Unravelling the Veil of Despair: A Comprehensive Data Visualization Project on Suicides in India

UNIVERSITY OF NORTH TEXAS DEPARTMENT OF INFORMATION SCIENCE

PROJECT REPORT

**Suicides in India**

**by**

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**ABSTRACT**

This paper investigates the complicated and unpleasant subject of suicides in India, illuminating the underlying reasons, prevalent patterns, and far-reaching implications for people and society. Suicide has become a major public health issue in India, with an increasing number of instances recorded yearly. This study tries to give a detailed understanding of the variables leading to the country's worrisome suicide rates by comprehensively examining existing data and related studies. Furthermore, it seeks to propose viable techniques and treatments that may aid in mitigating this serious societal issue. This study aims to give useful insights to the fields of mental health and public policy by looking into the sociological, economic, and psychological elements of suicide in India.

**1. INTRODUCTION**

Suicides have emerged as a sensitive issue in India, creating significant difficulties to the country's social fabric and public health institutions. The alarming increase in suicides has pushed politicians, as well as researchers and mental health experts, to look further into the underlying reasons of this terrible phenomena. Suicide, being a complex and diverse issue, needs a comprehensive knowledge in order to properly address its effects on people, families, and communities.

Suicide rates in India have risen alarmingly in recent decades, affecting people of all ages, genders, and socioeconomic origins. The causes of these catastrophes are complex and intertwined with a wide range of conditions, including but not limited to poverty, unemployment, social isolation, family problems, scholastic pressure, drug addiction, and mental health concerns. Furthermore, cultural norms, stigma associated with mental health, and inadequate access to mental healthcare resources compound the situation.

While there are geographical differences in suicide rates, no state or town is immune to this issue, making it critical to adopt a national strategy to suicide prevention. Suicide has far-reaching implications, impacting not just the person but also families, friends, and society as a whole. As a result, extensive research and data-driven analysis are critical in developing evidence-based solutions that effectively reduce suicide rates and help vulnerable groups.

In this paper, I tried to prove several reasons for suicide and different comparisons based on Age group, Gender, Year , and the state or region where more number of cases are happening. We believe that by throwing light on this unpleasant subject, we may contribute to the expanding body of information aimed at protecting the nation's well-being and establishing a society that prioritizes mental health and emotional well-being.

**2. DATA SPECIFICATION**

**Source: Kaggle**

**Link:** [**https://www.kaggle.com/datasets/rajanand/suicides-in-india**](https://www.kaggle.com/datasets/rajanand/suicides-in-india)

**Tools:**

* **Python**
* **Tableau**

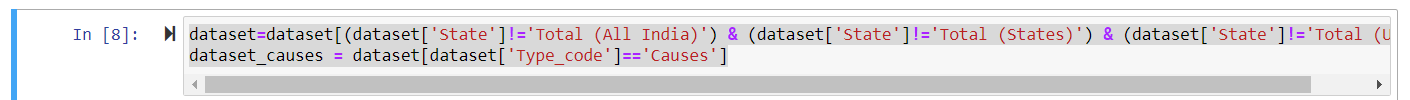
This particular dataset consists of data from 2001 to 2012. It has all the yearly suicide detail of all the states/u.t of India by various parameters. The Attributes include the following:

* State
* Year
* Type\_code
* Type (type of suicide)
* Gender
* Age Group
* Total Number of suicides

The dataset is collected from Kaggle. The collection is based on different types of suicides in India from 2001 through 2012 consisting of different measures and dimensions. **The dataset has 2,37,520 rows and 7 columns. Even though the data has less attributes, more comparisons can be made with Type\_code and Type with 2 lakh rows in the dataset.**

**3. DATA CLEANING**

The data set which I have imported has very clear values and I did not have a need to have much values to change. But, there was on thing I have to remove:



The given code performs data filtering on a dataset. The dataset contains information related to various states and union territories (UTs) of a country. The first line filters out rows from the dataset that corresponds to aggregate data, specifically those with the 'State' values of 'Total (All India)', 'Total (States)', and 'Total (UTs)'. These rows represent overall summary data and are not specific to any particular state or UT.

The second line further refines the dataset by extracting rows that have a 'Type\_code' value of 'Causes'. This indicates that the remaining data primarily focuses on the causes behind certain events or phenomena. The code effectively eliminates unnecessary total values and narrows down the dataset to only include specific state-level data related to the causes.

**4. METHODOLOGY**

**Data Collection**

The information was gathered from a variety of sources, including government databases, hospitals, and statistics websites. The information was then placed into a spreadsheet and analyzed.

We have imported the essential Python libraries for information handling and representation, such as Pandas, NumPy, Matplotlib, Seaborn, and Plotly. Plotly's make\_subplots feature is used to create subplots, while IPython.display's Picture class is used to display images in Jupyter Journal.

We may use these libraries to execute various information investigation tasks, create various types of plots and graphs, and display representations in Jupyter Notepad or other Python environments. We can now use the capabilities and methods provided by these libraries to visualize our data and get insight from it.

**Data Analysis**

**A screenshot of a computer

Description automatically generated**

The given code is written in Python using the pandas library. It is designed to load data from a CSV (Comma Separated Values) file named "Suicides in India 2001-2012.csv" and store it in a pandas DataFrame named 'dataset'. The CSV file likely contains information about suicides in India over the years 2001 to 2012. The 'pd.read\_csv' function reads the contents of the CSV file and creates a tabular data structure in the form of a DataFrame, where each row represents a different record and each column corresponds to a different attribute or piece of information.

After loading the data, the 'dataset.head()' function is called. This function displays the first few rows of the DataFrame, giving a preview of the dataset's structure and content. It is a useful way to quickly inspect the data and check if it has been loaded correctly. By default, 'dataset.head()' displays the first five rows, allowing the user to get an initial glimpse of the dataset's contents and column headers.

**1. Is the Suicide rate Increasing Every year from 2001 to 2012?**

A graph with a line

Description automatically generated

**Result:** The above graph shows that as the years keep moving on the suicides are increasing. Overall the trend is gradually increasing from 2001 to 2011 and dropped from 2011 to 2012.

**2. What are the top 10 states with the highest number of Suicides in India?**

**A screenshot of a graph

Description automatically generated**

**Result:** The above graph displays the list of top states with highest number of suicide attempts with Maharashtra leading with 901,905.

**3. What are the major causes for maximum suicides?**

**A screenshot of a graph

Description automatically generated**

**Result:** The above graph displays that the major cause of suicides in India is because of Family Problems. This can be related to Married people committing more suicides which is shown in the below Data Visualization Hypothesis 3. 341, 952 died committing suicides because of family problems.

**4. Which part of India has less number of suicides?**

**A graph with blue squares

Description automatically generated**

**Result:** The above graph displays the last 8 states in descending order with less number of suicides. From this, we can draw the conclusion that the Eastern part of India has less number of such cases.

**5. Does education assist with self-control and wisdom, which will aid in the prevention of suicides?**

**A graph of a graph

Description automatically generated**

**A graph of a bar graph

Description automatically generated**

**A graph of different colored bars

Description automatically generated**

**Result:** The three graphs above show that as the years and generations pass, persons who are well educated commit fewer suicides than those who are less educated or not educated. Thus, this research demonstrates that educated individuals have a strong intellect and realize the value of life.

**5. HYPOTHESIS**

**Results of the Hypothesis**

**5.1. The suicide rate among young adults (age group 15-29) in India has increased over the years from 2001 to 2012.**

**Attributes:** Age group, Year of suicide

This map is achieved by adding the Year into the columns and the Age group into the rows, with the Age group and Year in the filters as well as the Total in the marks section. Added colour divergence to clearly identify the maximum and minimum.

A screenshot of a computer

Description automatically generated

**Result:** The above map visualization determines the suicides performed according to the age group. We can interpret from the graph that the age group of 15-29, the younger people are committing more such acts when compared to other age groups. We see that 128,550 people of this age group committed suicides due to different reasons.

**5.2. There is a significant difference in suicide rates between genders in India, with a higher rate among males compared to females.**

**Attributes:** Gender, Year of suicide

This map is achieved by adding the Year into the columns and the Gender, Total into the rows, with the Gender in the filters as well as the Total, Gender in the marks section. Added colour to clearly identify the male graph and the female graph.

A screen shot of a graph

Description automatically generated

**Result:** The above map shows a significant difference between the rates of males and females. As per the data from 2001 to 2012 we see that more males committed suicides than females. The overall suicide rate of all males over the years are more at any particular point of view.

**5.3. Certain states in India show higher suicide rates compared to others, indicating a regional variation in suicide prevalence.**

**Attributes:** State, Year of suicide

This map is achieved by adding the Year into the columns and the State into the rows, with the Year in the filters as well as the Total in the marks section. Added colour to clearly identify which state has the maximum number of suicides.

A screenshot of a computer

Description automatically generated

**Result:** The above map shows that Maharashtra state has the most number of suicides and with a suicide rate of 9.92% percentage distribution over the years. Though the percentage distribution is low compared to other states the total count of the state is more.

**5.4. Married people committed more suicides than other type of people.**

**Attributes:** Type and Total

A screenshot of a computer

Description automatically generated

**Result:** The above map shows that Married people have committed more suicides compared to all the other categories. This seems to be contradictory to the age group data but the overall result proved to be surprisingly high when compared to other types of people.

**6. DISCUSSION**

In this data visualization project, we investigate India's worrying surge in suicides. We identify geographical discrepancies, susceptible groups, and the root causes of this critical public health issue through attractive visuals. Our interactive tools offer light on seasonal patterns, different sorts of disorders, different types of persons who commit suicide, and more.

**7. CONCLUSION AND RESULTS**

This project analyzed and visualized several comparisons, proving the different hypotheses on people committing suicide in India. It includes many factors which are impacting people to die. This analysis can be useful for government officials and psychologists to understand the patterns and comparisons of people's acts and deal with them accordingly. The "Suicides in India" data visualization project provides useful insights into the scope and intricacies of the issue. We presented the data in a clear and readily comprehensible manner utilizing multiple visualization tools, helping stakeholders to make educated decisions and plan focused actions. This initiative seeks to improve public awareness about suicide as a public health issue and to help efforts to reduce suicide rates in India.

**REFERENCES**

Gruère, G., & Sengupta, D. (2011). Bt cotton and farmer suicides in India: An evidence-based assessment. *The Journal of Development Studies*, *47*(2), 316–337. [https://doi.org/10.1080/00220388.2010.492863](https://doi.org/10.1080/00220388.2010.492863%20)

Adityanjee, D. (1986). Suicide attempts and suicides in India. *International Journal of Social Psychiatry*, *32*(2), 64–73. [https://doi.org/10.1177/002076408603200208](https://doi.org/10.1177/002076408603200208%20)

Mohanty, S., Sahu, G., Mohanty, M. K., & Patnaik, M. (2007). Suicide in India – a four year retrospective study. *Journal of Forensic and Legal Medicine*, *14*(4), 185–189. [https://doi.org/10.1016/j.jcfm.2006.05.007](https://doi.org/10.1016/j.jcfm.2006.05.007%20)