender and age characteristics

In past studies, researchers have concluded that men in the 35-54 age group have the highest risk of suicide during the economic crisis.

* + 1. Time Series Characteristics

In the process of studying the impact of the economic crisis on the change of suicide rate, the researchers also found another feature that the change of suicide rate does not coincide with the occurrence of economic crisis. The risk of suicide has occurred two years after the start of the economic crisis, that is, its risk has begun to increase in the third year of the economic crisis.

* 1. Other economic indicators

Researchers have also studied other economic indicators, including GDP, savings levels, gross national product (GNP), GDP at purchasing power parity, purchasing power level, female labor force participation rate and per capita health care expenditure.

1. Data and variables

In order to find out the relationship between global economic situation and suicide rate, I selected data from *United Nations Development Program. (2018), World development indicators, GDP (current US$) by country:1985 to 2016*. Using the total GDP and overall human development as indicators of the global economic situation.

To further discover the correlation between suicide rate and the economic factors, I selected data from *[Szamil]. (2017). Suicide in the Twenty-First Century [dataset]* and *World Health Organization. (2018*). Suicide prevention. Including age, age group, sex, population, generation, suicide rate and other indicators in the model.

Below is some hypothesis of the variables in the model.

Economic environment:

The better the economic environment is, the lower the suicide rate.

Age:

Suppose the suicide rate increases as the age increases and the peak is the middle age, after then, the suicide rate decreases as the age increases.

Sex:

Male are more likely to commit suicide compare to female.

GDP per capita:

As the GDP per capital increases, the suicide rate decreases.

Unemployment rate:

The lower the unemployment rate, the lower the suicide rate.

1. Research design and model development
   1. Processing the dataset:

From data retrieved from website, we will form a dataset for my project by data cleaning, either dropping or filling the NAN data, and remove the abnormal data.

* 1. Statistical analysis:

To do some basic analysis, it is necessary to analysis the statistical status for each variable. In this step, I can find some basic relationship between variables. The variables need to be selected are decided by my hypothesis above.

* 1. Find the relationship with model:

To find a direct relationship between the suicide rate and socioeconomic, a multi regression model will be built. From this coexistence of this model, I can discover the relationship suicide rate and each variable.

Other models like KNN, Regression tree, Neural network would also be used.

* 1. Compared the result to my hypothesis, I will do some analysis, while some results are unexpected and further analysis will carry on.

1. Further Analysis

Above analysis is based on a worldwide scale. However, according to the public information, China’s suicide rate has decreased significantly during the last decades, in the meantime, China’s economy boosted in a fantastic way, and the overall social welfare has also significantly improved. So, I would like to make further analysis of the relationship between China's social-economic factors and suicide rate. My hypothesis is that those factors should have a stronger relationship with the suicide rate.

1. Conclusion

My results illuminate the relationship between socioeconomic position and suicide rates and can be used to design and implement future policies on suicide prevention.