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Mortality Surveillance in the U.S. Army, 2014–2019

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PUBLIC HEALTH REPORT NO. S.0087545-22
MORTALITY SURVEILLANCE IN THE U.S. ARMY, 2014–2019

1 SUMMARY

1.1 Purpose

The U.S. Army Public Health Center (APHC) Division of Behavioral and Social Health Outcomes Practice (BSHOP) conducts mortality surveillance to provide U.S. Army leaders and public health practitioners with information on leading categories and causes of death largely affecting Regular Army (RA), activated U.S. Army National Guard (ARNG), and activated U.S. Army Reserve (USAR) Soldiers. The report describes the overall characteristics of U.S. Army Soldiers who have died from January 2014 to December 2019, assesses trends in annual crude rates, and compares direct age- and sex-adjusted mortality rates between the U.S. and Army populations. In addition, this report presents preliminary mortality data for calendar year 2020. This information is necessary to focus prevention efforts, plan programs, allocate resources, develop policies, monitor trends, and suggest mitigating strategies.

1.2 Methods

This retrospective surveillance analysis used administrative data sources to report on mortality among Cadets, RA, activated ARNG, and activated USAR Soldiers who died at ages 17 to 64 years from 2014 to 2019. Preliminary 2020 data for category of death are briefly presented because at the time of writing the report, complete data about causes of death were not available. These data provide insight into the mortality patterns during the beginning of the Coronavirus (COVID-19) pandemic. The Defense Civilian Intelligence Personnel System (DCIPS) and Armed Forces Medical Examiner System (AFMES) provided information on the category of death. This report uses seven groups for category of death, which are consistent with AFMES classification (accident, natural, suicide, homicide, combat, pending, and undetermined). The Suicide Data Repository (SDR), which is maintained by the Department of Defense (DoD) and Department of Veterans Affairs (VA), was the primary source of underlying cause of death because this information is no longer available from AFMES or DCIPS. This database has comprehensive cause of death information for all categories of death from sources such as the National Death Index (NDI) and Defense Casualty Analysis System (DCAS). Demographics such as sex, age, rank, and component were obtained from AFMES/DCIPS, and race-ethnicity along with Army population estimates were obtained from the Defense Manpower Data Center (DMDC).

Univariate statistics (counts and percent) were used to report the distribution of categories of death stratified by causes, age, sex, rank, component, and race-ethnicity over the cumulative period of 2014–2019. Annual crude rates for each category of death were calculated, and trends over time were assessed using Poisson regression. To calculate the crude rates, the number of deaths were divided by the number of Soldiers per year and multiplied by 100,000. Annual rates for combat and homicide categories of death were not included due to the high number of instances with fewer than 20 cases, which would lead to unstable rates. Direct age- and sex-

adjusted annual mortality rates for suicide, accidental, and natural deaths were compared between the U.S. Army and the U.S. population.

1.3 Results

From January 2014 to December 2019, there were 2,530 deaths in the Active Component of the U.S. Army. Most occurred among Soldiers who were male (92%), 17–34 years of age (68%), Non-Hispanic White (62%), RA (84%), and junior enlisted (E1–E4, 41%). These percentages are very similar to the overall sex, age, and rank distribution of the U.S. Army. Suicide (35%) and accidental (32%) deaths accounted for the largest proportion of deaths from 2014 to 2019. The leading underlying causes were motor vehicle crashes (n=74) followed by suicide by gunshot wound (n=73).

Note, the majority of Soldiers who died during this period, especially by accident (unintentional injury) and suicide, were young men between 17 and 34 years of age. In contrast, Soldiers who died from natural causes were often over age 34 years, senior enlisted, or in the Reserve Component, while the distribution of homicides was similar between Non-Hispanic White and Non-Hispanic Black Soldiers. Suicide (39%) and accidental deaths (26%) accounted for the largest proportion of deaths in calendar year 2020.

Suicide and accidental deaths had the highest crude mortality rates across the 6-year period. The crude mortality rate for accidental and suicide deaths increased from 2014 to 2019 but this increase was not statistically significant. Crude mortality rates for natural deaths decreased significantly over the 6-year period by 6% from year-to-year.

Each year from 2014 to 2019, the sex- and age-adjusted rates of death due to accidents and natural causes were significantly lower in the U.S. Army than in the U.S. population. For all the years in this report, the sex- and age-adjusted suicide rate in the U.S. Army surpassed the rate in the U.S. population, despite the rising suicide rate in the U.S. population.

1.4 Conclusions

This publication characterizes deaths from all causes among Active Duty RA, activated ARNG, and activated USAR Soldiers from 2014 to 2019. Overall, mortality rates from natural causes declined significantly. Suicide rates rose with each year. The decline in some mortality rates may be attributed to—

- Prescription monitoring programs that identify suspicious drug usage and access;
- Initiatives to reduce transportation-related accidents;
- The withdrawal and winding down of combat operations in Iraq and Afghanistan; and
- Programs directed to improve the physical and mental health of Soldiers.

This publication also highlights trends for suicide and accidental deaths and existing programs like the U.S. Army Suicide Prevention Program (SP2) and Travel Risk Planning System (TRiPS). Programs such as these need continuous support to remain effective, but also need to be periodically reevaluated to ensure successful initiatives remain in place and ineffective ones are replaced. In addition, the DoD's continued efforts to ensure Service members receive

regular health evaluations and referrals to various clinical and non-clinical services remain extremely important. However, this is not to discount the importance of preventive measures, which are also vital to maintaining optimal physical and mental health, such as the performance triad (P3).

Army mortality rates for natural and accidental deaths were lower when compared to rates for the U.S. population. However, Army suicide rates were statistically higher. Targeting young (17-34), male, and enlisted Soldiers is of particular importance due to their high amounts of preventable deaths (i.e., motor vehicle accidents and suicide). However, most natural deaths occurred in older (over 35), senior enlisted, male, Reserve Component Soldiers. This emphasizes the continued need to ensure Soldiers get appropriate annual screenings and the need to make sure that Soldiers in the Reserve Components are also targeted by prevention programs.

2 REFERENCES

Appendix A lists references used within this report. The glossary provides a list of abbreviations.

3 AUTHORITY

Army Regulation (AR) 40-5 (*Army Public Health Program*, 12 May 2020), Section 3-5.

4 BACKGROUND

The APHC's BSHOP analyzes surveillance data on mortality from all causes among Active Duty RA, activated ARNG, and activated USAR Soldiers. This report describes the characteristics of Soldiers who died from 2014 to 2019 and presents observed trends in the categories and causes of Soldier deaths over this time frame. In addition, this report presents preliminary mortality data for calendar year 2020.

Mortality surveillance has long been a useful tool in public health. It serves a variety of purposes including evaluating the effectiveness of adopted policies or looking for new or unusual trends in specific populations.[1] In the U.S. Army, mortality surveillance serves primarily to evaluate the effectiveness of accidental (unintentional) injury and suicide prevention efforts, monitor and identify continuing and emerging health trends, and inform program planning and resource allocation.

5 METHODS

5.1 Study Population

This retrospective surveillance analysis includes information on U.S. Army mortality among RA, activated ARNG, and activated USAR Soldiers from 2014 to 2019. Preliminary distribution of category of death for calendar year 2020 are presented because at the time of writing the report, complete data about causes of death were not available. Soldiers were included in this study if they were between 17 and 64 years of age at the time of death; Soldiers older than 64 at the time of death were excluded because the mandatory retirement age in the U.S. Army is

64. Aside from certain exceptions (like service secretaries), remaining on Active Duty over age 64 is extremely rare and deaths in that age group were considered outliers. Former U.S. Army Soldiers who died while in service with a foreign military were also excluded.

5.2 Data Sources and Metrics

The DCIPS collects information on Service members who died during their time in service, which was the primary source of *category of death* for U.S. Army Soldiers as determined by a civilian or AFMES coroner/medical examiner. The DoD Medical Mortality Registry, which is maintained by the Mortality Surveillance Division of the AFMES, served as the secondary source of information pertaining to category of death if information was missing in DCIPS. These data were current as of November 2021. AFMES has the legal authority under United States Code (U.S.C.) 1471 to review and change category of death for military tracking purposes using guidelines from the National Association of Medical Examiners (NAME). Depending on the jurisdiction, civilian personnel or AFMES medical examiners will conduct an investigation and issue a death certificate, autopsy report, toxicology report, and/or investigative report. Medical examiners and forensic pathologists follow accepted national standards and guidelines set forth by the NAME to classify deaths into five manners, based on an assessment of available circumstantial information and autopsy findings.[2] However, the U.S. Army reports seven categories of death, separating combat deaths from homicide and separating pending from undetermined. Because "manner of death" has a specific definition, this publication will use "category of death" to remain aligned with how the U.S. Army and AFMES report death classifications.

Consistent with the U.S. Army and AFMES, this publication reports seven categories of death: combat, accident, natural, suicide, homicide, undetermined, and pending. An accidental death is an unexpected, unintentional injurious event. A natural death is the result of disease, illness, or the aging process. A suicide is a death resulting from intentional fatal self-injury. Death by homicide is the result of being killed by another human. Combat deaths that occurred in theater are because of hostile action. If the manner of death cannot be determined from the evidence, then the death is classified as undetermined. Deaths that are still under investigation and on which determination has not been made are classified as pending. Most deaths initially classified as pending are confirmed and reclassified into another category within 12 months.

The SDR, created and maintained by a collaborative effort between the DoD and VA to improve suicide data across the DoD, served as the primary source of information on the *underlying cause of death* for all categories of death because this information is not available from AFMES or DCIPS. AFMES and DCIPS were used solely to determine category of death. These data were current as of November 2021. Cause of death is defined as the initial event that led to the chain of events resulting in death and is recoded from *International Classification of Disease*, *Tenth Revision* (ICD-10) codes obtained from the National Death Index.[3-5] For example, if *accident* is the category of death, then possible causes of death under *accident* may be drowning, suffocation, poisoning, or falls. Data on the causes of combat deaths are based on ICD-10 codes Y36 (Operations of war) and Y89.1 (Sequelae of war operations); therefore, no additional causes are presented for combat-related deaths. These definitions were obtained from the World Health Organization's (WHO) ICD-10 manual.[4] Table B-9 in Appendix B provides the categorization for major causes of death and respective ICD-10 codes.

The Centers for Disease Control and Prevention (CDC) Web-based Injury Statistics Query and Reporting System (WISQARS) was used to obtain population numbers and counts for accidental and suicide deaths in the U.S. population for males and females aged 17–64.[6] CDC Wide-ranging Online Data for Epidemiologic Research (WONDER) was used to obtain data relating to natural deaths.[3]

Demographic and military characteristics were obtained from the DMDC and classified into the following groups:

- Sex (female and male),
- Age (17–24 years, 25–34 years, 35–44 years, and 45–64 years),
- Rank (E1–E4, E5–E9, O1–O3, O4–O8, W1–W5),
- Race-ethnicity (Non-Hispanic White, Non-Hispanic Black, Non-Hispanic Asian/Pacific Islander, Hispanic, Non-Hispanic Native American, and unknown), and
- Component (RA, activated ARNG and activated USAR).

There were no Soldiers in ranks O9 or O10 in these data. To obtain the total population of the U.S. Army (also known as Army Strength), troop counts for September of each year were derived using DMDC population numbers.

5.3 Analytical Approach

The distribution of deaths overall, by causes and personal characteristic (i.e., sex, age, rank, race-ethnicity, and component) were presented using univariate statistics (counts and proportions). The five leading underlying causes of death are reported and based on counts. Tables B-5–B-8 in Appendix B shows the five leading causes of death stratified by age, sex, race-ethnicity, and rank.

Crude annual mortality rates by category of death were calculated and assessed for statistically significant trends from 2014 to 2019 using Poisson regression. Rates were not calculated for homicides and combat deaths because each category included fewer than 20 deaths per year and such rates are statistically unreliable estimates.[7,8] Rate ratios and 95% confidence intervals from the trend analyses are interpreted.

Direct age- and sex-adjusted annual mortality rates for the U.S. Army and the U.S. population were calculated and compared for suicide, accidental, and homicide deaths. The reference population for direct adjusted rates was the 2014 U.S. Army population. Since the U.S. Army population is younger and has a higher proportion of men than the U.S. population, adjusted rates are necessary because they control for the effects of age and sex differences between populations.[9] Sex- and age-adjusted rates were not calculated for combat, undetermined, and pending deaths as no comparison could be made with the general public. Statistical differences between age- and sex-adjusted rates for the U.S. Army and U.S. population were assessed using methodology adapted from the CDC's National Center for Health Statistics, which is based on the number of deaths, population size, and the size of the difference between the rates.[5-7]

Mortality data are not subject to sampling error because it is expected that all deaths in the population are captured, so 95% confidence intervals are not reported for crude or adjusted rates.[10] All data management and statistical analyses were conducted using SAS® 9.4 and Microsoft® Excel®.

6 RESULTS

6.1 Category and Cause of Death

From 2014 to 2019, 2,530 deaths occurred among U.S. Army Soldiers (Figure 1). During this period, suicide deaths (n=886, 35%) were the most common category of death, followed by accidental deaths (n=822, 33%). Half of the accidental deaths were transportation related (49%) and 15% were accidental overdoses (Figure 3). Gunshot wounds were the cause of 65% of suicide deaths followed by hanging/asphyxiation at 26% (Figure 4). Natural deaths (21%, n=539), which was the next most frequent category of death, were often caused by neoplasms or cancers (49%) (Figure 5). From 2014 to 2019, 94 deaths (4%) were homicides. Gunshot wounds were the cause of 79% of the homicide deaths (Figure 6). However, if legal interventions (i.e., includes legal execution and deaths by police or other law-enforcement agents) are included, that number increases to 82%. In 2019, the leading causes of death were gunshot wound (n=87) followed by motor vehicle crashes (n=74) (Table 1). The distribution for category of death was similar in 2020 with suicides accounting for 39% (n=186) and accidents representing 26% (n=124) of deaths (Figure 2). Table B-1 in Appendix B provides cumulative and annual counts and proportions for each category and cause of death.

6.2 Demographic and Military Characteristics

From 2014 to 2019, the plurality of deaths were among RA (85%), male (92%), and Non-Hispanic White (62%) Soldiers. For age and rank, distributions were similar between Soldiers 17–24 (33%) and 25–34 (35%) years old, and junior (41%) and senior (45%) enlisted (Table 2). Similar patterns were observed across most categories of death with the exception of natural and homicide deaths. Natural deaths occurred more frequently among Soldiers 35–44 (36%) or 45–64 (34%) years old, in the Reserve Component (25%), or who were senior enlisted (57%). Furthermore, deaths by homicide were distributed approximately equally between non-Hispanic White (44%) and non-Hispanic Black (40%) Soldiers.

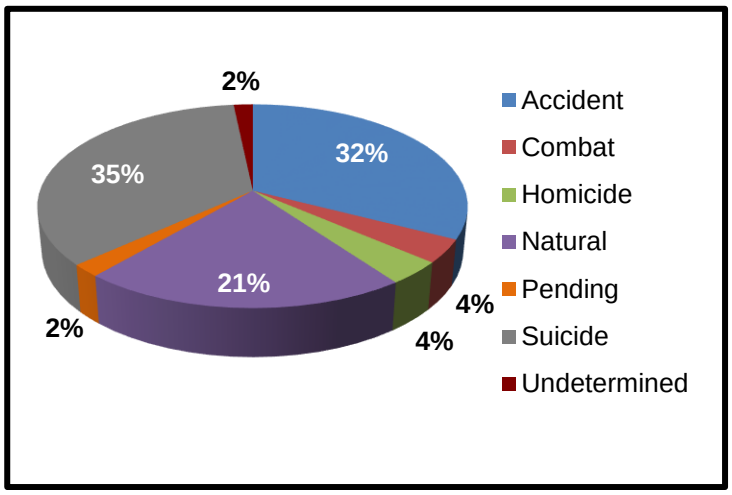

Figure 1. Categories of Deaths among U.S. Army Soldiers, 2014–2019 (n=2,530)

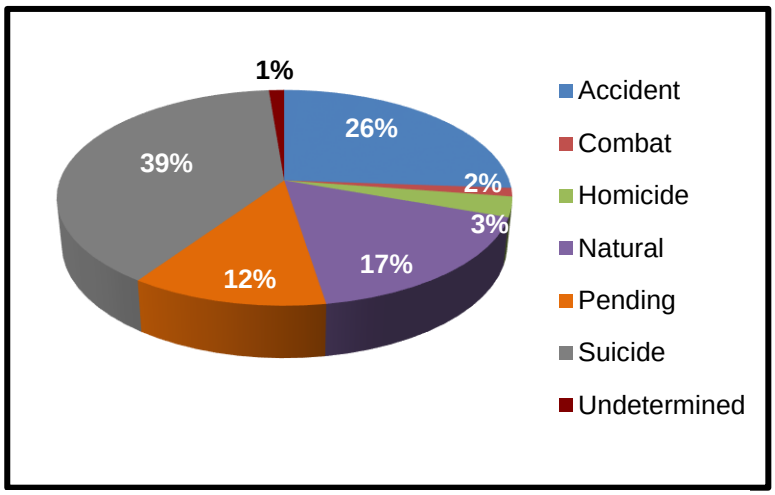

Figure 2. Categories of Deaths among U.S. Army Soldiers, 2020 (n=479)

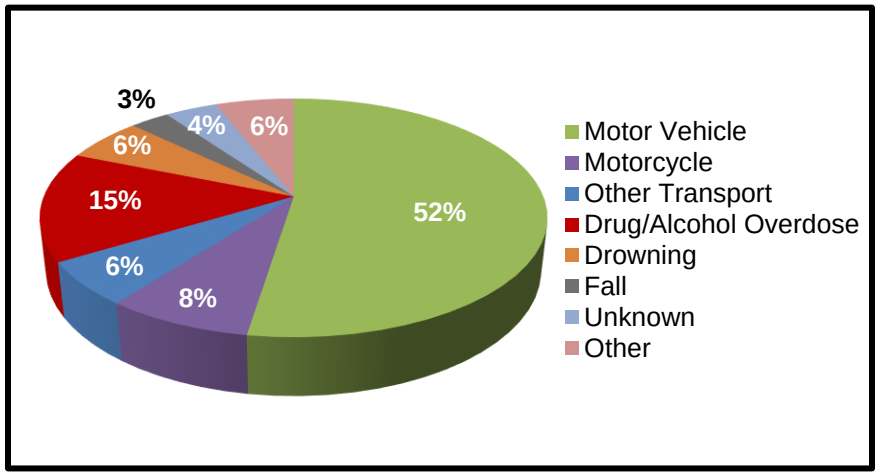

Figure 3. Causes of Accidental (Unintentional) Deaths among U.S. Army Soldiers, 2014–2019 (n=814)

Notes: Other transportation includes rail, water transport, and all other transportation. Drug/alcohol overdose includes poisonings from other solids and liquids, including medications. Drowning includes drownings in any body of water. Fall includes falls from ladders, buildings, and any other type of falls. Other includes accidental weapons discharges, explosions, poisonings from gases/vapors, and all other accidental deaths. Unknown includes unknown and pending causes. Eight deaths were removed from this distribution due to missing information.

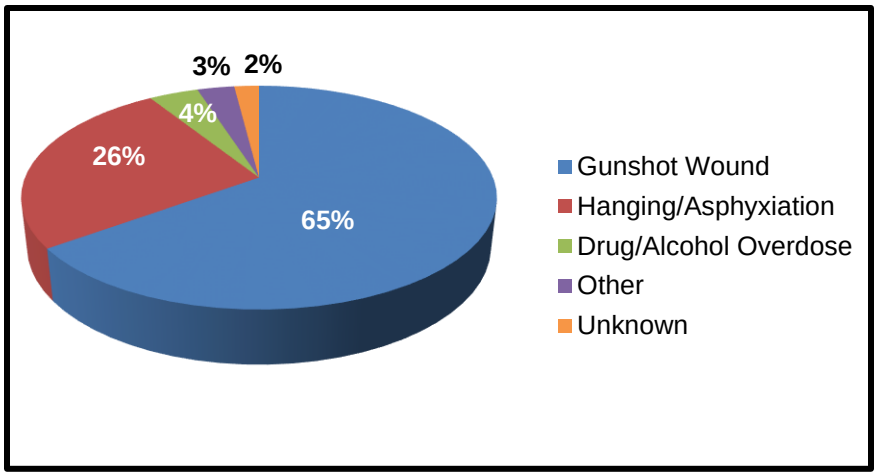

Figure 4. Causes of Suicides among U.S. Army Soldiers, 2014–2019 (n=883)

Notes: Drug/alcohol overdose includes poisonings with other solids and liquids, including medications. Other includes carbon monoxide and other gas/vapor poisonings, jumping from a high place, and all other means. Unknown includes unknown and pending causes. Three deaths were removed from this distribution due to missing information.

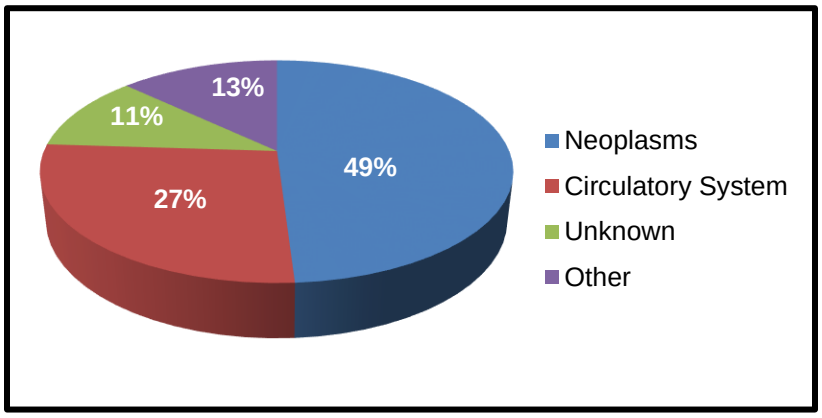

Figure 5. Causes of Natural Deaths among U.S. Army Soldiers, 2014–2019 (n=534)

Note: Other includes diseases related to the nervous system, respiratory system, digestive system, musculoskeletal system, mental and behavioral disorders, congenital malformations, blood, endocrine, skin, pregnancy, infections, and all other natural conditions. Unknown includes unknown and pending causes. Five deaths were removed from this distribution due to missing information.

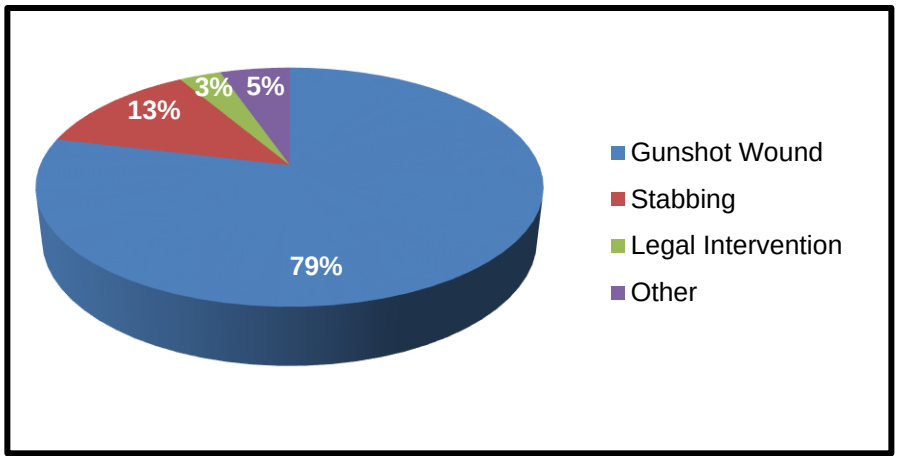

Figure 6. Causes of Homicides among U.S. Army Soldiers, 2014–2019. (n=94)

Notes: Legal intervention includes legal execution and deaths by police or other law-enforcement agents. Other includes hanging/strangulation/suffocation, vehicular impact/collision, bodily force, pending, and all other means.

Table 1. Leading Causes[a] of Death among U.S. Army Soldiers, 2019

Rank[b]	Cause of Death	Number of Deaths
1	Suicides from Gunshot Wounds	87
2	Motor Vehicle Accident	74
3	Suicides from Hangings/Asphyxiations	48
4	Neoplasms	29
5	Combat	16

Notes: [a]Cause of death based on the ICD-10 National Center for Health Statistics (NCHS) records.
[b]Ranked based on the number of deaths.

Table 2. Demographic and Military Characteristics of Deaths in the U.S. Army, by Category, 2014–2019 [a]

Characteristics - n (%)	Category of Death					
	Combat (n=96)	Accident (n=822)	Natural (n=539)	Suicide (n=886)	Homicide (n=94)	Total (n=2,530)
Sex						
Male	96 (100)	776 (94)	465 (86)	826 (93)	83 (88)	2331 (92)
Female	0	46 (6)	74 (14)	60 (7)	11 (12)	199 (8)
Age Group (yr)						
17–24	25 (26)	332 (40)	57 (11)	337 (38)	41 (44)	825 (33)
25–34	45 (47)	317 (39)	104 (19)	350 (40)	39 (42)	890 (35)
35-44	22 (23)	130 (16)	195 (36)	162 (18)	10 (11)	540 (21)
45–64	4 (4)	43 (5)	183 (34)	37 (4)	4 (4)	275 (11)
Race/Ethnicity						
Non-Hispanic White	70 (73)	511 (62)	313 (58)	575 (65)	41 (44)	1568 (62)
Non-Hispanic Black	11 (11)	164 (20)	139 (26)	129 (15)	38 (40)	495 (20)
Hispanic	7 (7)	90 (11)	52 (10)	108 (12)	9 (10)	276 (11)
Non-Hispanic Asian/Pacific Islander	3 (3)	21 (3)	21 (4)	41 (5)	0	88 (3)
Non-Hispanic Native American	1 (1)	10 (1)	2 (<1)	9 (1)	2 (2)	25 (1)
Unknown	4 (4)	26 (3)	12 (2)	24 (3)	4 (4)	78 (3)
Rank						
Cadet	0	4 (<1)	0	2 (<1)	0	7 (<1)
E1–E4	27 (28)	415 (50)	86 (16)	395 (45)	54 (58)	1026 (41)
E5–E9	59 (61)	305 (37)	309 (57)	393 (44)	37 (39)	1136 (45)
W1–W5	3 (3)	38 (5)	31 (6)	18 (2)	0	91 (4)
O1–O3	4 (4)	44 (5)	26 (5)	55 (6)	2 (2)	135 (5)
O4–O8	3 (3)	16 (2)	87 (16)	23 (3)	1 (1)	135 (5)
Component						
Regular Army	92 (96)	687 (84)	405 (75)	791 (89)	88 (88)	2138 (85)
National Guard	4 (4)	118 (14)	118 (22)	84 (9)	10 (11)	345 (14)
Army Reserve	0	17 (2)	16 (3)	11 (1)	1 (1)	47 (2)

Legend: E = Enlisted, W = Warrant Officer, O = Officer

Note: This table only includes pending and undetermined deaths in the Total column.

6.3 Mortality Rates

From 2014 to 2019, the category with the highest annual mortality rates was suicide deaths followed by accidental deaths (Figure 7). The crude rate for suicides increased from 25.4 deaths per 100,000 Soldiers in 2014 to a high of 31.9 per 100,000 Soldiers in 2018 and then declined to 29.3 per 100,000 Soldiers in 2019. For accidental deaths, the rate remained relatively stable from 25 deaths per 100,000 Soldiers in 2014 to 26 deaths per 100,000 Soldiers in 2019, peaking in 2017 at 30 deaths per 100,000 Soldiers.

The rate of accidental and suicide deaths showed a slight upward trend of 2% (RR=1.02, 95% CI: 0.99–1.06) and 3% (RR=1.03, 95% CI: 1.00–1.07) year-to-year, respectively. However, neither of these trends were statistically significant. The mortality rate for natural causes declined 6% (RR=0.94, 95% CI: 0.89–0.98) year-to-year from 18.8 deaths per 100,000 Soldiers in 2014 to 13.4 deaths per 100,000 Soldiers in 2019. Table B-2 in Appendix B provides crude mortality rates, rate ratios, and 95% confidence intervals.

In each year from 2014 to 2019, the sex- and age-adjusted rates of death due to accidents and natural causes were significantly lower for the U.S. Army than for the U.S. population (Figure 8). However, the adjusted suicide rate was significantly higher for the U.S. Army than for the U.S. population (p<0.01). The adjusted suicide rate for the U.S. population increased modestly year-to-year from 2014 to 2019, which slightly reduced the gap in rates between the U.S. Army and U.S. population. Table B-3 in Appendix B provides sex- and age-adjusted mortality rates.

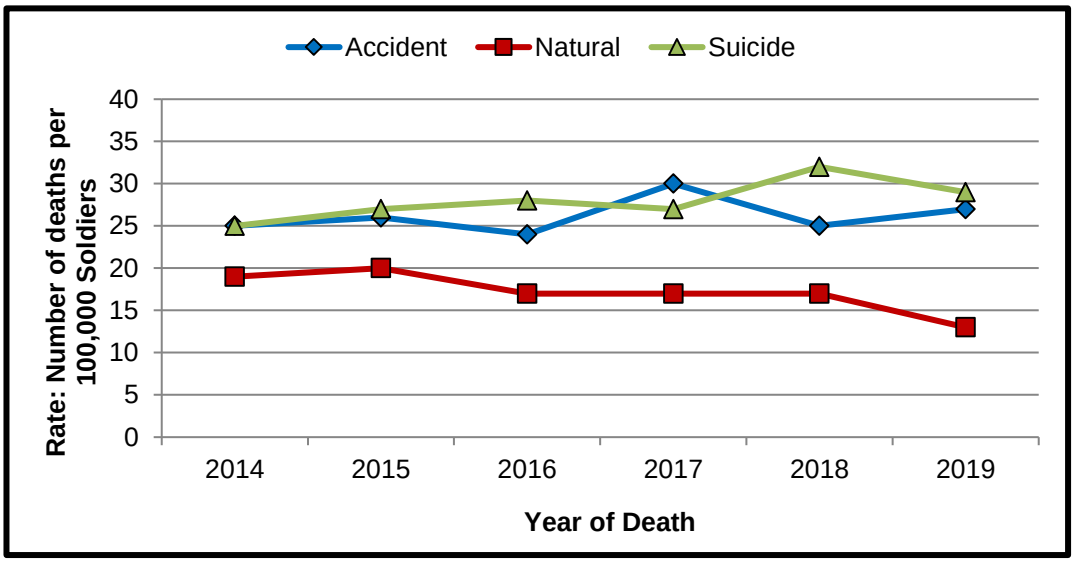

Figure 7. Annual Crude Rates by Category of Death among U.S. Army Soldiers, 2014–2019

Note: Annual crude rates for homicide and combat deaths are not shown because there were fewer than 20 homicides and combat deaths in those years, resulting in unstable rates. Rates are interpreted as the number of deaths per 100,000 Soldiers. Denominator data were obtained from the DMDC.

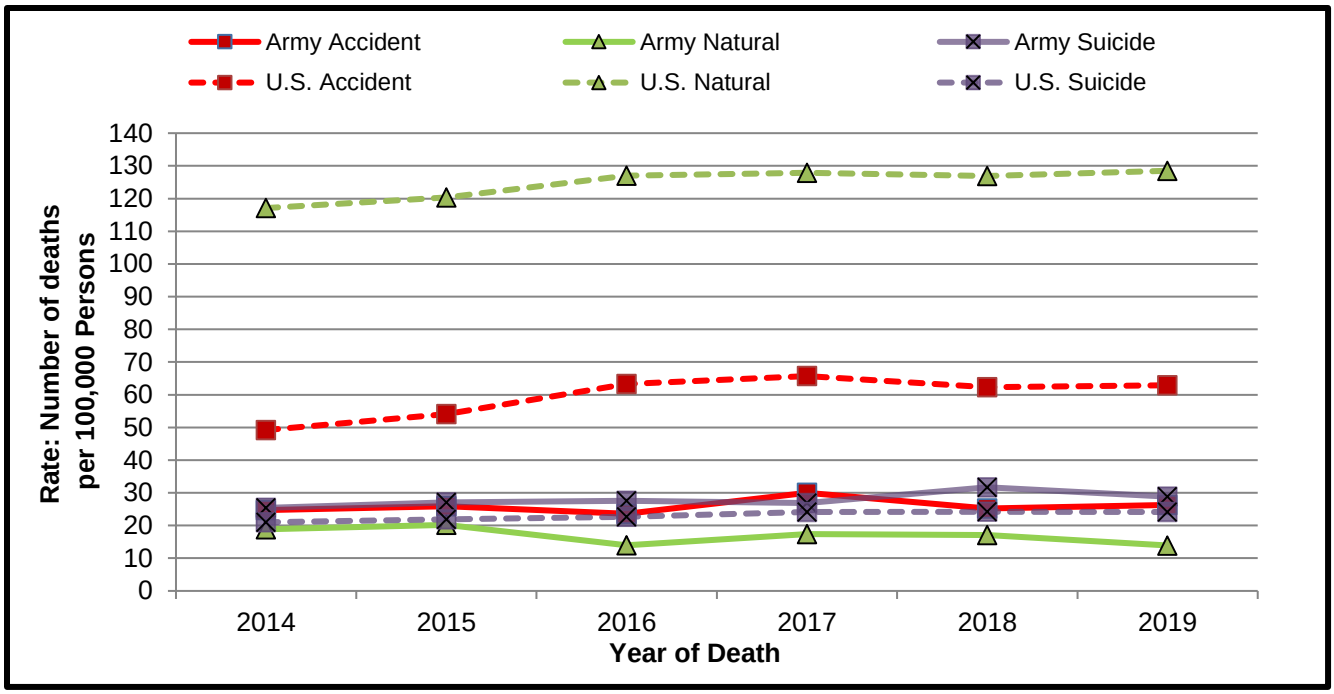

Figure 8. Age- and Sex-Adjusted Mortality Rates in the U.S. Army and U.S. Population, 2014–2019

Notes: Age- and sex-adjusted mortality rates are presented using the direct adjustment method. U.S. population rates were calculated using available data from the CDC[3,6]. Denominator data were obtained from the DMDC. The 2014 U.S. Army population was used as a standard comparison population for both the U.S. Army and the U.S. population. Rates are interpreted as the number of deaths per 100,000 Soldiers (Army rates) or persons (U.S. rates).

7 DISCUSSION

From 2014 to 2019, the highest Army mortality rates were for accidental and suicide deaths, while annual mortality rates for deaths from natural causes declined significantly over the 6-year period. Mortality rates for natural and accidental deaths were statistically lower in the Army when compared to rates for the U.S. population, while suicide rates were statistically higher. The leading causes of death were motor vehicle crashes and suicide by gunshot wound. The characteristics of Soldiers who died aligned with the distribution observed across the U.S. Army, with cases being predominantly male, Non-Hispanic White, younger than 35 years of age, Active Duty, and junior enlisted. The exceptions were Soldiers who died from natural causes, where the greatest proportions were among Reserve Component, 35 years of age or older, and senior enlisted ranks. A high proportion of homicides were among both non-Hispanic White and non-Hispanic Black Soldiers.

The U.S. Army has implemented a myriad of programs to address preventable deaths by targeting the most frequent causes, which are transportation-related and firearms. The Motorcycle Mentorship Program (MMP), TRiPS, and the privately owned vehicle/motorcycle (POV/POM) Toolbox aim to educate Soldiers on preventing situations that may lead to transportation-related crashes.[11] There is continued emphasis on Soldiers' utilization of these

tools, which is reflective of the preventive value of measures in addressing a major safety concern.[12] The Sole Provider Program (SPP) and the Drug Enforcement National Prescription Drug Take-Back Day seek to reduce deaths by accidental and intentional overdose.[13,14] Measures to register and secure weapons on military installations aim to prevent firearm-related homicides, suicides, and accidents on post. These types of efforts to reduce and track the number of firearms on military installations will continue.[15-17] The Ask, Care, Escort (ACE) Training Program and the U.S. Army SP2 seek to prevent suicides.[18] The next steps should involve evaluating these programs for effectiveness as it relates to reducing preventable deaths.

From a primary prevention standpoint, the Performance Triad (P3) emphasizes the importance of sleep, activity, and nutrition for optimal physical, mental, and emotional health, which target the leading causes of death.[19] From a secondary prevention standpoint, the annual Periodic Health Assessment (PHA) tracks Service member health and medical readiness through self-reported or provider-administered screening tools. The PHA has evolved over the years as a way to identify the health needs of Soldiers and refer them to clinical or non-clinical services.[20,21] For instance, medical providers may refer Soldiers who screen positive for a behavioral health condition to the Behavioral Health Service Line (BHSL). The BHSL provides a comprehensive array of clinical services to address Soldier and Family behavioral health needs as part of a continuum of suicide prevention efforts.[22] Another important secondary prevention tool is the Commander's Risk Reduction Toolkit, which compiles a Soldier's health information and allows leaders and commanders to evaluate, identify, and track Soldiers at high risk for suicidal behaviors and adverse outcomes.[18,23,24] These administrative systems can be used to identify and reduce risky health behaviors, leading to a significant reduction in preventable deaths among Soldiers.

7.1 Limitations

Several caveats must be considered when interpreting mortality surveillance data. First, misclassification of mortality cases by medical examiners evaluating and reporting category and cause of death is possible, but the extent to which this occurs is unknown. However, civilian and AFMES pathologists use all available information before a determination is made for any suicide case or any case with questionable or suspicious circumstances. Second, due to data lags and the fact that data for this report were obtained in 2020, the number of cases missing information for underlying causes of death was highest for 2019 and reporting for that year may underestimate the true mortality burden. Also, some deaths may have been reclassified since the beginning of the analysis for this report. Finally, Soldiers who were separated from the Army were not included in the databases used for this report. This may mean that the rates in this report underestimate a Soldier's risk of death, as injured and chronically ill Soldiers tend to leave service and associated deaths would not be captured in this report. For instance, veterans have a significantly higher suicide rate than the general population and BH conditions significantly increase suicide risk. Often, these BH conditions are the cause for separation or the result of other chronic conditions that led to separation.[25] In addition, many chronic conditions take years to develop and may present only after a Soldier separates from the Army. Despite these limitations, these data are comprehensive and capture all deaths that occurred among Cadets, Active Duty Soldiers, and activated Reserve Component Soldiers.

Various DoD organizations, such as AFMES, in collaboration with BSHOP and the Defense Center for Telehealth and Technology (T2), routinely report on characteristics and trends related to suicide deaths in the U.S. Army. Each organization uses different methodology, which can result in minor differences in reported data.

7.2 Conclusion

This publication characterizes deaths from all causes among Active Duty RA, activated ARNG, and activated USAR Soldiers from 2014 to 2019. Overall, mortality rates from natural causes declined significantly. Suicide rates rose with each year. Army rates of natural and accidental deaths were lower when compared to rates for the U.S. population but, Army suicide rates were statistically higher. The decline in natural deaths may be attributed to various health-focused primary prevention programs implemented across the DoD such as the P3 and PHA which promote healthy behaviors and ensure Service members are referred and have access to clinical and non-clinical services which are vital to maintaining optimal physical and behavioral health. Suicide and accidental death rates remained consistently elevated over the 6-year period and as such, focus should shift to evaluating and refining current transportation-related and suicide prevention programs for effectiveness on reducing motor vehicle crashes and suicide by gunshot wounds, which were the most prevalent causes.

Targeting young (17-34), male, and enlisted Soldiers is of particular importance due to their high amounts of preventable deaths (i.e., motor vehicle accidents and suicide). However, most natural deaths occurred in older (over 35), senior enlisted, male, Reserve Component Soldiers. This emphasizes the continued need for Soldiers to receive appropriate annual screenings and extending those services to Reserve Components Soldiers.

8 POINT OF CONTACT

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Appendix A

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Appendix B

Supplemental Tables and Figures

Table B-1. Category and Causes of Deaths in the U.S. Army, 2014–2019[a] (n=2,530)[b]

Category - n (%)	Year of Death						
	2014 (n=434)	2015 (n=415)	2016 (n=385)	2017 (n=431)	2018 (n=427)	2019 (n=419)	2014-2019 (n=2,511)
Combat	**31 (7)**	**3 (1)**	**12 (3)**	**20 (5)**	**14 (3)**	**16 (4)**	**96 (4)**
Accident[c]	**136 (31)**	**137 (33)**	**123 (32)**	**154 (36)**	**128 (30)**	**136 (32)**	**814 (32)**
Motor Vehicle	76 (56)	71 (52)	70 (57)	77 (50)	66 (52)	71 (52)	431 (53)
Motorcycle	15 (11)	13 (10)	12 (10)	10 (7)	11 (9)	2 (1)	63 (8)
Air, Space & Other Transportation[d]	9 (7)	12 (9)	3 (2)	10 (7)	7 (5)	6 (4)	47 (6)
Drug/Alcohol Overdose[e]	16 (12)	21 (15)	18 (15)	31 (20)	24 (19)	11 (8)	121 (15)
Drowning[f]	6 (4)	7 (5)	9 (7)	9 (6)	5 (4)	12 (9)	48 (6)
Falls[g]	5 (4)	5 (4)	2 (2)	3 (2)	3 (2)	5 (4)	23 (3)
Other[h]	6 (4)	5 (4)	9 (7)	11 (7)	8 (6)	10 (7)	49 (6)
Unknown[i]	3 (2)	3 (2)	0	3 (2)	4 (3)	19 (14)	32 (4)
Natural[j]	**104 (24)**	**109 (26)**	**85 (22)**	**86 (20)**	**84 (20)**	**68 (16)**	**534 (21)**
Neoplasms	56 (54)	58 (53)	48 (57)	38 (45)	34 (40)	29 (43)	263 (49)
Circulatory System	30 (29)	36 (33)	19 (22)	23 (27)	30 (36)	7 (10)	145 (27)
Other[k]	17 (16)	11 (10)	12 (14)	11 (13)	11 (13)	8 (12)	70 (13)
Unknown[i]	1 (1)	4 (4)	6 (7)	12 (15)	9 (11)	24 (35)	56 (11)
Suicide[l]	**140 (32)**	**144 (35)**	**144 (37)**	**139 (32)**	**165 (39)**	**151 (36)**	**883 (35)**
Gunshot Wound	99 (71)	92 (64)	99 (69)	95 (68)	103 (62)	87 (58)	575 (65)
Hanging/Asphyxiation	28 (20)	38 (26)	34 (24)	36 (26)	44 (27)	48 (32)	228 (26)
Drug/Alcohol Overdose[e]	7 (5)	8 (6)	5 (4)	6 (4)	6 (4)	1 (1)	33 (4)
Other[m]	5 (4)	5 (3)	3 (2)	2 (1)	7 (4)	3 (2)	25 (3)
Unknown[i]	1 (1)	1 (1)	3 (2)	0	5 (3)	12 (8)	22 (2)
Homicide	**17 (4)**	**14 (3)**	**16 (4)**	**17 (4)**	**17 (4)**	**13 (3)**	**94 (4)**
Gunshot Wound	11 (65)	12 (86)	9 (56)	16 (94)	15 (88)	11 (85)	74 (79)
Sharp Object	3 (18)	2 (14)	4 (25)	0	1 (6)	2 (15)	12 (13)
Legal Intervention[n]	2 (12)	0	1 (6)	0	0	0	3 (3)
Other[o]	0	0	1 (6)	1 (6)	1 (6)	0	3 (3)
Unknown[i]	1 (6)	0	1 (6)	0	0	0	2 (2)
Undetermined[p]	**5 (1)**	**8 (2)**	**5 (1)**	**15 (3)**	**5 (1)**	**3 (1)**	**41 (2)**
Pending[q]	**1 (<1)**	**0**	**0**	**2 (<1)**	**14 (3)**	**32 (8)**	**49 (2)**

Notes for Table B-1:
[a]Includes active duty Regular Army, activated National Guard, and activated Army Reserve Soldiers.
[b]Total includes all deaths, including 19 deaths excluded in other categories due to missing information.
[c]Excludes 8 deaths that had missing information.
[d]Other transportation includes rail, water transport, and all other transportation.
[e]Drug/alcohol overdose includes poisonings from other solids and liquids, including medications.
[f]Includes accidental drowning in any body of water.
[g]Includes falls from high places, ladders, and any other type of fall.
[h]Includes explosions, pending, and all other accidental deaths.
[i]Includes any deaths that have no known cause of death or are classified as unknown.
[j]Excludes 5 deaths that had missing information.
[k]Includes diseases related to: nervous system, respiratory system, digestive system, musculoskeletal system, mental and behavioral disorders, congenital malformations, blood, endocrine, skin, pregnancy, infections, surgical complications, and all other natural conditions.
[l]Excludes 3 deaths that had missing information.
[m]Includes carbon monoxide and other gas/vapor poisonings, jumping from a high place, and all other means.
[n]Legal intervention includes legal execution and deaths by police or other law enforcement agents.
[o]Includes strangulation, blunt object, bodily force, and all other means.
[p]Excludes 2 deaths that had missing information.
[q]Excludes 1 death that had missing information

Table B-2. Deaths in the U.S. Army, by Category of Death, 2020 (n=479)

Category of Death	2020 n (%)
Accident	**124 (26)**
Combat	**6 (1)**
Natural	**81 (17)**
Homicide	**16 (3)**
Suicide	**186 (39)**
Pending	**59 (12)**
Undetermined	**6 (1)**

Note: 1 death was excluded due to missing information

Table B-3. Crude Mortality Rates for the U.S. Army, Overall, 2014–2019[a]

	Category of Death[b]		
Year of Death	**Accident**	**Natural**	**Suicide**
2014	25	19	25
2015	26	20	27
2016	24	17	28
2017	30	17	27
2018	25	17	32
2019	27	13	29
Rate Ratio (95% CI)[c]	1.02 (0.99–1.06)	0.94 (0.89–0.98)	1.03 (1.00–1.07)

Legend: RR = Rate Ratios, CI= confidence intervals
Notes: [a]Mortality rates per 100,000 Soldiers are presented. Rates based on fewer than 20 deaths are considered to be unstable and are not presented here. [b]Combat, homicide, undetermined, and pending death rates are also not presented here due to fewer than 20 deaths per year. [c]Rate ratios assessed trends in mortality rates from 2014 to 2019, bolded are statistically significant.

Table B-4. Age- and Sex-Adjusted Annual Mortality Rates for the U.S. Army and U.S. Population, 2014–2019[a]

	Category of Death					
	Accident[b]		Natural[b]		Suicide[b]	
	Army	U.S.	Army	U.S.	Army	U.S.
Year of Death						
2014	24.7	49.2	18.9	117.1	25.4	21.0
2015	25.9	54.1	20.2	120.3	27.1	21.9
2016	23.6	63.3	14.0	127.0	27.6	22.7
2017	30.0	65.7	17.4	127.9	26.9	24.1
2018	25.2	62.3	17.1	126.9	31.7	24.2
2019	26.3	62.9	13.9	128.5	28.8	24.1

Notes: [a]Age- and sex-adjusted mortality rates are presented using the direct adjustment method. U.S. rates were calculated using available data from the CDC for the same age groups[2]. The 2014 Army population was used as a standard comparison population for both the U.S. Army and the U.S. population. Rates based on fewer than 20 deaths are considered to be unstable and are not presented. Combat, undetermined and pending death rates are also not presented due to relatively few deaths per year. [b]There is a statistically significant difference between these rates. Differences were statistically significant at $p<0.01$ for all category of death.

Table B-5. Leading Causes[a] of Death by Age Group among U.S. Army Soldiers, 2014–2019

Rank[b]	17–24	25–34	35–44	45–64
1	Motor Vehicle Accident[c] (N=215)	Suicide by Gunshot Wound (N=245)	Suicide by Gunshot Wound (N=108)	Neoplasms[d] (N=106)
2	Suicide by Gunshot Wound (N=195)	Motor Vehicle Accident[c] (N=152)	Neoplasms[d] (N=91)	Cardiovascular Diseases and Events[e] (N=41)
3	Suicide by Hanging/Asphyxiation (N=106)	Suicide by Hanging/Asphyxiation (N=74)	Cardiovascular Diseases and Events[e] (N=60)	Suicide by Gunshot Wound (N=27)
4	Accidental Overdose (N=44)	Accidental Overdose (N=48)	Motor Vehicle Crash[c] (N=51)	Other Illness[f] (N=22)
5	Homicide by Gunshot Wound (N=34)	Homicide by Gunshot Wound (N=31)	Suicide by Hanging/Asphyxiation (N=42)	Motor Vehicle Crash[c] (N=19)

Notes: [a]Cause of death based on the ICD-10 National Center for Health Statistics (NCHS) records. [b]Rank based on the number of deaths. [c]Includes accidents involving heavy transport vehicles, buses, and individuals injured in collisions with motor vehicles, regardless of whether they were a passenger, driver, or pedestrian. [d]Includes deaths directly attributed to primary or secondary neoplasms and complications of neoplasms. [e]Includes cardiac events, embolisms, aneurysms, strokes, and hemorrhages. [f]Includes diseases related to: nervous system, respiratory system, digestive system, musculoskeletal system, mental and behavioral disorders, congenital malformations, blood, endocrine, skin, pregnancy, infections, surgical complications, and all other natural conditions.

Table B-6. Leading Causes[a] of Death by Sex among U.S. Army Soldiers, 2014–2019

Rank[b]	Female	Male
1	Neoplasms[d] (N=52)	Suicide by Gunshot Wound (N=622)
2	Suicide by Gunshot Wound (N=37)	Motor Vehicle Accident[c] (N=401)
3	Motor Vehicle Accident[c] (N=30)	Suicide by Hanging/Asphyxiation (N=214)
4	Cardiovascular Diseases and Events[e] (N=16)	Neoplasms[d] (N=211)
5	Suicide by Hanging/Asphyxiation (N=14)	Cardiovascular Diseases and Events[e] (N=130)

Notes: [a]Cause of death based on the ICD-10 National Center for Health Statistics (NCHS) records. [b]Rank based on the number of deaths. [c]Includes accidents involving heavy transport vehicles, buses, and individuals injured in collisions with motor vehicles, regardless of whether they were a passenger, driver, or pedestrian. [d]Includes deaths directly attributed to primary or secondary neoplasms and complications of neoplasms. [e]Includes cardiac events, embolisms, aneurysms, strokes, and hemorrhages.

Table B-7. Leading Causes[a] of Death by Race-Ethnicity among U.S. Army Soldiers, 2014–2019

Rank[b]	White	Black	Hispanic	Asian/Pacific Islander	Native American
1	Suicide by Gunshot Wound (N=383)	Motor Vehicle Accident[c] (N=100)	Suicide by Gunshot Wound (N=64)	Suicide by Gunshot Wound (N=19)	Suicide by Gunshot Woun[d] (N=6)
2	Motor Vehicle Accident[c] (N=252)	Suicide by Gunshot Wound (N=85)	Motor Vehicle Accident[c] (N=50)	Suicide by Hanging/Asphyxiation (N=16)	Motor Vehicle Accident[c] (N=6)
3	Neoplasms[d] (N=162)	Neoplasms[d] (N=63)	Suicide by Hanging/Asphyxiation (N=33)	Neoplasms[d] (N=12)	Suicide by Hanging/Asphyxiation (N=2)
4	Suicide by Hanging/Asphyxiation (N=145)	Cardiovascular Diseases and Events[e] (N=42)	Neoplasms[d] (N=21)	Motor Vehicle Accident[c] (N=10)	Homicide by Gunshot Wound (N=2)
5	Accidental Overdose (N=98)	Suicide by Hanging/Asphyxiation (N=27)	Cardiovascular Diseases and Events[e] (N=17)	Accidental Drowning (N=5)	Accidental Overdose (N=1)

Notes: [a]Cause of death based on the ICD-10 National Center for Health Statistics (NCHS) records. [b]Rank based on the number of deaths. [c]Includes accidents involving heavy transport vehicles, buses, and individuals injured in collisions with motor vehicles, regardless of whether they were a passenger, driver, or pedestrian. [d]Includes deaths directly attributed to primary or secondary neoplasms and complications of neoplasms. [e]Includes cardiac events, embolisms, aneurysms, strokes, and hemorrhages.

Table B-8. Leading Causes[a] of Death by Rank among U.S. Army Soldiers, 2014–2019

Rank[b]	E1–E4	E5–E9	W1–W5	O1–O3	O4–O8
1	Motor Vehicle Accident[c] (N=254)	Suicide by Gunshot Wound (N=274)	Aircraft Accident[f] (N=23)	Suicide by Gunshot Wound (N=42)	Neoplasms[d] (N=48)
2	Suicide by Gunshot Wound (N=227)	Neoplasms[d] (N=153)	Neoplasms[d] (N=20)	Motor Vehicle Accident[c] (N=22)	Cardiovascular Diseases and Events[e] (N=26)
3	Suicide by Hanging/Asphyxiation (N=126)	Motor Vehicle Accident[c] (N=146)	Suicide by Gunshot Wound (N=15)	Neoplasms[d] (N=14)	Suicide by Gunshot Wound (N=15)
4	Accidental Overdose (N=66)	Suicide by Hanging/Asphyxiation (N=90)	Motor Vehicle Accident[c] (N=5)	Cardiovascular Diseases and Events[e] (N=9)	Motor Vehicle Accident[c] (N=8)
5	Accidental Drowning (N=27)	Cardiovascular Diseases and Events[e] (N=87)	Other Illness[g] (N=5)	Suicide by Hanging/Asphyxiation (N=8)	Suicide by Hanging/Asphyxiation (N=5)

Notes: [a]Cause of death based on the ICD-10 National Center for Health Statistics (NCHS) records. [b]Rank based on the number of deaths. [c]Includes accidents involving heavy transport vehicles, buses, and individuals injured in collisions with motor vehicles, regardless of whether they were a passenger, driver, or pedestrian. [d]Includes deaths directly attributed to primary or secondary neoplasms and complications of neoplasms. [e]Includes cardiac events, embolisms, aneurysms, strokes, and hemorrhages. [f]Includes all aircraft and helicopters. [g]Includes diseases related to: nervous system, respiratory system, digestive system, musculoskeletal system, mental and behavioral disorders, congenital malformations, blood, endocrine, skin, pregnancy, infections, surgical complications, and all other natural conditions.

Table B-9. Causes of Death and Recoded Cause of Death Category

Category	Cause Text	Recoded Cause
Combat	Other and unspecified war operations	Operations of War
	War operations involving firearm discharge and other forms of conventional warfare	
	War operations involving other explosions and fragments	
Accident	Bus occupant injured in collision with fixed or stationary object in traffic accident	Motor Vehicle
	Bus occupant injured in collision with pedal cycle in traffic accident	
	Car occupant injured in collision with car, pick-up truck, or van in traffic accident	
	Car occupant injured in collision with fixed or stationary object in traffic accident	
	Car occupant injured in collision with heavy transport vehicle or bus in traffic accident	
	Car occupant injured in noncollision transport accident in traffic accident	
	Car occupant injured in unspecified traffic accident	
	Heavy transport vehicle occupant injured in collision with heavy transport vehicle or bus in traffic accident	
	Heavy transport vehicle occupant injured in noncollision transport accident in nontraffic accident	
	Heavy transport vehicle occupant injured in noncollision transport accident in traffic accident	
	Passenger injured in collision with other and unspecified motor vehicles in traffic accident	
	Pedal cyclist injured in collision with two- or three-wheeled motor vehicle in traffic accident	
	Pedestrian injured in collision with car pick-up truck or van in traffic accident	

Table B-9. Causes of Death and Recoded Cause of Death Category (continued)

Category	Cause Text	Recoded Cause
	Pedestrian injured in collision with car, pick-up truck or van in nontraffic accident	
	Pedestrian injured in collision with heavy transport vehicle or bus in nontraffic accident	
	Pedestrian injured in collision with heavy transport vehicle or bus in traffic accident	
	Pedestrian injured in collision with two- or three-wheeled motor vehicle in traffic accident	
	Pedestrian injured in nontraffic accident involving other and unspecified motor vehicles	
	Pedestrian injured in traffic accident involving other and unspecified motor vehicles	
	Person injured in traffic collision between car and two- or three-wheeled powered vehicle	
	Person injured in traffic collision between other specified motor vehicles	
	Person injured in unspecified motor-vehicle accident, nontraffic	
	Person injured in unspecified motor-vehicle accident, traffic	
	Person injured in unspecified vehicle accident	
	Pick-up truck or van occupant injured in collision with fixed or stationary object in traffic accident	
	Pick-up truck or van occupant injured in collision with heavy transport vehicle or bus in traffic accident	
	Pick-up truck or van occupant injured in collision with other and unspecified motor vehicles in traffic accident	
	Pick-up truck or van occupant injured in noncollision transport accident in nontraffic accident	
	Pick-up truck or van occupant injured in noncollision transport accident in traffic accident	

Table B-9. Causes of Death and Recoded Cause of Death Category (continued)

Category	Cause Text	Recoded Cause
	Unspecified pedal cyclist injured in collision with other and unspecified motor vehicles in traffic accident	
	Motorcycle driver injured in noncollision transport accident in traffic accident	Motorcycle
	Motorcycle rider injured in collision with car pick-up truck or van in traffic accident	
	Motorcycle rider injured in collision with fixed or stationary object in nontraffic accident	
	Motorcycle rider injured in collision with fixed or stationary object in traffic accident	
	Motorcycle rider injured in collision with other and unspecified motor vehicles in traffic accident	
	Motorcycle rider injured in collision with two- or three-wheeled motor vehicle in traffic accident	
	Motorcycle rider injured in noncollision transport accident in traffic accident	
	Motorcycle rider injured in unspecified traffic accident	
	Motorcycle driver injured in noncollision transport accident in traffic accident	
	Motorcycle rider injured in collision with car pick-up truck or van in traffic accident	
	Motorcycle rider injured in collision with fixed or stationary object in nontraffic accident	
	Motorcycle rider injured in collision with fixed or stationary object in traffic accident	
	Pedestrian injured in collision with railway train or railway vehicle	Air, Space & Other Transportation
	Driver of special all-terrain or other off-road motor vehicle injured in nontraffic accident	
	Helicopter accident injuring occupant	

Table B-9. Causes of Death and Recoded Cause of Death Category (continued)

Category	Cause Text	Recoded Cause
	Other nonpowered-aircraft accidents injuring occupant	
	Other powered aircraft accidents injuring occupant	
	Other private fixed-wing aircraft accident injuring occupant	
	Person on ground injured in air transport accident	
	Unspecified aircraft accident injuring occupant	
	Unspecified water transport accident	
	Accidental poisoning by and exposure to alcohol	Drugs/Alcohol Overdose
	Accidental poisoning by and exposure to antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified	
	Accidental poisoning by and exposure to narcotics and psychodysleptics [hallucinogens], not elsewhere classified	
	Accidental poisoning by and exposure to other and unspecified drugs, medicaments and biological substances	
	Accidental drowning and submersion while in natural water	Other
	Accidental drowning and submersion while in swimming-pool	
	Accidental handgun discharge and malfunction	
	Accidental poisoning by and exposure to organic solvents and halogenated hydrocarbons and their vapors	
	Accidental poisoning by and exposure to other gases and vapors	
	Accidental rifle shotgun and larger firearm discharge and malfunction	
	Contact with other and unspecified machinery	
	Explosion of other materials	

Table B-9. Causes of Death and Recoded Cause of Death Category (continued)

Category	Cause Text	Recoded Cause
	Exposure to excessive natural cold	
	Exposure to excessive natural heat	
	Exposure to other specified electric current	
	Fall from out of or through building or structure	
	Fall involving ice-skates, skis, roller-skates or skateboards	
	Fall on and from ladder	
	Hypo-osmolality and hyponatremia	
	Other accidental hanging and strangulation	
	Other slipping tripping and stumbling and falls	
	Parachutist accident	
	Pneumoconiosis due to other dust containing silica	
	Striking against or struck by other objects	
	Struck by thrown projected or falling object	
	Unspecified cause of accidental drowning and submersion	
	Unspecified fall	
	Unspecified threat to breathing	
Natural Causes	Acute leukemia of unspecified cell type	Neoplasms
	Acute lymphoblastic leukemia [ALL]	
	Acute myeloblastic leukemia	
	Benign neoplasm of lower jaw bone	
	Burkitt lymphoma	
	Chronic lymphocytic leukemia of B-cell type	
	Diffuse large B-cell lymphoma	
	Intrahepatic bile duct carcinoma	
	Leukemia	

Table B-9. Causes of Death and Recoded Cause of Death Category (continued)

Category	Cause Text	Recoded Cause
	Liver cell carcinoma	
	Lymphoblastic (diffuse) lymphoma	
	Malignant melanoma of skin	
	Malignant neoplasm of appendix	
	Malignant neoplasm of bone and articular cartilage	
	Malignant neoplasm of brain	
	Malignant neoplasm of breast	
	Malignant neoplasm of cardia	
	Malignant neoplasm of cerebrum except lobes and ventricles	
	Malignant neoplasm of cervix uteri	
	Malignant neoplasm of colon	
	Malignant neoplasm of connective and soft tissue	
	Malignant neoplasm of esophagus	
	Malignant neoplasm of kidney	
	Malignant neoplasm of larynx	
	Malignant neoplasm of liver	
	Malignant neoplasm of major salivary gland	
	Malignant neoplasm of oropharynx	
	Malignant neoplasm of ovary	
	Malignant neoplasm of overlapping sites of rectum, anus, and anal canal	
	Malignant neoplasm of pancreas	
	Malignant neoplasm of parotid gland	
	Malignant neoplasm of peritoneum	
	Malignant neoplasm of pharynx	
	Malignant neoplasm of rectum	
	Malignant neoplasm of retroperitoneum	
	Malignant neoplasm of spinal cord	
	Malignant neoplasm of stomach	

Table B-9. Causes of Death and Recoded Cause of Death Category (continued)

Category	Cause Text	Recoded Cause
	Malignant neoplasm of testis	
	Malignant neoplasm of thyroid gland	
	Malignant neoplasm of tongue	
	Malignant neoplasm of tonsil	
	Malignant neoplasm of trachea	
	Malignant neoplasm of unspecified part of bronchus or lung	
	Malignant neoplasm of vertebral column	
	Malignant neoplasm without specification of site	
	Malignant neoplasms of independent (primary) multiple sites	
	Multiple myeloma	
	Mycosis fungoides	
	Myeloid leukemia	
	Non-Hodgkin lymphoma	
	Secondary malignant neoplasm of other specified sites	
	Acute ischemic heart disease	Circulatory System
	Acute myocardial infarction	
	Alcoholic cardiomyopathy	
	Aneurysm of other specified arteries	
	Aneurysm of unspecified site	
	Atherosclerosis	
	Atherosclerotic heart disease of native coronary artery	
	Cardiac arrest	
	Cardiac arrhythmia	
	Cardiogenic shock	
	Cardiomegaly	
	Cardiomyopathy	
	Cerebral infarction	
	Cerebrovascular diseases	

Table B-9. Causes of Death and Recoded Cause of Death Category (continued)

Category	Cause Text	Recoded Cause
	Chronic ischemic heart disease	
	Dilated cardiomyopathy	
	Disease of pericardium	
	Diseases of the circulatory system complicating pregnancy childbirth and the puerperium	
	Dissection of aorta	
	Essential (primary) hypertension	
	Gastrointestinal hemorrhage	
	Heart disease	
	Hypertensive heart disease with heart failure	
	Hypertensive heart disease without heart failure	
	Hypertrophic cardiomyopathy	
	Infective myocarditis	
	Malformation of coronary vessels	
	Myocarditis	
	Nontraumatic intracerebral hemorrhage	
	Nontraumatic intracranial hemorrhage	
	Nontraumatic subarachnoid hemorrhage	
	Peripheral arteriovenous malformation	
	Phlebitis and thrombophlebitis of other and unspecified deep vessels of lower extremities	
	Pulmonary embolism without acute cor pulmonale	
	Ruptured aortic aneurysm	
	Secondary pulmonary hypertension	
	Stroke	
	Ventricular fibrillation and flutter	
	Acidosis	Other Natural Conditions
	Acute pancreatitis	
	Alcohol dependence	

Table B-9. Causes of Death and Recoded Cause of Death Category (continued)

Category	Cause Text	Recoded Cause
	Alcohol induced acute pancreatitis	
	Alcoholic cirrhosis of liver	
	Alcoholic fatty liver	
	Anoxic brain damage	
	Autoimmune thyroiditis	
	Cerebral edema	
	Degenerative disease of nervous system	
	Disorders of muscle	
	Disorders of urea cycle metabolism	
	Encephalopathy	
	Epilepsy	
	Hemophagocytic lymphohistiocytosis	
	Histoplasmosis	
	Hyperkalemia	
	Ill-defined and unknown cause of mortality	
	Influenza	
	Inhalation and ingestion of other objects causing obstruction of respiratory tract	
	Kidney failure	
	Mastocytosis	
	Motor neuron disease	
	Neutropenia	
	Pneumonia	
	Pregnancy related conditions	
	Respiratory failure	
	Sepsis	
	Surgical complications	
	Volvulus	
Suicide	Intentional self-harm by handgun discharge	Gunshot Wound
	Intentional self-harm by other and unspecified firearm and gun discharge	

Table B-9. Causes of Death and Recoded Cause of Death Category (continued)

Category	Cause Text	Recoded Cause
	Intentional self-harm by rifle shotgun and larger firearm discharge	
	Intentional self-harm (suicide) by hanging, strangulation and suffocation	Hanging/Asphyxiation
	Intentional self-poisoning by and exposure to antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs	Drug/Alcohol Overdose
	Intentional self-poisoning by and exposure to nonopioid analgesics, antipyretics and antirheumatics	
	Intentional self-poisoning by and exposure to other and unspecified drugs, medicaments and biological substances	
	Intentional self-harm (suicide) by all other and unspecified means and their sequelae	Other
	Intentional self-harm (suicide) by jumping from a high place	
	Intentional self-harm by crashing of motor vehicle	
	Intentional self-harm by drowning and submersion	
	Intentional self-harm by sharp object Intentional self-harm by sharp object	
	Intentional self-poisoning by and exposure to other gases and vapors	
	Self-harm by jumping or lying in front of moving object	
Homicide	Assault by handgun discharge	Gunshot Wound
	Assault by other and unspecified firearm and gun	
	Assault by rifle shotgun and larger firearm discharge	
	Assault (homicide) by sharp object	Sharp Object
	Assault by unspecified means	Other
	Legal intervention involving firearm discharge	Legal Intervention

Glossary

Acronyms and Abbreviations

AFMES
Armed Forces Medical Examiner System

ALARACT
All Army Activities

APHC
U.S. Army Public Health Center

AR
Army Regulation

BSHOP
Behavioral and Social Health Outcomes Practice

CDC
Centers for Disease Control and Prevention

DHA
Defense Health Agency

DCIPS
Defense Civilian Intelligence Personnel System

DMDC
Defense Manpower Data Center

DOD
Department of Defense

E1–E9
Enlisted rank

ICD-10
International Classification of Disease, Tenth Revision

NAME
National Association of Medical Examiners

NDI
National Death Index

OTSG

Office of The Surgeon General of the U.S. Army

O1–O8
Officer rank

P3
Performance Triad

POM
Privately owned motorcycle

POV
Privately owned vehicle

SP2
Army Suicide Prevention Program

SPP
Sole Provider Program

TRiPS
Travel Risk Planning System

T2
Defense Center for Telehealth and Technology

U.S.
United States

VA
Department of Veterans Affairs

W1–W5
Warrant Officer rank

WHO
World Health Organization

WISQARS
Web-based Injury Statistics Query and Reporting System

WONDER
Wide-ranging Online Data for Epidemiologic Research