Preparing for the likely rise in suicides due to COVID-19: A review of the literature

Jordan Pekevski, PhD

**ABSTRACT**

Suicide is one of the leading causes of death in the world, and the rates of suicides have been steadily increasing. The COVID-19 pandemic brings a number of potential stressors that may lead to a further increase in the suicide rate. This review paper analyzes the suicide rates of previous similar historic events, including pandemic/epidemic, mass violence events, natural disasters, and economic recessions. The impact of current stressors caused by the pandemic are examined, including economic, quarantine and isolation, media exposure and misinformation, substance use, and mental health. Evidence-based suicide prevention strategies are reviewed.

**Key words:** suicide, COVID-19, mental health, suicide prevention

“Sometimes even to live is an act of courage.”
—Lucius Annaeus Seneca

**INTRODUCTION**

Even prior to the coronavirus 19 (COVID-19) pandemic, death by suicide was a serious public health issue. According to the World Health Organization (WHO), suicide is among the top 20 leading causes of death in the world and is the second leading cause of death for young people, aged 15-29 years. On the global level, approximately 800,000 people die by suicide every year. In the United States, suicide is the tenth leading cause of death. Suicide is the second leading cause of death for young people, aged 10 to 34 years, and the fourth leading cause of death for individuals between the ages of 35 and 54 years. In 2018, suicide was responsible for over 48,000 deaths in the United States. Per data from the Centers for Disease Control and Prevention (CDC), the rates of suicide have steadily increased from 1999 to 2018, with an average of approximately 1 percent increase per year from 1999 to 2006 and approximately 2 percent per year from 2006 to 2018. The suicide rate has increased 35 percent from 1999 to 2018. There is a concern that the current pandemic will further increase suicide rates. There are a number of reasons why an increase in suicide rates may be expected. I will review similar historical events that may help us predict the outcome in the current situation and will also discuss risk factors for increase in suicide rates based on current factors. I will then focus on evidence-based suicide prevention strategies.

**HISTORICAL EVENTS**

Research exists on two previous widespread viruses: the influenza pandemic that lasted from 1918 to 1920, ie, Spanish flu, and the severe acute respiratory syndrome (SARS) epidemic that lasted from 2002 to 2004. In terms of spread, the influenza pandemic is more consistent with the current situation. Unfortunately, little direct mental health data exist on the influenza pandemic. However, Wasserman matched the social and political events in the United States between 1910 and 1920 to monthly suicide and mortality rates and concluded that the influenza epidemic was associated with an increase in suicide rates. Similarly, Chang and colleagues reported a small and short-lived increase in suicides in Taiwan.
during the influenza epidemic. SARS was reported to be related to increased suicide rate among older adults in Hong Kong. The motives were noted to be stress over fears of being a burden to their families, social disengagement, and anxiety at the time of the SARS epidemic. When comparing individuals who contracted SARS to a matched control group, a 12-year follow-up study noted that individuals who contracted SARS had a higher rate of suicide and psychiatric disorders. A 30-month follow-up study of individuals who contracted SARS reported a much higher prevalence of mental health disorders than in the general population. This study did not examine the rates of suicide.

Given limited data on pandemics and epidemics, an examination of other types of significant events and their impact on suicidality and mental health may be useful. This paper will review mass violence events, eg, war and terrorism, natural disasters, and economic depressions/recessions. The findings on the relationship of violence with suicidal rates and/or ideation is mixed. Some studies have found an increase in suicidal rates and/or ideation during the times of war, others have not found a significant relationship, and yet others have found a decrease. Similarly for terrorism, some studies reported an increase in suicide rates and/or ideation, others reported no effect, and yet others reported a decrease. Claassen and colleagues reported no change in the suicide rate on a national basis following the 9/11 terrorist attacks but a temporary decrease in the rate of individuals within 150 miles of the World Trade Center. Salib and Cortina-Borja reported a temporary decrease and no long-term significance.

The diversity of findings may indicate that violence is not the cause of the change in suicidal rates, but that there is another factor. Pridmore and colleagues reported a decrease in the suicide rate during World War II, but an increase in the suicide rate during the Vietnam War. They asserted that it is the social integration of the people that played a role in this relationship and not the wars themselves. Similarly, Claassen and colleagues argued that the drop in the suicide rate was due to the increased social cohesion of the people in the immediately affected area. Marshall asserted that it is the change in the economic condition rather than a direct effect of the war that was responsible for the suicide trend.

A review of the relationship between natural disasters and suicide rate and/or suicide ideation also reveals mixed findings. This literature shows a mix between a positive relationship, a negative relationship, and no relationship. Some gender differences were also noted in the studies. Examining suicide risk among young children after the Great East Japan Earthquake, Fujiwara and colleagues reported an increase in suicidal ideation for girls but not for boys. Similarly, Hyodo and colleagues reported a decrease in long-term mortality from suicide in men and an increase in women, following the Niigata-Chuetsu earthquake in Japan. The damage caused by the disaster has also been reported to play a role in the relationship with suicide rates, such that suicide rates tended to increase when the damage was extensive and suicide rates tended to decrease when the damage was less severe.

Compared to the data on mass violence and natural disasters, the data on the relationship between economic recessions and suicide rate are more consistent. A number of studies have reported a positive relationship between these two variables. For example, one study that examined the impact of business cycles on the suicide rate in the United States between 1928 and 2007 reported an overall increase in the suicide rate during recessions. This study also reported that the suicide rate peaked in 1932, the last year of the Great Depression. The largest increase in the overall suicide rate occurred during the Great Depression, between 1929 and 1933, increasing by 22.8 percent. In this study, there was also a significant correlation between unemployment and suicide for individuals between the ages of 25 and 74 years. A paper that reviewed studies of the suicide mortality rate in Greece during that country’s economic recession and subsequent implementation of radical austerity measures, between 2011 and 2014, reported that 18 of the 24 reviewed articles showed an increase of suicide rates during the economic recession period. Furthermore, 10 out of 12 studies that examined the...
correlation between the suicide rate and unemployment showed a positive correlation. This correlation was more prominent among males of working age. However, there are some exceptions to the relationship generally found between economic recession and suicide rate. For example, one study reported a suicide rate increase in some, but not all, East/Southeast Asian countries as a result of a 1997-1998 economic crisis that affected these countries. The authors concluded that the differential increase in suicide rates was most closely associated with the impact on unemployment. Another study reported no significant increase in the suicide rate in Iceland following the 2008 Global Recession, noting that investing in social protection during the economic crisis and the strong welfare system may have mitigated suicide risk.

**CURRENT RISK FACTORS**

The mixed findings in the literature on similar historical events show that it is not the events themselves that lead to an increase in the suicide rate, but that the events create cultural, social, political, and economic factors that mediate the relationship between the events and the suicide rate. During the COVID-19 pandemic, there are a number of risk factors that could negatively affect the suicide rate. These are not stand-alone risk factors but are interconnected and influence one another, and will likely mediate the relationship between the current pandemic and the suicide rate.

Economic

Reviewing the effects of past economic depressions/recessions is particularly relevant given the financial implications of the current pandemic. According to a report by the Congressional Research Service, the unemployment rate peaked in April to 14.7 percent, which is an unprecedented level not seen since this research institute began collecting data in 1948. The unemployment rate in November was still elevated as compared to the pre-COVID-19 rate, at 6.7 percent. The unemployment rate is significantly greater for minorities, young workers, and workers without a college degree. Additionally, according to a report by the Brookings Institution, the pandemic has been especially damaging small businesses, with their revenue being down 20 percent since January. Chapter 11 bankruptcies have increased in comparison to last year. Layoffs and shutdowns are driving declines in total working hours. Individuals in the labor force who are not currently participating in the labor force quadrupled from January to April and have remained significantly elevated into July. The COVID-19 pandemic has resulted in a 4.3 percent contraction of the world economy in 2020 and an estimated 3.6 percent contraction in the US economy.

As noted above, the relationship between economic recessions and rise in suicide rates has been well established. Additionally, financial difficulties can lead to housing loss. During the housing crisis in the United States, the suicides related to eviction and foreclosure doubled between 2005 and 2010 and led to a significant increase in the overall suicide rate. Economic disruption also has a great impact on mental health. One meta-analysis showed that there is a significant relationship between depression and both unemployment and perceived job security across studies. Economic crises may at times reduce alcohol use at a societal/country level due to affordability. However, economic crises have been shown to increase alcohol use at the individual level, especially for vulnerable groups or those most affected by the crisis, thus leading to higher rates of alcohol-related problems. Financial difficulties may also reduce access to mental health and substance use treatment.

**Quarantine, isolation, and physical distancing**

Individuals infected with COVID-19, as well as those who have potentially been exposed to a person infected with COVID-19, have been asked to self-quarantine. A number of cities, state regions, and even entire countries have implemented restriction of movement and gatherings in order to decrease the rapidly rising COVID-19 rates. Quarantining can be a negative experience due to boredom, separation from loved ones, loss of freedom, inadequate supplies, impact on finances, stigma, and uncertainty regarding health status. Quarantining can have negative mental health effects. Brooks and colleagues reviewed 24 research articles regarding quarantine. They reported...
that quarantined individuals had an increase in acute stress disorder, post-traumatic stress disorder (PTSD), depression, anxiety, and general psychological symptoms such as irritability, anger, stress, and insomnia. Additionally, for healthcare providers who had been quarantined, there were reports of exhaustion, detachment from others, poor concentration and indecisiveness, deteriorating work performance, alcohol abuse or dependency, and avoidance behaviors, such as minimizing direct contact with patients and not reporting to work.\textsuperscript{50}

Isolation has a detrimental effect on mental health and is related to suicide. In fact, both the objective condition of isolation, eg, living alone, and the subjective feeling of being alone, eg, feeling of loneliness, are associated with suicidal outcomes, including both suicidal ideation and suicidal attempts.\textsuperscript{51} Feelings of loneliness have significantly increased from April through September 2020, especially for individuals who were under stay-at-home, shelter-in-place, or lockdown orders. Predictably, this has been associated with an increase in depression and suicidal ideation.\textsuperscript{52}

Social isolation and loneliness are linked to all-cause mortality, cardiovascular disease, and mental health symptoms, including those of depression, anxiety, substance use, and eating disorders.\textsuperscript{53-56} Loneliness is also associated with problematic internet use, greater number of hours spent online, and frequent news updates about the pandemic through social media.\textsuperscript{57} In addition, there has also been reported increase in domestic violence, violence against women, and child abuse and neglect during this time of restrictive measures on movement and socialization.\textsuperscript{58-61} In turn, this type of violence is associated with substance use, mental health problems, and suicide.\textsuperscript{62-65}

\textbf{Misinformation, rumors, and media exposure}

The political division in the United States during the COVID-19 epidemic and the politicization of the virus have resulted in misinformation and rumors regarding the virus.\textsuperscript{66} However, this phenomenon is not limited to the United States. Misinformation and rumors can lead to discontinuation of healthy behaviors and engagement in unhealthy behaviors. There have been media reports of unintentional deaths by poisoning due to misinformation and rumors regarding COVID-19\textsuperscript{67-69} as well as reports of suicides.\textsuperscript{70} Additionally, media coverage that sensationalizes suicide may lead to an increase in suicides.\textsuperscript{71} The increase of rumors on social media regarding COVID-19 has been linked to emotions such as fear, anger, and sadness.\textsuperscript{72}

Media exposure impacts individual’s mental health. Greater exposure to news on social media regarding COVID-19 has been associated with an increase in symptoms of depression and anxiety.\textsuperscript{73,74} Social media exposure to information on an infectious virus is also related to an increase risk perception of that virus.\textsuperscript{75} Furthermore, there is evidence to suggest that emotional states can be transferred to others through social media, leading to emotional contagion.\textsuperscript{76} Research has shown that exposure to media reports of mass trauma events leads to an increase in initial, but not extended, PTSD symptoms in individuals who are not directly exposed to the event.\textsuperscript{77} In an adolescent sample, one recent study reported a positive relationship between suicidal ideation or behavior and higher exposure to mass media reporting on COVID-19 and feelings of loneliness.\textsuperscript{78}

\textbf{Substance use}

The reported sale of alcohol early in the pandemic was staggering. Nielsen reported a 54 percent increase in sales in the United States for the week ending March 21, 2020, as compared to the previous year, and a 262 percent increase in online sales of alcohol. Although the percent increase has decreased over time for alcohol purchased in stores to a 26 percent increase from the previous year in the week ending April 25, 2020, the trend has continued to rise for internet sales, to a 477 percent increase.\textsuperscript{79} A study that was conducted between May and June 2020 reported an overall increase in alcohol consumption as compared to alcohol consumption a year prior.\textsuperscript{80} Another study reported similar results, stating that while 13 percent of participants reported decreased alcohol use since the pandemic started, 60 percent reported an increase in alcohol use. Individuals that experienced COVID-19-related stress were consuming more alcohol and were using alcohol a greater number of days
than those who did not report this stress. Besides stress, this study reported that increased alcohol availability and boredom were reasons for increased alcohol use.\textsuperscript{81} Other studies have also reported an increase in the use of alcohol or alcohol use problems since the COVID-19 pandemic.\textsuperscript{78,82-89} Similarly, an increase in alcohol use and alcohol use problems have been reported in the aftermath of other disasters.\textsuperscript{90-93} Although research on alcohol use predominates, there have been a few studies that reported an increase in other substance use since the start of the COVID-19 pandemic.\textsuperscript{85-88,94,95} The other substances studies have generally been tobacco, cannabis, and the general concept of “substance use,” defined as any licit or illicit substance.

Individuals with substance use disorder have been found to be at an increased risk of developing COVID-19 and to have a more negative outcome, including death and hospitalization.\textsuperscript{96} Substance use is associated with mental health problems, such as depression and anxiety.\textsuperscript{97-101} Additionally, substance use has been reported to be associated with increased likelihood of suicide attempts.\textsuperscript{102-104} A review on the topic of suicide and suicide risk by Turecki and colleagues notes that substance abuse is frequently found in a large proportion of individuals who die by suicide, with alcohol misuse being involved in up to 40 percent of the cases and illicit substance use in 25 percent of the cases.\textsuperscript{105} Complicating the situation, support groups, such as Alcoholics Anonymous and Narcotics Anonymous, may not be as accessible as prior to the pandemic, due to restrictions on movement and gatherings.

\textit{Mental health}

Given the impact on mental health of the previously reviewed factors, it is not surprising that there has been a worsening in mental health during the COVID-19 pandemic. Studies have reported a worsening in a number of mental health areas, including depression, anxiety, insomnia, general psychological distress, and an increase in stress.\textsuperscript{78,89,106-112} There is evidence that individuals with pre-existing mental health conditions fare worse. When compared to a control group, studies have reported that those with mental health conditions had greater depression, anxiety, stress, general psychological distress, and worries about suicidal ideation, impulsivity, anger, physical health, and COVID-19.\textsuperscript{82,109,113} A number of factors have been reported to be associated with a worsening in mental health during the COVID-19 pandemic, including loneliness, lack of social support, chronic illness, poor sleep, greater exposure to COVID-19 news and social media, exposure to individuals with COVID-19, quarantine status, uncertainty about the future, financial worries, unemployment, being a healthcare worker, student status, younger age group, and female gender.\textsuperscript{82,109-112}

Although the development of suicidal ideation and behavior is complex and involves contributions from biological, psychological, clinical, and social and environmental factors, the psychological component is one of the key antecedents to suicide. Turecki and colleagues note that the rate of individuals who experience a mental illness at the time they commit suicide ranges from about 90 percent for North America to about 30 to 70 percent in east Asia.\textsuperscript{105} Not only is mental health and substance use linked to suicide but previous suicide attempts are also associated with an increased risk for future suicidal attempts.\textsuperscript{114} Furthermore, an individual committing suicide will affect a number of other individuals. One study estimated that each suicide affects approximately five individuals of the nuclear family and between 14 and 30 individuals who came into weekly contact with the individual who committed suicide.\textsuperscript{115} A meta-analysis that pooled estimates of past-year and lifetime exposure to suicide reported a past-year prevalence of 4.31 percent and a lifetime prevalence of 21.83 percent.\textsuperscript{116} Those affected by suicide are more likely to experience symptoms of depression, anxiety disorders, and suicidal behavior than individuals not affected by suicide.\textsuperscript{117-120}

\textit{Suicidal ideation and attempts during COVID-19}

An increase in rates of suicide ideation and attempts has already been reported.\textsuperscript{78,121,122} In a sample of 11- to 21-year-old individuals gathered from a large pediatric emergency department in a metropolitan area in Texas, Hill and colleagues reported a
significant increase in suicidal ideation in March and July 2020 and a significant increase in the rates of suicide attempts in February, March, April, and July 2020, as compared to the previous year. Murata and colleagues reported high rates of depression, anxiety, PTSD, and suicidal ideation or behavior since the COVID-19 pandemic started, and they noted that adolescents were significantly more likely to report these symptoms compared to adults. In the adolescent sample, 37 percent endorsed suicidal ideation and 1.7 percent endorsed attempting suicide since COVID-19; while in the adult sample, 16 percent endorsed suicidal ideation and 0.2 attempted suicide. These rates are higher than in pre-COVID-19 studies.

In the adult sample, predictors of suicidal ideation or behavior were a lifetime history of suicidal ideation, loneliness, and perceived stress, while in the adolescent sample, the predictors were loneliness and higher exposure to media reporting on COVID-19. In an adult sample, Ammerman and colleagues reported 17.5 percent of participants acknowledging suicidal ideation in the past month and 4.9 percent attempting suicide in this time frame. Approximately 45 percent of those who endorsed past-month suicidal ideation reported this ideation being explicitly linked to COVID-19 at least half of the time, and approximately 65 percent of these individuals reported this to be the case at least some of the time. Furthermore, in an exploratory portion of this study, the authors found that approximately 9 percent of the individuals in this study purposefully exposed themselves to COVID-19, with approximately 50 percent of these individuals indicating the reason for this was to kill themselves.

An additional worrisome trend is the increase in sale of firearms in the United States. By September 2020, more firearms have been sold than any other full year on record. A study comparing suicidal ideation among individuals who bought firearms during the COVID-19 pandemic to non-firearm owners and firearm owners who did not purchase firearms during the pandemic reported more frequently lifetime, past-year, and past-month suicidal ideation in those that purchased firearms during the pandemic. However, those who purchased firearms during the pandemic and endorsed lifetime or recent suicidal ideation were also more likely to utilize safe storage practices that may mitigate suicide risk.

**SUICIDE PREVENTION**

Suicide is preventable. Given the number of factors affecting suicide, both directly and indirectly, a multilevel approach is necessary. Sectors that need to be involved include the government (local, state, and federal), social services, healthcare organization, education, the media, the community, and individuals.

Given the strong relationship that suicide has with economic recessions, lack of financial security, and unemployment, government policies need to be enacted to protect the economy and the fiscal well-being of individuals. This can include financial safety nets, such as additional unemployment benefits, food and housing security programs, and emergency loans. Certain labor market policies, such as job training, job search assistance, subsidized employment, increase in the earned income tax credits, and increased minimal wage, may be beneficial and have been shown to have a positive effect on mental health and reduction of suicide rates.

Although physical distancing has been necessary to slow down the spread of COVID-19, “social distancing” has become an unfortunate misnomer. Social isolation and loneliness have been consistently shown to be related to suicidal ideation and behavior. Social connectedness and ideas for how to maintain social connectedness while maintaining physical distancing need to be promoted. Examples of community engagement activities include community gardens, community cleanup, shared interest classes/groups, and group physical exercise. Modifications to community engagement activities can be made to increase physical distancing while maintaining the social connection. Community support needs to be provided to those living alone and with limited social connections. Creation of peer norm groups, which normalize protective factors such as help-seeking and peer connectedness, can be established both in a school setting and a community setting.

Teaching coping and problem-solving skills will lead to long-term resilience. The lack of these skills has been associated with suicide attempts.
Pre-existing programs that teach coping and problem-solving skills include school-based programs and parenting programs. School-based programs may be provided to all students of a school, at a particular grade level, or to students considered to be at a high risk for suicide. Parenting programs can target just the caregivers or may include the children and/or the wider family. A number of such programs exist, and there is some evidence indicating the effectiveness of these programs in decreasing mental health problems, substance use, and/or risk of suicide.\(^{131-135}\)

Specific guidelines need to be created for media professionals, and media outlets should ensure the use of these guidelines. The WHO has published such guidelines for suicide prevention.\(^{136}\) Similar guidelines for preventing the spread of rumors and misinformation in the media would also be beneficial. The Organisation for Economic Co-operation and Development has recommended the following to limit misinformation on online platforms: supporting fact-checking organizations, ensuring human moderators to complement technological solutions, issuing transparency reports regarding misinformation, and improving users’ literacy skills regarding health and media.\(^{137}\) A consistent message based on scientific facts and coming from trusted sources will significantly cut down misinformation and rumors. Providing healthy coping skills and positive stories through the media instead of sensationalizing the distressing news could also limit the damaging effect that the media has on mental health and instead promote healthy coping skills and altruistic behavior.

Increasing access to health and mental health treatment, while enacting strategies to limit substance use and lethal means, will create greater resiliency and decrease suicide rates. Increasing health and mental health access can be accomplished by increasing financial support and staff for health and mental health facilities, increasing the availability of telehealth services, and developing tools and digital services for self-care that individuals can digitally access. Increasing suicide screenings will lead to appropriate referrals for mental health treatment. Screenings may be increased by incorporating them as a standard practice in primary care or potentially including a brief suicide screener to be used at COVID-19 testing sites. Increased monitoring on the sale of alcohol, providing education regarding the negative effects of substance use, dispelling myths regarding substance use, and ensuring the availability of treatment for substance use disorders will decrease the negative impact on mental health and suicides. A number of alcohol policies have been found to be helpful in decreasing suicide rates, including alcohol taxation, minimum legal drinking age, limiting liquor outlet density, and zero tolerance laws.\(^{125,138}\) Access to lethal means is an important predictor of suicide, and restricting access to means and information about means can prevent suicide.\(^{105,125}\) Examples of limiting means include withdrawing medication if an alternative is available, limiting the quantity of potentially fatal medications that can be given at a time, limiting certain pesticides, more stringent firearms regulations, and public education campaigns for safe firearm storage.

Gatekeeper training teaches key people, e.g., primary care providers, first responders, teachers, clergy, officers, to identify individuals at high risk for suicide and to refer these individuals for appropriate care. This type of training can last from a few hours to a few days.\(^{139}\) Trainings can be completed in-person or online. The Suicide Prevention Resource Center has published documents to assist in selecting and implementing the gatekeeper training program best fitted to the individual who desires training.\(^{140,141}\) There is no clear consensus on the effectiveness of gatekeeper training; however, there is some evidence for an improvement in knowledge, beliefs/attitudes, self-efficacy, and reluctance to intervene among trainees.\(^{142,143}\)

Clinical interventions for individuals at risk of suicide include crisis intervention, mental health treatment, and treatment to prevent re-attempts. The goal of crisis intervention is to connect the individual who is at risk, or a loved one of the individual, with professional staff or trained volunteers. This is done through telephone hotlines, online chat, text messaging, or in-person. These types of crisis interventions have been found to be effective in decreasing suicidality and mental health symptoms.\(^{144,145}\) Treatment of
individuals at risk for suicide is often conducted by a licensed mental health professional, can be done in a one-on-one session or a group session, and can last anywhere from a few weeks to ongoing therapy. There are several evidence-based therapies that can be utilized. Treatment to prevent re-attempts focuses on follow-up contact with individuals who attempted suicide and can be done in a number of modalities, including home visits, telephone contact, mail, and email. The goal is to keep these individuals engaged in treatment. There are several evidence-based programs included under this approach.

After a completed suicide, a postvention can be utilized to mitigate the negative impact of the suicide on others. This may involve counseling, debriefing, and/or bereavement support groups and may target mental health professionals involved in the person's care, surviving family members, friends, and/or close contacts. There are multiple approaches for postventions and the outcome results have been mixed, with some studies showing a decrease in suicidality and mental health symptoms, while others have not.

**CONCLUSION**

Suicide is a serious problem on a global scale, and there are indications that the suicide rate is likely to increase due to COVID-19-related factors. The COVID-19 pandemic is a global public health emergency and has caused significant disruption in multiple areas of people's lives. There is evidence of worsening mental health during the pandemic and some preliminary evidence for increase in suicide ideation and attempts. Unless we take steps to address the increasing disruption of the pandemic on people's lives, work on improving the mental health of individuals, and engage in evidence-based suicide prevention, we are likely to see a rise in the rates of suicide. Fortunately, a number of interventions are possible to ameliorate the impact of COVID-19. We should use this challenge to not only address the potential negative consequences of this pandemic but also to reshape our policies and procedures so as to create resilience to future public health emergencies.

**REFERENCES**


Special Issue on COVID-19 and Mental Health

Journal of Emergency Management
Vol. 20, No. 9