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## Characteristics of U.S. Suicide Decedents in 2005–2010 Who Had Received Mental Health Treatment

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### Abstract

**Objective**—To inform suicide prevention efforts in mental health treatment, the study assessed associations between recent mental health treatment, personal characteristics, and circumstances of suicide among suicide decedents.

**Methods**—Data from 18 states reporting to the National Violent Death Reporting System between 2005 and 2010 (N=57,877 suicides) were used to compare circumstances among adult decedents receiving any or no type of mental health treatment within two months before death.

**Results**—Of suicide decedents, 28.5% received treatment before suicide. Several variables were associated with higher odds of receiving treatment, including death by poisoning with commonly prescribed substances (adjusted odds ratio [AOR]=3.04, 95% confidence interval [CI]52.84–3.26), a history of suicide attempts (AOR=2.77, CI=2.64–2.90), depressed mood (AOR=1.69, CI=1.62–1.76), and nonalcoholic substance abuse or dependence (AOR=1.13, CI=1.07–1.19).

**Conclusions**—For nearly a third of all suicide decedents, better mental health care might have prevented death. Efforts to reduce access to lethal doses of prescription medications seem warranted to prevent overdosing with commonly prescribed substances.

In 2010, suicide accounted for approximately 38,000 deaths in the United States, corresponding to a suicide rate of 12.43 per 100,000 individuals (1). Although mental health treatment helps reduce suicidal behavior (2), each year an estimated 30% of suicide decedents will have received treatment within one month of their death (3). This fact suggests that providers may have opportunities to improve suicide prevention efforts. Compared with suicide decedents who did not receive mental health treatment, those who

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received treatment often had more severe symptoms (4). Research is currently scarce on the co-occurring health- and life-stress-related circumstances among suicide decedents who received treatment. Life events that are considered relevant factors to suicidal behaviors (5) are routinely documented in the National Violent Death Reporting System (NVDRS) but have not yet been investigated in relation to mental health treatment before suicide. The objective of this explorative study was to assess associations between recent mental health treatment and circumstances of death among suicide decedents to better understand the unique qualities of individuals who had received mental health treatment and to help inform suicide prevention efforts.

## Methods

We obtained 2005–2010 data from the NVDRS, which captures details on violent deaths among the deaths registered within each of 18 states (Alaska, Colorado, Georgia, Kentucky, Maryland, Massachusetts, Michigan, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, Utah, Virginia, and Wisconsin). Data for Michigan and Ohio were available for only 2010. Data sources for NVDRS include death certificates, law enforcement reports, and coroner and medical examiner reports; these sources are used to more comprehensively describe each violent incident. Suicide deaths are identified according to the manner of death recorded in the various data sources. State abstractors follow a strict coding manual to ensure consistent reporting and reconcile any differences across the data sources (6).

Adult suicide decedents who received mental health treatment within two months before death were compared with suicide decedents who were not known to have received mental health treatment shortly before death. Because help-seeking behavior among adolescents differs from behavior among adults, only decedents over age 18 were considered (7). Treatment was defined as seeing a psychiatrist, psychologist, general medical doctor, therapist, or other counselor for a mental health or substance misuse problem; receiving a prescription for a psychiatric medication; attending anger management classes; or residing in an inpatient or halfway house facility for mental health problems (6).

To qualify as suicide by poisoning, a substance had to be ingested and deemed coresponsible for the death. Drugs on the scene that were not ingested were not counted (6). Suicides by poisoning were coded as poisoning involving commonly prescribed substances if one or more of the substances used in the act was technically a controlled substance that would require a prescription (6).

Suicide decedents were compared with respect to sociodemographic characteristics, health- and stress-related characteristics, and the suicide method involved. Logistic regression was used to calculate odds ratios for receiving treatment before suicide for all above characteristics. We adjusted comparisons for age, sex, race-ethnicity, and history of suicide attempt. History of suicide attempt was adjusted only for age, sex, and race-ethnicity. Because of multiple testing, we set the level of statistical significance to .001. We performed analyses using PASW Statistics 18. This study was determined to be exempt from

human subjects review by the Institutional Review Board of the Centers for Disease Control and Prevention.

## Results

Of the 57,877 suicides among persons > 18 years of age recorded in NVDRS between 2005 and 2010, 16,471 (28.5%) had received treatment within two months of suicide. Of those who did not receive treatment in the two months before suicide (N=41,406), 3,198 (7.7%) had received mental health treatment in the past. Being male (adjusted odds ratio [AOR]=.47), race-ethnicity other than non-Hispanic white (AORs=.61–.73), and being ages 19–49 (AOR=.69–.91) or ≥ 70 (AOR=.63) were all associated with lower odds of receiving treatment (Table 1). Among life events registered in the NVDRS, intimate partner problems were the most prevalent type of problem before suicide and affected 15,168 (30.3%) of all 50,024 decedents with known circumstances (Table 1).

Compared with persons who died from hanging, those who died by drug poisoning involving a substance that commonly requires prescription (AOR=3.04), by sharp instruments (AOR=1.30), or by falling or jumping (AOR=1.44) had higher odds of recent mental health treatment. Suicides by firearms were associated with lower odds of receiving treatment (AOR=.88) (Table 1). Among 3,758 persons who received treatment and died by poisoning involving commonly prescribed substances, 3,060 (81.4%) were tested for use of antidepressants at the time of death, with 2,278 of them (74.4%) testing positive.

Among the decedents, having recent mental health treatment was positively associated with having depressed mood at time of death (AOR=1.69), a history of suicide attempt (AOR=2.77), and substance use problems other than alcoholism (AOR=1.13) (Table 1). Receiving treatment was inversely associated with having intimate partner conflicts (AOR=.75), perpetrating interpersonal violence (AOR=.64), financial problems (AOR=.87), criminal legal problems (AOR=.60), other legal problems (AOR=.82), and homelessness (AOR=5.66).

## Discussion

Nearly a third of suicide decedents received help from some type of mental health care provider before taking his or her own life. Earlier studies have found a similar proportion of service utilization, which was even higher when general health care services—particularly, primary care provider visits—were also taken into account (3). The demographic distribution among suicide decedents known to have received mental health care in the two months prior to death generally reflected patterns of mental health seeking in the general population, in that smaller proportions of males, persons of minority race-ethnicity, individuals < 30 years, and older adults (> 70 years) were known to access mental health services before suicide. Gender-specific help-seeking behavior, stigma, and socioeconomic factors often play a large role in these treatment disparities (8). However, when controlling for age, race-ethnicity, sex, and history of suicide attempt, we still found that some health- and life-stress-related circumstances were more common among decedents who had sought treatment, which indicates an area for improvement in the delivery of mental health services.

Depressed mood and substance misuse were associated with receiving mental health treatment. Although the effect size for substance misuse was relatively small, this association is consistent with research showing that patients were treated more often for depression when comorbidities were present (9). However, we also found that many suicide decedents who killed themselves by drug poisoning had received mental health treatment before their suicide, and commonly prescribed substances were often involved in these deaths. There is common agreement that drugs should be prescribed only in small package sizes to at-risk individuals to prevent suicide (10). In Britain, reduced pack size of analgesics have been shown to be effective in reducing suicides with paracetamol (acetaminophen in the U.S.) (11). More research is needed to investigate substances used and their responsibility for fatal outcomes among decedents, mechanisms involved, and best prevention practices. In contrast to suicide decedents who used poison, those who used firearms were less likely to have received treatment before death. Firearms are considered one of the most violent and lethal methods of suicide, and the use of violent methods has been described as reflecting a further step in the suicidal process. Individuals choosing firearms as their method may be less inclined to seek or accept treatment (12).

The higher odds of receiving mental health treatment observed among persons with a history of suicide attempts underscore that mental health treatment can provide an opportunity to address the needs of some previous suicide attempters. More follow-up treatment, therapies tailored to specifically reduce self-directed violence (including cognitive or other therapies and strategies intended to improve coping skills to better handle risk factors associated with suicide [13]), and monitoring of prescription medications might reduce the risk of subsequent attempts.

Connecting mental health providers to other services relevant to the circumstances frequently seen among decedents may also help prevent some suicides. Some life events, particularly intimate partner problems, were prevalent for more than 15,000 of all suicide decedents, reflecting sociological concerns with intimacy, including marriage and the association of divorce with high suicide rates (14). However, decedents experiencing partner problems had lower odds of receiving treatment before suicide. Clinicians and other public health professionals may be able to collaborate with successful programs and strategies that involve friends or family of the at-risk individual in order to reach out to individuals affected by family problems (15).

This study had several limitations. NVDRS data do not indicate which type of mental health service was received. Different quantities and treatment types were subsumed as mental health treatment, and findings for specific treatments may be different. The data are not nationally representative but representative of only the 18 states participating in the NVDRS. The information provided on the circumstances of deaths was from proxies and was subject to recall bias. Further, we could not assess whether substances that commonly require prescription were actually prescribed, because drugs were assigned to the prescription drug category only on the basis of the substance name or the name of the metabolite identified. Some of these substances might have been acquired on the street. Even in cases in which the drug was actually prescribed, we cannot rule out that the prescription may have been prescribed for a person other than the decedent.

## Conclusions

The findings suggest that the substances used in suicides by poisoning and efforts to reduce access to lethal doses of prescription medications warrant further research. Further, better collaboration between mental health service providers and providers of other services, including outreach to individuals with intimate partner problems, may help reduce suicide deaths.

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**Table 1**  
**Odds of mental health treatment of suicide decedents over age 18 in the National Violent Death Reporting System, 2005–2010<sup>a</sup>**

Characteristic	Mental health treatment (N=16,471)		No mental health treatment (N=41,406)		OR	95% CI	AOR <sup>b</sup>	95% CI
	N	%	N	%				
Sex <sup>c</sup>								
Female (reference)	5,660	34.4	6,942	16.7	1.00		1.00	
Male	10,811	65.6	34,451	83.2	.39*	.37–.40	.47d*	.45–.49
Age group <sup>c</sup>								
19–29	2,437	14.8	7,899	19.1	.66*	.63–.70	.69d*	.65–.73
30–49	7,083	43.0	16,067	38.8	.95*	.91–.99	.91d*	.87–.95
50–69 (reference)	5,687	34.5	12,227	29.5	1.00		1.00	
70	1,264	7.7	5,204	12.6	.52*	.49–.56	.63d*	.59–.67
Race-ethnicity <sup>c</sup>								
White, non-Hispanic (reference)	14,760	89.6	34,311	82.9	1.00		1.00	
Black, non-Hispanic	675	4.1	2,871	6.9	.55*	.50–.60	.61d*	.56–.67
American Indian/Native American	189	1.1	712	1.7	.62*	.53–.73	.61d*	.52–.72
Asian/Pacific Islander	233	1.4	688	1.7	.79*	.68–.91	.73d*	.63–.86
Hispanic	527	3.2	1,926	4.7	.64*	.58–.70	.65d*	.59–.72
Health characteristic <sup>e</sup>								
Depressed mood	8,566	52.0	12,949	38.6	1.72*	1.66–1.79	1.69*	1.62–1.76
Alcohol abuse or dependence	3,352	20.4	5,970	17.8	1.18*	1.13–1.24	1.08	1.03–1.14
Other substance use problem	2,809	17.1	4,600	13.7	1.29*	1.23–1.36	1.13*	1.07–1.19
General health problem	3,738	22.7	7,534	22.5	1.01	.97–1.06	1.07	1.01–1.12
Primary suicide method used <sup>c</sup>								
Hanging (reference)	3,603	21.9	9,712	23.5	1.00		1.00	
Firearm	6,596	40.0	23,107	55.8	.77*	.73–.81	.88*	.84–.93
Sharp instrument	363	2.2	715	1.7	1.37*	1.20–1.56	1.30*	1.13–1.49

Characteristic	Mental health treatment (N=16,471)		No mental health treatment (N=41,406)		OR	95% CI	AOR <sup>b</sup>	95% CI
	N	%	N	%				
Poisoning involving commonly prescribed drug	3,758	22.8	2,382	5.8	4.25*	3.99–4.53	3.04*	2.84–3.26
Poisoning with other known substance	1,094	6.6	2,389	5.8	1.23*	1.14–1.34	.99	.91–1.08
Poisoning with unknown substance	174	1.1	1,055	2.6	.45*	.38–.52	.37*	.31–.44
Drowning	226	1.4	420	1.0	1.45*	1.23–1.71	1.31	1.10–1.56
Falling or jumping	361	2.2	647	1.6	1.50*	1.32–1.72	1.44*	1.25–1.66
Other	290	1.8	799	2.0	.98	.85–1.13	.95	.82–1.10
Life event <sup>c</sup>								
Intimate partner conflict	4,389	26.6	10,779	32.1	.77*	.74–.80	.75*	.72–.79
Victim of interpersonal violence	88	.5	146	.4	1.23	.94–1.60	.91	.69–1.21
Perpetrator of interpersonal violence	333	2.0	1,282	3.8	.52*	.46–.59	.64*	.56–.72
Job problem	2,317	14.1	4,469	13.3	1.07	1.01–1.13	1.10	1.04–1.16
Financial problem	2,011	12.2	4,494	13.4	.90*	.85–.95	.87*	.82–.92
Criminal legal problem	1,038	6.3	3,793	11.3	.53*	.49–.57	.60*	.56–.65
Other legal problem	602	3.7	1,419	4.2	.86	.78–.95	.82*	.74–.91
History of suicide attempt	5,584	33.9	4,687	14.0	3.16*	3.02–3.30	2.77 <sup>d</sup> *	2.64–2.90
Suicide of close person	280	1.7	559	1.7	1.02	.88–1.18	.97	.83–1.13
Non-suicidal loss	1,112	6.8	2,041	6.1	1.12	1.04–1.21	1.12	1.03–1.21
Homelessness	118	.7	383	1.1	.69*	.56–.85	.66*	.57–.75

<sup>a</sup>Reported by 18 states. Treatment seeking was assessed for the two months before death.

<sup>b</sup>Adjusted for age group, sex, race-ethnicity, and history of suicide attempt if not otherwise noted

<sup>c</sup>Values do not add up to 100% because of missing values.

<sup>d</sup>Sex adjusted for age group, race-ethnicity, and history of suicide attempt. Age group adjusted for sex, race-ethnicity, and history of suicide attempt. Race-ethnicity adjusted for sex, age group, and history of suicide attempt. History of suicide attempt adjusted for age group, sex, and race-ethnicity.

<sup>e</sup>Analyzed only for individuals with known circumstances (N=50,024 of 57,877; 86.4%). Total persons treated with known circumstances, N=16,470; total not treated, N=33,554. The reference category is an answer of no to the respective item.

\* p<.001