U.S. Army Public Health Center

Public Health Report

Surveillance of Suicidal Behavior: U.S. Army Reserve Component Soldiers, January–December 2017

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Public Health Report No. S.0047739.3-17, Surveillance of Suicidal Behavior: U.S. Army Reserve Component Soldiers, January–December 2017

TABLE OF CONTENTS

FIGURE

TABLES

PUBLIC HEALTH REPORT NO. S.0047739.3-17
SURVEILLANCE OF SUICIDAL BEHAVIOR:
U.S. ARMY RESERVE COMPONENT SOLDIERS
JANUARY–DECEMBER 2017

1. SUMMARY

1.1 Purpose

Since 2008, the U.S. Army Public Health Center (APHC) Behavioral and Social Health Outcomes Program (BSHOP) has collected, analyzed, and disseminated surveillance data on suicidal behavior cases (suicides, suicide attempts, and suicidal ideations) among all activated U.S. Army Soldiers (Active Duty, National Guard, and Reserve). In 2016, suicidal behavior among non-activated U.S. Army Reserve Component (RC) (including National Guard and Reserve) Soldiers became of particular interest due to inconsistent reporting of suicidal behavior counts between organizations. In addition, RC Soldiers make up an integral part of the U.S. Army by providing operational and combat support to state governments and the Active Duty component during natural disasters, times of war, and other national emergencies. It is crucial that they are medically and combat ready and able to convert to active status when needed. Hence, this publication reports on the frequency and characteristics of suicidal behavior among RC Soldiers during calendar year 2017 using multiple data sources stored in the Army Behavioral Health Integrated Data Environment (ABHIDE). Although the ABHIDE is the most comprehensive data warehouse for information pertaining to suicidal behavior in the U.S. Army, information on the health status of RC Soldiers is limited. RC Soldiers—particularly those non-activated—often seek healthcare services at medical facilities outside the Army beneficiary network.

1.2 Methods

Suicide cases among activated and non-activated RC Soldiers were obtained from the Armed Forces Medical Examiner System (AFMES) (including confirmed and pending cases) and Army G-1, respectively. Suicide attempt and suicidal ideation cases among activated RC Soldiers were identified by Department of Defense Suicide Event Reports (DoDSERs), which are completed only for cases hospitalized or evacuated. Suicidal ideation cases were also identified by isolating inpatient medical encounters with *International Classification of Diseases, Ninth Revision* (ICD-9) code (V6284) or *Tenth Revision* (ICD-10) code (R45851) in any diagnosis positions (Dx1–Dx8) in the Military Health System Data Repository (MDR). The most recent serious event was captured for each Soldier. Medical encounters and diagnoses for behavioral health (BH) conditions were based on military medical claims during a Soldier's time in service while in active status and were obtained from the MDR.

1.3 Results

1.3.1 U.S. Army National Guard

During the 2017 calendar year, 354 U.S. Army National Guard (ARNG) Soldiers had a documented suicidal behavior: 122 died by suicide (16% were activated, 84% were not

activated), 22 had a documented suicide attempt, and 210 had a reported suicidal ideation. The rate of suicide was 38 per 100,000 ARNG Soldiers.

All events occurred in the U.S. and were among junior enlisted, single, White males under age 25. Gunshot wounds and drug/alcohol overdose were the primary methods for dying by and attempting suicide, respectively. Almost half of cases communicated their suicidal intentions prior to the act. The principal stressors documented among suicide and attempt cases were work-related and relationship problems. The majority of suicide (n=118), and all suicide attempt and suicidal ideation cases had military medical claims data while in active status during their military career. Fifty-nine percent of suicide attempt cases had a behavioral healthcare visit within 30 days prior to the event. Twenty-seven percent, 68%, and 60% of suicide, attempt, and ideations cases had a BH diagnosis, respectively. Of cases with a BH diagnosis, the most prevalent diagnoses were adjustment, mood, and anxiety disorders.

The suicide rate was highest among ARNG Soldiers 17–24 years (46/100,000 Soldiers). Moreover, the suicide rate among ARNG Soldiers 35–59 years of age (41/100,000 Soldiers) was almost as high as the rate among Soldiers 17–24 years of age.

1.3.2 U.S. Army Reserve

During the 2017 calendar year, 213 U.S. Army Reserve (USAR) Soldiers engaged in a suicidal behavior: 62 died by suicide (11% were activated, 89% were not activated), 17 had a documented suicide attempt, and 133 had a reported suicidal ideation. The rate of suicide was 33 per 100,000 USAR Soldiers, which was higher than the rate for USAR Soldiers in 2016 (21/100,000 Soldiers).

A high proportion of suicidal behavior cases occurred in the U.S. among enlisted, single, White males. With regard to age, most suicide and suicidal ideation cases were over 24 years of age, whereas most suicide attempt cases were under age 25. Gunshot wounds and drug/alcohol overdose were the primary methods for dying by and attempting suicide, respectively. The principal stressors documented among suicide attempt cases were ever being a victim of abuse and work stress. DoDSERs were missing for 89% (n=53) of USAR suicide cases, who were all non-activated at the time of the suicide. As a result, we were unable to report on stressors and other personal/legal problems experienced among this group prior to the suicide event. The majority of suicide (n=60) and suicide attempt (n=16), and all suicidal ideation cases had military medical claims data while in active status during their military career. Forty-one percent of suicide attempt cases had a behavioral healthcare visit dated within 30 days prior to the event. Thirty-eight percent, 31%, and 68% of suicide, suicide attempt, and suicidal ideation cases had a BH diagnosis, respectively. Of cases with a BH diagnosis, the most prevalent diagnoses were mood and adjustment disorders.

The suicide rate among junior enlisted (42/100,000 Soldiers) was greater than the rate of senior enlisted (34/100,000 Soldiers).

1.4 Conclusion

These findings highlight the importance of implementing suicide prevention programs across all components. However, further investigation is needed to assess the substantial increase in suicide rates from 2016 to 2017 among USAR Soldiers, specifically. While targeting prevention programs and efforts toward young and enlisted RC Soldiers remains important, such programs and efforts should also target older RC Soldiers (those over age 25) and expand to include non-activated RC Soldiers, as the latter group accounted for the majority of suicide cases. Since DoDSERs among non-activated USAR cases and medical records during non-active status were not available, efforts will be made to identify alternate sources of personal/legal problems and BH information in future reports. A 2017 Department of Defense Instruction (DODI) requiring DoDSER completion for RC suicide and suicide attempt cases (DOD, 2017) may improve the capture of BH conditions and stressors among non-activated members of the RC Soldier population.

2. REFERENCES

See Appendix A for a list of the references cited in this report.

3. AUTHORITY

Army Regulation 40–5 (*Preventive Medicine*, 25 May 2007).

4. METHODS

See Appendix B for the methods used to generate this report. Appendix C presents the BH conditions of interest and their corresponding diagnosis codes (Table C-1), as well as the data sources included in the ABHIDE (Figure C-1).

5. RESULTS

5.1 U.S. Army National Guard Results

5.1.1 Suicide Cases

5.1.1.1. Demographics/Military Characteristics

In 2017, 122 ARNG Soldiers died by suicide (including activated and non-activated cases) translating to a rate of 38 per 100,000 ARNG Soldiers (Table 1). Most cases were male (95%), 17–24 years old (45%), White (82%), single (58%), junior enlisted (51%), and not activated (84%) (Table 2).

ARNG Soldiers who were 17–24 years old had the highest rate of suicide (46/100,000 Soldiers), but a similar rate (41/100,000 Soldiers) was observed in the 35 to 59 year old age group (Table 1). Meanwhile, rates among the two aforementioned groups were higher than the rate among those 25–34 years of age (29/100,000 Soldiers). Moreover, the rate of suicide among senior enlisted (44/100,000 Soldiers) was higher than the suicide rate among junior enlisted (37/100,000 Soldiers).

5.1.1.2 Event Characteristics

In 2017, all suicides among ARNG Soldiers occurred in the United States (Table 3). The most common method of suicide was gunshot wound (79%) followed by hanging/asphyxiation (14%). Almost half (48%) of Soldiers communicated their suicidal intentions prior to the act.

5.1.1.3 Personal and Legal/Administrative History

Among Soldiers with DoDSERs on file (n=109) who had personal (n=81) and legal/administrative (n=28) problems within 1 year prior to the suicide, the most frequent personal problems were relationship (n=59) and work-related stress (n=33) (Table 4). Civil legal problems (n=18) were the principal legal/administrative issue.

5.1.1.4 Behavioral Health Indicators

Thirty-five percent (n=41) of suicide cases with military medical claims data (n=118) had an outpatient or inpatient BH encounter while on active status during their military career (Table 5). More than a quarter were diagnosed with a BH disorder. Primary diagnoses among those with at least one BH diagnosis were adjustment (56%), anxiety (56%), and mood (44%) disorders.

5.1.2 Suicide Attempt Cases

5.1.2.1 Demographics/Military Characteristics

The number of suicide attempt cases reported among activated ARNG Soldiers in 2017 was 22 (Table 1). Cases were mostly male (68%), 17–24 years old (50%), White (68%), single (55%), and junior enlisted (55%).

5.1.2.2 Event Characteristics

The majority of attempts occurred in the U.S. (91%) by overdose (55%) (Table 3). Of these, 64% and 36% of attempts involved drugs or alcohol, respectively. Approximately 14% of cases communicated suicidal intentions prior to attempt.

5.1.2.3 Personal and Legal/Administrative History

The majority of attempts had personal issues (73%) which occurred within 1 year prior to the event (Table 4). Work stress (n=9), relationship problems (n=7), and ever being a victim of abuse (n=5) were the most frequently cited issues. Legal/administrative issues (27%) were primarily related to administrative separation (n=4) and Article 15 (n=3). (Note: “Article 15” refers to non-judicial proceedings under the Uniform Code of Military Justice.)

5.1.2.4 Behavioral Health Indicators

Seventy-seven percent (n=17) of suicide attempt cases had a behavioral healthcare visit in the military medical system while on active status during their military career (Table 5). Of these, three-quarters (76%) had contact with a provider within 30 days preceding the event. Over two-thirds (68%) were diagnosed with a BH disorder prior to their event. Of those with a BH diagnosis, the most frequent diagnoses were mood (87%), adjustment (53%), and anxiety (67%) disorders.

5.1.3 Suicidal Ideation Cases

5.1.3.1 Demographics/Military Characteristics

There were 210 suicidal ideation cases reported among activated ARNG Soldiers in 2017 (Table 2). Most cases were male (72%), aged 17–24 (45%), White (66%), single (56%), and junior enlisted (52%).

5.1.3.2 Behavioral Health Indicators

The majority of suicidal ideation cases (72%, n=151) had a BH encounter (inpatient or outpatient) in the military medical system while in active status since entering the ARNG (Table 5). Of these encounters, 76% occurred within 30 days preceding the event. Two-thirds (60%) of cases were diagnosed with a BH disorder before their event. Of those with a BH diagnosis, the primary diagnoses were mood (70%), adjustment (57%), and anxiety disorders (53%).

5.1.4 U.S. Army National Guard Tables

Tables 1–5 present the ARNG results.

Table 1. Crude and Stratum-specific Suicide Rates[a–c] among U.S. Army National Guard Soldiers, 2016–2017

	Suicide			
	2016		2017	
	Rate	95% CI	Rate	95% CI
Overall	34	28–40	38	31–45
Sex				
Female	–	–	–	–
Male	39	31–46	44	36–52
Rank				
E1–E4	41	31–50	37	28–46
E5–E9	31	20–41	44	32–56
Age				
17–24	39	28–50	46	33–58
25–34	39	28–51	29	19–38

35–59	–	–	41	27–55	

Legend:
CI = confidence interval
E = Enlisted
Notes:
[a]Sample included Army National Guard cases aged 17–59 with identifiable demographic factors.
[b]Army National Guard suicide counts were provided by the Armed Forces Medical Examiner System (AFMES, 2018) and Army G-1. Army National Guard population counts (denominators) were provided by the Defense Manpower Data Center (DMDC, 2018).
[c]Cells without reported values reflect counts greater than 0 but less than 20; rates were not calculated or reported for counts less than 20.

Table 2. Demographic and Military Characteristics by Suicidal Behavior for U.S. Army National Guard Soldiers, 2016–2017

	Suicidal Behavior n (%)					
	Suicide[a]		Suicide Attempt[b]		Suicidal Ideation[b]	
	2016 (n=108)	2017 (n=122)	2016 (n=25)	2017 (n=22)	2016 (n=136)	2017 (n=210)
SEX						
Male	103 (95)	116 (95)	14 (56)	15 (68)	99 (73)	152 (72)
Female	5 (5)	6 (5)	11 (44)	7 (32)	37 (27)	58 (28)
AGE (years)						
17–24	47 (44)	55 (45)	21 (84)	11 (50)	62 (46)	95 (45)
25–34	46 (43)	34 (28)	4 (16)	6 (27)	37 (27)	59 (28)
35–59	15 (14)	33 (27)	0 (0)	5 (23)	37 (27)	56 (27)
RACE-ETHNICITY						
White	87 (81)	100 (82)	18 (72)	15 (68)	94 (69)	139 (66)
Black	9 (8)	13 (11)	3 (12)	3 (14)	20 (15)	46 (22)
Hispanic	5 (5)	4 (3)	3 (12)	2 (9)	12 (9)	14 (7)
Asian/Pacific Islander	4 (4)	2 (2)	0 (0)	2 (9)	7 (5)	9 (4)
American Indian	3 (3)	3 (2)	1 (4)	0 (0)	3 (2)	2 (1)
MARITAL STATUS						
Single	74 (69)	71 (58)	18 (72)	12 (55)	80 (59)	117 (56)
Married	29 (27)	41 (34)	5 (20)	9 (41)	50 (37)	78 (37)
Divorced	5 (5)	8 (7)	2 (8)	1 (5)	6 (4)	15 (7)
Other[c]	0 (0)	2 (2)	0 (0)	0 (0)	0 (0)	0 (0)
RANK[d]						
E1–E4	66 (61)	62 (51)	23 (92)	12 (55)	82 (60)	110 (52)
E5–E9	35 (32)	49 (40)	2 (8)	10 (45)	45 (33)	84 (40)
W1–W5	1 (1)	1 (1)	0 (0)	0 (0)	2 (1)	3 (1)

O1–O3	5 (5)	9 (7)	0 (0)	0 (0)	2 (1)	11 (5)
O4–O8	1 (1)	1 (1)	0 (0)	0 (0)	5 (4)	2 (1)
ACTIVATION STATUS						
Activated	12 (11)	19 (16)	25 (100)	22 (100)	136 (100)	210 (100)
Not activated	96 (89)	103 (84)	0 (0)	0 (0)	0 (0)	0 (0)

Legend:
E=Enlisted
O=Officer
W=Warrant Officer
Notes:
[a]Included those confirmed or pending confirmation by the Armed Forces Medical Examiner System.
[b]Suicide attempt and suicidal ideation cases are from Department of Defense Suicide Event Reports (DoDSERs), which are completed only for cases hospitalized or evacuated. DoDSERs were only available for activated ARNG Soldiers.
[c]Included widowed (n=1) and legally separated (n=1).
[d]No cases reported for Cadets.

Table 3. Event Characteristics[a] by Suicidal Behavior for U.S. Army National Guard Soldiers, 2016–2017

	Suicidal Behavior n (%)			
	Suicide[b]		Suicide Attempt[c]	
	2016 (n=108)	2017 (n=122)	2016 (n=25)	2017 (n=22)
LOCATION OF EVENT[d]				
U.S.	107 (99)	122 (100)	20 (80)	20 (91)
In Theater	1 (1)	0 (0)	5 (20)	2 (9)
METHOD OF EVENT[d]				
Gunshot Wound	87 (81)	96 (79)	1 (4)	1 (5)
Hanging/Asphyxiation	14 (13)	17 (14)	4 (16)	2 (9)
Drug/Alcohol Overdose	3 (3)	2 (2)	15 (60)	12 (55)
Cutting	0 (0)	0 (0)	4 (16)	3 (14)
Other[e]	2 (2)	1 (1)	1 (4)	4 (18)
Unknown[f]	2 (2)	6 (5)	0 (0)	0 (0)
SUBSTANCE INVOLVEMENT				
Event Involved Alcohol	–	35 (32)	2 (8)	8 (36)
Event Involved Drugs	–	11 (10)	12 (48)	14 (64)
OTHER EVENT CHARACTERISTICS				
Communicated Prior to Event	–	52 (48)	2 (8)	3 (14)

Notes:
[a]Data were obtained from Department of Defense Suicide Event Reports (DoDSERs), except as noted. DoDSERs were not completed for 94 suicide cases in 2016 and 13 suicide cases in 2017. Since data were reported for very few suicide cases in 2016, substance involvement and other event characteristics were not reported.

[b]Included those confirmed or pending confirmation by the Armed Forces Medical Examiner System.
[c]Cases identified from Department of Defense Suicide Event Reports (DoDSERs), which are available only for cases hospitalized or evacuated. DoDSERs were only available for activated ARNG Soldiers.
[d]Obtained from the Defense Casualty Information Processing System for suicide cases and obtained from DoDSERs for suicide attempt cases.
[e]Included carbon monoxide poisoning (n=2), jumping from heights (n=1), being struck by moving object (n=2), and other (n=3).
[f]Included those pending confirmation.

Table 4. Personal and Legal/Administrative History[a] by Suicidal Behavior for U.S. Army National Guard Soldiers, 2016–2017

	Suicidal Behavior n(%)		
	Suicide[b,c]	Suicide Attempt[d]	
	2017 (n=122)	2016 (n=25)	2017 (n=22)
LEGAL/ADMINISTRATIVE HISTORY	28 (26)	9 (36)	6 (27)
Article 15	6	1	3
Civil Legal Problems	18	1	1
Administrative Separation[e]	6	6	4
Medical Board[f]	3	2	2
PERSONAL HISTORY	81 (74)	19 (76)	16 (73)
Relationship Problem	59	7	7
Work Stress	33	9	9
Physical Health Problem	16	4	5
Victim of Abuse			
Previous Year	4	6	0
Ever	13	8	5
Perpetrator of Abuse	12	2	0
Spouse/Family/Friend Death	5	1	1
Financial Stress	19	2	1
Spouse/Family Health Problem	7	0	1
Spousal/Family/Friend Suicide Ever	10	1	3

Notes:
[a]Personal and legal/administrative history within 1 year before suicidal event, except as noted. Data were obtained from Department of Defense Suicide Event Reports (DoDSERs).
[b]Included those confirmed or pending confirmation by the Armed Forces Medical Examiner System.
[c]Data were not available for 94 suicide cases in 2016 and 13 suicide cases in 2017. Since data were reported for very few suicide cases in 2016, values were not reported in this table.
[d]Cases identified from DoDSERs, which are available only for cases hospitalized or evacuated. DoDSERs were only available for activated ARNG Soldiers.
[e]Considered for separation from the Army on the basis of conduct or inability to meet standards of duty performance and discipline.
[f]Medical evaluation board to determine fitness for continued duty.

Table 5. Behavioral Health (BH) History[a] by Suicidal Behavior for U.S. Army National Guard Soldiers, 2016–2017

	Suicidal Behavior n (%)					
	Suicide[b]		Suicide Attempt[c]		Suicidal Ideation[c]	
	2016 (n=108)	2017 (n=122)	2016 (n=25)	2017 (n=22)	2016 (n=136)	2017 (n=210)
BH MEDICAL ENCOUNTERS[k]						
Inpatient	12 (12)	7 (6)	5 (20)	7 (32)	40 (29)	48 (23)
Outpatient	30 (29)	41 (35)	17 (68)	17 (77)	110 (81)	151 (72)
30 Days Before Event	–	–	14 (82)	13 (76)	89 (81)	115 (76)
BH DIAGNOSIS[d,e,k]	**21 (20)**	**32 (27)**	**10 (40)**	**15 (68)**	**91 (67)**	**125 (60)**
Within 1 Year Before Event	7 (33)	16 (50)	9 (90)	13 (87)	72 (79)	90 (72)
More Than One BH Diagnosis	16 (76)	24 (75)	5 (50)	12 (80)	62 (68)	81 (65)
Within 1 Year Before Event	5 (31)	8 (33)	4 (80)	9 (75)	33 (53)	39 (48)
Any Mood Disorder[f]	14 (67)	14 (44)	4 (40)	13 (87)	64 (70)	88 (70)
Within 1 Year Before Event	5 (36)	6 (43)	3 (75)	11 (85)	36 (56)	48 (55)
Posttraumatic Stress Disorder	6 (29)	11 (34)	1 (10)	3 (20)	30 (33)	31 (25)
Within 1 Year Before Event	3 (50)	5 (45)	1 (100)	2 (67)	20 (67)	15 (48)
Other Anxiety Disorder[g]	10 (48)	18 (56)	4 (40)	10 (67)	42 (46)	66 (53)
Within 1 Year Before Event	1 (10)	7 (39)	3 (75)	5 (50)	23 (55)	28 (42)
Adjustment Disorder	10 (48)	18 (56)	9 (90)	8 (53)	61 (67)	71 (57)
Within 1 Year Before Event	2 (20)	5 (28)	8 (89)	6 (75)	39 (64)	37 (52)
Substance Use Disorder	9 (43)	12 (38)	1 (10)	6 (40)	19 (21)	29 (23)
Within 1 Year Before Event	2 (22)	2 (17)	0 (0)	5 (83)	9 (47)	17 (59)
Previous Suicide Attempt/Self-Harm[h]	4 (4)	1 (1)	5 (20)	3 (14)	11 (8)	22 (10)
Within 1 Year Before Event	2 (50)	0 (0)	5 (100)	3 (100)	8 (73)	18 (82)
Previous Suicidal Ideation[i]	10 (10)	5 (4)	5 (20)	6 (27)	42 (31)	64 (30)
Within 1 Year Before Event	7 (70)	3 (60)	4 (80)	6 (100)	36 (86)	53 (83)
Sleep Disorders[j]						

Within 1 Year Before Event	3 (3)	3 (3)	5 (20)	3 (14)	34 (25)	35 (17)

Legend:
ICD-10 = *International Classification of Diseases, Tenth Revision*
Notes:
[a]BH medical claims data were obtained from the Military Health System Data Repository. Military medical claims data were not available for 4 suicide cases in 2016 and 4 suicide cases in 2017.
[b]Included those confirmed or pending confirmation by the Armed Forces Medical Examiner System.
[c]Cases identified from Department of Defense Suicide Event Reports (DoDSERs), which are available only for cases hospitalized or evacuated. DoDSERs were only available for activated ARNG Soldiers.
[d]Diagnosed with at least one of the following: mood, posttraumtic stress disorder, other anxiety disorders, adjustment disorder, or substance use disorders.
[e]Ever diagnosed during time in service, except as noted.
[f]Includes major depression, other depressive and bipolar disorders.
[g]Included panic disorder, generalized anxiety disorder, or obsessive-compulsive disorder.
[h]Based on ICD-10 X-,T-, and Z-codes for self-inflicted injuries.
[i]Based on an ICD-10 R-code for suicidal ideation.
[j]ICD-10 codes indicating sleep problems include F51, G47, and Z72.820.
[k]Percentages calculated based on the number of Soldiers who had medical claims data: 104 suicide cases in 2016 and 118 suicide cases in 2017.

5.2 U.S. Army Reserve Results

5.2.1 Suicide Cases

5.2.1.1 Demographics/Military Characteristics

In 2017, 62 USAR Soldiers died by suicide (including activated and non-activated Soldiers) translating to a rate of 33 per 100,000 USAR Soldiers (Table 6). Most cases were male (92%), 17–24 years old (46%), White (69%), single (55%), junior enlisted (56%), and not activated (89%) (Table 7). Junior enlisted had a higher rate of suicide—42 suicides per 100,000 Soldiers—than senior enlisted (34/100,000 Soldiers) (Table 6).

5.2.1.2 Event Characteristics

All suicides occurred in the U.S. The most common method of suicide was gunshot wound (85%) followed by hanging/asphyxiation (13%) (Table 8).

5.2.1.3 Behavioral Health Indicators

Among suicide cases with medical claims data (n=60), 47% had an outpatient or inpatient BH encounter during their military career (Table 10). Over one-third (37%) were diagnosed with a BH disorder. Of those with a BH diagnosis, the primary diagnoses were adjustment (59%), mood (59%) and substance use (45%) disorders.

5.2.2 Suicide Attempt Cases

5.2.2.1 Demographics/Military Characteristics

There were 17 suicide attempt cases reported among activated USAR Soldiers in 2017 (Table 7). The majority of cases were male (53%), 17–24 years old (65%), non-White (53%), single (76%), and junior enlisted (71%).

5.2.2.2 Event Characteristics

The majority of attempts (88%) occurred in the U.S., and the most common method was overdose (53%) (Table 8). As a result, 53% and 24% of attempts involved some type of drug or alcohol, respectively. Approximately 12% of cases had communicated suicidal intentions prior to their attempt.

5.2.2.3 Personal and Legal/Administrative History

The majority of attempts had personal issues (71%) which occurred within 1 year of the event (Table 9). Ever being a victim of abuse (n=8) and work stress (n=7) were the most frequently

cited personal issues. Legal/administrative issues (24%) were primarily related to administrative separation (n=3) and Article 15 proceedings (n=1).

5.2.2.4 Behavioral Health Indicators

Sixty-three percent (n=10) of suicide attempt cases had a behavioral healthcare visit during their military career, of which nearly three-fourths (70%) had a BH encounter within 30 days prior to the event (Table 10). Thirty-one percent of cases were diagnosed with a BH disorder before their event, and the most frequent diagnoses were adjustment (80%) and mood (80%) disorders.

5.2.3 Suicidal Ideation Cases

5.2.3.1 Demographics/Military Characteristics

There were 133 suicidal ideation cases reported among activated USAR Soldiers in 2017 (Table 7). The majority of cases were male (66%), 25 years or older (71%), non-White (57%), and of enlisted rank (90%).

5.2.3.2 Behavioral Health Indicators

The majority (77%) of USAR suicidal ideation cases had a BH encounter (inpatient and/or outpatient); 75% of these encounters occurred in the 30 days preceding the event (Table 10). Over two-thirds (68%) of USAR suicidal ideation cases were diagnosed with a BH disorder before their event; the most frequent diagnoses were adjustment (77%), mood (66%), and anxiety disorders (59%).

5.2.4 U.S. Army Reserve Tables

Tables 6 through 10 present the USAR results.

Table 6. Crude and Stratum-specific Suicide Rates among U.S. Army Reserve Soldiers, 2016–2017[a–c]

	Suicide			
	2016		2017	
	Rate	95% CI	Rate	95% CI
Overall	21	15–28	33	25–41
Sex				
Female	–	–	–	–
Male	26	18–34	40	29–50
Rank				
E1–E4	–	–	42	28–56
E5–E9	–	–	34	20–48
Age				
17–24	–	–	–	–
25–34	–	–	29	26–55
35–59	–	–	–	–

Legend:
CI = confidence interval
E = Enlisted
Notes:
[a]Rates included only Army Reserve cases aged 17–59 with identifiable demographic factors.
[b]Army Reserve suicide counts used to calculate rates were provided by the Armed Forces Medical Examiner System and the Army G-1. Army Reserve population counts (denominators) were provided by the Defense Manpower Data Center (DMDC, 2018).
[c]Cells without reported values reflect counts greater than 0 but less than 20; rates were not calculated or reported for counts less than 20.

Table 7. Demographic and Military Characteristics by Suicidal Behavior for U.S. Army Reserve Soldiers, 2016–2017

	Suicidal Behavior n (%)					
	Suicide[a]		Suicide Attempt[b]		Suicidal Ideation[b]	
	2016 (n=41)	2017 (n=62)	2016 (n=13)	2017 (n=17)	2016 (n=111)	2017 (n=133)
SEX						
Male	38 (93)	57 (92)	8 (62)	9 (53)	63 (57)	88 (66)
Female	3 (7)	5 (8)	5 (38)	8 (47)	48 (43)	45 (34)
AGE (yr)						
17–24	13 (32)	17 (27)	7 (54)	11 (65)	29 (26)	39 (29)
25–34	19 (46)	29 (47)	4 (31)	4 (24)	38 (34)	49 (37)
35–59	9 (22)	16 (26)	2 (15)	2 (12)	44 (40)	45 (34)

RACE-ETHNICITY						
White	32 (78)	43 (69)	8 (62)	8 (47)	49 (44)	57 (43)
Black	4 (10)	6 (10)	2 (15)	3 (18)	42 (38)	41 (31)
Hispanic	3 (7)	9 (15)	1 (8)	6 (35)	16 (14)	25 (19)
Asian/Pacific Islander	1 (2)	4 (6)	1 (8)	0 (0)	3 (3)	10 (8)
American Indian	1 (2)	0 (0)	1 (8)	0 (0)	1 (1)	0 (0)
MARITAL STATUS						
Single	23 (56)	34 (55)	8 (62)	13 (76)	48 (43)	63 (47)
Married	15 (37)	25 (40)	2 (15)	4 (24)	51 (46)	55 (41)
Divorced	3 (7)	3 (5)	3 (23)	0 (0)	11 (10)	13 (10)
Other[c]	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	2 (2)
RANK[d]						
E1–E4	19 (46)	35 (56)	9 (69)	12 (71)	44 (40)	58 (44)
E5–E9	19 (46)	23 (37)	4 (31)	4 (24)	52 (47)	61 (46)
W1–W5	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	2 (2)
O1–O3	1 (2)	3 (5)	0 (0)	1 (6)	8 (7)	6 (5)
O4–O8	2 (5)	1 (2)	0 (0)	0 (0)	6 (5)	6 (5)
ACTIVATION STATUS						
Activated	2 (5)	7 (11)	13 (100)	17 (100)	111 (100)	133 (100)
Not activated	39 (95)	55 (89)	0 (0)	0 (0)	0 (0)	0 (0)

Legend:
E = Enlisted
O = Officer
W = Warrant Officer
Notes:
[a]Included those confirmed or pending confirmation by the Armed Forces Medical Examiner System.
[b]Suicide attempt and suicidal ideation cases are from Department of Defense Suicide Event Reports (DoDSERs), which are completed only for cases hospitalized or evacuated. DoDSERs were only available for activated USAR Soldiers.
[c]Included legally separated (n=1) and widowed (n=2).
[d]No cases reported for Cadets.

Table 8. Event Characteristics[a] by Suicidal Behavior for U.S. Army Reserve Soldiers, 2016–2017

	Suicidal Behavior n (%)			
	Suicide[b]		Suicide Attempt[c]	
	2016 (n=41)	2017 (n=62)	2016 (n=13)	2017 (n=17)
LOCATION OF DEATH[d]				
U.S.	41 (100)	62 (100)	11 (85)	15 (88)
In Theater	0 (0)	0 (0)	2 (15)	2 (12)
METHOD OF DEATH[d]				
Gunshot wound	27 (66)	53 (85)	0 (0)	0 (0)
Hanging/asphyxiation	7 (17)	8 (13)	0 (0)	3 (18)
Drug/alcohol overdose	1 (2)	0 (0)	7 (54)	9 (53)
Cutting	0 (0)	0 (0)	2 (15)	2 (12)
Other[e]	2 (5)	1 (2)	4 (31)	3 (18)
Unknown[f]	4 (10)	0 (0)	0 (0)	0 (0)
SUBSTANCE INVOLVEMENT				
Event Involved Alcohol	–	–	4 (31)	4 (24)
Event Involved Drugs	–	–	4 (31)	9 (53)
OTHER EVENT CHARACTERISTICS				
Communicated Prior to Event	–	–	4 (31)	2 (12)

Notes:
[a]Data were obtained from Department of Defense Suicide Event Reports (DoDSERs), except as noted. DoDSERs were not completed for 39 suicide cases in 2016 and 55 suicide cases in 2017. Since data were reported for very few suicide cases, substance involvement and other event characteristics were not reported.
[b]Included those confirmed or pending confirmation by the Armed Forces Medical Examiner System.
[c]Cases identified from Department of Defense Suicide Event Reports (DoDSERs), which were available only for cases hospitalized or evacuated. DoDSERs were only available for activated USAR Soldiers.
[d]Obtained from the Defense Casualty Information Processing System for suicide cases and obtained from DoDSERs for suicide attempt cases.
[e]Included poisoning (n=4), jumping from heights (n=1), being struck by moving object (n=1), exsanguination (n=1), vehicle crash (n=1),drowning (n=1), and other (n=1).
[f]Included cases pending confirmation.

Table 9. Personal and Legal/Administrative History[a] for U.S. Army Reserve Soldiers among Suicide Attempt Cases, 2016–2017

	Suicide Attempt[b] n (%)	
	2016 (n=13)	2017 (n=17)
LEGAL/ADMINISTRATIVE HISTORY	3 (23)	4 (24)
Article 15	2	1
Civil Legal Problems	1	0
Administrative Separation[c]	1	3
Medical Board[d]	0	2
PERSONAL HISTORY	9 (69)	12 (71)
Relationship Problem	6	6
Work Stress	3	7
Physical Health Problem	4	4
Victim of Abuse		
Previous Year	1	1
Ever	6	8
Perpetrator of Abuse	1	0
Spouse/Family/Friend Death	1	4
Financial Stress	3	0
Spouse/Family Health Problem	1	1
Spousal/Family/Friend Suicide Ever	2	2

Notes:
[a]Personal and legal/administrative history within 1 year before suicidal event, except as noted. Data were obtained from Department of Defense Suicide Event Reports (DoDSERs). DoDSERs were not available for 39 suicide cases in 2016 and 56 suicide cases in 2017, so these values were not reported.
[b]Cases identified from DoDSERs, which are available only for cases hospitalized or evacuated. DoDSERs were only available for activated USAR Soldiers.
[c]Considered for separation from the Army on the basis of conduct or inability to meet standards of duty performance and discipline.
[d]Medical evaluation board to determine fitness for continued duty.

Table 10. Behavioral Health (BH)[a] Indicators by Suicidal Behavior for U.S. Army Reserve Soldiers, 2016–2017

	Suicidal Behavior n (%)					
	Suicide[b]		Suicide Attempt[c]		Suicidal Ideation[c]	
	2016 (n=41)	2017 (n=62)	2016 (n=13)	2017 (n=17)	2016 (n=111)	2017 (n=133)
BH MEDICAL ENCOUNTERS[k]						
Inpatient	5 (12)	6 (10)	3 (23)	3 (19)	31 (28)	45 (34)
Outpatient	22 (54)	28 (47)	9 (69)	10 (63)	94 (85)	102 (77)
30 Days Before Event	–	–	5 (55)	7 (70)	73 (78)	77 (75)
BH DIAGNOSIS[d,e,k]	**19 (46)**	**22 (37)**	**7 (54)**	**5 (31)**	**83 (75)**	**91 (68)**
Within 1 Year Before Event	5 (26)	2 (9)	6 (86)	4 (80)	65 (78)	64 (70)
More Than One BH Diagnosis	8 (42)	14 (64)	5 (71)	4 (80)	67 (81)	70 (77)
Within 1 Year Before Event	3 (38)	1 (7)	2 (40)	3 (75)	30 (45)	33 (47)
Any Mood Disorder[f]	10 (53)	13 (59)	5 (71)	4 (80)	58 (70)	60 (66)
Within 1 Year Before Event	4 (40)	0 (0)	2 (40)	3 (75)	25 (43)	25 (42)
Posttraumatic Stress Disorder	0 (0)	4 (18)	1 (14)	2 (40)	37 (45)	34 (37)
Within 1 Year Before Event	0 (0)	0 (0)	0 (0)	2 (100)	21 (57)	21 (62)
Other Anxiety Disorder[g]	7 (37)	7 (32)	4 (57)	2 (40)	49 (59)	54 (59)
Within 1 Year Before Event	1 (14)	0 (0)	2 (50)	1 (50)	23 (47)	25 (46)
Adjustment Disorder	9 (47)	13 (59)	5 (71)	4 (80)	60 (72)	70 (77)
Within 1 Year Before Event	2 (22)	2 (15)	3 (60)	3 (75)	28 (47)	32 (46)
Substance Use Disorder	7 (37)	10 (45)	2 (29)	1 (20)	14 (17)	24 (26)
Within 1 Year Before Event	2 (29)	1 (10)	1 (50)	1 (100)	5 (36)	14 (58)
Previous Suicide Attempt/Self Harm[h]	0 (0)	2 (3)	2 (15)	1 (6)	12 (11)	12 (9)
Within 1 Year Before Event	0 (0)	1 (50)	2 (100)	1 (100)	8 (67)	8 (67)
Previous Suicidal Ideation[i]	3 (7)	3 (5)	3 (23)	2 (13)	30 (27)	45 (34)
Within 1 Year Before Event	1 (33)	1 (33)	3 (100)	2 (100)	24 (80)	36 (80)
Sleep Disorders[j]						
Within 1 Year Before Event	4 (10)	1 (2)	3 (23)	2 (13)	38 (34)	33 (25)

Legend: ICD-10 = *International Classification of Diseases, Tenth Revision*

Notes:

[a]BH medical claims data were obtained from the Military Health System Data Repository. Medical claims data were not available for 2 suicide cases and 1 suicide attempt case in 2017.

[b]Included those confirmed or pending confirmation by the Armed Forces Medical Examiner System.

[c]Cases identified from Department of Defense Suicide Event Reports (DoDSERs), which are available only for cases hospitalized or evacuated. DoDSERs were only available for activated ARNG Soldiers.

[d]Diagnosed with at least one of the following: mood, posttraumatic stress disorder, other anxiety disorders, adjustment disorder, substance use disorders, personality disorders (i.e., borderline or antisocial personality disorders or psychosis)
[e]Ever diagnosed during time in service, except as noted.
[f]Includes major depression, other depressive and bipolar disorders.
[g]Included panic disorder, generalized anxiety disorder, or obsessive-compulsive disorder.
[h]Based on ICD-10 X-,T-, and Z-codes for self-inflicted injuries.
[i]Based on an ICD-10 R-code for suicidal ideation.
[j]ICD-10 codes indicating sleep problems include F51, G47, and Z72.820.
[k]Percentages calculated based on the number of Soldiers who had medical claims data: 60 suicide cases and 16 suicide attempt cases in 2017.

6. DISCUSSION

During the 2017 calendar year, 354 ARNG Soldiers engaged in suicidal behavior: 122 died by suicide, 22 attempted suicide, and 210 had a reported suicidal ideation. In the USAR, there were 213 Soldiers with a documented suicidal behavior: 62 died by suicide, 17 attempted suicide, and 133 had a reported suicidal ideation. Overall crude suicide rates were 38 per 100,000 ARNG Soldiers and 33 per 100,000 USAR Soldiers, both of which are higher than the rate for Active Duty (AD) (25 per 100,000) Soldiers in 2017 (APHC, 2018). There was a notable increase in the rate of suicide among USAR Soldiers, from 21 per 100,000 Soldiers in 2016. Furthermore, the overall higher rates of suicide among the ARNG and USAR warrants further assessment of suicidal behavior to gain a better understanding of risk and protective factors which may differ from the Active Duty (AD) population.

The 2017 suicide rates among ARNG and AD Soldiers aged 17–24 were greater than the rates among their older counterparts. Moreover, the 2017 suicide rate among ARNG Soldiers aged 35–59 years (41/100,000 Soldiers) was almost as high as that of Soldiers 17–24 years (46/100,000 Soldiers) which was not the case for AD Soldiers 35–59 years old (APHC, 2018). These findings indicate greater focus, in the form of age-specific preventive measures, should also be placed on ARNG Soldiers who are over age 25. For example, a case series analysis or health records review could be conducted to identify significant differences across age groups and components, such as what Soldiers may consider as stressful life events and whether these events are viewed or handled differently across groups.

Conducting a case series analysis may be challenging due to the lack of access to all medical information, particularly for non-activated RC Soldiers, which comprised the majority of suicide cases. Since non-activated Soldiers seek healthcare services at medical facilities outside the Army beneficiary network, this introduces difficulties in reporting BH indicators within a relevant time frame of the suicidal event. The periodic health assessment (PHA) is a preventive screening tool designed to assess and document Individual Medical Readiness and is required for all Soldiers. The PHA collects information on BH conditions and stressors experienced within the last 12 months and may serve as an alternative source to report on these indicators for the next iteration of this report. It is important to continue to work on ways to gather complete BH data on all Soldiers, regardless of their activation status.

DoDSERs were missing for 89% (n=53) of USAR suicide cases. None of these Soldiers were activated at the time of their suicide. As a result, we were unable to report on stressors and other personal/legal problems experienced among this group prior to the suicide event. This finding was not the case for the ARNG, as only 10% of all ARNG suicide cases were missing DoDSERs. This discrepancy in reporting between the USAR and ARNG may be attributed to the ARNG suicide prevention program being primarily responsible for managing the completion of DoDSERs; this may not be the case for the USAR. All DoDSERs completed for activated USAR suicide cases were entered by the DoDSER data manager at the APHC using information contained within the ABHIDE. In November 2017, the DOD implemented an Instruction requiring DoDSER completion for suicides and suicide attempts among the Selected Reserve (i.e., Troop Program Units, the Active Guard and Reserve, and Individual Mobilization Augmentees) (DOD, 2017). However, a policy mandating or establishing a USAR suicide prevention program that includes oversight of DoDSER completion as one of its primary duties should be devised and implemented to increase documentation and reporting of these important data elements.

Implementation of the aforementioned DODI (DOD, 2017) may result in increased reporting of suicide attempts among non-activated Selected Reserve Soldiers. However, since these cases are reported only during hospitalizations within the Army healthcare system, the Instruction's impact on overall capture remains uncertain.

7. CONCLUSION

These findings highlight the importance of implementing suicide prevention programs across all components. Further investigation is needed to assess the substantial increase in suicide rates among USAR Soldiers from 2016 to 2017. While targeting suicide prevention efforts toward young, enlisted RC Soldiers remains important, such efforts should also target older RC Soldiers (over 25 years of age) and should expand to non-activated RC Soldiers, as the latter group accounted for the majority of suicide cases. Since DoDSERs for non-activated USAR cases and medical records during non-active status were not available, efforts to identify alternate sources of personal/legal problems and BH information will be made in future reports. A recent DODI (DOD, 2017) requiring DoDSER completion for RC suicide and attempt cases may improve the capture of BH conditions and stressors among non-activated members of this Army population.

8. POINT OF CONTACT

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APPENDIX A

REFERENCES

AFMES. 2018. https://www.health.mil/Military-Health-Topics/Research-and-Innovation/Armed-Forces-Medical-Examiner-System. Accessed 28 August 2018.

APHC. 2018. Technical Report No. S.0049809.1, *Surveillance of Suicidal Behavior, January through December 2017.* Prepared by Brooks RD, E Corrigan, M Toussaint, and JA Pecko. Aberdeen Proving Ground, Maryland.

DA. 2019. Regulation 638–8, *Army Casualty Program.* https://armypubs.army.mil/

DMDC. 2018. *DMDC Overview.* https://dwp.dmdc.osd.mil/appj/dwp/dmdc_overview.jsp. Accessed 21 August 2019.

DOD. 2017. Instruction 6490.16, *Defense Suicide Prevention Program.* https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/649016_dodi_2017.pdf?ver=2017-11-06-141259-267

MDR. 2019. https://www.health.mil/Military-Health-Topics/Technology/Clinical-Support/Military-Health-System-Data-Repository. Accessed 21 August 2019.

NCQA. 2010. *HEDIS® Technical Specifications 2011.* Vol. 2. Washington, DC: NCQA.

Spiess A, MS Gallaway, EY Watkins, E Corrigan, JV Wills, JC Weir, AM Millikan Bell, and MR Bell. 2016. The ABHIDE (Army Behavioral Health Integrated Data Environment): A suicide registry. *Mil Behav Health* 4(1):8–17; doi: 10.1080/21635781.2015.1093974

T2. 2017. *Department of Defense Suicide Event Report (DoDSER) Calendar Year 2016 Annual Report*. http://www.dspo.mil/Portals/113/Documents/DoDSER%20CY%202016%20Annual%20Report_For%20Public%20Release.pdf?ver=2018-07-02-104254-717. Accessed 21 August 2019.

APPENDIX B

METHODS

B-1 POPULATION AND DEFINITIONS

This surveillance report describes the population of U.S. Army Reserve Component (RC) Soldiers aged 17–59 who experienced suicidal behavior during calendar year 2017. Suicidal behavior counts were provided for suicide cases among both activated and non-activated RC Soldiers; non-activated RC suicide cases only included Selected Reserve Soldiers. Suicide attempt and suicidal ideation cases were only reported for activated RC Soldiers.

The following National Center for Telehealth and Technology (T2) definitions (T2, 2017) apply to this report:

- Suicide: Self-inflicted death with evidence (either explicit or implicit) of intent to die.
- Suicide attempt: A self-inflicted, potentially injurious behavior with a non-fatal outcome for which there is evidence (either explicit or implicit) of intent to die.
- Suicidal ideation: Any self-reported thoughts of engaging in suicide-related behaviors.

B-2 DATA SOURCES

The Army Behavioral Health Integrated Data Environment (ABHIDE) is a comprehensive database containing information on Soldiers who exhibited a suicidal behavior while serving in the U.S. Army (Spiess, et al., 2016). The ABHIDE includes data from multiple data sources: Armed Forces Medical Examiner System (AFMES), Defense Manpower Data Center (DMDC), Military Health System Data Repository (MDR), Department of Defense Suicide Event Report (DoDSER) system, and Defense Casualty Information Processing System (DCIPS). (See Appendix C, Figure C-1 for a complete list of the data sources included in the ABHIDE.)

The AFMES provides the Department of Defense (DOD) and other Federal agencies with comprehensive forensic investigative services, including medical mortality surveillance and forensic pathology. As such, the AFMES was the primary source for identifying suicide cases among activated RC Soldiers (AFMES, 2018). Data for suicide cases among non-activated RC Soldiers were obtained from Army G-1, which ensures current and future personnel readiness and well-being of the Army through the development and integration of policies and programs for all Army components. The DoDSER system, the principal suicide surveillance tool used to collect and report the contextual factors present among Service members who engaged in suicide-related behavior, was primarily used to identify suicide attempt and suicidal ideation cases (T2, 2017). DoDSERs are completed by behavioral health (BH) providers (e.g., mental health counselors, psychiatrists or social workers) based on their review of Soldier health records and/or interviews with the Soldier's healthcare providers (medical professionals), Family members, friends, or coworkers. The DMDC is a data repository which receives and maintains demographic, military, and deployment information on all military personnel, thus creating an archive of information throughout a Soldier's military career (DMDC, 2018). ARNG and USAR

population totals (or rate denominators) were obtained from DMDC. Medical encounters related to suicide were extracted from the MDR, the centralized data repository that captures and archives military healthcare data worldwide, both direct and purchased care (MDR, 2018). The DCIPS interfaces with the DMDC to retrieve personnel data. By providing casualty statistics, the DCIPS serves as a supplemental source for information pertaining to both the person and the suicide event (Department of the Army (DA), 2019).

B-3 METRICS

Suicidal Behavior:
Data for suicide cases among activated and non-activated RC Soldiers were obtained from the AFMES (including confirmed and pending cases) and Army G-1, respectively. Pending cases are those under investigation. DoDSERs for RC suicide cases are required to be completed within 60 days of AFMES confirmation. Information on personal and legal/administrative history and other variables obtained from the DoDSER are not available for pending/probable cases under investigation.

Data for suicide attempt and suicidal ideation cases among activated RC Soldiers were identified by DoDSERs, which are completed only for cases hospitalized or evacuated within 30 days of the event. Suicidal ideation cases were also identified by isolating inpatient medical encounters with *International Classification of Diseases, Ninth Revision* (ICD-9) code (V6284) or *International Classification of Diseases, Tenth Revision* (ICD-10) code (R45851) in any diagnosis positions (Dx1–Dx8) in the MDR. The Army's DoDSER Program Manager enters unreported ideation cases from the MDR into the DoDSER system. Inpatient medical encounters were not used to identify suicide attempt cases since suicide attempt encounter codes do not distinguish between suicide attempts and non-suicidal self-harm.

Personal and Event Characteristics:
Demographic (i.e., sex, age, race, marital status) and *military* (i.e., rank and activation status) characteristics were obtained from the following sources in the order of most to least complete: (1) DMDC, (2) AFMES and/or, (3) DoDSERs. Each variable was categorized accordingly: sex (i.e., Male and Female), age (i.e., 17–24, 25–34, 35–64), race-ethnicity (i.e., White, Black, Hispanic, Asian/Pacific Islander, and American Indian), marital status (i.e., Single, Married, Divorced, and Other), rank (i.e., E1–E4, E5–E9, W1–W5, O1–O3, O4–O9, Cadets), and activation status (i.e., Activated and Non-activated). The race-ethnicity category "American Indian" included Alaska Natives and Native Americans. The "Other" category for marital status included widowed or legally separated persons.

Event characteristics included location (i.e., U.S., In Theater, Other, and Unknown), method of event (i.e., Gunshot wound, Hanging/asphyxiation, Drug/alcohol overdose, Cutting, Other, and Unknown), substance involvement (i.e., drugs and alcohol), and communication prior to event. Communication prior to the event was defined as communicating potential for self-harm verbally, through writing, or via text message to a supervisor, chaplain, mental health staff, friend, or spouse; suicide notes were excluded. The location and method of suicides and attempts were obtained from the DCIPS and DoDSERs, respectively. All other event

characteristics were obtained from DoDSERs. Event characteristics were collected for suicides and suicide attempts only.

Personal and Legal/Administrative History:
Major life events and stressors of interest occurring within 1 year of the suicidal behavior event and reported on DoDSERs were grouped into two major, non-mutually exclusive themes: Legal/administrative history and Personal history. Personal and legal/administrative issues were collected only for those suicides and suicide attempts that were documented in DoDSERs.

Legal/administrative history included Article 15, Uniform Code of Military Justice proceedings; civil legal problems; administrative separation; and medical board. Administrative separation is based on Soldier misconduct or inability to meet the standard of duty. Soldiers on medical board status are being evaluated to determine their fitness for continued duty.

Personal history encompassed relationship problems, work stress, physical health problems, victim or perpetrator of abuse, financial stress, and the death, suicide, and/or health problems of a spouse, Family member, or friend. Indication of work problems included workplace hazing, job problems, poor performance, and coworker conflicts. Lifetime histories for being a victim of abuse or experiencing the death of a Family member or friend were collected due to their potential negative impact on Soldiers' quality of life.

Behavioral Health Conditions:
Medical encounters and diagnoses for BH conditions were based on medical claims occurring in the military healthcare system while on active status during a Soldier's time in service and were obtained from the MDR. Inpatient and outpatient medical encounters with an ICD-9 or -10 code of interest in any diagnosis position, i.e., Dx1–Dx8 or Dx1–Dx4, respectively, were isolated. See Appendix C, Table C-1 for the list of BH conditions of interest and their corresponding ICD-9/10 code(s).

A diagnosis was defined as an inpatient encounter with an ICD-9/10 code in any diagnosis position of Dx1–Dx8, or an outpatient encounter with ICD-9/10 codes for the same condition in the second through fourth diagnosis positions (Dx2–Dx4) dated within 1 year but not on the same day. These definitions were based on the Healthcare Effectiveness Data and Information Set guidelines from the National Committee for Quality Assurance (NCQA) for major depressive disorders and were applied to all BH conditions (NCQA, 2010).

B-4 ANALYSIS

Descriptive statistics (e.g., counts, proportions, and means) were calculated for each variable by suicidal behavior in 2016 and 2017. Annual crude suicide rates were calculated for 2016 and 2017 by dividing the number of RC Soldiers who died by suicide by the total population averaged across 12 months for U.S. Army Soldiers aged 17–59 then multiplying by 100,000. Suicide rates for ARNG and USAR Soldiers were calculated separately. Stratified crude suicide rates were calculated by sex, rank and age by dividing the number of suicides by the total population of Soldiers within the respective category. The most serious recent event was counted for Soldiers who had more than one suicidal event. Rates account for differences in the

total number of Soldiers across years and/or categories, which allows for more appropriate comparisons. Crude rates (number of suicides/100,000 Soldiers) and 95% confidence intervals were reported. All data management and analytical procedures were performed using SAS® 9.4 and Microsoft® Excel®.

B-5 LIMITATIONS

This report included suicide cases among activated and non-activated Soldiers, however, suicide attempt and suicidal ideation cases were included for only activated Soldiers. The person who completes the DoDSER may not be familiar with the case, resulting in missing fields/entries. However, in an attempt to increase completeness, medical providers who were familiar with the suicidal behavior case are also interviewed to ascertain relevant information. Suicide attempt and suicidal ideation cases were captured only if the Soldier was hospitalized or evacuated, which may have resulted in underestimated counts. While ICD codes were used to capture additional suicidal ideation cases, ICD codes were not used to capture additional suicide attempt cases because ICD-10 codes for sucide attempts also include self-harm and do not differenticate between the two behaviors. For this reason, only suicide attempts with completed DoDSERs were captured. Although the most recent serious event was captured for each Soldier, history of suicidal behavior among cases was also ascertained. Population data were not available by race/ethnicity, so race-specific rates were not calculated. Rates of suicide attempt and suicidal ideation were not calculated because population (denominator) data for RC Soldiers were not separated by activation status. After an alternate data source is obtained for the next report, race-stratified attempt and ideation rates will be calculated and reported.

APPENDIX C

SUPPLEMENTAL TABLES AND FIGURES

Table C-1. Categories of Behavioral Health Medical Encounters and Diagnoses

Broad Category	Diagnosis Category	ICD-9 DX, V-Codes, E-Codes	ICD-10 DX, Z-Codes
Behavioral Health (BH) Conditions			
Organic Conditions		290, 293, 294, 310	F01–F04
Substance Use	Alcohol	291, 303, 3050	F10
	Drugs	292, 304, 3052–3059	F11–F19
Personality Disorder		301	F21, F60
Psychosis	Schizophrenia	2950–2953, 2955–2959	F20
	Schizophreniform	2954	
	Delusional or Shared	297, 2971, 2973	F22, F24
	Paranoia	2970, 2972, 2978, 2979, 2983, 2984	F22, F23
	Brief Psychotic Disorder	2988	F23
	Psychosis NOS	2989	F29
	Other Psychoses	2908, 2909, 298, 2980, 2981, 2982	F28
Mood Disorders	Bipolar	2960, 2964–2968	F30, F31, F340
	Major Depression	2962, 2963	F32 OR F33
	Dysthymia	3004	F341
	Depression NOS	311, 29699	F348 OR F349
	Other Mood	296, 2961, 2969, V790	F39
Anxiety	Social Phobia	30023	F40
	Phobias	30020, 30022, 30029	
	Anxiety NOS	300, 3000, 30000	F41

Broad Category	Diagnosis Category	ICD-9 DX, V-Codes, E-Codes	ICD-10 DX, Z-Codes
	Other Anxiety	30009, 30010	
	Panic	30001, 30021	
	GAD	30002	
	OCD	3003	F42
Acute Stress Reaction		308	F430
PTSD		30981	F431
Adjustment Disorder		All 309 (except 309.81)	F432, F438, F439
Dissociative		30012–30015, 3006	F44, F481
Conversion		30011	F44
Somatoform		3007, 3008, 3078	F45
Eating Disorder		3071, 3075	F50
Factitious		30016, 30019	F681
Attention Deficit Disorder		314	F90
Conduct/Emotional Disorder		312, 313	F91
Unspecified Mental Disorder		3009	-
Psych Factors, Physical Condition		306, 316	-
Other BH Conditions		299, 302, 315, 317–319, 3070, 3072, 3073, 3076, 3077	F52, F66, F70, F804, F808, F84, F95, F984, F985, F64–F659, F800–F802, F81–F82, F88–F89, F980–F981, F4321, F1010
BH Screening		-	Z046, Z0471, Z0472, Z134
Partner Relationship Problems		V6100–V6104, V6110	Z630
Family Circumstances Problems		V612, V618, V619	Z62, Z635–Z639
Maltreatment Problems		99580–99585, V6111, V6112, V6121, V6122, V6283	T74, T76, Z69–Z6982
Life Circumstance Problems		V620–V625, V628–V629	Z72810, Z72811, Z73–Z736, Z55–Z559, Z56–Z569, Z60–Z609, Z65–Z659
Mental or Behavioral Problems, Substance Abuse Counseling		V40, V402, V403, V409, V6542	Z714–Z7142, Z715–Z7152

Broad Category	Diagnosis Category	ICD-9 DX, V-Codes, E-Codes	ICD-10 DX, Z-Codes
Personal Trauma		9955, V154, V6121	Z914, Z9149 , Z91410, Z6281, Z69010, Z69020, Z6911, Z6981
Suicidal Ideation		V6284	R45851
Suicide Attempt/Self-harm		E95–E959, E98–E9890	X71–X83, X838XX, T3992X, T1491, T1491X, T1491XA, Z915, T360X2 –T375X2, T378X2, T379X2–T387X2, T38802, T38812, T38892, T38902, T38992, T39012, T39092, T391X2, T392X2, T39312, T39392, T394X2, T398X2, T3992, T400X2–T405X2, T40602, T40692, T407X2, T408X2, T40902, T40992, T410X2, T411X2, T41202, T41292, T413X2, T4142, T415X2, T420X2–T426X2, T4272, T4272X, T428X2, T43012, T43022, T431X2, T43202, T43212, T43222, T43292, T433X2, T434X2, T43502, T43592, T43602, T43612, T43622, T43632, T43692, T438X2, T4392, T440X2–T448X2, T44902, T44992, T450X2–T454X2, T45512, T45522, T45602, T45612, T45622, T45692, T457X2, T458X2, T4592, T460X2,–T468X2, T46902, T46992, T470X2– T478X2, T4792, T480X2, T481X2, T48202, T48992, T483X2– T486X2, T48902, T48992, T490X2– T498X2, T4992, T500X2–T508X2, T50902, T50992, T50A12, T50A22, T50, T50A92, T50B12, T50B92, T50Z14, T50Z92, T510X2–T513X2, T518X2, T5192, T5192X, T520X2–T524X2, T528X2, T5292, T530X2–T537X2, T5392, T540X2–T543X2, T5492, T550X2, T551X2, T560X2–T568X2, T56892,

Broad Category	Diagnosis Category	ICD-9 DX, V-Codes, E-Codes	ICD-10 DX, Z-Codes
			T5692, T570X2–T573X2, T578X2, T5792, T5802, T5802X, T5812, T582X2, T588X2, T5892, T590X2–T597X2, T59812, T59892, T5992, T600X2–T604X2, T608X2, T6092, T6102, T6112, T61772, T61782, T618X2, T6192, T620X2–T622X2, T628X2, T6292, T63002, T63012, T63022, T63032, T63042, T63062, T63072, T63082, T63092, T63112, T63122, T63192, T632X2, T63302, T63312, T63322, T63332, T63392, T63412, T63422, T63432, T63442, T63452, T63462, T63482, T63512, T63592, T63612, T63622, T63632, T63692, T63712, T63792, T63812, T63822, T63832, T63892, T6392, T6402, T6482, T650X2, T651X2, T65212, T65222, T65292, T653X2–T656X2, T65812, T65822, T65832, T65892, T6592, T71112, T71122, T71132, T71152, T71162, T71192, T71222, T71232
Sleep Disorders		29182, 29285, 3074–30748, 327–3278, 7805–78056, 78058, V694, 327–32780, 7805–78056, 78058, V694	F51, G47, Z72820
V-codes and Z-codes are not diagnostic codes; they are are used for coding encounters.			

Legend:
GAD = generalized anxiety disorder
ICD = *International Classification of Diseases*
NOS = not otherwise specified
OCD = obsessive-compulsive disorder
PTSD = posttraumatic stress disorder

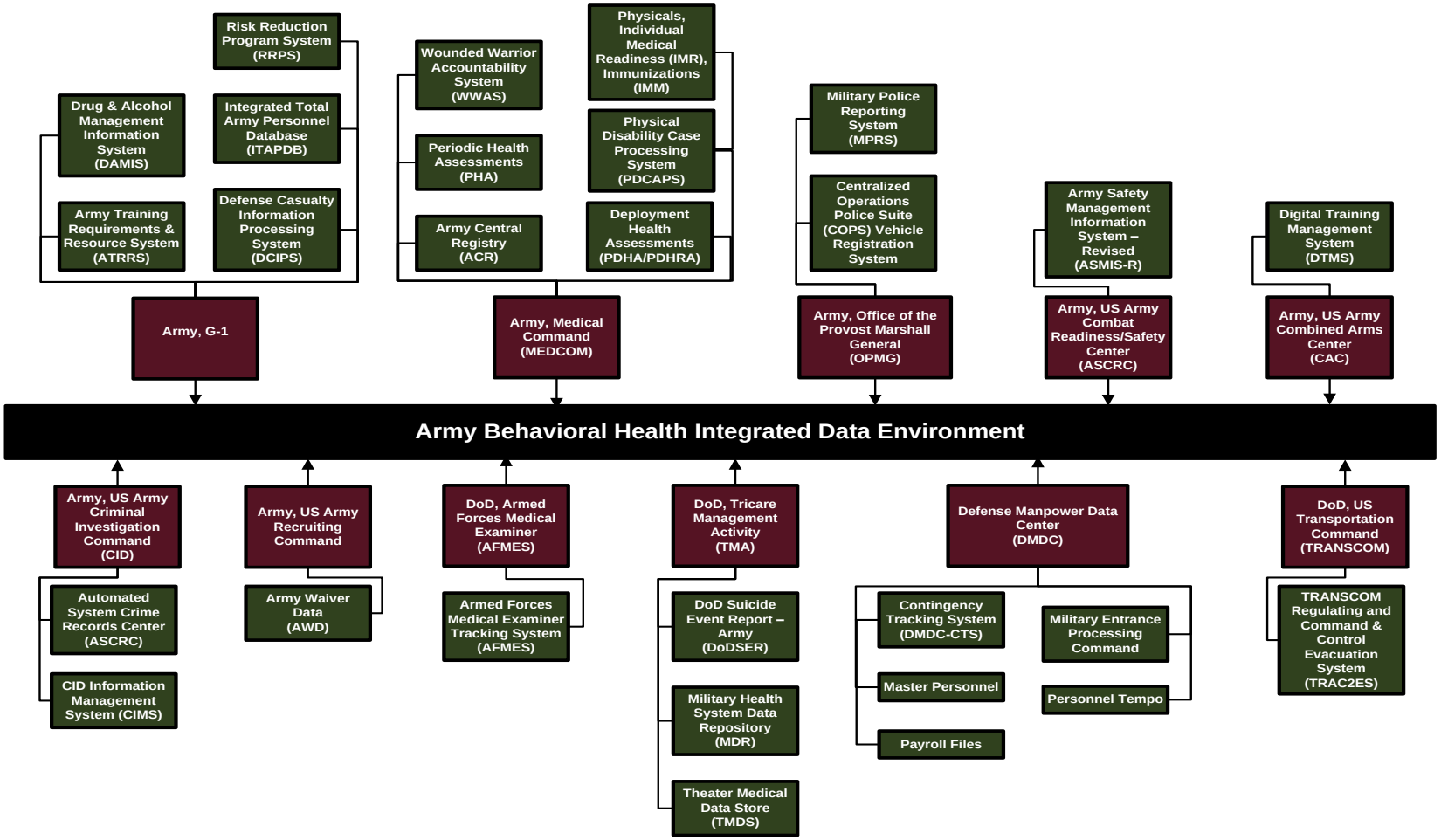

Figure C-1. Administrative Data Sources in the Army Behavioral Health Integrated Data Environment

GLOSSARY

ACRONYMS AND ABBREVIATIONS

ABHIDE
Army Behavioral Health Integrated Data Environment

AFMES
Armed Forces Medical Examiner System

APHC
U.S. Army Public Health Center

AR
Army regulation

ARNG
U.S. Army National Guard

BH
Behavioral health

BSHOP
Behavioral and Social Health Outcomes Program

CI
Confidence interval

DA
Department of the Army

DCIPS
Defense Casualty Information Processing System

DMDC
Defense Manpower Data Center

DOD
Department of Defense

DODI
Department of Defense instruction

DoDSER
Department of Defense Suicide Event Report

E
Enlisted

GAD
Generalized anxiety disorder

ICD-9
International Classification of Diseases, Ninth Revision

ICD-10
International Classification of Diseases, Tenth Revision

MDR
Military Health System Data Repository

NCQA
National Committee for Quality Assurance

NOS
Not otherwise specified

O
Officer

OCD
obsessive-compulsive disorder

PHA
Periodic Health Assessment

PTSD
posttraumatic stress disorder

RC
Reserve Component

SAS
Statistical Analysis System

T2
National Center for Telehealth and Technology

USAR
U.S. Army Reserve

WO
Warrant Officer