IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 7.918 ⁜ Vol. 12, Issue 1, January 2023

DOI: 10.17148/IJARCCE.2023.12101

Detecting and Prevention Emerging Suicide Threat Rates and Violence Using Machine Learning

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Abstract: Suicide has been a world problem, that has no respect or regard for its victims. Suicide treat is like a moving invisible virus that can capture anybody regardless of age, sex, county and seems to have no cure because you do not know who might be the next victim. But due to a lot of data collected on death rates caused by suicide based on age, generation, gender, county and research on prevention, we have been able to see that suicide might have a cure and can be prevented through various methods mostly involving mental, emotional and financial health. This research paper shows that indeed an individual can escape the wave of this invisible virus called Suicide.

Keywords: CDC, suicide, ML, mental health.

I. INTRODUCTION

Suicide is one of the major issues that claim many people's lives in the most developed and high Human Index development countries. The reasons for people's final decision to commit suicide are numerous, but research is ongoing, and research using machine learning, network science, data science, and other sophisticated technologies should only fill the gap and eliminate suicide problems among people. Given the increasing urban population, job stress, unemployment,pandemic,epidemic and a lack of future hope are always strategic issues to work on, not only in terms of research but also in terms of economics. Because it is one of the main issues that push people to make the wrong decision to end their lives. credits goes to the CDC and information and technology researchers for their contributions to the war on suicide.It took a few decades for people to realize that suicide would be an issue across societies.This report provides detailed data on suicide and suicide rates from 1985 to 2016 based on a variety of suicide cases and general medical characteristics. These data provide information on the suicide issue in the United States and around the world in general by variables such as country,year,sex,age,suicide number,population,suicide rate,HDI for year, GDP per _capital,generation, and cause of suicide.

Understanding changes in the health and well-being of the US population requires information on these suicide patterns.Suicide is the tenth-leading cause of death in the United States. It is the fourth-leading cause of death for adolescents ages 15-19 globally. In 2019, there were an estimated 3.5 million people who planned a suicide, 1.4 million suicide attempts and 47,511 deaths by suicide. Firearms were involved in half of all suicides, and there were more than twice as many deaths by suicide than by homicide.Companion reports provide additional information on the leading causes of suicide and suicide rates in the United States and other countries around the world.

The suicide data in this report can be used to detect, predict, monitor, prevent and evaluate the United States' suicide behavior and characteristics in terms of current suicide levels and long-term suicide trends, as well as to identify segments of the U.S. population at higher risk of age range from suicide cases. Differences in suicide rates between societal groups, including race and ethnicity, may reflect population differences in factors such as socioeconomic status, access to mental health services, and so on. This white paper is based on the facts of data science and machine learning realities the types of knowledge in the ML or Data science to emerge, converge, and stabilize, and new ways of knowing continue to swirl about and detecting suicide among communities.

II. BACKGROUND

World Health Organization discovered that at least one personal dies every 40 seconds all over the world amounting to 8,000,000 deaths per year 14.3% of deaths worldwide because of lack of efficient testing sophisticated materials , Sadly 80% of these people died without knowing if they had mental health issues symptoms and others knowing it later. Horrible example In Rwanda due many people survivors of the 1994 genocide against the Tutsi has increased mental health issues on daily basis and its 36.5% of total patient. as sampled developed country United State, US suicide is

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considered as the 10th leading cause of death in US and the second , fourth death person aged 10-34 and 35-44 years in the different research like CDC stated in their research there is increase of 33% increase in the suicide rate in 2019, To understand how the decline varied among different sub populations by demographic and other characteristics, CDC analyzed changes in counts and age-adjusted suicide rates from 2018 to 2019 by demographic characteristic where about 12 million adults reported serious thoughts of suicide during the past there is data shows 1.4 million attempted suicide and 3.5 million planned , numbers has been suddenly increased since covid-19 virus hits the world on the percentage of 10% suicide as additional , epidemic rise unemployed people , depression , being lone and apart away from family due to way of prevention pandemic restrictions, mental health issues due economic crisis all these contributed the numbers to go on the peak .

If our become successfully we will save live of millions of people died each yearly due to lack of this program accessible to everyone and affordable as well. In the searching process, was reviewed 23 after further screening based on the data files of suicide and suicide rate using the search term in valuable. Then we removed the duplicate data files, reducing the total number to three. The irrelevant data source were discarded after the Suicide rate including United State and variables underwent screening. There were 3500 full inputs and variables data in excel that remained for auxiliary screening and were studied in accordance with the criteria outlined in Table 1. Lastly, in this systematic review, we only selected 2 prospective data file of.xlms to be analyzed intensively and extracted before we outlined the comprehensive analytical results,prediction and findings.detecting suicide rate using advanced technology like ML assisted us to discover accurate results based on data extraction and recommendation and our opinion was vital in our research after get result.

III. METHODOLOGY

3.1. STUDY IDENTIFICATION AND SELECTION

The selection included the majority of studies that used Machine Learning & Data Science as their data source for detecting suicide mental health problems. Data science and machine learning bring domain expertise from programming, mathematics, and statistics together to generate insights and make sense of information and critical decisions., As a result, ML and Data science have produced a massive amount of findings, recommendations, and offer a unique opportunity for causes,prevention and understanding of social health mental issues and interaction among significantly suicide decisions. [41] Suicide is a complex phenomenon that has captivated philosophers, theologians, physicians, sociologists, and artists for centuries; in The Myth of Sisyphus, the French philosopher Albert Camus claims that it is the only serious philosophical problem. As a serious public health issue, it requires our attention; however, prevention and control are difficult tasks. The current study describes how they discussed their findings and
prevention strategies until they reached a consensus and agreement.

3.2. INCLUSION AND EXCLUSION CRITERIA

The total number of collected data files and searches was 23 after further screening based on the data files of suicide and suicide rate using the search term in valuable. Then we removed the duplicate data files, reducing the total number to three. Two reviewers evaluated the excel data file for the United States and the rest of the world during the screening stage. After that, two competent excel data file sources were chosen for reviewers to screen, and the data files would proceed to the next stage if they met the criteria. The following were the inclusion criteria:(1) the real platform was published in English between 1985 and 2016 with seven variables (valuables) for all 148 countries, (2) the data was extracted from kaggle, and (3) the data sources discussed different types of suicide mental health problems. Following the screening stage, the data sources and challenge organizers were sent to confirm whether we could use it or for further evaluation and search of the other data sources file's eligibility according to CDC organizers team challenges. The reviewers then compared and they give us go ahead[Kaggle chosen].

3.3. ASSESSMENT OF METHODOLOGICAL QUALITY

This systematic review adopted the Center Diseases Presentational Control challenge Program 2021(CDC) checklist for evaluating several methodological quality data file used comprehensively [45]. The major features and limitations based on the extraction of data such as data source, keywords, duration, and geographical location of data extracted; the quality of data such as data set related to suicide threat diseases problems; study design such as suitable methodology applied; and the results such as clear study objectives and outcomes, were analyzed and compared to indicate the strengths and weaknesses for each of the data file used and past studies.

The selected data file to be extracted which have met the criteria of inclusion and exclusion are as shown in result paragraph figure and tables . The Data file were selected based on the suicide title, variables , source of data [platform],location ,objectives, published year,outcomes, findings, data set, feature extraction method,data science & machine learning techniques.

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3.4. DATA QUALITY

Globally, data on suicide and suicide attempts is scarce and of poor quality. Only about 80 Member States have high-quality vital registration data which will be wont to estimate suicide rates directly. Poor-quality mortality data is not unique to suicide, but given the sensitivity of suicide – and the illegality of suicidal behavior in some countries – it is likely that under-reporting and mis-classification are more of a problem for suicide than for most other causes of death. Suicide and suicide attempt surveillance and monitoring must be improved in order for effective suicide prevention strategies to be implemented. Cross-national differences in suicide patterns, as well as changes in suicide rates, characteristics, and methods, highlight the importance of each country improving the comprehensiveness, quality, and timeliness of their suicide-related data. This includes vital suicide registration, hospital-based suicide attempt registries, and nationally representative surveys collecting information on self-reported suicide attempts.

3.5. MACHINE LEARNING TECHNIQUES

Machine learning techniques are currently popular approaches for detecting mental health problems, particularly suicide. Previous research employed classification techniques to detect a wide range of mental health issues, including stress, suicidal idealization, distress, and depression. For the analysis, numerous approaches were developed. of information used in various types of mental health issues Detection's. Several researchers created new methods, In addition, various online resources were used for data extraction, such as Kaggle, world data and WHO mental health., other public resources from different types of WHO will be possibly used for data extraction in various types of research in the future.

Utilization of machine learning algorithms and compare them to find the best and most appropriate prediction model that can provide us with an estimate of the number of individuals who will be affected by the problem based on particular characteristics such as country, age, gender, etc. the following terms were used in this section:

1-Linear Regression model
2-Polynomial Regression model
3-Decision Tree Regression model
4-Random Forest Regression model
5-Nearest Neighbors Regression model
6-Neural System Regression model

1- Linear Regression model

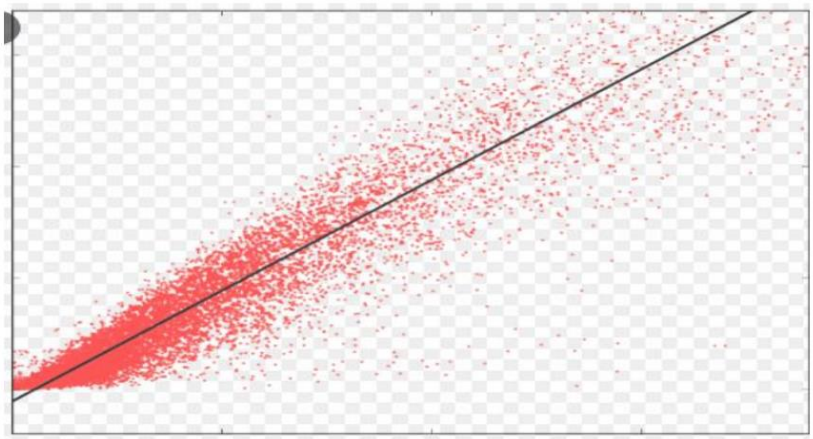

Fig 1: Linear Regression model

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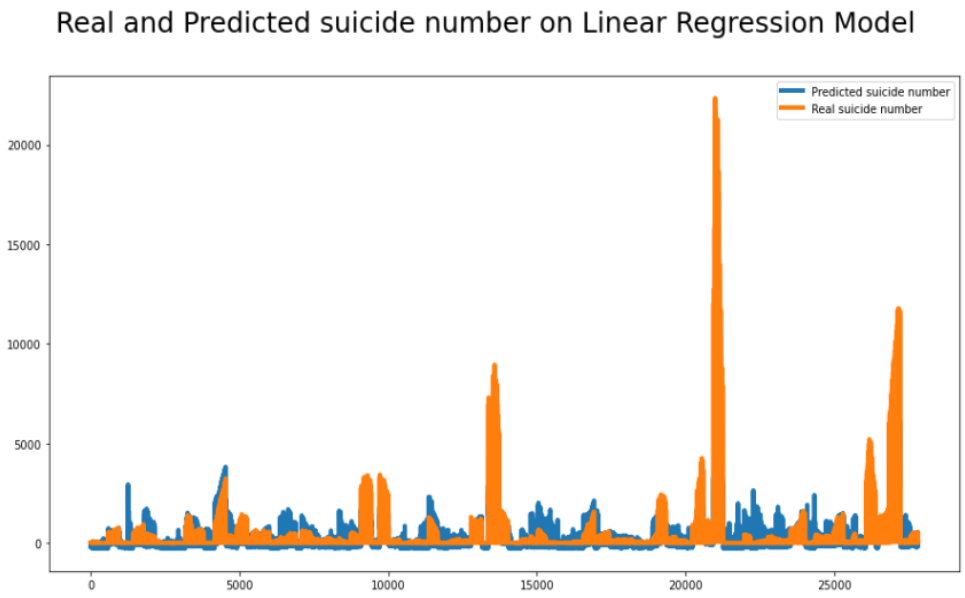

Fig 1.1: Linear Regression model

According to the above graph and results, the accurate predicted values for linear regression model is 0.472, which is not good, And the graph confirmed this result.

1-Polynomial Regression model

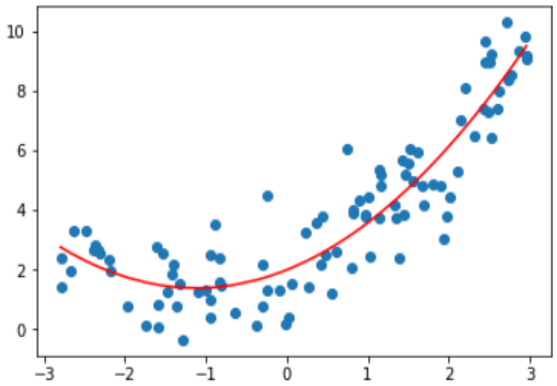

Fig 2: Polynomial Regression model

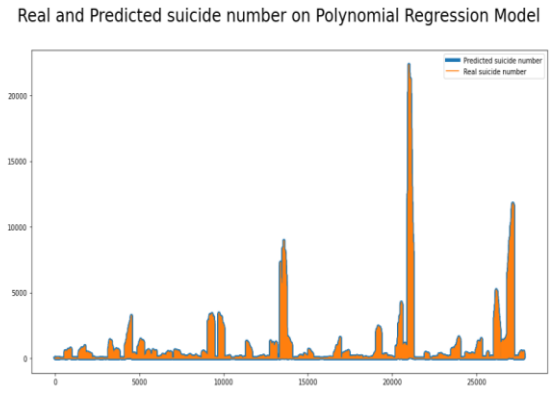

Fig 2.1: Polynomial Regression model

According to the above graph and results, the accurate predicted values for Polynomial regression model is **0.99999998**, we think it is very good, And the error percentage is 0.01537, and we think it is very good also, and the graph confirmed this result.

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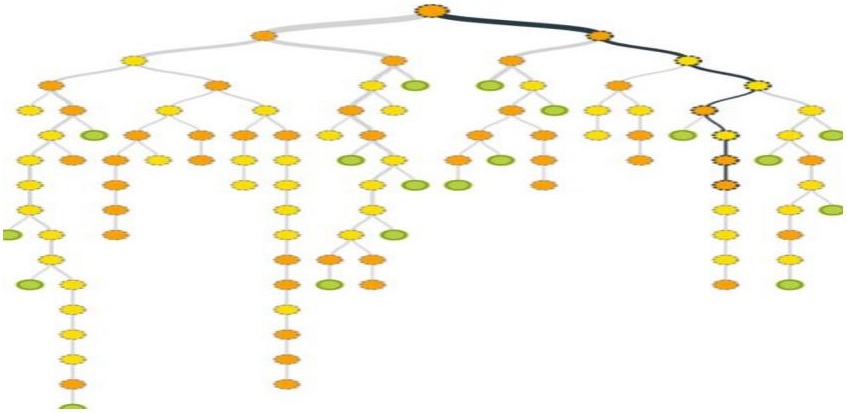
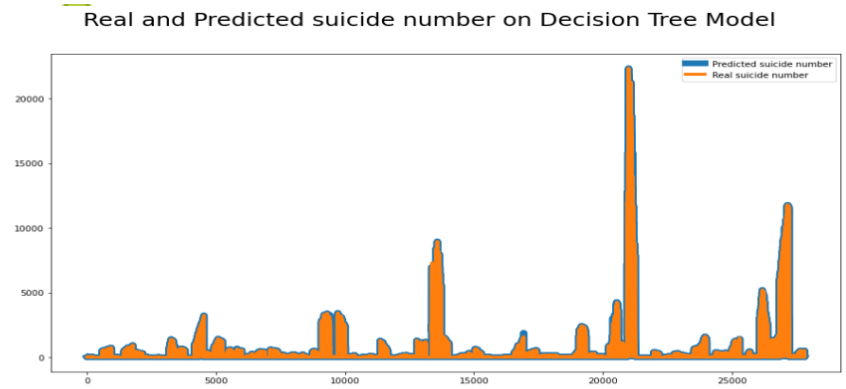
2-Decision Tree Regression model





According to the above graph and results, the accurate predicted values for Decision tree regression model is 0.9972, and i think it is good, and the graph confirmed this result.

3-Random Forest Regression model

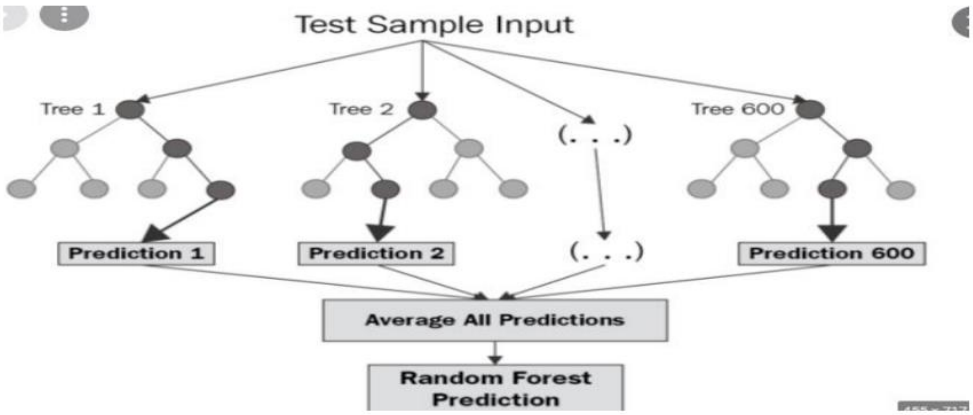


Fig 4: Random Forest Regression model

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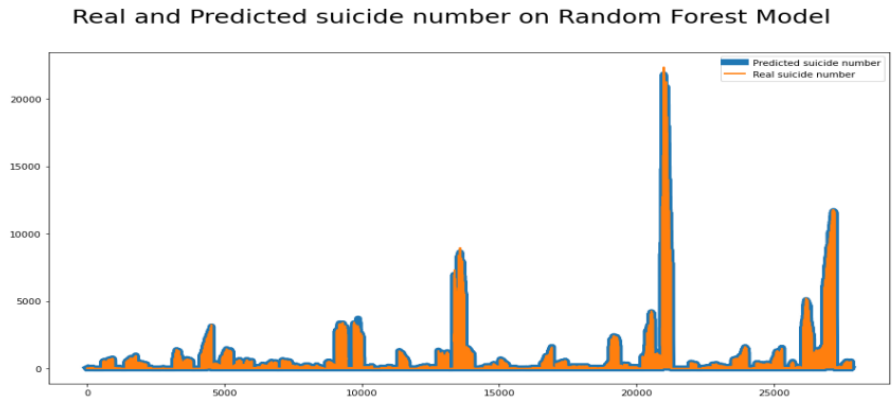

Fig 4.1: Random Forest Regression model

According to the above graph and results, the accurate predicted values for Random Forest regression model is 0.9973, we think it is good, and the graph confirmed this result.

4-Nearest Neighbors Regression model

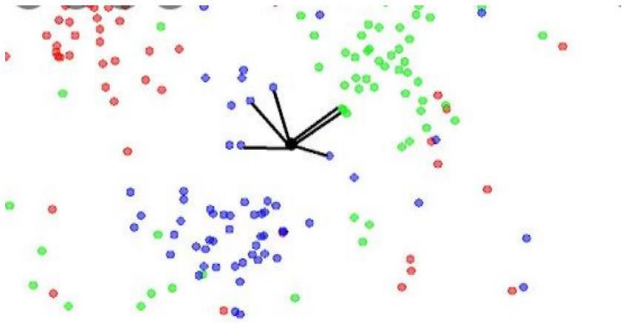

Fig 5: Nearest Neighbors Regression model

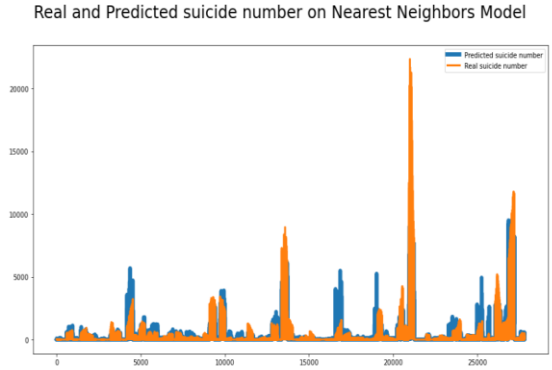

Fig 5.1: Nearest Neighbors Regression model

According to the above graph and results, the accurate predicted values for Nearest Neighbors regression model is 0.46862, we think it isn't good, and the graph confirmed this result.

6-Neural System Regression model

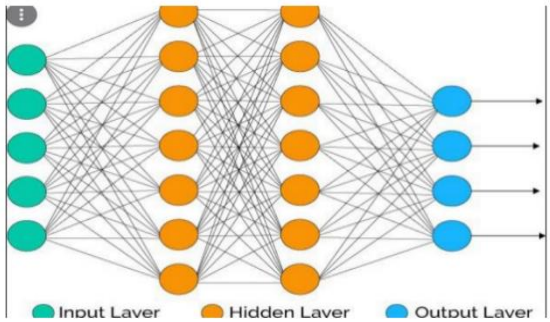

Fig 6: Neural System Regression Model

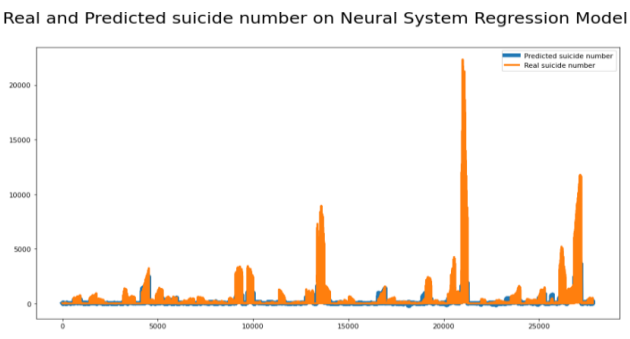

Fig 6.1: Neural System Regression Model

According to the above graph and results, the accurate predicted values for Neural system regression model is 0.3199, we think it isn't good, and the graph confirmed this result. **We examined six predictive models and discovered that**

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the second model (Polynomial Regression) provides the most accurate prediction as well as the lowest error percentages, hence we recommend using it to forecast the number of suicide cases.

4. RESULTS & DISCUSSION

The 1 data source were published between 1985 and 2016 in English language. A chart graph , correlations , histogram from until the final output of selected is provided in Figure 1. The analysis of the 2 selected data file was based on the criteria of inclusion and exclusion as provided in Table 1. The summary of the selected data sources were in accordance feature extraction method, machine learning and data science techniques, and This white paper discusses the results and findings of the selected data source in

(i) Section III.

The paper output also touched on mental health problem detection in WHO as implemented in various countries. The studies also described the different types of mental health problems general . The result of this paper is to reduce suicide issues. This paper reduces overall suicide rate of the united state which is major issues that claim many people's lives in the US and across the world. As CDC challenges prescribed they didn't give us access the researchers in Table 2 prepared the own data sets, except for one, CDC used data from another study. The data sets provided were based on the US where the research was conducted to address suicide mental issues, the type of CVS used, and the duration of data extraction. The advantage of using an original data set from trusted website is that the information is specific to the objectives of the research ++++ depending on the situation and suicidal general. Several data were extracted directly from public posts in Kaggle & Data world. Two kinds of data were extracted. The second type included data extracted supported only US from data science companies services, like Kaggle and data.world.

(ii) Output results from file extracted and content explanation to every. content about tables and figures shown from file on suicide issues.

We will work on this project to research the information using data science and machine learning algorithms so as to gather true statistics and understand why they exist. First, we'll target analysis part by using data science to read the datasets, make wrangling, cleaning and processing to be told more about suicide statistics normally, additionally as offer our views and suggestions to help reduce the world suicide rate and The following are going to be the results of our analysis part and also the relationship between the suicide rate and:

4.1. The Difference Between Male and Feminine Suicide Rates

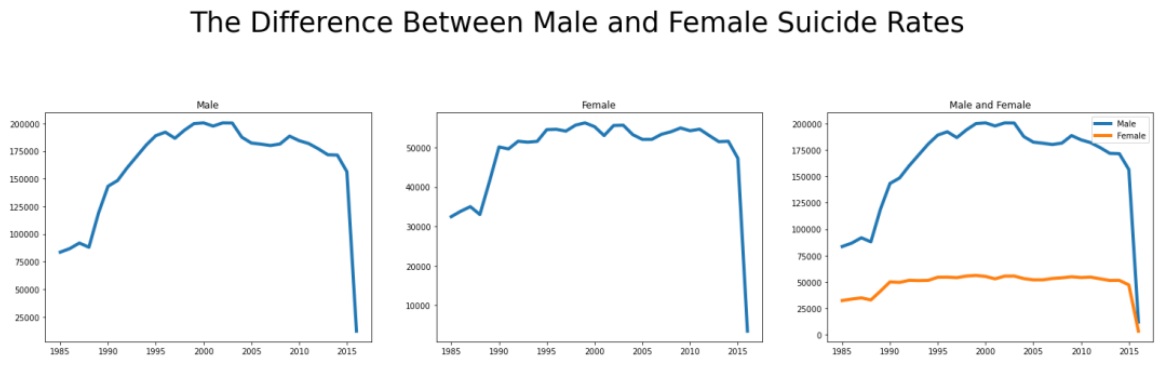

Fig 7: difference between Male and Female Suicide Rates.

We discovered from the graphs that:
1-Observation No 1 is Suicide Male numbers are on top of female numbers no matter of age

Our opinion is:

The suicide rate of males is **over** females due to:

4.1.1. Method lethality:

Despite the suicide rate being higher in men, women typically have higher rates of suicidal idealization and behavior than men (Cantor, 2000). The difference, therefore, seems to be mortality rates, which are lower in women than in men,

DOI: 10.17148/IJARCCE.2023.12101

suggesting that the difference is also in either intent or within the lethality of the tactic used (Canetto & Sakinofsky, 1998). Intent is usually not considered to be the rationale for this discrepancy: although Rich et al., (1988) used psychological autopsy data to suggest that girls are less out to dying than men, corroborated this finding.

Furthermore, Beautrais et al. (1996) found that the proportion of males and females who made a medically serious attempt was almost equal, but that twice as many ladies used non-violent methods. this means that the difference in suicide mortality rates between males and females may be a results of method choice, instead of intent. This difference in method choice is strongly supported by statistical evidence; Denning et al. (2000) stated that girls use methods like drug overdose and monoxide poisoning, while men tend to use firearms and hanging Male suicide methods are often more violent, making them more likely to be completed before anyone can intervene.

4.1.2. Depression (help seeking):

This suggests that the gender difference lies in help-seeking instead of in rates of depression itself, a premise supported by consistent reports that help-seeking behaviour for mental disease are less common in men than in women, even when experiencing similar levels of distress (Kessler, Brown, and Broman, 1981). Rickwood and Braith waite (1994) noted that gender is one amongst the foremost consistent predictors of help-seeking behaviour, and research shows that men are more likely to agree that they might not seek professional therapy for depression or perhaps seek help from their friends (Padesky & Hammen, 1981). This could explain the discrepancy in suicide rates between males and females, as helping leads to treatment, which is mostly accepted as being more likely to alleviate depression than no treatment in the least. Hence, men who don't seek help for depression are likely to suffer more severely because of an absence of treatment, which could end in an increased risk of suicide.

4.1.3. Responsibility:

This factor will be associated with family or work. When there's an economic downturn that leads to increased unemployment, as an example, there tends to be an associated increase in suicides, typically 18–24 months after the downturn. One 2015 study found that for each 1% increase in unemployment, there was a 0.79% increase within the suicide rate. Having to stress more about finances or trying to seek out employment can exacerbate psychological state issues for anyone. But there are elements of social pressure and psychological state, too

Our Recommendation based on research is:

Communication: It’s too simplistic to mention women are willing to share their problems and men tend to bottle them up. But it's true that, for generations, many societies have encouraged men to be "strong" and not admit they’re struggling. It often starts in childhood. "We tell boys that 'boys don't cry'," says Colman O’Driscoll, former decision maker of operations and development at Lifeline, an Australian charity providing 24-hour crisis support and suicide prevention services.

"We condition boys from a awfully young age to not express emotions, because to precise emotions is to be "weak." Mara Grunau, administrator at the Centre for Suicide Prevention in Canada, points out that it’s how we talk over with our kids and the way we encourage them to speak about themselves too: "Mothers talk far more to their daughters than to their sons... and that they share and identify feelings more," she says. "We almost expect women to be emotional."

4.1.4. Artificial intelligence (AI):

Technology is presenting new options too. Not everyone might want to burden themselves with another person's problems, even over a helpline. But AI – like chatbots – might allow a vulnerable person to speak and acquire the assistance they have without concern of judgement.

4.1.5. Awareness Campaign:

Another strategy is to concentrate on the impact that a suicide has on loved ones. Calm’s campaign, Project 84, so named to represent the 84 men who die hebdomadally by suicide within the UK, stresses the devastation left behind. this will counteract the sense by some men that "it's the ‘right’ thing to require themselves out of the equation," Gunning says. He emphasis's: "Staying is often an option."

4.1.6. Non-Violence:

Other solutions must do with simply making suicides harder to complete. After barriers were installed on the Clifton span in Bristol, England,

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(iii)2-Observation number 2 is that the male and feminine suicide rates began to fall in 2005 and reached an occasional point in 2016.

This is because more knowledge and awareness of suicide was discovered and created and preventive measures were taken by the govt., individuals and society.

4.2. The Suicide Rates and Group Age Relationship

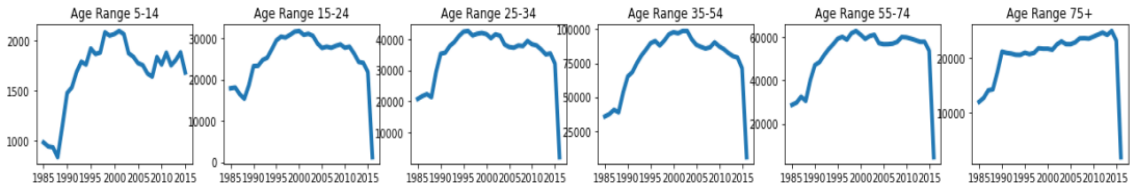

Fig 8: The Suicide Rates and Group Age Relationship

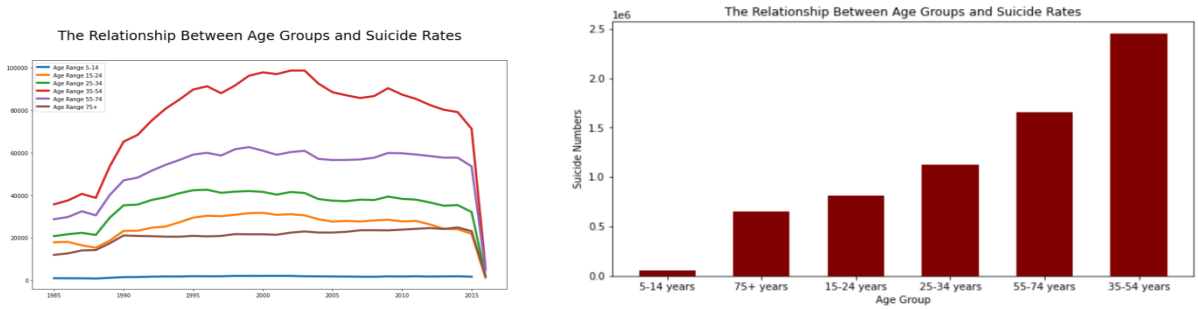

Fig 8.1: The Suicide Rates and Group Age Relationship

4.2.1. Observation no 1 is that the highest Suicide rate in age range 35-54 and so 55- 74 so 25-34

Young adults aged 18 to 25 are at higher risk for suicidal thoughts and attempts than other age groups. However, adults aged 35 to 64 have higher rates of death from suicide than other age groups they're to:

(i) Older adults tend to plan suicide more carefully. They are also more likely to use more lethal methods.
(ii) Grief over lost loved ones
(iii) Chronic illness and pain
(iv) Cognitive impairment
(v) Financial troubles

Our Recommendation based on research are:

The National Suicide Prevention Lifeline outlines five action steps you'll take if you recognize an older adult who is wondering suicide.

(i) Ask: Don't be afraid to be direct with the person in danger. Ask questions like, "Are you considering suicide?" and "How am i able to help you?" to initiate a conversation in a very supportive and unbiased way. make sure to concentrate carefully to their answers and acknowledge their emotional pain.

(ii) Be there: If you're able to, be physically present for the person so as to ease feelings of isolation and supply a way of connectedness. If a face-to-face visit isn't possible, be there for them via phone or video call. Work with the individual to spot others who could also be willing to lend their help. make certain to not make any promises that you just are unable to stay.

(iii) Keep them safe: know if the person has already made any attempts on their life. Do they need a particular plan or timing in mind? Do they need access to their planned method of self-harm? Learning the answers to those questions can

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facilitate your understand whether this individual is in immediate danger. In general, the more detailed a person's suicide plan is, the upper their risk.

(iv) Help them connect: If someone in your life is pondering suicide, it's important for them to ascertain a network they will depend on now and in future moments of crisis.

(v) Follow up: Studies have shown that following up can reduce suicide-related deaths in high-risk populations. Once you've had an initial conversation with the vulnerable person and helped them establish a support network, confirm to test in. this may be finished a fast telephone call, text message, or maybe a card.

4.2.2. Observation Number 2 is that the lowest Suicide rate in age range 5- 14 then +75 and so 15-24

Suicide round the age of 5 is difficult to seek out thanks to the actual fact that they do not have responsibilities or reasons to require their life. Suicide within this age range may be caused by childhood violence, mental disorders, harassment, etc. Most literature (including this mini review) on youth suicide refers to school-age children (7–12 years) and adolescents (13–20 years). These youth are naturally susceptible to psychological state problems, especially during the years of adolescence (13). this era in life is characterized by movement, changes, and transitions from one state into another, in several domains at the identical time. kids should make decisions about important concrete directions in life, for instance, school, living situation, peer group. For older adults (75+), suicide is low among them. Suicide can only occur and be caused by lowliness, illness, sickness, etc. Other more transient factors that reflect an imminent risk of suicide crisis include unbearable mental pain and related experiences of depression and hopelessness, which can cause a suicidal state of mind.

Our Recommendation based on research is:

They must address new challenges with reference to building their own identity, developing self-esteem, acquiring increasing independence and responsibility, and building new love. More awareness, care, and love given to adults 75+

4.2.3. Observation Number 3 suicide rate decreased quickly after 2015

Over the 20-year period (1996–2015), there was a statistically significant decrease in the rate of suicide (22.3%) decrease, from 14.2 per 100,000 in 1996 to 11.0 per 100,000 in 2015).

4.3. The Suicide Rates and Generation Relationship

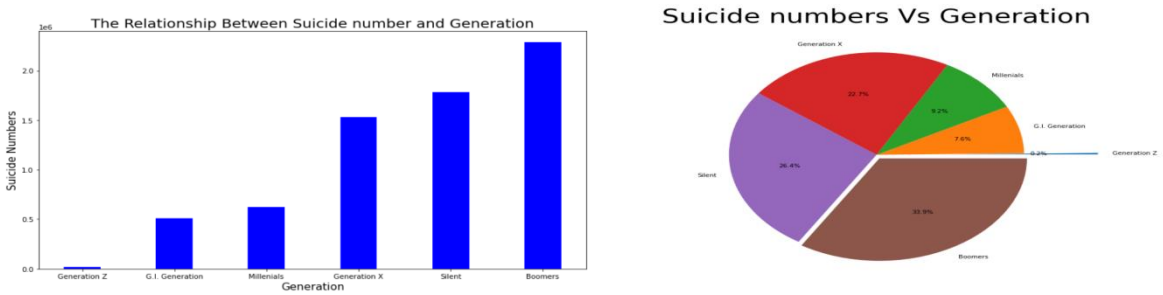

Fig 9: The relationship between suicide number and Generation

We found from the Above Graphs That the Boomers generation has the very best suicide rate 33.9%, and also the Generation Z has very cheap suicide rate 0.2%.

Boomers

It has long held true that elderly people have higher suicide rates than the general population. The Boomers had higher suicide rates than earlier generations; the confluence of that with the very fact that they're now setting out to become older, when the danger traditionally goes up is worrisome. How did a generation that started off with such a lot going for it find yourself so despondent in midlife? It might be that those very advantages made it harder to address setbacks, said Barry Jacobs, director of behavioral sciences at the Crozier Keystone medical practice Residency Program in Pennsylvania.

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 7.918 ⁜ Vol. 12, Issue 1, January 2023

DOI: 10.17148/IJARCCE.2023.12101

"There was an illusion of choice" — where people thought they'd be ready to recreate themselves again and again, he said. "These people feel a greater sense of disappointment because their expectations of leading glorious lives didn't come to fruition." Instead, compared with their parents' generation, boomers have higher rates of obesity, prescription and illicit abuse, alcoholism, divorce, depression, and mental disorders. As they age, many augment that list of chronic illness, disabilities, and also the strains of caring for his or her parents and for adult children who still rely on them financially. Boomers have struggled more with existential questions of purpose and meaning.

Generation Z

Generation Z has all-time low suicide rate because they're young and have fewer responsibilities and disappointments in life. Although Generation Z has the very best depression rate and mental instability, According to a report, Generation Z (which is the current generation) is significantly more likely (about 27%) than other generations to report their mental health as poor. However, at the same time, they are 37% more likely to receive mental health treatment compared to other generations, reducing the attempts at suicide.

Our Recommendation based on research are:

□i. Technology

Technology has developed a way to reduce and dictate suicide treats through the use of a machine learning model that would help us find out the chances of a particular individual resorting to suicide in the future.

□ii. Communication

These factors can be used to help both generations avoid attempting and also reduce the rate of attempts in society. To help individuals dealing with the thought of suicide.

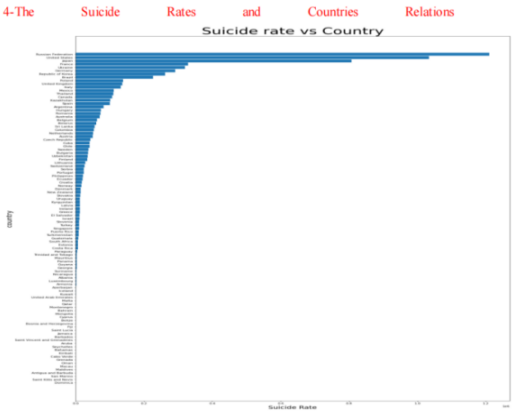

Fig 10: The suicide rates and countries relations

Fig 10b: The suicide rates and countries relations

4.3.1. According to the graph, the four countries with the highest suicide rates are: [Russian Federation, United States, Japan, France]

The suicide rate in these countries are high because of

- □ Financial pressure
- □ Isolating technology
- □ Historical practices

Recommendation is: to reduce the rate of these factors. And the bottom four countries are as follows: [Dominica, Saint Kitts and Nevis, San Marino, Antigua and Barbuda]

□ These countries have lower suicide rates because they have less financial pressure, isolating technology, violence, and historical practices.

Our Recommendation based on research is:

Creation of awareness to maintain the low rate of suicide in these countries.Also, we will do a specific data analysis for the United States in order to better understand the behaviour of Americans who are dealing with the suicide problem, and we will gain more valuable information about the United States' suicide problem and its relationship with:

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 7.918 ⁜ Vol. 12, Issue 1, January 2023

DOI: 10.17148/IJARCCE.2023.12101

4.3.2. Check The Suicide Rates and Group Age Relationship (USA)

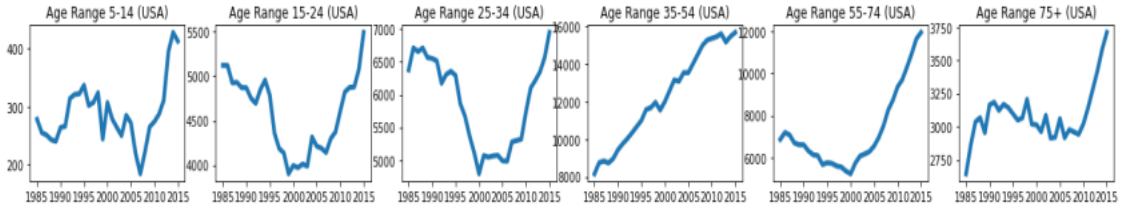

Fig 11: the suicide rates and group age relationship

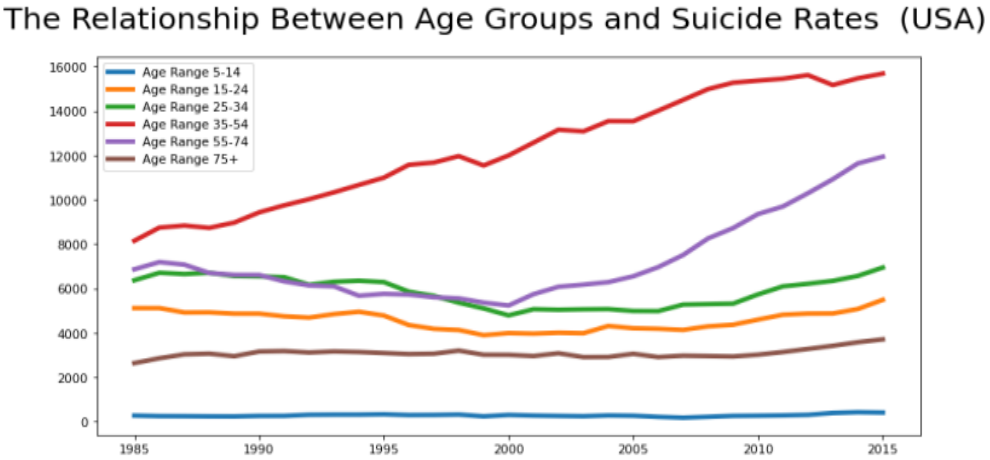

Fig 12: the relationship between age group and suicide rates(USA)

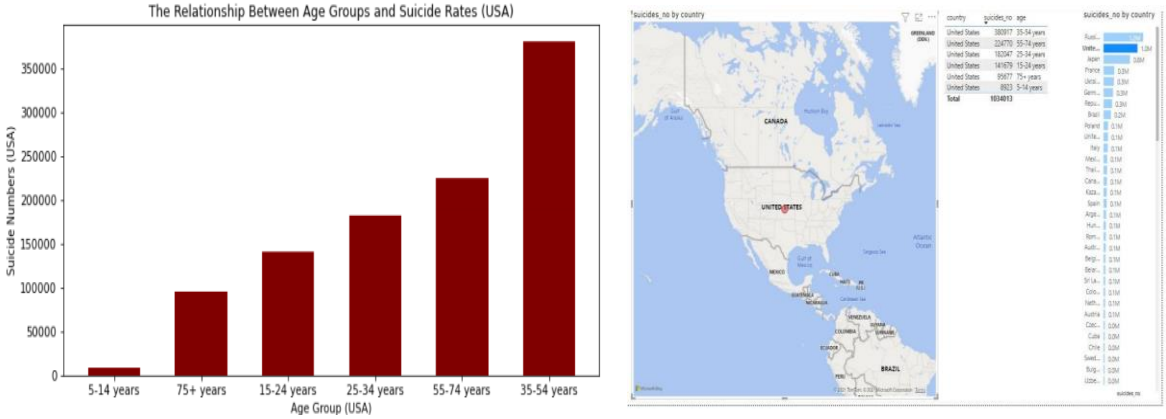

Fig 12.1: the relationship between age group and suicide rates (USA)

I. USA Observation-

- We discovered the same three notes that we discovered on statistics on the entire data set during our analysis of USA data.
- 1-the highest Suicide rate in age range 35-54 and then 55-74 and then 25-34
- 2-The Lowest Suicide rate in age range 5-14 and then +75 and then 15-24
- 3-The suicide rate has been steadily increasing since the year 2000, and this is a very critical problem faced the USA Community.

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 7.918 ⁜ Vol. 12, Issue 1, January 2023

DOI: 10.17148/IJARCCE.2023.12101

4.3.3 The Suicide Rates and Generation Relationship (USA)

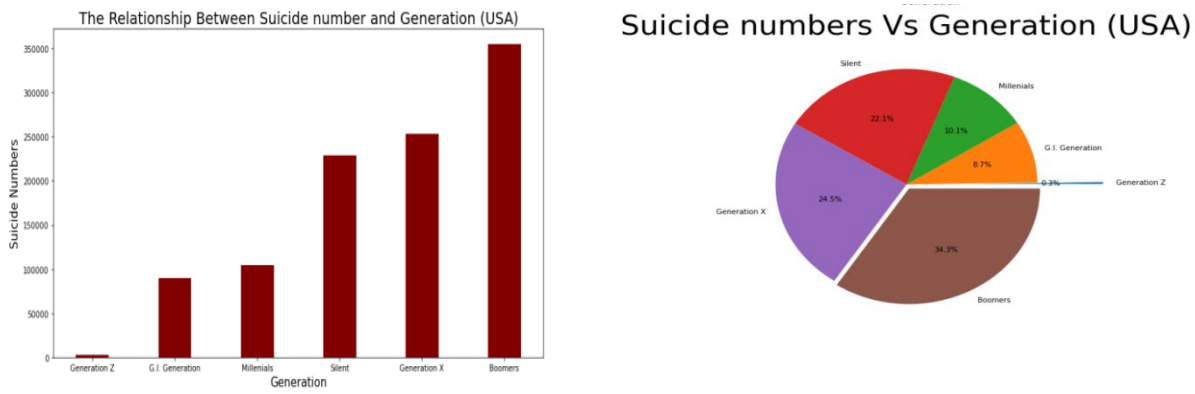

Fig 13: The Suicide Rates and Generation Relationship (USA)

II. USA Observation-

We found also from the Above Graphs That the Boomers generation has the highest suicide rate, and the Generation Z has the lowest suicide rate, and this result was confirmed when we checked this point across the entire datasets.

4.3.4. Check which years had the highest and lowest suicide rate.

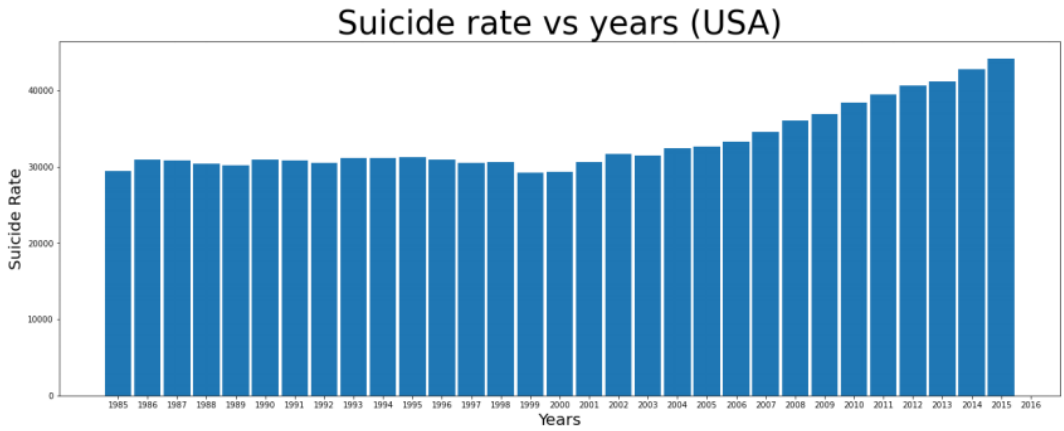

Fig 14: Suicide rate vs years (USA)

III. USA Observation-

We discovered that the suicide rate in the USA increases gradually every year.From the above USA statistics, we can get the following conclusion:

USA Analysis Conclusion:

We discovered that the behaviour of the suicide rate in the United States is almost similar to the behaviour of the suicide rate in all countries data, but the main difference is that the suicide rate has been steadily increasing since the year 2000, and this is a very serious problem facing the United States community. Data from the National Vital Statistics System, Mortality From 1999 through 2014, the age-adjusted suicide rate in the United States increased 24%, from 10.5 to 13.0 per 100,000 population, with the pace of increase greater after 2006. Suicide rates increased from 1999 through 2014 for both males and females and for all ages 10-74. The percent increase in suicide rates for females was greatest for those aged 10-14, and for males, those aged 45-64. The most frequent suicide method in 2014 for males involved the use of firearms (55.4%), while poisoning was the most frequent method for females (34.1%). Percentages of suicides attributable to suffocation increased for both sexes between 1999 and 2014. Data from 2018, showed that suffocation-related suicide

International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified ⁜ Impact Factor 7.918 ⁜ Vol. 12, Issue 1, January 2023
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deaths (including hanging and strangulation) were the predominant means of suicide, accounting for 53.2% of all suicides, followed by poisoning (18%) and firearms (13.7%). Between 1981 and 2018, the rate of suicide by hanging/strangulation/suffocation increased for both sexes; among males it was the leading means of suicide (45.3%), followed by firearms (33.7%). The predominant means of suicide among females was poisoning (40.4%). We found that rates of suicide by firearms/explosives were relatively stable. In the United States, suicide rates had been rising prior to the 2008 recession, and the upward trend continued thereafter; this suggests that a broader constellation of determinants may be at play. Our results showed a similar pattern in Newfoundland and Labrador—there was no year or period in which the trend in suicide mortality diverged from the steady increase. The provincial upturn in suicide rates since 1981 preceded not only the global economic crisis that occurred in the latter part of the study period, but also a regional crisis that occurred in the decade prior.

(I) Economic: Studies from the U.S. examining historical trends indicate that suicide rates increase during economic recessions marked by high unemployment rates, job losses, and economic instability and decrease during economic expansions and periods marked by low unemployment rates, particularly for working-age individuals 25 to 64 years old.56,57 Economic and financial strain, such as job loss, long periods of unemployment, reduced income, difficulty covering medical, food, and housing expenses, and even the anticipation of such financial stress may increase an individual's risk for suicide or may indirectly increase risk by exacerbating related physical and mental health problems.

(II) Mental Health: While most people with mental health problems do not attempt or die by suicide18,19 and the level of risk conferred by different types of mental illness varies,64-66 previous research indicates that mental illness is an important risk factor for suicide.5,67 State-level suicide rates have also been found to be correlated with general mental health measures such as depression.68,69 Findings from the National Comorbidity Survey indicate that relatively few people in the U.S. with mental health. (III) Connectivity: Sociologist, Emile Durkheim theorized in 1897 that weak social bonds, i.e., lack of disconnectedness, were among the chief causes of suicidal.120 Disconnectedness is the degree to which an individual or group of individuals are socially close, interrelated, or share resources with others. Many ecological cross-sectional and longitudinal studies have examined the impact of aspects of social capital on depression symptoms, depressive disorder, mental health more generally, and suicide.

Our Recommendation based on research :

Suicide is a complex public health problem that requires a comprehensive and sustained prevention effort. Suicide rates are influenced by a constellation of social, economic, environmental, and psychological factors in the population. The need for a public health approach to prevention that accounts for geographic and demographic differences in the epidemiology of suicide.

Suicide Prevention In The USA

• Tracking and monitoring data to observe trends and inform policies and programs.
• Identifying risk and protective factors associated with suicide and developing evidence-based suicide prevention strategies.
• Evaluating programs, policies, and practices to determine if they effectively prevent risk for suicide.

(I) Strengthen economic supports: Economic supports for individuals and families can be strengthened by targeting household financial security and ensuring stability in housing during periods of economic stress. Strengthening household financial security can potentially buffer the risk of suicide by providing individuals with the financial means to lessen the stress and hardship associated with a job loss or other unanticipated financial problems. The provision of unemployment benefits and other forms of temporary assistance, livable wages, medical benefits, and retirement and disability insurance to help cover the cost of necessities or to offset costs in the event of disability, are examples of ways to strengthen household financial security.

• Housing stabilization policies aim to keep people in their homes and provide housing options for those in need during times of financial insecurity. This may occur through programs that provide affordable housing such as through government subsidies or through other options available to potential home buyers such as loan modification programs, move-out planning, or financial counseling services that help minimize the risk or impact of foreclosures and eviction.

Potential Outcomes

• Reductions in foreclosure rates
• Reductions in eviction rates
• Reductions in emotional distress
• Reductions in rates of suicide

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

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(II) Strengthen access and delivery of suicide care

Coverage of mental health conditions in health insurance policies: Federal and state laws include provisions for equal coverage of mental health services in health insurance plans that is on par with coverage for other health concerns (i.e., mental health parity) 73 Benefits and services covered include such things as the number of visits, copays, deductibles, inpatient/outpatient services, prescription drugs, and hospitalizations. Reduce provider shortages in underserved areas: Access to effective and state-ofthe-art mental health care is largely dependent upon the training and the size of the mental health care workforce. Over 85 million Americans live in areas with an insufficient number of mental health providers; this shortage is particularly severe among low-income urban and rural communities.

There are various ways to increase the number and distribution of practicing mental health providers in underserved areas including offering financial incentives through existing state and federal programs (e.g., loan repayment programs) and expanding the reach of health services through telephone, video and web-based technologies. Such approaches can increase the likelihood that those in need will be able to access affordable, quality care for mental health problems, which can reduce risk for suicide. Safer suicide care through systems change: Access to health and behavioral health care services is critical for people at risk of suicide; however, this is just one piece of the puzzle. Care should also be delivered efficiently and effectively. More specifically, care should take place within a system that supports suicide prevention and patient safety through strong leadership, workforce training, systematic identification and assessment of suicide risk, implementation of evidence-based treatments (see Identify and Support People at Risk), continuity of care, and continuous quality improvement. Care that is patient-centered and promotes equity for all patients is also of critical importance.

Potential Outcomes

- Increased use of mental health services
- Lower rates of treatment attrition
- Reductions in depressive symptoms

(III) Create protective environments:

 Reduce access to lethal means among persons at risk of suicide: Means of suicide such as firearms, hanging/suffocation, or jumping from heights provide little opportunity for rescue and, as such,have high case fatality rates (e.g., about 85% of people who use a firearm in a suicide attempt die from their injury).

 Intervening at Suicide Hotspots. Suicide hotspots, or places where suicides may take place relatively easily, include tall structures (e.g., bridges, cliffs, balconies, and rooftops), railway tracks, and isolated locations such as parks. Efforts to prevent suicide at these locations include erecting barriers or limiting access to prevent jumping, and installing signs and telephones to encourage individuals who are considering suicide, to seek help.

 Safe Storage Practices. Safe storage of medications, firearms, and other household products can reduce the risk for suicide by separating vulnerable individuals from easy access to lethal means. Such practices may include education and counseling around storing firearms locked in a secure place (e.g., in a gun safe or lock box), unloaded and separate from the ammunition; and keeping medicines in a locked cabinet or other secure location away from people who may be at risk or who have made prior attempts.

 Organizational policies and culture that promote protective environments may be implemented in places of employment, detention facilities, and other secured environments (e.g., residential settings). Such policies and cultural values encourage leadership from the top down and may promote prosocial behavior (e.g., asking for help), skill building, positive social norms, assessment, referral and access to helping services (e.g., mental health, substance abuse treatment, financial counseling), and development of crisis response plans, postvention and other measures to foster a safe physical environment. Such policies and cultural shifts can positively impact organizational climate and morale and help prevent suicide and its related risk factors (e.g., depression, social isolation).

 Community-based policies to reduce excessive alcohol use: Research studies in the United States have found that greater alcohol availability is positively associated with alcohol-involved suicides.103-105 Policies to reduce excessive alcohol use broadly include zoning to limit the location and density of alcohol outlets, taxes on alcohol, and bans on the sale of alcohol for individuals under the legal drinking age.105 These policies are important because acute alcohol use has been found to be associated with more than one third of suicides and approximately 40% of suicide attempts.

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(IV) Promote connectedness: Promoting connectedness among individuals and within communities through modeling peer norms and enhancing community engagement may protect against suicide.

• Peer norm programs: seek to normalize protective factors for suicide such as help seeking, reaching out and talking to trusted adults, and promote peer connectedness. By leveraging the leadership qualities and social influence of peers, these approaches can be used to shift group-level beliefs and promote positive social and behavioral change. These approaches typically target youth and are delivered in school settings but can also be implemented in community settings.

• Community engagement activities: Community engagement is an aspect of social capital. Community engagement approaches may involve residents participating in a range of activities, including religious activities, community clean-up and greening activities, and group physical exercise. These activities provide opportunities for residents to become more involved in the community and to connect with other community members, organizations, and resources, resulting in enhanced overall physical health, reduced stress, and decreased depressive symptoms, thereby reducing risk of suicide.

Potential Outcomes

• Increases in healthy coping attitudes and behaviors
• Increases in referrals for youth in distress
• Increases in positive perceptions of adult support

(V) Teach coping and problem-solving skills: Building life skills prepares individuals to successfully tackle every day challenges and adapt to stress and adversity. Life skills encompasses many concepts, but most often include coping and problem-solving skills, emotional regulation, conflict resolution, and critical thinking. Life skills are important in protecting individuals from suicidal behaviors. Social-emotional learning programs: focus on developing and strengthening communication and problem-solving skills, emotional regulation, conflict resolution, help seeking and coping skills. These approaches address a range of risk and protective factors for suicidal behavior. They provide children and youth with skills to resolve problems in relationships, school, and with peers, and help youth address other negative influences (e.g., substance use) associated with suicide. Parenting skill and family relationship programs: provide caregivers with support and are designed to strengthen parenting skills, enhance positive parent-child interactions, and improve children's behavioral and emotional skills and abilities. Programs are typically designed for parents or caregivers with children in a specific age range and can be self-directed or delivered to individual families or groups of families.

(VI) Lessen harms and prevent future risk: Some approaches that can be used to lessen harms and reduce future risk of suicide include postvention and safe reporting and messaging following a suicide.

• **Postvention:** approaches are implemented after a suicide has taken place and may include debriefing sessions, counseling, and/or bereavement support groups for surviving friends, family members, or other close contacts. These programs have not typically been evaluated for their impact on suicide, attempts, or idealization, but they may reduce survivors' guilt, feelings of depression, and complicated grief.170 Safe reporting and messaging about suicide: The manner in which information on a recent suicide is communicated to the public (e.g., school assemblies, mass media, social media) can heighten the risk of suicide among vulnerable individuals and can inadvertently contribute to suicide contagion. Reports that are inclusive of suicide prevention messages, stories of hope and resilience, risk and protective factors, and links to helping resources (e.g., hotline), and that avoid sensationalizing events or reducing suicide to one cause, can help reduce the likelihood of suicide contagion.

(VI) Meditation: To reduce suicidal issues among Americans, we discovered that the meditation process could also save and facilitate many people to change their bad decisions of taking their own lives. Research showed that meditation offers the opportunity, the potential to step back and a get different mind perspective to see what things happen to us aren't always as they appear, which most cases of suicidal thoughts lack. However, we have the ability to alter our perception of it. People should learn this lesson so that they will be able to control everything that happens to them in life, as well as other new causes of suicide is at the same time , this sort of constantly mind -wandering is also causes of unhappiness and suicidal problem among people.

IV. CONCLUSION

Suicide In the world as a given selected sample USA indeed itself is real and has become a sad reality to many individuals, families and communities. Through data, statistics and research and results collected and made, it has shown that suicide rates in the USA is similar to suicide rates in other countries. Preventive measures have been taken and will continue to be taken to be able to be improved upon and worked on in order to create a healthy society that generations to come can live in without fear.

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International Journal of Advanced Research in Computer and Communication Engineering
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DOI: 10.17148/IJARCCE.2023.12101

ACKNOWLEDGMENT

I would like to acknowledge and give thanks in a special way to the Almighty God from whom all knowledge, wisdom and understanding rightly comes, for all he has done while carrying out my research. relatives and friends for their financial and moral support. It is a great pleasure for me to also acknowledge the assistance and support of people who helped me to start and finish this research paper successfully especially Dr. Hu Yuchuan who guide me in accomplishment of this work. I would like to give thanks to Zhejiang University for giving me enough knowledge and skills that helped me to conduct this research.

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I am founder and C.E.O of **TJ & Company.Inc** , I joined **Abayo & Co**. In 2022 as the IT Consultant Prior to **JB Dondolo.**Inc US-Texas , I was the Web Designer at JB Dondolo.Inc During my tenure at **Abayo & Co.** , I helped the company to be transformed from analogy to paperless firm based and a company making decision based on data. I am a Postgraduate student of Zhejiang University, where I majored in Industrial Design Engineering. I currently live in China, Ningbo-Yishoun st. I was awarded Tony Elumelu Foundation 2021, EU:AFRICA JOURNEY , Garage 48 and Zhejiang University - Best International Enrollment ambassador 2022. I am interested in research Technology and innovation widely in Data Science for health and business, ML and Industrial Design When I'm not keeping busy with you can find me on Linkedin :http://www.linkedin.com/in/turatsinze-jr-%E7%8E%8B%E4%BC%9F-67b205174/

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 7.918 ⁜ Vol. 12, Issue 1, January 2023

DOI: 10.17148/IJARCCE.2023.12101

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