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# Demographics of Suicide Victims in Maine for 2017 and 2018 with Emphasis on Suicide Notes

by Victoria Rideout, Raymond Kennard, Alicia McCarthy Wilcox, and Mark Flomenbaum

## Abstract

This study examined Maine suicide deaths from 2017 and 2018 to determine if there were correlations between the demographics of suicide victims and variables of the suicide acts: age, gender, veteran status, method, and presence of a note. Results indicate that 30 percent of suicide victims in Maine left a note. Initial findings from this study revealed interesting correlations between the act of leaving a suicide note and suicide methods that require advanced planning, e.g., carbon monoxide poisoning. A lower percentage of notes were associated with spur-of-the-moment type suicides. Based on these preliminary findings, we suggest modifying targeted interventions to mitigate and reduce suicide rates in Maine including programs to support overlooked vulnerable populations. Due to Maine's high rate of suicide by firearms, we also suggest that new policies and laws be implemented to limit access to and possession of firearms for individuals identified as at risk of suicide.

state of Maine approximately \$211 million per year in medical and work-loss costs (AFSP 2019), so reducing the suicide rate will have a positive impact on both the general well-being of the population and the cost of health care. To lower the state's suicide rate, however, it is imperative to first understand who commits suicide and why and how they do so. The better we understand the circumstances around, and risk factors for, suicide, the more likely we are to prevent its occurrence.

## OVERVIEW

The suicide rate in the United States increased by 30 percent between 1999 and 2016 (Stone et al. 2018), and suicide ranks among the top 10 causes of death, with 44,965 people in the United States dying by suicide in 2017 (CDC 2017). The American Foundation for Suicide Prevention reported that the rate of suicide in Maine was 12.7 per 100,000 people in 2008; by 2017, however, it had risen an alarming 48 percent to 18.8 per 100,000 people (AFSP 2019). The increase in Maine's suicide rate is 38 percent higher than the national average and is currently growing more than twice as fast as the national rate (AFSP 2019). The economic impact of suicide is also of substantial concern; beside the dollar value associated with potentially avoidable deaths, suicide-prevention efforts cost the United States \$34.6 billion in 2005 (Caine 2013), increased to \$58.3 billion in 2013 (Shepard et al. 2015), and are still rising (Caine 2013). The American Foundation for Suicide Prevention estimates that suicides cost the

## General Demographics

The demographics of suicide victims are complex and multifactorial (Brown et al. 2000). Some of the identifiable variables of the victims are age, gender, veteran status, and method used. General statistics about these variables have been reported for the United States and other developed countries. In general, men tend to die from suicide more often than women do (Stone et al. 2018): four out of every five suicide deaths are men. Although men are four times more likely than women to die from suicide, there are studies that suggest women attempt suicide more often than is reflected in the number of deaths. Women tend to choose less rapidly lethal methods, such as overdoses (rather than firearms), which result in a lower death rate (Lester 2008). Baldwin, Boilini, and Lamvu (2017) report that the suicide rate among veterans is higher than that of the general population and continues to increase, and research indicates that post-traumatic stress disorder (PTSD) and other service-related mental illnesses may be the reason for this increased suicide rate (Baldwin, Boilini, and Lamvu 2017).

### Methods of Suicide

The methods used to commit suicide are variable and tend to be correlated with other demographics. Figure 1 shows that use of a firearm is the most common method of committing suicide. In 27 states, about 50 percent of suicide victims used firearms; asphyxiations (usually by hanging) make up 28 percent of suicides; intoxications (usually by drug overdose) make up 14 percent; and other methods such as jumping from heights, carbon monoxide poisoning, and intentional motor vehicle crashes make up 8 percent (AFSP 2019; Stone et al. 2018). Men and veterans of both sexes are more likely to commit suicide by firearms than are nonveteran women, and women are more likely to use drug intoxication and asphyxiation (Lester 1984). It is important to note that these percentages are aligned with more recent data from the American Foundation for Suicide Prevention (2019), which reports a slight increase in suicide by firearms (50.6 percent) and a decrease in death by asphyxiation and intoxication by 1 percent each.

### Suicide Notes

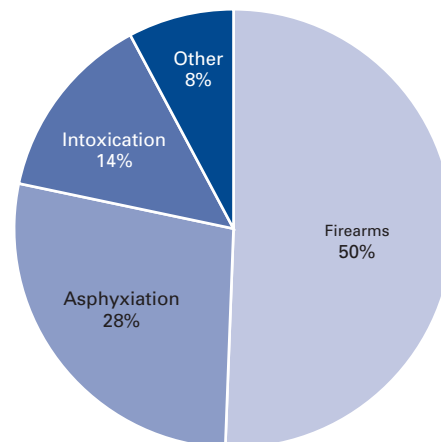
A report by Pestian, Matykiewicz, and Linn-Gust (2012) indicates that 10 percent to 44 percent of people who commit suicide in the United States leave notes. A study from Kentucky that used six years of data reported that 18.25 percent of suicides included a note (Cerel et al. 2014). In relation to age and gender, few differences have been reported between people who leave and do not leave notes (Cerel et al. 2014). One study from Queensland, Australia, found a statistically significant correlation between the presence of suicide notes in people who lived alone and committed suicide by gassing (Leenaars et al. 2003). This same study also found that women, indigenous people, and those who commit suicide by vehicle crashes are less likely to leave notes. Australia is somewhat similar to the United States in that it is a developed, English-speaking country (Leenaars et al. 2003); however, between 1997 and 2005, Australia's suicide rate declined, which is different from the increase experienced in the United States (Carpenter et al. 2016). There have been few studies in the United States that look at the specifics of suicide notes, and none, to our knowledge, that looked specifically at Maine.

### Maine

Maine's population differs socially and economically from other states. Maine's population is both the oldest and the whitest in the United States, and many people are from lower- and middle-class backgrounds. Other research projects in Maine are currently looking at suicide rates and the variable demographics of suicide victims. One project is looking at variables for suicides in the northern New England area of Maine, New Hampshire, and Vermont (Dr. Marcella Sorg, funded by Maine-Vermont Violent Death Reporting System and the University of Maine).

This study reviewed data from all Maine suicides from the years 2017 and 2018. We collected general demographics of the suicide victims and placed special emphasis on suicide notes: How often were they written? Which subpopulation more frequently wrote them? To whom were they addressed? How long were they? The purpose of this study was to identify correlations between previously known risk factors for suicides and the last comments of those who wrote suicide notes. This knowledge could be useful in more efficiently targeting intervention methods as well as for shining additional light on the issue of suicide in Maine. The hope is to prompt policymakers and government officials to look at these issues in more depth to change current laws and to institute new data-driven suicide-prevention programs to combat the problem.

FIGURE 1: **Relative Percentages of Methods of Suicides**



Source: AFSP (2019)

METHODS

Data were gathered using reports from the Office of Chief Medical Examiner in Augusta, Maine. A master list was generated of all suicide cases in the state from 2017 and 2018. All cases were de-identified and individualized only by case number. The hard-copy folder of each case on the list was retrieved and reviewed. Specific data collected included age, sex, veteran status, method of suicide, presence or absence of note, length of note, and to whom it was addressed (by statute, “Original written or recorded material that might express suicidal intent must be sent to the Office of Chief Medical Examiner,” MRS Title 22, Ch711, § 3028, ¶5). The raw data was entered in a spreadsheet.

Definitions

*Suicide:* The Maine Office of Chief Medical Examiner defines suicide as “an intentional, self-inflicted act committed to do self-harm or cause the death of oneself.” This definition excludes accidents, as well as the deaths of persons who do not have the developmental or mental competency to comprehend death, such small children or mentally handicapped individuals.

*Suicide note:* A suicide note is defined by the Office of Chief Medical Examiner as a note or message left by the victim before committing or attempting to commit suicide. These notes can be handwritten or typed hard-copy notes, or text messages, voice mails, emails, or even video recordings that allude to the writers’ imminent self-inflicted death.

*Age categories:* For ease of comparison to data sets presented by the American Foundation of Suicide Prevention and other sources, such as the World Health Organization, suicide cases were grouped in the following age ranges: <15, 15–24, 25–34, 35–44, 45–54, 55–64, 65–74, 75–84, and >85 years old.

*Note length:* For this study, we defined suicide note lengths as short (less than 50 words), medium (between 50 and 100 words), and long (over 100 words). Word count was used rather than page length because we felt that the size of the message is more important than the size of the medium.

RESULTS

Maine had a total of 535 suicides during 2017 and 2018, and in 30 percent of those suicides, the decedent left a note. Data on the suicides are further categorized into age, gender, veteran status, method of suicide, length of suicide note, and addressee of suicide note.

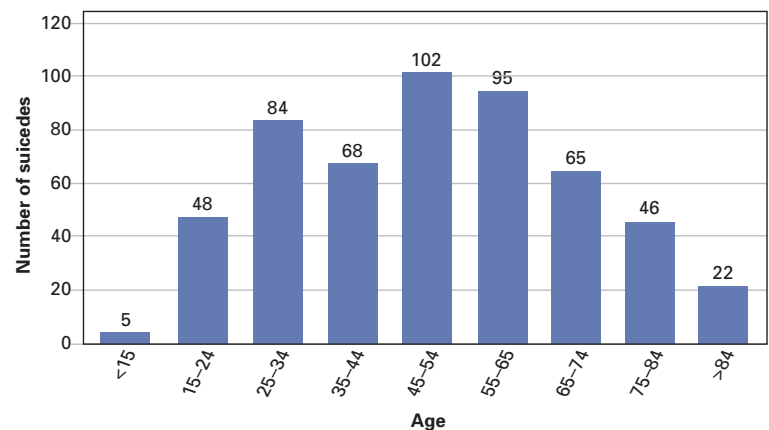
Age

Analysis of rates of suicide by age groups is shown in Figure 2. These rates correlate closely to data presented by the American Foundation for Suicide Prevention (2019), with the highest rates of suicide occurring among adults between the ages of 45 and 54. Sixty-two percent of Maine’s suicide victims are over the age of 50, with the average age being 50 years old. Less than 24 percent of people who commit suicide in Maine are under the age of 25. So despite Maine’s aging population, the state falls within the average for age demographics in most states.

Method of Suicide

As shown in Table 2, this study found that use of firearms is the most prevalent method of suicide in Maine, accounting for over 56 percent of suicides. The next two most common methods of suicide were hangings and asphyxiation (22 percent), followed by drug overdoses (14 percent). Compared to the national data (AFSP 2019), Maine’s rate of suicide by firearm is significantly higher than average (50.6 percent), and Maine’s rate of suicides by asphyxiation is lower than the national average (27.7 percent). The difference between

FIGURE 2: Number of Suicides by Age in Maine, 2017–2018



Maine and national rates of firearm-related suicides is significant, particularly as a study by Kalesan et al. (2015) found that Maine’s rate of gun ownership was the twelfth lowest in the country at 22.6 percent, well below the national average of 29.1 percent. Yet, while Maine is reported to have the sixth highest rate of death by opioid overdose at 29.9 opioid-involved overdose deaths per 100,000 people (NIDA 2019), the rate of confirmed suicide by overdoses or poisonings in the state of Maine is remarkably similar to the national average of 13 percent to 14 percent.

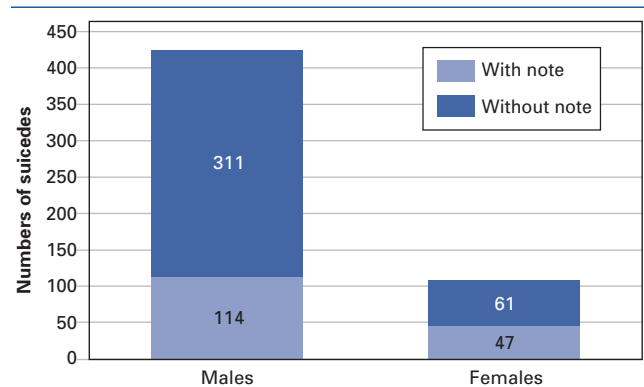
We also analyzed data to see if there was any correlation between the method of suicide and the existence of a suicide note. We found that people who commit suicide by carbon monoxide poisonings and overdoses are far more likely to leave a note compared to those who used other methods. People who commit suicide by firearms are less likely to leave a note than people who choose most other methods (Table 1). These correlations should be further investigated as they may help us better understand why people commit suicide and what means they choose. Leaving a note may indicate that the victim gave more thought to, or spent more time on, planning the act. For example, more preparation is needed for carbon monoxide-related suicides compared to other methods, which may be why these people were more likely to leave notes. Firearms, on the other hand, may be used more spontaneously, as they require less planning than other methods, which may be why victims of firearm-related suicide are less likely to leave notes.

**TABLE 1: Methods of Suicide in Maine and Percentage of Suicide Notes**

Method	Percentage of deaths	Percentage leaving notes
Hanging/asphyxiation	22	31
Gunshot wound	56	25
Overdose	14	42
Carbon monoxide	3	71
Blunt force impact	2	44
Incised wound	2	36
Drowning	1	29
Other*	1	0

\*Other includes burns, motor vehicle crashes, and unknown

**FIGURE 3: Number of Suicides with and without Notes by Gender**

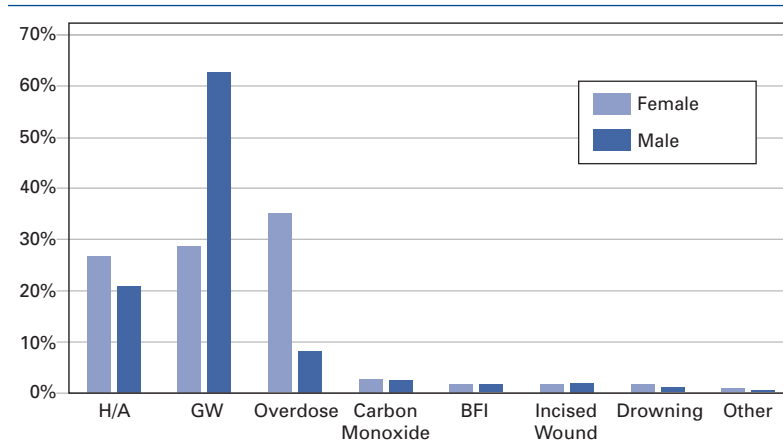


*Gender*

In Maine, males die from suicide more than four times as often as females do (Figure 3). The American Foundation for Suicide Prevention (2019) reports a slightly lower national ratio of 3.5 male suicides for every female suicide. These data may be a bit misleading, however. A study by Tsirigotis, Gruszczynski, and Tsirigotis (2011) showed that women are three times more likely than men to attempt suicide. However, the study also supports our findings that women are far less frequently victim of fatal suicides. This phenomenon has been labeled the gender paradox (Canetto and Sakinofsky 1998). Interestingly, the data in Figure 3 show that successful female suicide victims were more likely to leave suicide notes than their male counterparts (43.5 percent vs. 26.8 percent).

As shown in Figure 4, our study found that women are 4.5 times more likely to commit suicide by overdosing and are slightly more likely to choose hanging or asphyxiation than men are. However, men are 2.3 times more likely than women to commit suicide by firearms. National studies found that women are more likely than men to choose less violent methods of suicide. For example, women were 7.25 times more likely than men to attempt suicide by drug overdose (Tsirigotis, Gruszczynski, and Tsirigotis 2011), and men were six times more likely than women to choose more violent and instantaneously fatal methods such as by firearms (CDC 2017). Although these studies tracked suicide attempts in the United States as whole, the distribution of suicide method by gender correlates with the rates in Maine remarkably well. These national studies show that

FIGURE 4: **Methods of Suicide by Gender**



H/A = hanging/asphyxiation; GW = gunshot wound; BFI = blunt force impact; "Other" includes burns, motor vehicle crashes, and unknown

the rate of death from suicide in females is lower than it is in males. The studies, however, do not imply that women are not at the same risk of suicide. These differences only indicate that women generally choose methods of suicide that have longer periods for successful intervention. A larger and more-inclusive study of suicide attempts would have to be performed before we could draw any conclusions about which group is at a higher risk.

**Veteran Status**

Veteran status is also a significant risk factor for suicide, and in Maine, 22 percent of suicide victims have prior military experience. Veterans make up only 8.7 percent of Maine’s population, which means they are 2.5 times more likely to commit suicide than nonveterans are (Maine BVS 2019).

**Suicide Notes**

Although the specific contents of suicide notes are not the focus of this study, it may be of interest to offer some general findings. Many notes only offer farewells, while other tell in specific detail why the victims committed suicide and what they want to be done with their bodies and possessions. In some notes, the writers graphically express anger and sadness; in other notes, the writers seem more resigned to their decisions.

The suicide notes in our study ranged from three words to five pages although the majority of notes (51 percent) were short, consisting of fewer than 50 words. Nineteen percent of notes were medium length, and 19 percent were long. We also coded 11 percent of the note lengths as “unknown” because although notes were known to have been written, they were not received by the medical examiner’s office.

Some suicides notes were addressed to specific family and friends; some were addressed to no one; while others appeared to be addressed to a specific person, but it was not clear who the intended person was. Some notes only gave an unidentified contact number for the police to call. We grouped suicide notes into three basic categories: people the victim knew (such as family and

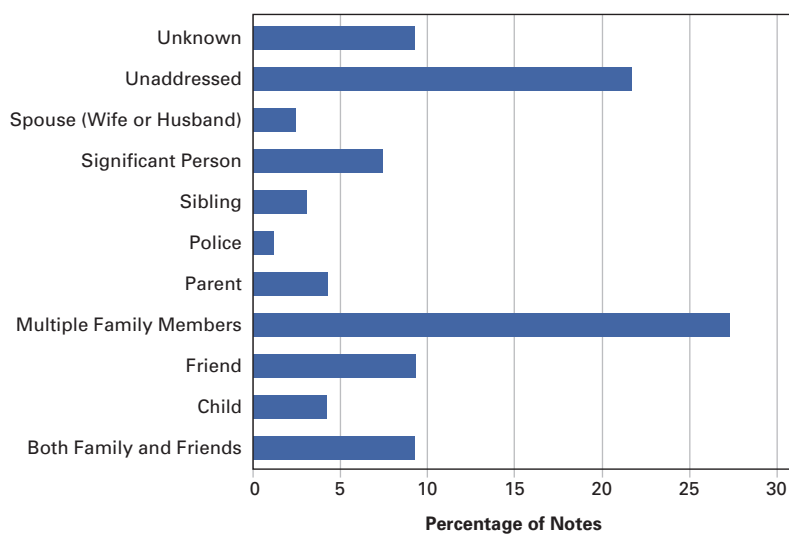
friends); no one or people the victim did not know (e.g., police); and unknown addressees (where we could not tell who the addressee was). As expected, most suicide notes were addressed to people whom the victims knew.

We further divided the notes addressed to people the victims knew into multiple subcategories (notes addressed to more than one person: multiple family members, both family and friends; and notes addressed to one person: spouses, significant persons, parents, children, friends) to look for significant relationship trends between the suicide victims and the note addressees. In this study we defined “spouse” as people who were legally married, which we separated from “significant persons,” which we defined as boyfriends, girlfriends, or fiancés/fiancées.

As Figure 5 shows, most suicide notes were addressed to multiple family members (27.3 percent). Nearly 22 percent of the notes were not addressed to anyone, which may suggest that these suicide victims felt alone and did not have connections to anyone. More than a quarter of the notes were addressed to both family and friends (9.3 percent), friends (9.3 percent), and unknown addressees (9.3 percent). The remaining notes were addressed to significant persons (7.5 percent), spouses (2.5 percent), siblings (3.1 percent), parents (4.3 percent), children (4.3 percent), and police officers (1.2 percent). We often found it difficult to assign notes



FIGURE 5: **Suicide Notes by Addressee**



to categories due to the fluidity and ambiguous nature of the relationships. This ambiguity may only be ours, because as the note readers, we may never have fully understood the relationship between the victims and the addressees of the notes.

### DISCUSSION

This study looked at suicides committed in Maine during the two-year period of 2017–2018. We examined some of the demographics of the victims, including age, sex, veteran status, and the suicide method. We then tried to correlate these data with whether the victim left a suicide note, and if so, its length and to whom it was addressed. In particular, we were looking to see if suicide notes correlated with any of the known risk factors for suicide, and to see if anything about the note might provide new insights into who commits suicide and why they do. The goal would be to further identify an at-risk population early enough to prevent the tragic outcome.

We found that suicides in Maine did not differ significantly from suicides in other populations: males were more likely to commit suicide than females, older people were more likely to commit suicide than younger people, veterans were more likely to commit suicide than nonveterans, and firearms were the preferred method for males (over 60 percent) and veterans of both

sexes, whereas overdose and hanging/asphyxiation were used more commonly by females (the two methods combined accounted for approximately 60 percent of female suicides). We did not specifically examine data for other known risk factors such as marital or socioeconomic status.

Since Maine’s population is overwhelmingly white and of French or English descent, comparative analyses of race would have little or no statistical significance. And although we considered county-level analyses, we felt that it would be difficult or impossible to obtain statistically significant results for county of residence/death as a factor for determining suicide risk. We also determined that average income was not an appropriate method of separating areas of the state as the average income does not differ greatly between most counties in Maine.

For the years 2017 and 2018, we found that 30 percent of the people who committed suicide in Maine left a note. This percentage is within the average range for the United States (10 percent to 44 percent in a 2012 study [Pestian, Matykiewicz, and Linn-Gust 2012]). In our study, approximately 20 percent of men and 50 percent of women left notes. We also found that people who committed suicide by firearm left the lowest percentage of notes, which raised the question of whether suicide notes are more related to gender (female vs. male) or to method used (firearms vs. all other methods). The inherent gender bias of the suicide method may account for the apparent gender bias in the presence of notes.

A further confusing issue involves suicide by overdose. Because it is often impossible to determine if the act was inadvertent (accidental) or intentional (suicidal), overdose suicides in the United States are underreported (Rockett et al. 2018). The presence of a note, therefore, is one of the best ways to tell if the act was an intentional suicide. But since most suicide victims don’t leave notes, the group of suicide by overdose victims becomes heavily weighted with note leavers. This issue can skew the statistical analysis to make it appear that that people who commit suicide via overdose leave notes more often than people who commit suicide by other means.

In our study, over 50 percent of victims who left notes left a short note, possibly suggesting that the suicide was hastily planned. In most cases, we felt that the shorter notes were written at the last minute and with whatever medium was at hand, whereas lengthier notes appeared more deliberately thought out. For example, many long notes were written on ruled notebook paper, while shorter notes were written on items such as paper plates, old mail, and the backs of receipts. The haste or deliberateness with which the note was written does not reflect the time from initial suicidal ideation, but only the time between the final commitment to perform the act (when the person wrote the note) and its realization. If we can consider the populations of people who left no note and people who left short notes to be somewhat similar, we may find other demographic similarities between people who decide to commit suicide on the spur of the moment. Then we could compare this group to a group of persons with known clinical depression to see if, indeed, their suicides were more planned out and if they did leave notes behind.

The addressee of the notes was the most variable feature in our study. Over 25 percent of the notes were specifically addressed to family members; 20 percent of the notes were not addressed to anyone at all. We often found it difficult to tell the relationship of the victim and the addressee. We hypothesized that when an individual is identified by name, the victim was attempting to connect with a person whose relationship was significant, and we wondered if these recipients represent a group of people who may have had the most influence on preventing the suicide. It is possible that a better understanding of the people suicide victims reach out to can help target more-effective suicide-prevention programs.

## CONCLUSION AND FUTURE DIRECTION

It is our hope that this study of the demographics of Maine's suicide victims can be used to develop better suicide-prevention efforts, efforts that specifically target particular populations of victims, surviving friends and relations, and most commonly used suicide methods.

For example, because Maine has the highest median age in the United States, and older people have a higher rate of suicide than younger people, we suggest that suicide-prevention efforts might be better focused on programs for middle-age and elderly people. The Maine.

gov website focuses mostly on suicide in younger and school-aged people. The little information Maine.gov does have on suicide prevention for older people links to federal websites and hotlines. We believe that Maine should create more programs and resources that focus on preventing suicide in older adults.

Similarly, the state should target veterans and those in the military more specifically. Although less than 10 percent of Mainers are veterans, 25 percent of all Maine suicides are committed by veterans. In 2018, Maine's Veterans Bureau released information on veterans' suicide and attempted to disseminate awareness about the issue (Maine BVS 2018). We look forward to future analyses to see the effectiveness of this action.

**Maine's high rate of suicide by firearm is...of great concern, and... the state should make greater efforts to address this problem.**

Maine's high rate of suicide by firearm is also of great concern, and we feel that the state should make greater efforts to address this problem. Gun laws need to be stricter to prevent people from using guns not only to harm others but also themselves. The data presented here support enacting laws like the recently rejected *red flag* law, which would allow police to temporarily seize guns from individuals who could pose a threat to themselves or others. The state should also explore enacting other laws and policies that require background and mental health checks as a requirement for gun ownership, as well as requiring that gun owners receive proper training.

We also believe that the suicide notes contain a wealth of information that, if analyzed properly, could provide insights into the motivations of suicide victims, and thereby provide new directions for focused preventive efforts. Prior studies on suicide notes focused mostly on whether a note was left. Our study has provided some basic information on which people wrote notes, how hastily they did so, and to whom the notes were addressed. We suggest creating a database of suicide notes that can be analyzed by the medical examiner's



office and psychologists. Retrospective analyses of the suicide victims in the context of their notes would likely identify people who might not have been considered part of the usual at-risk population. This analysis may bring to light other issues that contribute to suicide, especially more specific factors such as financial issues or specific traumas that a person has faced. Better knowledge about the particular traumas that lead a person to commit suicide may help us better focus our suicide-prevention efforts. 🐼

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**Mark Flomenbaum** is the chief medical examiner for the state of Maine.