



# Suicide: Where's The Risk?

## Introduction

A person commits suicide every 11.9 minutes, making it the tenth leading cause of death in America. Worldwide, according to 2015 data from the World Health Organization (WHO), nearly eight hundred thousand people die by suicide each year. This translates to an estimated global mortality rate of 10.7 per 100,000. The actual figures may be 10-15% higher than reported as suicides often go under-reported for a variety of reasons.<sup>1</sup>

Suicide takes a high toll on a nation's economy, both economically and emotionally. Suicide and suicide attempts cost the U.S. economy \$57 billion in the form of medical care and lost productivity.<sup>2</sup> While it may be harder to quantify the emotional costs, the devastating effects of suicide can be felt in family members, loved ones and community members for years to come.

The Center for Disease Control and Prevention (CDC) tracks suicide rates as part of its reporting via the National Violent Death Reporting System (NVDRS). Originally established in 2002 with participation from only six states, it is now able to collect data from all fifty states, Puerto Rico and the District of Columbia. This data reporting system helps provide a more complete picture of violent deaths across America including homicides and reported suicides.<sup>2</sup>

In 2017, there were 47,173 suicides in America and an estimated 1,400,000 suicide attempts. The suicide rate was the highest among individuals between the ages of 45-54 and second highest in people age 85 and above. Furthermore, almost 80% of all suicide deaths were Caucasian males. Interestingly, the highest suicide rate for women, 10 per 100,000, was in the 45-54 age group. Comparatively, the highest age group for men was in the 65+ age group at 31 per 100,000.<sup>3,4,5</sup>

**Table 1. Most Common Methods of Suicide in the U.S.<sup>6</sup>**

Firearm use	51%
Suffocation, including hanging	28%
Poisoning, including drugs of abuse, alcohol, and prescription drugs	14%

Given the high incidence of incomplete suicides, a history of attempted suicide(s) is obviously an important factor in the overall underwriting consideration. Medical information related to an attempted suicide should provide insight into the underlying cause and any related treatment.

The most difficult task in underwriting is assessment of an individual with a history of suicidal ideation and/or suicidal intent. **Ideation** deals *solely* with the *thought of suicide* (e.g., "I'm better off dead") whereas **intent** involves *both the thought and an actual plan* (e.g., obtaining the means, writing a farewell letter, etc.). It is difficult, if not virtually impossible, to detect either ideation, intent, or both, without a frank admission from the proposed insured. Therefore, it is imperative to look for clues. Table 2 provides suicidal ideation incidence rates based upon a recent *National Survey on Drug Use and Health*.

**Table 2. Suicidal Ideation of U.S. Adults in 2017<sup>7</sup>**

Adults age 18+	4.3%
Adults ages 18-25	10.5%

## Underwriting Considerations

### Risk Factors

Claims experience demonstrates the importance of underwriting the risk of suicide at the inception of the life insurance contract. The underwriter must identify applicants who are potential suicide risks and determine their insurability. This is not an easy task since over 50 percent of adults who commit suicide never display any obvious signs related to mental illness. Conversely, there is still a high correlation between mental illness and suicide, but underwriters often encounter difficulty in obtaining full psychiatric medical records.<sup>3</sup>

Knowing why people commit suicide may help identify insurance applicants who are or will be potential suicide risks. Listed below are some of the underlying causes that lead to suicidal ideation or completed suicide.<sup>4</sup>

- Mental health issues (e.g., depression, anxiety disorders, bipolar disorder, schizophrenia, PTSD, etc.)
- Substance abuse (e.g., alcohol and drugs)
- Relationship problems/loss
- Criminal problems including incarceration
- Other legal problems
- Physical health problems (e.g., chronic pain, terminal illness, etc.)
- Financial problems
- Job related problems
- Eviction and/or homelessness
- School problems.

According to National Alliance on Mental Illness, the following are warning signs of a potential suicide attempt:<sup>8</sup>

- Threats or comments about killing self
- Increased alcohol and/or drug use
- Aggressive behavior
- Impulsive or reckless behavior
- Talking, writing or thinking about death
- Dramatic mood swings
- Social withdrawal from friends, family and community.

Typically, suicide is *not* an impulsive or spontaneous act. Rather, it can be a culmination of underlying cause(s) which overwhelm a person to the point where he or she perceives there is no other solution available than to end his or her life.

## Suicide in the Elderly

One segment of the population at increased risk for suicide is the elderly. Older Americans (age 65 and up) comprise approximately 12% of the population yet account for at least 18% of all suicide deaths **although this figure may be under reported by as much as 40%.**<sup>9</sup>

Under-reporting may be due to what is termed "**silent suicides**" (e.g., overdoses, self-starvation/dehydration, and questionable accidents). The risk of suicide continues to rise with age with individuals age 85 and older having the highest incidence rate.

Suicide rates are higher for cancer patients than those of the general population, particularly for cancer patients older than 50. Suicide rates are the highest for individuals



diagnosed with prostate, lung, colorectal, bladder, head and neck, testicular tumors and Hodgkin's lymphoma. The risk of suicide is greatest during the first year following diagnosis but still remains elevated 5 years out from the diagnosis.<sup>10</sup>

It should also be noted that the elderly population has a higher rate of **double suicides** (both partners taking their own lives simultaneously) than other age groups. While the causes prompting one to commit suicide remain the same, the following factors are more likely to impact the senior population as outlined in the table below.

**Table 3. Risk Factors for Elderly Suicide Risk<sup>11</sup>**

Relationship concerns	Employment and/or financial issues
Recent life crisis	Legal concerns
Substance abuse concerns	Housing issues
Physical health concerns	Mental health issues

## Occupational Risk: First Responders and Military

Suicide rates are also on the rise in the workplace. Additional research from the CDC reveals that the workplace suicide rate for those between the ages of 16 to 64 rose by 34% from 2000 to 2016.<sup>12</sup> Researchers point to the following as possible causes in some occupational groupings: job-related demands, stressful work environments, work/home life imbalances, and socioeconomic inequalities.<sup>13</sup>

Studies indicate that certain occupations are experiencing rising suicide rates. Here, we take a closer look at **first-responders of law enforcement personnel and firefighters** along with **military service members** (both active-duty and retired). Shared occupational factors and risk factors among these professions will be further explored.

Research from the nonprofit group, *Badge of Life*, shows law enforcement officers have a 69% higher risk of suicide than the general population. Furthermore, their research indicates that, on average, eleven officers commit suicide every month. More officers are believed to have died by their own hands than from shootings and traffic fatalities combined.<sup>14</sup>

Death by suicide affects officers in small towns and big cities alike. Using Chicago as an example of a large American city, a U.S. Department of Justice report found that between 2013 and 2015, Chicago Police Department

officers had a suicide rate of up to 60% greater than the national average.<sup>15</sup>

**Table 4. Suicide Risk Factors for Police Officers<sup>21</sup>**

Male
Single
Age 40-44
15-19 years of service
Mid-career burnout

Historically, these deaths can be challenging to quantify due to limited high-quality data on first responder suicides. For example, no federal agency officially tracks the number of law enforcement suicides. Furthermore, few local departments or family members disclose it as the cause of death.

The Firefighter Behavioral Alliance (FBHA) estimates that only 40% of actual firefighter suicides are reported as such.<sup>16</sup> In addition, the media as a whole has been generally quiet on reporting this information to the general public. However, in recent years, growing awareness has prompted better tracking of first responder suicides.

The U.S. military shares its own revealing statistics: as of 2018, active-duty military suicides are at near-record high levels. They are approaching the same levels as a previous peak in 2012. Suicide rates for the military branches are published annually in the *Department of Defense Suicide Event Report*, or DoDSER.<sup>17</sup>

Historically, military suicide rates have been lower on average than the general population; thus, the rise over the past decade among both active-duty military service members and veterans is quite alarming. Suicide is reported as the second leading cause of death in the U.S. military.<sup>1</sup> Based on the most recent available data reported in 2016, the suicide rate for veterans was 1.5 times greater than civilians who never served in the military. This translates to 14% of all adult suicide deaths in America, or twenty veterans per day taking their own lives.<sup>18</sup>

What do members of these professions have in common as it relates to suicide? Both first responders and military members share mental health risks and the potential stigma associated with asking for help.

A study by The Ruderman Foundation found that, on average, police officers witnessed one hundred eighty-eight "critical incidents" in their careers.<sup>16</sup> Chronic exposure to trauma can lead to substance abuse concerns along with mental health issues like depression

and PTSD, which, if not dealt with properly, can lead to fatal results. One former Chicago police officer calls it a "perfect storm": combining having to manage significant violence on the job with a lack of resources and the fear of being judged or even fired if an officer admits to needing help.<sup>19</sup>

Among these professions, good mental health is perceived as a pre-requisite for employment. One is expected to be brave and portray a tough exterior in order to do the job well. These factors combined with feelings of shame and the stigma associated with asking for assistance lead many to ignore the resources that are available.

Additionally, US military service members and veterans report the following risk factors contributing to suicide risk: relationship problems, legal concerns, workplace issues, traumatic brain injuries (TBIs), chronic pain and sleep disorders. The most common method of execution is by firearms according to the Department of Defense (DoD).<sup>1</sup> The CDC adds that, generally, no one single factor is seen as a cause of suicide but rather it is a combination of them.<sup>17</sup>

Help is available for those who make the effort to seek it out. Admittedly, it may be more accessible in some areas than others. Overall though, the CDC offers a variety of suicide prevention strategies for employers including employee assistance and wellness programs, online mental health screenings and tools, and improved marketing of their toll-free National Suicide Prevention Lifeline.<sup>13</sup>

Similarly, the U.S. government and the Department of Veteran's Affairs recently reaffirmed their commitment to improving mental health services. In 2018, the White House finalized plans for an interagency suicide prevention program for recently separated service members. They also pledged to reduce suicides among the troops and veterans by 20% by 2025.<sup>20</sup>

## Youth Suicide (Children and Adolescents)

Suicide also affects individuals in younger age groups. In the United States, suicide rates doubled in the 15- to 19-year age group and tripled in the 10- to 14-year age group from 1960 to the 1990s. Unfortunately, the increase continued with the CDC reporting more than a 30% increase in 25 states since 1999.<sup>22</sup>

Suicide rates remain trending upward with multiple studies indicating a sharp increase in the percentage of teens and young adults diagnosed with depression, anxiety and suicide.<sup>23,24</sup> According to CDC data reviewed

in 2017, suicide was the second leading cause of death for individuals between the ages of 10 and 34.<sup>22,25</sup>

Suicidal ideation often precedes suicide attempts; one US survey reported that 34% of adolescents who suffered suicidal ideation subsequently went on to attempt suicide. After puberty, the rate of suicide in adolescents increases with age. Data indicates there are as many as 50-100 suicide attempts for every completed suicide in adolescents.<sup>24</sup>

Research also demonstrates gender differences in suicidal ideation and attempts. High school aged girls are more likely to experience *suicidal ideation*, have a *specific* suicide plan, and experience more suicide attempts than boys. However, adolescent boys are more likely to *complete* suicide since boys often choose more lethal means through firearm use or hanging.<sup>24</sup>

Regardless of gender, the presence of psychiatric disorders, usually depressive disorder, is found in the majority of adolescents who attempt or commit suicide.<sup>24</sup> Research found the majority of youth suicide victims had seen a health care provider within one month prior to committing suicide. This differs from 54% of adults who committed suicide in the absence of a diagnosed mental illness.<sup>2,26</sup>

Other predisposing disorders include eating disorders, substance use disorders and oppositional defiance disorder. A history of hospitalizations for suicidality also holds predictive value for subsequent suicide attempts. The risk for repeat suicide attempt is highest in the first year and remains elevated even a decade afterwards. The median time to suicide was three years after hospitalization. One study showed that adolescents who survived a self-poisoning attempt were not only at increased risk to die by completed suicide but also were at increased risk of accidental deaths.<sup>24</sup>

Identification of risk factors is key to assessing suicide mortality risk of adolescents.<sup>27,28,29</sup>

**Table 5. Risk Factors for Youth Suicide<sup>21</sup>**

Mental illness
Substance use including tobacco use
Previous suicide attempts
Non-suicidal self-injury
Firearms in the house
Exposure to friends/family member's suicide
Bullying or exposure to violence

## Looking Forward: Digital Suicide Prevention?

Review of suicide risk factors mentioned above is the mainstay of underwriting, but according to the CDC, more than half of those that die by suicide have no known mental condition. Plus, other social, relational, or occupational issues may occur acutely and may not be evident or present during the initial underwriting process.

Can technology digitally identify individuals at high-risk for suicide? Is it possible to objectively identify suicide risk in those without a current psychiatric diagnosis? Can digital medicine using innovative wearable technology and/or prediction models better assist underwriters in assessing this risk? Let's review what is currently available in this rapidly advancing field and what potentially is on the horizon.

Smartphone apps are already available as suicide prevention resources. **Stay Alive** is a free app based in the United Kingdom and marketed as a suicide prevention resource.<sup>30</sup> Those with suicidal thoughts or those concerned with someone else who may be suicidal can use the app and access help and support. The app includes safety plans, reasons for living, stress-reduction strategies such as breathing exercises, as well as local and national crisis resources. Some emergency departments in the UK include this app as part of the discharge paperwork for mental health patients.

**Virtual Hope Box**, which has favorable reviews on both the Apple App Store and Google Play, is another coping skill app aimed at military service members suffering from depression.<sup>31</sup> Researchers surmise that users of the smartphone app benefit from having convenient access to cognitive behavioral therapy.<sup>32,33</sup> However, a recent review of various available smartphone apps found them overall to be less than ideal. The survey participants felt the majority of apps were mere checklists; up to 13% of respondents felt apps contained potentially *harmful* information, and over half felt apps had no interactive features.<sup>34</sup> Currently, there is a lack of evidenced-based literature on the effectiveness of smartphone suicide applications.

Recognizing that military members are particularly vulnerable to suicide risk, researchers have begun collecting and analyzing both population and patient data in an attempt to develop algorithms for suicide prevention. These algorithms assess the impact and interaction of various known risk factors, identify a high-risk profile individual, and quickly calculate a risk

assessment.<sup>35</sup> A study published in 2015 used a machine learning system to develop a suicide risk algorithm that correlated successfully with over half of the soldiers who committed suicide within 12 months of hospitalization.<sup>35</sup>

Data review is also being used to intervene with youth populations. Researchers in South Korea used data mining techniques in the adolescent population and discovered that school delinquency, low levels of family interaction, and stress were the biggest risk factors for suicide attempts.<sup>36</sup>

In addition to data mining techniques, computerized digital speech analysis has shown promise in correlating with suicidal thoughts. Research demonstrated speech variances in depressed and/or suicidal individuals. These identifiable variances in sound frequency and voice range can be red flags for suicidal ideation. Researchers from the University of Massachusetts also identified subtle facial expression changes that correlate with suicidal thoughts. This was done by analyzing how the study subjects responded to various videos.<sup>37</sup>

Thus, the technology platforms listed above are being utilized to predict suicide risk in vulnerable populations, such as military personnel and youth. What if behavioral data on insured applicants could be obtained through a smart device? For new business applications, underwriters could run the data through machine learning, using algorithms to analyze facial expressions, speech analysis, and heart rate to evaluate risk. But, what happens when a depressed person forgets to charge his or her phone? Regarding in force management, this technology may also prove beneficial as a means to manage suicide risk among existing policy holders after the contestability period has ended. Lots of speculation and unanswered questions remain, but an almost guaranteed fact is that underwriting may look quite different in the future.

## Conclusion

Regardless of age, suicide is a significant public health concern which affects the insurance industry and the greater society at-large. While its devastating effects impact society universally, certain demographic groups may be more vulnerable as outlined above. Intervention is key, and numerous resources are available to help prevent the terrible tragedy of suicide. To properly identify and stratify the suicide risk of applicants, underwriters must be aware of risk factors and potential red flags. As the world moves into the digital age, technological advances may one day help insurers assess these risks.



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