

# United States Suicide Rates by Region

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## Introduction

Suicide is a well-known cause of death and affects everyone. Different factors can lead to increased risk. These factors include race, ethnicity, sexuality, and location (*CDC*). The major health crisis was a cause of death for over 48,000 people, this equates to one person every 11 minutes. We decided to look into regional factors, not only because we honestly did not know the answer but also because this could indicate where the most public health resources are needed.

## Methodology

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Data presented by the Center for Disease Control was uploaded in csv format using the pandas package. Pandas was used over Polars because of the organization of the data. The size of the data does not require a package like Polars.

After this a dataset from Kaggle was thoroughly checked. The "Region" dataset provided state abbreviations with what region of the United States they are located. This is essential because it allowed us to analyze by region, which is the focus of the research.

Basic data analysis was performed and the data was narrowed down to only instances of death by suicide. We did narrow down to the specific year of 2017 because this was the most recent year of full data. We looked at a description of the data, covariance, and correlation between variables. The main variables we looked at were 'Region' and 'Age Adjusted Death Rate'.

Visualizations were created using the seaborn package. Boxplots for number of deaths and age adjusted death rate were visualized. From here regression models were created to determine predicted rates over time for each region.

Lastly, multiple PCAs were created to visualize the regions further through clustering.

## Results

We have broken down the results by age adjusted death rate and number of deaths below.

### **Age Adjusted Death Rate (AADR):**

-The west experienced the greatest AADR with a mean of about 20 per million. The northeast appeared to be the most well off with a mean of about 12.5 per million.

### **Deaths:**

The number of deaths is slightly higher in the midwest compared to other regions. The west and south were very close to this rate.

### **Both:**

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-Deaths were expected to drop in all regions, except the south. The south maintained a steady rate. The rate of decline in deaths was about the same between the other three regions.

-The PCA algorithm indicated that those in the south are at a higher risk of dying at a young age by suicide.

## **Discussion**

Further analysis should be performed using Years Potential Life Lost (YPLL). This measure would allow us to better determine the true impact of suicide by region in the United States. However, age-adjusted death rate is also an accurate measure to indicate rates in the United States with adjustment. Based on the results, it appears that as you leave the northeast, the greater the risk of suicide is. This however does not take into account the other social determinants of health that need to be accounted for.

## **Conclusion**

Further analysis is necessary to gain a greater picture of the crisis at hand. We hope research like this can help with allocating necessary care to those suffering.

## **PSA**

If you are struggling please consult a crisis line. 988 is an example of a 24/7 phone line that can help.

We would also like to reference the CDC as an extra resource (statement below):

“Suicide deaths reflect only a portion of the problem. Every year, millions of Americans seriously think about suicide, plan, or attempt suicide. Suicide and suicide attempts can contribute to lasting impacts on individuals, families, and communities. The good news is that suicide is preventable. CDC’s National Center for Injury Prevention and Control’s vision of “no lives lost to suicide” relies on implementing a comprehensive public health approach to prevention. This approach:

Uses data to drive decision-making

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Implements and evaluates multiple prevention strategies that enhance resilience and improve well-being based on the best available evidence  
Works to prevent people from becoming suicidal”

## Citations

Centers for Disease Control and Prevention. (2023, April 6). Facts about suicide. Centers for Disease Control and Prevention. Retrieved April 24, 2023, from <https://www.cdc.gov/suicide/facts/index.html>

Suicide Prevention Resources:

- [Suicide Prevention Resource for Action | Suicide | CDC](#)
- 911/Local Emergency Center
- [NIMH » Suicide Prevention \(nih.gov\)](#)