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Demographic, Clinical, and Service Utilization Factors Associated with Suicide-Related Visits among Alaska Native and American Indian Adults

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Abstract

Alaska Native and American Indian people (AN/AIs) are disproportionately affected by suicide. Within a large AN/AI health service organization, demographic, clinical, and service utilization factors were compared between those with a suicide-related health visit and those without. Cases had higher odds of a behavioral health diagnosis, treatment for an injury, behavioral health specialty care visits, and opioid medication dispensation in the year prior to a suicide-related visit compared to gender, age, and residence (urban versus rural) matched controls. Odds of a suicide-related visit were lower amongst those with private insurance and those with non-primary care ambulatory clinic visits.

Keywords

American Indian/Alaska Native; suicide; risk factors

Many people who die by suicide seek healthcare just prior to their death. Nationally, 77% of suicide decedents contact a primary care provider in the year before death; 32% see a behavioral health (BH) provider (Luoma, Martin, & Pearson, 2002). The U.S. Surgeon General recommends screening for suicide risk in healthcare settings (U.S. Public Health Service, 1999); however, understanding the most efficient and effective way to assess and intervene remains an important area for investigation (U.S. Preventive Services Task Force, 2014).

The average annual suicide death rate among Alaska Native and American Indian people (AN/AIs) in Alaska's southcentral region is more than 50% higher than the U.S. all races rate. Indeed, suicide is the leading cause of injury death among AN/AIs aged 15 to 24 in Alaska. Moreover, significant morbidity has been incurred: 17.7 versus 5.3 per 10,000 were

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hospitalized after suicide attempts for AN/AIs in the southcentral region versus non-Natives statewide, respectively, (Injury Prevention Program and the Alaska Native Epidemiology Center, 2014).

Two Alaska-wide studies of service utilization associated with suicide have been conducted with mixed samples of non-Natives and AN/AIs. In one, most people (64%) sought healthcare from a doctor in the 6-months prior to their death. Thirty-nine percent saw a BH counselor or therapist in the last year of life (Perkins, Sanddal, Howell, Sanddal, & Berman, 2009). In the second, a greater proportion of people attempting suicide were single, unemployed, and had less than a high school education as compared to the 2000 U.S. Census general population. Fatal versus nonfatal attempts were more likely among males, people 25 years of age or older, and people with a substance abuse history (Wexler, Hill, Bertone-Johnson, & Fenaughty, 2008). The only comprehensive investigation of service utilization specific to AN/AIs occurred in one rural northern region (Hill, Perkins, & Wexler, 2007). In the year prior to death by suicide, AN males ($n = 30$) were 2.8 times more likely to receive hospital treatment and 22.2 times more likely to be treated for an alcohol-related injury than controls ($n = 30$).

To better understand how the tribal healthcare system in Alaska could respond to this increased risk of suicide, we retrospectively examined the demographic, clinical, and service utilization characteristics of AN/AIs with a suicide-related visit.

Method

Setting

Southcentral Foundation (SCF), a tribally-owned and operated healthcare facility in Anchorage, Alaska, provides primary healthcare services to more than 65,000 AN/AIs residing in southcentral Alaska. The primary care clinic (PC) is staffed by 36 clinical workgroups, each composed of a lead physician, advanced nurse practitioner or physician assistant, a registered nurse, and one or more Certified Medical Assistants or Licensed Practical Nurses. A master's level Behavioral Health Consultant (BHC) is shared amongst several PC workgroups and supports routine screening and management for depression and substance abuse, including interventions when questions about suicide potential arise.

In addition to PC services, SCF offers other specialty care including outpatient and residential BH services. SCF BH services are also offered to the Alaska Native Medical Center (ANMC) emergency/urgent care and inpatient units. Co-managed by SCF and the Alaska Native Tribal Health Consortium, ANMC is 150-bed hospital providing secondary and tertiary services for approximately 136,000 AN/AIs in all regions of Alaska. Inpatient psychiatry services are provided at private hospitals or a state-run public facility.

Project approval was granted by the Alaska Area Institutional Review Board and governing tribal organizations. Both SCF and ANMC use the Resource and Patient Management System (RPMS) as the electronic medical record and SIGNATURE as their billing software package (Gartner, 2002; Indian Health Service, 2015).

Participants

Cases comprised all AN/AIs seen at an SCF clinic or ANMC between January 1, 2005 and December 31, 2009 with a diagnostic code for a self-inflicted injury or death (ICD-9-CM codes e-950 to e-959). The sample was restricted to adults because of special considerations for research involving children and because only adults receive depression and substance abuse screening in the SCF PC clinics. As explained later, data were abstracted for a year before the index visit, thus, only those 19 and older at this visit were included. Cases were matched with AN/AIs who were the same age in years on the date of the suicide-related index visit, gender, and residence type (urban vs. rural). The most recent visit was used as the index visit if more than one suicide-related visit was present.

Measures

For all cases and controls, additional demographic, clinical, and service use factors were extracted then categorized according to the distribution, with particular attention to the avoidance of small cell sizes that could inadvertently identify individual AN/AIs.

Other demographic factors included marital status, insurance status, religious affiliation, and zip code to estimate median income.

Assessed the year prior to and 6-months after index visit, the clinical factors included depression and substance abuse screening score(s); ICD-9-CM diagnostic codes for number of BH conditions, physical conditions, and injuries; and medications dispensed. Depression screening was conducted with the Patient Health Questionnaire - 2 (PHQ-2; i.e., depressed mood and anhedonia) with a cutoff score of 3, immediately followed by the PHQ-9 when cutoff was reached. Substance abuse screening was conducted with a modified Alcohol Use Disorders Identification Test (AUDIT) with a cutoff score of 7 for women and 8 for men. The score closest to the date of the suicide-related index visits was used when more than one depression or substance abuse screening score was recorded. ICD-9-CM BH diagnostic codes included mood, anxiety, impulse control, pain, psychotic, personality, and substance abuse disorders. Psychotropic medications included antidepressants, benzodiazepines, mood stabilizers, and antipsychotics. Injuries included fractures, dislocation, sprain, and other. Physical conditions encompassed acute myocardial infarction, angina, congestive heart failure, chronic obstructive pulmonary disorder, dementia, diabetes, malignancy, osteoarthritis, spine disorder, and stroke.

Service utilization included number and type of visits within PC clinics, BH care, emergency/urgent care, and other ambulatory clinics like women's health. For PC visits involving a BHC as well as BH specialty care visits, number of visits was categorized as none, one, or two or more visits. Both PC visits and other ambulatory visits were categorized as none, one or two, three to six, and seven or more. Number of ANMC inpatient days was quantified as none, one or more.

Among cases only, means of self-harm were categorized into highly and less-lethal levels. Highly lethal means included firearms or suffocation and less-lethal included poisoning, cutting, other means such as drowning and falling, and sequelae (e.g., liver disease after poisoning). Limited, easily accessible data was also assembled for all adult AN/AIs seen at a

SCF clinic or ANMC to depict how cases and controls compared to the broader service population (referred to as total service population).

Statistical Analyses

Descriptive analyses of demographic, clinical, and service utilization data were conducted for cases, controls, and the total service population. Fisher's exact tests investigated potential differences by degree of lethality, comparing high and less-lethal means among cases.

Univariable conditional logistic regression estimated the odds ratio (OR) and 95% CI for a suicide-related visit by demographic, clinical, and service utilization factors in the year prior amongst cases and controls. All factors with a univariable association of $p < 0.25$, with the exception of marital status and religion, were included in the multivariable models and interactions investigated (Hosmer & Lemeshow, 2000). Cases and controls missing values on one or more factors were excluded from subsequent multivariable models.

Results

Most of the 890 cases were female (58%); mean age was 31.9 years ($SD = 11.4$); 65% lived in urban areas (Table 1). Cases were younger ($p < .0001$) and more urban ($p < .0001$) than the total service population. A substantial proportion of cases ($n = 165$, 19%) had more than one suicide-related visit.

As presented in Table 2, seventy-five percent of cases were not married (never married, divorced, separated, or widowed) compared to 68% of matched controls. More than half of cases (56%) and controls (54%) lived in an area with a median income of $49,999 or less. Twenty-one percent of cases received Medicaid/Medicare compared to 11% of controls. Most cases (79%) and controls (75%) had a religious affiliation recorded in their electronic medical record. In comparison, 55% of the total service population was not married; 42% received Medicaid/Medicare; 76% had a recorded religious affiliation. Of cases, 75% had one or more BH condition compared to 7% of controls. Most cases (75%) and controls (84%) were not screened for depression or substance abuse in the year prior. Of AN/AIs screened, 25% and 9% of cases and 10% and 9% of controls were positive for depression and substance abuse respectively. One or more physical conditions was present among 24% of cases; 42% of cases had a healthcare visit with an injury-related diagnosis. Psychotropic medication was over seven times more likely among cases versus controls; opioid use four times more likely among the former. By way of context, 27% of the total service population had a BH condition; 26% a physical condition; 38% an injury-related visit; 60% an opioid medication dispensed; 2% a psychotropic medication dispensed. All ambulatory service utilization and inpatient service utilization was greater among cases than controls. For context, the mean number of visits, by clinic type, for the total service population was as follows: BH specialty 7.3 ($SD = 11.4$), other ambulatory 12.5 ($SD = 18.8$), and emergency/urgent care 4.6 ($SD = 6.3$). Twenty-eight percent of the total service population had at least one inpatient stay; comparable percentages were 18% and 10% for cases and controls, respectively.

All demographic, clinical, service utilization factors were statistically significant in univariable analyses ($p \leq 0.01$) comparing cases to controls (Table 3) except religious affiliation ($p = 0.056$). A total of 877 cases (96%) and 886 controls (>99%) were included in multivariable models. Income ($p = 0.332$), depression ($p = 0.684$) and substance abuse screening ($p = 0.410$), physical conditions ($p = 0.514$), psychotropic medication ($p = 0.198$), PC visits ($p = 0.188$), BHC visits ($p = 0.818$), emergency/urgent care visits ($p = 0.642$), and inpatient stays ($p = 0.648$) were not statistically significant in the multivariable model. Multivariable results presented exclude marital status and religious affiliation given missing data for a large number of individuals, low statistical significance ($p = 0.71$ and $p = 0.57$, respectively) in univariable models, and no change in multivariable estimates, significance, or direction when included.

When compared to those with private insurance, AN/AIs receiving Medicaid or Medicare benefits had approximately 3 times the odds and AN/AIs with no insurance had about 2 times the odds of a suicide-related visit ($p = 0.013$). Those with a BH condition ($p < 0.001$) and those treated for an injury ($p < .001$) were more likely to have a suicide-related visit. In addition, AN/AIs with opioid medication dispensation ($p < 0.001$) and those with a higher number of BH specialty visits ($p = 0.021$) had higher odds of a suicide-related visit. AN/AIs with increased ambulatory visits outside of PC ($p = 0.002$) had lower odds of a suicide-related visit after adjustment for demographic, clinical, and service utilization factors, but higher odds in the univariable model. A forward stepwise conditional logistic regression examined performance of this odds ratio. The odds became less than one as number of BH conditions was added to income and insurance status.

As seen in descriptive statistics for the 6-months after the index visit (Table 4), 28% of cases were seen in PC one or two times and another 26% seen three or more times. Of cases, 18% saw a BHC and 22% had a BH specialty visit. Roughly a quarter (26%) of cases had an inpatient stay and 80% had one or more emergency/urgent care visit.

Among cases, documented means of attempt at the index visit were 58.3% poisoning, 22.7% cutting, 5.3% firearms, 3.3% suffocation, 8.5% other means, and 1.9% sequelae of attempts. AN/AIs with index visits involving highly lethal means ($n = 76$) were more likely than less lethal cases ($n = 814$) to have been men (76% vs. 38%; $p < 0.001$), rural dwellers (66% vs. 33%; $p < 0.001$), low income (61% under 39k vs. 18%; $p < 0.001$), and have a BH condition (43% vs. 23%; $p < 0.001$). AN/AIs with index visits involving highly lethal means were less likely than those with less lethal means to have PC visits (33% vs. 68%; $p < 0.001$), or emergency/urgent care visits (43% vs. 70%; $p < 0.001$).

Discussion

This is the first large-scale examination of demographic, clinical, and service utilization factors associated with suicide-related visits among AN/AIs in a tribally operated, urban healthcare organization. Slightly more than 1% of the total service population (n = 890 out of 64,528 adults) had least one diagnostic code for a self-inflicted injury over a 5-year period; 19% of cases had two or more suicide-related visits.

Those with a suicide-related visit were more likely to be women, living in urban settings, and averaging 32 years of age. Increased risk of suicide among these AN/AIs was also associated with not being married, being of poorer socioeconomic status, experiencing BH distress (one or more BH diagnoses including substance abuse, prescribed psychotropic medication), diagnosed with chronic physical health conditions, seeking care for a physical injury, and being dispensed opioid medication. These results mirror those of other studies.

In northern Alaska, breakups and interpersonal strife have been associated with non-fatal suicide attempts, alcohol strongly linked to fatal suicide attempts. Further, income and active engagement, whether through school, work, or personal relationships, were associated with lower risk of suicide (Wexler et al., 2008). In another study, injury-related visits in northern Alaska were more common in cases than controls; alcohol-related visits per provider notations and elevated blood alcohol levels significantly differentiated cases from and controls (Hill et al., 2007). Although not assessed in this study, cultural spirituality has been associated with reductions in attempted suicide with no effect for AI commitment to Christianity (Garroutte et al., 2003).

The relationships of service utilization to suicide risk found here deserve discussion. As expected, any type of visit in the year prior was associated with increased odds of a suicide-related visit. However, the absolute percentage of cases receiving care in the year prior and 6-month after was low. Very few cases had a BH specialty visit (23%) in the year prior; even fewer saw a PC-based BHC (17%). Cases involving highly lethal means (i.e., firearms and suffocation) were even less likely than all cases to use BH specialty or BHC services in the year prior. In addition, 35% of all cases had no PC visits; 33% had no emergency/urgent care visits; 31% had no visits to other ambulatory clinics; 82% did not have an inpatient stay. Obviously, a healthcare system cannot respond to the suicide-related needs of AN/AIs who seldom or never use services. Rates of low service utilization prior to suicide attempts appear common in the literature for Plains Indians (Mock, Grossman, Mulder, Stewart, & Koepsell, 1996) and ANs (Wexler et al., 2008) compared to the rates for all of US and Europe (Luoma et al., 2002). Hill et al. (2007) did not find significant differences with respect to inpatient visits, emergency room visits, or scheduled outpatient visits in rural northern Alaska where services are significantly more limited than in this particular urban setting. Whether our findings reflect differences in service availability, particularly compared to rural Alaska, or other factors like reticence to use predominantly Western approaches is unknown.

Service use within 6-months after the index visit was also low among cases. Although an increase may be expected based on referral protocols, the proportion with BH specialty and BHC visits remained stable (22% and 18%, respectively), as did the proportion of cases without outpatient visits or inpatient stays (47% PC, 42% other ambulatory, and 74% inpatient). However, 80% of cases had an emergency/urgent care visit within 6-months after the index visit.

Considered simultaneously, the following demographic and clinical factors had the strongest effect sizes in descending order: any BH condition, two or more BH visits, physical injury, Medicaid/Medicare versus private insurance, opioid medication dispensation, and no

insurance versus private insurance. Three or more visits to other ambulatory clinics were protective when factors were considered simultaneously. How other ambulatory services may be protective is not fully understood. Some aspect of specialist care may be especially protective, as may the addition of more services.

The value of screening in PC for depression and substance abuse in identifying cases was of particular interest. In univariable analyses, positive depression screening was associated with increased likelihood of a suicide-related attempt. However, among cases screened for depression in the year prior, the sensitivity of the PHQ to identify those that would have a suicide-related visit was only 25%. Although the PHQ-2 and PHQ-9 are sensitive in detecting major depression in PC (Kroenke, Spitzer, & Williams, 2003), these measures may be inadequate to predict suicide-related risk among AN/AI adults. Low overall rates of screening plus prior work showing systematic variation in depression screening by patient and provider factors complicates interpretation of these findings (Dillard, Muller, Smith, Hiratsuka, & Manson, 2012).

Beyond supporting existing recommendations to incorporate suicide-related screening and interventions into PC (Luoma et al., 2002), screen those with chronic pain (Tang & Crane, 2006), and young AN/AI men in the presence of alcohol-related injuries (Hill et al., 2007), our study suggests those with physical injuries, regardless any involvement of alcohol, should be screened. PC, emergency/urgent care, and other ambulatory clinics appear the most promising venues for suicide screening per visit frequencies. Emergency/urgent care clinics appear to be the most common service setting for AN/AIs after a suicide-related visit. Targeted screening strategies could be adapted for specific AN/AI subpopulations (e.g., by age and gender) to increase their sensitivity and specificity (Gaynes et al., 2004). Less than optimal screening numbers plus the small number of AN/AIs seen by BHCs suggest that -- even amongst organizations with expressed institutional commitment -- BH needs are likely underestimated and available resources may be underutilized.

This study used available electronic medical record information. These sources do not contain information about other potentially important factors like education level, employment, spirituality, family history of suicide, alcohol involvement at suicide-related visit, sleep, sexual orientation, psychosocial stressors such as relationship discord. Others could not be used to differentiate between fatal and non-fatal suicide-related visits given very low cell sizes. Due to a large number of missing values (15%) it was not possible to measure the full effect of marital status and religious affiliation on risk of suicide. Additionally, records did not contain the endorsement of the PHQ-9 item specific to suicidality among those screened. Self-inflicted injury data relied on ICD codes, whereas other studies included additional contextual information that may be important (e.g., previous attempts, contributing psychosocial stressors, location of act; Wexler et al., 2008). Average income per zip code area and insurance status served as proxy measures of economic status. Service utilization outside of the SCF and ANMC systems such as inpatient psychiatric hospitalization could not be assessed. Future research should explore the nature of injury types (e.g., interpersonal, accidental, and chronic) and their association with personal consequences (e.g., loss of function), treatment consequences (e.g. opioid

dispensation), and consider the impact of demographic variables such as age and gender that were controlled in this effort.

Conclusions

Considering all factors simultaneously, AN/AIs with BH conditions, those who received care for injuries, were dispensed opioid medication, or were uninsured or who had Medicaid/Medicare were at elevated risk for a suicide-related visit. PC, emergency room/urgent care, and other ambulatory clinics offer the most useful opportunities for screening and detecting, especially when BH services remain underutilized. These settings could employ suicide risk detection algorithms to signal need for a thorough suicide risk assessment. Emergency and urgent care settings should be prepared to address ongoing suicide risk given low rates of other service use in the 6-months after a suicide-related visit.

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Table 1

Gender, Age, and Residence Characteristics of Cases and Total Service Population

	Cases[1] (N = 890)		Total Service Population[2] (N = 64528)		
	N	**%**	**N**	**%**	***P***
Gender					.17
Female	520	58	36225	56	
Male	370	42	28303	44	
Age in years[3]					<.0001
19 to 24	310	35	13106	20	
25 to 34	279	31	13883	22	
35+	301	34	37539	58	
Residence					<.0001
Rural	315	35	30280	47	
Urban[4]	575	65	34248	53	

[1] Alaska Native/American Indian adults with a diagnostic code for a self-inflicted injury between 2005 and 2009

[2] Alaska Native/American Indian adults with any visit between January 1, 2005 and December 31, 2009

[3] As of most recent suicide-related visit

[4] Includes Anchorage, Eagle River, Chugiak, Palmer, Wasilla, and Willow

Table 2

Demographic, Clinical, and Service Utilization Factors in the Year Prior to a Suicide-Related Visit among Cases, Matched Controls, and Total Service Population

		Suicide-related Visit (N = 890)		No Suicide-related Visit (N = 890)		Total Service Population (N = 64528)	
Factor	**Missing**	**N**	**%**	**N**	**%**	**N**	**%**
Demographic[2]							
Marital status[§]	145						
Single		630	75	546	68	33129	55
Married		141	17	226	28	21731	36
Divorced/separated/widowed		69	8	23	3	5626	9
Estimated Income[3]	7						
0 - 39.9K		190	22	162	18	---	---
40 - 49.9K		302	34	320	36	---	---
50 - 59.9K		199	23	230	26	---	---
60K+		192	22	178	20	---	---
Insurance status							
None		599	67	657	74	37315	58
Medicaid/Medicare		185	21	97	11	10885	17
Any private insurance		106	12	136	15	16328	25
Religious affiliation[§§]	164						
None		177	21	196	25	13575	24
Any		667	79	576	75	42822	76
Clinical							
One or more behavioral health conditions[4]		668	75	58	7	17258	27
Depression screening score(s)[5]	10						
Absent in year prior		664	75	747	84	---	---
Negative in year prior		165	19	125	14	---	---
Positive in year prior		55	6	14	2	---	---
Substance abuse screening score(s)[6]							
Absent in year prior		669	75	749	84	---	---

Factor	Missing	Suicide-related Visit (N = 890) N	Suicide-related Visit (N = 890) %	No Suicide-related Visit (N = 890) N	No Suicide-related Visit (N = 890) %	Total Service Population (N = 64528) N	Total Service Population (N = 64528) %
Negative in year prior		201	23	128	14	---	---
Positive in year prior		20	2	13	1	---	---
One or more chronic physical condition		211	24	32	4	16979	26
One or more injury		378	42	54	6	24280	38
Opioid medication dispensed		394	44	100	11	38415	60
Psychotropic medication dispensed		346	39	44	5	1290	2
Service utilization							
Primary care visits							
None		313	35	464	52	---	---
One or two		190	21	224	25	---	---
Three to six		214	24	146	16	---	---
Seven or more		173	19	56	6	---	---
Behavioral health consultant visits							
None		732	82	839	94	---	---
One		65	7	33	4	---	---
Two or more		93	10	18	2	---	---
Primary care provider change		72	8	71	8	---	---
Behavioral health specialty care visits							
None		686	77	846	95	60130	93
One		43	5	20	2	---	---
Two or more		161	18	24	3	---	---
Other ambulatory visits							
None		280	31	362	41	11402	18
One or two		220	25	227	26	---	---
Three to six		193	22	153	17	---	---
Seven or more		197	22	148	17	---	---
Emergency or urgent care visits							
None		291	33	509	57	24590	38
One or two		252	28	261	29	---	---
Three or more		347	39	120	13	---	---

Factor	Missing	Suicide-related Visit (N = 890) N	Suicide-related Visit (N = 890) %	No Suicide-related Visit (N = 890) N	No Suicide-related Visit (N = 890) %	Total Service Population (N = 64528) N	Total Service Population (N = 64528) %
One or more inpatient stays		160	18	88	10	18227	28

[1] Alaska Native/American Indian adults with any visit between January 1, 2005 and December 31, 2009

[2] As of date of electronic query

[3] Includes mood, anxiety, impulse control, pain, psychotic, personality, and substance abuse disorders.

[4] Screening with Patient Health Questionnaire, scores of 10 or above positive

[5] Primary care screening with modified Alcohol Use Disorders

[§] Missing 4042 values for Total Service Population.

[§§] Missing 8131 values for Total Service Population.

Table 3

Univariable and Multivariable Conditional Logistic Regression Estimating Odds of a Suicide-Related Visit According to Demographic, Clinical, and Service Utilization Factors in the Year Prior

	Univariable		Multivariable[1,2]	
Factor	**OR (95% CI)**	***p***	**OR (95% CI)**	***p***
Demographic				
Marital status (ref. married)[§]		<0.001		---
Single	1.8 (1.4 - 2.3)		---	
Divorced/separated/widowed	4.5 (2.6 - 7.9)		---	
Income (reference 60K or higher)		0.009		0.332
0 to 39.9K	1.7 (1.1 - 2.7)		2.0 (0.7 - 5.4)	
40 to 49.9K	0.9 (0.7 - 1.2)		1.0 (0.5 - 1.9)	
50 to 59.9K	0.8 (0.6 - 1.0)		1.0 (0.5 - 2.1)	
Insurance (ref. private insurance)		<0.001		0.013
None	1.2 (0.9 - 1.6)		2.2 (1.2 - 4.0)	
Medicaid/Medicare	2.5 (1.8 - 3.7)		3.1 (1.4 - 6.5)	
Any religious affiliation	1.3 (1.0 - 1.6)	0.056	---	---
Clinical				
Any behavioral health condition (ref. none)	44.6 (26.2 - 75.7)	<0.001	33.8 (17.1 - 70.0)	<0.001
Depression screening (ref. negative)		<0.001		0.684
Absent	0.6 (0.4 - 0.8)		1.5 (0.6 - 3.7)	
Positive	2.8 (1.5 - 5.4)		1.0 (0.2 -4.5)	
Substance abuse screening (ref. negative)		<0.001		0.410
Absent	0.5 (0.4 - 0.7)		1.9 (0.7 - 4.6)	
Positive	0.9 (0.4 - 2.0)		2.0 (0.2 - 17.2)	
Any physical condition	7.6 (5.1 - 11.4)	<0.001	0.8 (0.4 - 1.7)	0.514
Any injury	10.5 (7.4 - 15.0)	<0.001	4.8 (2.6 - 8.8)	<0.001
Opioid medication dispensed	6.8 (5.0 - 9.1)	<0.001	2.8 (1.6 - 4.8)	<0.001
Psychotropic medication dispensed	13.6 (9.0 - 20.6)	<0.001	1.6 (0.8 - 2.3)	0.198
Service Utilization				
Primary care visits (ref. none)		<0.001		0.188
One or two	1.6 (1.2 - 2.1)		1.3 (0.7 - 2.5)	
Three to six	2.9 (2.2 - 4.0)		1.8 (0.9 - 3.7)	
Seven or more	6.8 (4.6 - 10.2)		3.1 (1.1 - 9.2)	
Behavioral health consultant visits (ref. none)		<0.001		0.818
One	2.9 (1.8 - 4.7)		1.4 (0.5 - 4.2)	
Two or more	6.6 (3.8 - 11.3)		1.1 (0.2 - 4.5)	
Behavioral health visits (ref. none)		<0.001		0.021
One	2.5 (1.4 - 4.4)		0.8 (0.3 - 2.3)	
Two or more	9.8 (5.8 - 16.4)		5.4 (1.6 - 18.1)	
Other ambulatory visits (ref. none)		<0.001		0.002

	Univariable		Multivariable[1,2]	
Factor	**OR (95% CI)**	***p***	**OR (95% CI)**	***p***
One or two	1.3 (1.0 - 1.6)		0.6 (0.3 - 1.0)	
Three to six	1.7 (1.3 - 2.3)		0.4 (0.2 - 0.7)	
Seven or more	1.9 (1.4 - 2.6)		0.3 (0.1 - 0.6)	
Emergency or urgent care visits (ref. none)		<0.001		0.642
One or two	1.7 (1.3 - 2.2)		1.2 (0.7 - 1.8)	
Three or more	5.5 (4.1 - 7.3)		1.3 (0.7 - 2.4)	
Any inpatient stay	2.0 (1.5 - 2.6)	<0.001	1.2 (0.6 - 2.1)	0.648

[1] Listed variables with univariable p < .25 included in multivariable analysis, except marital status and religious affiliation.

[2] Missing 17 values among variables included in multivariable regression analysis, missing more likely to be women ($p = 0.049$).

[§] Due to missing more than 15% of values, variables were excluded from multivariable model.

Table 4

Clinical and Service Utilization Characteristics in the 6 Months after a Suicide-Related Visit Among Cases and Controls

		Suicide-related visit (N = 890)		No suicide-related visit (N = 890)	
Factor	**Missing**	**N**	**%**	**N**	**%**
Clinical					
One or more behavioral health conditions		615	69	172	19
Depression screening score(s)	2				
Absent		752	85	851	96
Negative		108	12	34	4
Positive		28	3	5	1
Substance abuse screening score(s)					
Absent		757	85	856	96
Negative		119	13	32	4
Positive		14	2	2	0
One or more physical conditions		168	19	91	10
One or more injury		289	32	134	15
Opioid medication dispensation		311	35	238	27
Psychotropic medication dispensation		312	35	110	12
Service utilization					
Primary care visits					
None		418	47	613	69
One or two		245	28	261	29
Three or more		227	26	16	2
Primary care provider change		48	5	50	6
Behavioral health consultant visits					
None		733	82	870	98
One or more		157	18	20	2
Behavioral health visits					
None		697	78	868	98
One		193	22	22	2
Other ambulatory visits					

Factor	Missing	Suicide-related visit (N = 890)		No suicide-related visit (N = 890)	
		N	%	N	%
None		371	42	475	53
One or two		240	27	328	37
Three to six		180	20	59	7
Seven or more		99	11	28	3
Emergency or urgent care visits					
None		177	20	621	70
One or two		470	53	255	29
Three or more		243	27	14	2
One or more inpatient stays		234	26	84	9