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Nonfatal Suicidal Behaviors in U.S. Army Administrative Records, 2004–2009: Results from the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS)

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Abstract

Objective—Although the U.S. Army suicide rate is known to have risen sharply over the past decade, information about medically documented, nonfatal suicidal behaviors is far more limited. Here we examine trends and sociodemographic correlates of suicide attempts, suspicious injuries, and suicide ideation among regular Army soldiers.

Methods—Data come from the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS) Historical Administrative Data Study (HADS), which integrates administrative records for all soldiers on active duty during the years 2004 through 2009 (n = 1.66 million).

Results—We identified 21,740 unique regular Army soldiers with a nonfatal suicidal event documented at some point during the HADS study period. There were substantial increases in the annual incidence rates of suicide attempts (179–400/100,000 person-years) and suicide ideation (557–830/100,000 person-years), but not suspicious injuries. Using hierarchical classification rules to identify the first instance of each soldier's most severe behavior, we found increased risk

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of all outcomes among those who were female, non-Hispanic White, never married, lower-ranking enlisted, less educated, and of younger age when entering Army service. These sociodemographic associations significantly differed across outcomes, despite some patterns that appear similar.

Conclusion—Results provide a broad overview of nonfatal suicidal trends in the U.S. Army during 2004 through 2009 and demonstrate that integration of multiple administrative data systems enriches analysis of the predictors of such events.

More than a decade has passed since Operation Enduring Freedom (OEF) commenced in Afghanistan in 2001, followed in 2003 by Operation Iraqi Freedom (OIF). During the intervening years the U.S. military experienced a dramatic increase in documented psychiatric morbidity and suicides (Armed Forces Health Surveillance Center, 2012a, 2012b). The Army had the largest increase in suicide deaths among U.S. military branches, from 8.7 per 100,000 in 2001 to 21.5 per 100,000 in 2011, surpassing the adjusted civilian rate for the first time in 2008 (Lineberry & O'Connor, 2012; Nock et al., 2013). This substantial rise in suicide deaths has resulted in widespread scrutiny and intensified prevention efforts (Hoge & Castro, 2012; Kuehn, 2009). Comprehensive approaches to prevention must account for a broad range of self-injurious thoughts and behaviors. Suicide attempts, in particular, are critically important targets for research and intervention. In addition, suicide attempt is the strongest predictor of future suicide death (Joiner et al., 2005). Those with a previous attempt are about 40 times more likely than nonattempters to eventually die by suicide (Harris & Barraclough, 1997). Numerous civilian studies indicate that the risk of suicide attempt increases during adolescence and early adulthood (Nock et al., 2008), suggesting that many U.S. military service members (i.e., predominantly young adults) are in a high-risk age group.

Medically documented suicide attempts and other nonfatal suicidal events among active-duty soldiers have received less attention than suicide deaths in the research literature. In general, studies that have focused on such events were conducted prior to the OEF/OIF era (e.g., Rock, 1988), targeted a specific subset of the active Army population (e.g., currently deployed soldiers; Wojcik, Akhtar, & Hassell, 2009), were based on survey self-reports rather than medical records (e.g., Bray et al., 2009; Luxton et al., 2011; Nock et al., 2014), or examined U.S. military branches in aggregate based on a single Department of Defense (DoD) administrative data system (Bush et al., 2013) and may not have had the granularity to adequately address these issues.

This study presents the data development and first results of an initiative to identify and study these important outcomes using historical administrative data from the U.S Army as part of the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS; http://www.armys-tarrs.org; Kessler et al., 2013; Ursano et al., 2014). A primary component of Army STARRS is the Historical Administrative Data Study (HADS), an integrated administrative data file containing elements from 38 different Army and DoD data systems for the over 1.6 million soldiers (regular Army, Army Reserve, and National Guard) on active duty at some time during calendar years 2004 through 2009. In the current investigation, we use data from HADS to examine the incidence, time trends, and sociodemographic correlates of nonfatal suicidal events among all regular Army soldiers on

active duty during this period. The study is the most comprehensive study of well-documented nonfatal suicidal events in the military and one of a few in any population.

U.S. Army Coding Systems for Nonfatal Suicidal Events

In addition to concerns about underreporting and patient privacy (Ritchie, Keppler, & Rothberg, 2003), inconsistencies in the definitions and medical documentation of nonfatal suicidal events have made it challenging to carry out systematic research in this area within the Army and across the DoD. In an effort to address the problem of varying definitions, the DoD (Office of the Under Secretary of Defense, 2011) recently implemented the Self-Directed Violence Classification System (SDVCS), a system originally developed by the Centers for Disease Control and Prevention (Crosby, Ortega, & Melanson, 2011) that defines a suicide attempt as “a non-fatal self-directed potentially injurious behavior with any intent to die as a result of the behavior” (Crosby et al., 2011, p. 21). Adoption of the SDVCS brings DoD definitions in line with both the CDC and the Department of Veterans Affairs.

Medical documentation of nonfatal suicidal events within the Army continues to present a challenge to research. Whereas suicide deaths of active-duty soldiers are investigated and tracked by the Armed Forces Medical Examiner System, there is no single database that documents all nonfatal events despite recent attempts to improve surveillance. Thus, comprehensive efforts to identify these outcomes require examination of multiple Army administrative data systems. In the next sections, we describe the various coding systems used by the Army, all of which are integrated in the Army STARRS HADS and examined in the current study.

ASER and DoDSER

One of the military's primary mechanisms for recording suicidal behaviors was developed, expanded, and refined over the course of OIF. In March 2004, the Army implemented the Army Suicide Event Report (ASER), a form designed to be completed by medical providers to collect information on any suicide-related event that resulted in death, hospitalization, or evacuation, and potential risk factors surrounding that event (Gahm, 2005). The 2007 ASER added more specific coding options for nonfatal events and adopted the World Health Organization's (WHO) definition of suicide attempt/gesture as “any act with a non-fatal outcome, in which an individual deliberately initiates a non-habitual behavior that, without intervention from others, will cause self-harm” (Platt et al., 1992). In 2008, the DoD's National Center for Telehealth and Technology, along with suicide prevention programs from all U.S. military branches and the DoD's Suicide Prevention and Risk Reduction Committee, created the Department of Defense Suicide Event Report (DoDSER; Gahm et al., 2012; Reger, Luxton, Skopp, Lee, & Gahm, 2009). This reporting system was implemented DoD-wide, replacing all previous suicidal event reporting systems, including the ASER. This new standardized system allowed, for the first time, aggregate analyses of suicidal events across the DoD (Gahm et al., 2012). Despite its potential as the first system specifically designed to track suicidal events, the DoDSER is limited in that it requires active surveillance by local mental health providers to identify potential cases. Such active surveillance programs are subject to variation across providers and installations in the degree to which they are implemented.

ICD-9-CM Codes

E95x Codes—The WHO's *International Classification of Diseases*, 9th Revision–Clinical Modification (*ICD*-9-CM) includes E codes to classify external causes of injury. The codes ranging from E950 to E958 are used to identify self-inflicted poisoning or injury with suicidal intent. They are divided into 10 major categories based on method, such as (a) poisoning by solid or liquid substance, (b) injury by hanging, strangulation, and suffocation, (c) injury by firearms, air guns, and explosives, and (d) injury by cutting and piercing instrument. E95x codes have been used as indicators of suicide attempts in several previous studies (Farmer & Rohde, 1980; Lundin, Lundberg, Allebeck, & Hemmingsson, 2011; Shi, Thiebaud, & McCombs, 2004; van de Voorde, Hooft, & Mulkers, 1993; Walkup, Townsend, Crystal, & Olfson, 2012; Wojcik et al., 2009).

E98x Codes—This series of *ICD*-9-CM codes, ranging from E980 to E988, is used when the intent (i.e., accidentally or purposely) of a poisoning or injury is undetermined (Centers for Disease Control and Prevention, 2012). These codes are subset of the same 10 major categories of poisonings and injuries used for E95x codes, as described previously. E98x codes have been used to indicate potential suicide attempts in several studies (Farmer & Rohde, 1980; Lundin et al., 2011).

V62.84 Code—A V code for suicide ideation (V62.84) was added to the *ICD*-9-CM in October 2005. Since that time, use of this code in the U.S. military has increased substantially. Primary diagnoses of suicide ideation among U.S. active component Armed Forces rose from 5 in 2006 to 355 in 2010. Nonprimary diagnoses using this V code are far more common and also increased greatly during this time, reaching approximately 3,200 in 2010 (Armed Forces Health Surveillance Center, 2011).

STANAG Codes

In accordance with the 1950s NATO Standardization Agreement 2050, U.S. military hospitals utilize an additional injury coding system referred to as STANAG (Amoroso, Bell, Smith, Senier, & Pickett, 2000). STANAG codes are used for inpatient hospitalization encounters to indicate the (a) intent, (b) cause/activity, and sometimes (c) location of the injury (some cause/activity codes require the location and others do not). Intent—referred to as the “trauma code”—has three general classes: (a) battle wound or injury, (b) intentionally inflicted non-battle injury, and (c) accidental injury. Subcategories are specified within each of these classes. Within the intentionally inflicted non–battle injury class, two subcategories indicate if injuries are intentionally self-inflicted or intentionally inflicted by another person. Those that are intentionally self-inflicted are relevant to the study of suicide attempts and have previously been used in studies of suicide and self-inflicted injuries in the U.S. military (Bell, Harford, Amoroso, Hollander, & Kay, 2010; Trofimovich, Skopp, Luxton, & Reger, 2012).

Overlap Among Army Medical Data Systems

As noted, there is no centralized Army system for tracking suicidal behaviors that do not result in death. Each Army installation establishes its own local processes for identifying such cases, which may include manual review of emergency room logs and hospital

admissions, as well as educating health care providers to notify the behavioral health clinic of any nonfatal suicidal events. Currently, medical codes related to suicidal behavior (e.g., E95x) do not automatically trigger completion of a DoDSER form, and vice versa, because the codes are not monitored as part of determination for a DoDSER.

The current study integrates these various data sources in the Army STARRS HADS to comprehensively capture medically documented, nonlethal suicidal events among all regular Army soldiers on active duty from 2004 to 2009. We first classify Army/DoD administrative records into distinct categories of nonfatal suicidal outcomes. We then examine temporal changes in incidence rates of suicide attempts, suspicious injuries, and suicide ideation, as well as associations between sociodemographic risk factors and each outcome.

Methods

Sample

The Army STARRS HADS includes individual-level records from 38 Army and DoD administrative data systems for all soldiers on active duty between January 1, 2004, and December 31, 2009 (n = 1.66 million). This includes 975,057 regular Army soldiers (i.e., excluding those in the U.S. Army National Guard and Army Reserve) comprising 37.0 million person-months of service. During this time 21,740 unique soldiers had a suicide attempt, suspicious injury, or suicide ideation. We selected an equal-probability sample of 183,826 control person-months from the Army, exclusive of individuals identified as cases (soldiers with a suicide attempt, suspicious injury, or suicide ideation) and any person-months during which a soldier died (suicides, combat deaths, homicides, and deaths due to other injuries or illnesses). To create the control sample, we selected every 200th person-month after stratifying the HADS records by number of months in service, deployment status (never, currently, and previously deployed), gender, and rank. This control sample was selected to reduce the computational intensity of statistical analyses (described in the following sections). The total analytic sample combined the person-months involving a nonfatal suicidal event with the control sample person-months (total n = 205,566 person-months). Control sample person-months were each assigned a weight of 200 to adjust for the undersampling of months not associated with a non-fatal suicidal event.

Measures

The following Army and DoD data systems were examined to identify nonfatal suicidal events: the DoDSER system (described previously), which also includes all ASER records; the Military Health System Data Repository (MDR), including outpatient, inpatient, and ancillary health care information from encounters at both military treatment facilities (direct care) and civilian treatment facilities participating in the TRICARE network (purchased care); the Theater Medical Data Store (TMDS), which includes soldier medical treatment information recorded during combat operations; and the TRANS-COM (Transportation Command) Regulating and Command and Control Evacuating System (TRAC^{2}ES), a DoD-wide tracking system for all military aeromedical evacuations (patient movements) using fixed-wing aircraft across the world.

Categorization of Suicidal Events

DoDSER records, *ICD*-9-CM codes (E95x, E98x, and V62.94), and STANAG codes were organized into five categories of events:

1. *Definite Suicide Attempt*. This category includes soldiers with an ASER or DoDSER record indicating suicide attempt. From 2004 to 2006, medical providers completing the ASER identified whether the suicidal event resulted in (a) *completed suicide*, (b) *hospitalization*, (c) *evacuation*, or (d) *other* (Gahm, 2005; Gahm & Lucenko, 2006, 2007). There were no explicit options for indicating a non-lethal suicide attempt, suicide ideation, or any other nonfatal self-injurious behavior. Thus, if a 2004–2006 ASER record listed the type of event as *hospitalization*, *evacuation*, or *other*, and also indicated a method of injury, we categorized the event as a definite suicide attempt (those with a missing or unknown method were excluded from this category). A 2007 revision of the ASER changed the options for event type to (a) *completed suicide*, (b) *suicide attempt/gesture*, and (c) *suicidal ideation only (without an attempt or gesture)*. We included all 2007 ASER records coded as *suicide attempt/gesture* in our definite suicide attempt category. Beginning with the first DoDSER form in 2008, medical providers were required to identify the type of event as (a) *suicide*, (b) *suicide attempt (evidence of intent to die)*, (c) *self-harm (without intent to die)*, or (d) *suicidal ideation only (without attempt/self-harm)*. For 2008–2009 DoDSER records, we included those in which either *suicide attempt (evidence of intent to die)* or *self-harm (without intent to die)* was listed as the type of event. *Self-harm (without intent to die)* was included in the definite suicide attempt category because it was unclear how medical providers who filled out the DoDSER were making determinations about suicidal intent, and it has been recommended that self-injurious behaviors should be considered nonsuicidal only when there is absolutely no evidence of intent to die (Nock & Favazza, 2009). It also brings the 2008–2009 DoDSER data more in line with the 2004–2007 ASER, which did not require providers to make this distinction.

2. *Probable Suicide Attempt*. This category includes soldiers with a record containing an *ICD*-9-CM E95x code for self-inflicted poisoning or injury with suicidal intent (E950–E958). We excluded E959 (late effects of a self-inflicted injury) because our focus was on acute injuries rather than encounters due to previous self-inflicted injuries. E95x codes were categorized as *probable* suicide attempts because the procedures for assigning these codes are not as rigorous or time-consuming as those for completing an ASER/DoDSER.

3. *Suspicious Injury*. This category includes *ICD*-9-CM E98x codes (in combination with a suspicious injury diagnosis) and STANAG codes. Our list of suspicious injuries was based on previous work identifying *ICD*-9-CM injury codes most frequently associated with suicide attempts (Patrick et al., 2010). We considered certain injuries (e.g., open wound to elbow, forearm, or wrist; poisoning by psychotropic agents) suspicious when they were accompanied by an E980–E988 code indicating the injury was potentially self-inflicted and the intent was

undetermined. As with E959, the E989 code (late effects) was excluded (a full list of the included diagnostic codes is available from the authors upon request). STANAG codes for intentionally self-inflicted injuries were also included in this category because these codes do not indicate if there was suicidal intent.

4. *Definite Suicide Ideation*. This category is composed only of ASER and DoDSER records. If a 2004–2006 ASER listed the type of event as *hospitalization*, *evacuation*, or *other*, but did not indicate a method of injury, it was categorized as definite suicide ideation. We also included ASER/DoDSER records from 2007 to 2009 specifically listing *suicidal ideation* as the event type.

5. *Probable Suicide Ideation*. This category includes records with an *ICD*-9-CM V code for suicide ideation (V62.84). Due to inconsistent use of this V code, these events were categorized as probable suicide ideation.

Sociodemographic Correlates of Suicidal Events

To examine sociodemographic correlates of these categories, we identified one event per soldier. If a soldier had records indicating multiple events, we selected the first most severe event using a hierarchical classification scheme with three components. First, we selected the most severe event(s). For example, if a soldier had one record indicating suicide ideation and one record indicating suicide attempt, we included only the suicide attempt. Second, we selected the record(s) from the most substantiated source. For example, if a soldier had an E95x record and DoDSER record indicating a suicide attempt, we included only the DoDSER, as it requires a more thorough investigation and validation of the event. Third, we selected the event that occurred first. For example, if a soldier had two or more suicide attempts, we selected the earliest attempt.

Analysis

After identifying and categorizing records for each type of nonfatal outcome, annual incidence rates were calculated based on the ratio of the number of soldiers within each category per year divided by the number of person-*years*, not person-*months*, in the population for that particular year (i.e., soldiers per 100,000 person-years). To examine relationships over time, Pearson correlations between the monthly incidence rates for each pair of outcomes were estimated. In these correlation analyses, the monthly observations for definite and probable suicide ideation rates were limited to 2007 through 2009, the years during which all suicide ideation codes were in use by the Army.

Average annual incidence rates per 100,000 person-years were calculated within subgroups defined by sociodemographic predictors (gender, age at entry into the Army, race, education, marital status, rank) and each hierarchical classification outcome (the first most severe nonfatal event). Logistic regression analyses were used to examine the univariate associations of sociodemographic predictors with each outcome. To test whether associations with sociodemographic predictors differed across outcomes, separate logistic regression models were calculated, where the dependent variable was an aggregate of the outcome categories (i.e., any nonfatal event) and the independent variable was the interaction between one of the sociodemographic variables (e.g., gender) and each nonfatal

event category (e.g., definite suicide attempt). In these analyses a significant interaction indicates that the sociodemographic variable is differentially associated with one or more of the outcomes.

Given evidence that suicidal events increased substantially over the study period (Department of the Army, 2012), all logistic regression equations included a separate dummy predictor variable for calendar month and year to control for secular trends. Estimated model coefficients and the confidence limits were exponentiated to obtain estimated odds-ratios (OR) and 95% confidence intervals (CI). Significance of predictors was evaluated using Wald χ^2 tests and statistical significance was determined based on .05-level two-sided tests.

Results

Army and DoD administrative records during the years 2004 through 2009 documented 185 to 799 soldiers per year with a definite suicide attempt (37 to 152 per 100,000 person-years), 738 to 1,572 with a probable suicide attempt (149 to 298/100,000), 275 to 318 with a suspicious injury (56 to 60/100,000), 9 to 907 with definite suicide ideation (386 to 830/100,000), and 160 to 3,995 with probable suicide ideation (381 to 726/100,000) (Table 1). Incidence rates of suicide ideation and attempts increased each year during the study period, except for a slight decrease in attempts in 2009. From 2004 to their peak in 2008, rates for definite and probable suicide attempts increased 405% and 200%, respectively. It should be noted, however, that the ASER/DoDSER system was first implemented in 2004, so part of the increase in definite attempts is likely due to lower compliance among providers during the first year of this new system (Gahm, 2005). The rate of definite suicide ideation increased 184% from 2007 (the year this coding option was first introduced in the ASER/DoDSER system) to 2009. Probable suicide ideation increased 191% between 2006 (the first full year after the introduction of the V62.84 code) and 2009.

Over the six-year period covered by HADS, incidence rates of definite and probable suicide attempts were significantly correlated ($r = .61$, $p < .0001$), as were rates of definite and probable suicide ideation ($r = .63$, $p < .0001$). Suicide attempt and suicide ideation rates also were correlated with reported suicide death rates (Department of the Army, 2012) over the same time period (rs = .38 to .44, $p < .05$). In contrast, annual incidence rates of suspicious injuries remained stable throughout the study period and were not correlated with any other nonfatal outcome or with reported rates of suicide deaths.

Among soldiers with a DoDSER suicide attempt record, 56.9% also had an E95x code; and among those with an E95x code, 24.7% also had a DoDSER suicide attempt record. Among 2,418 total soldiers with a STANAG code for intentionally self-inflicted injury, only 232 did not have a DoDSER, E95x, or E98x record, suggesting that sole use of these STANAG codes in the Army is uncommon.

Sociodemographic Characteristics Across Nonfatal Suicidal Events

To examine sociodemographic correlates of each nonfatal outcome, we identified each soldier's first most severe event using the hierarchical classification scheme previously

described. Among 21,740 unique soldiers with at least one nonfatal event during 2004 through 2009, this classification scheme resulted in a total of 3,594 definite suicide attempts, 6,197 probable suicide attempts, 1,326 suspicious injuries, 1,851 cases of definite suicide ideation, and 8,772 cases of probable suicide ideation (Table 2).

Table 3 displays the basic sociodemographic characteristics (gender, age at entry into the Army, race, education, marital status, and rank) for each hierarchically classified event. As can be seen in Table 4, there is substantial variation in the distribution of risk (rate per 100,000 person-years) across sociodemographic subgroups and event categories. Logistic regression analyses controlling only for secular time (Table 5) found that odds of any outcome are significantly higher among those who are female, non-Hispanic White, never married, lower ranking enlisted (particularly E1–E2), entered the Army prior to age 21, and have less than a high school education (including GED and alternative education).

We then examined whether associations with predictor variables differed across nonfatal event categories. Analysis of the interactions between each sociodemographic variable and the five outcomes in predicting suicidality revealed significant differences for gender (Wald $\chi^2_4 = 180.3$, $p < .0001$), age at entry into the Army (Wald $\chi^2_8 = 125.7$, $p < .0001$), education (Wald $\chi^2_{12} = 41.2$, $p < .0001$), marital status (Wald $\chi^2_8 = 51.1$, $p < .0001$), and rank (Wald $\chi^2_{20} = 87.7$, $p < .0001$), indicating that ORs for these sociodemographic variables differed across outcomes. Associations with race did not differ significantly (Wald $\chi^2_{16} = 14.6$, $p = .56$). Similar results were obtained using multinomial regression as an alternative approach, where each sociodemographic variable served as the independent variable in separate models and the five outcomes served as levels of the dependent variable.

Discussion

Incidence rates of suicide ideation and attempts increased annually among regular Army soldiers during the years 2004 through 2009, with the exception of a slight decrease in the attempt rate in 2009. Annual rates of definite and probable suicide attempts were correlated, as were rates of definite and probable ideation. Rates of both suicide attempts and suicide ideation were also correlated with reported rates of suicide deaths during the same period (Department of the Army, 2012), indicating that the Army experienced parallel increases in fatal and nonfatal suicidal events during the years 2004 through 2009. Annual rates of definite attempts were approximately three to eight times higher than those of suicide deaths. When probable suicide attempts are included, the attempt-to-death ratio for those years was in the range 13 to 22. In the U.S. general population in 2008, the crude rate of documented injuries from self-harm was approximately 11 times greater than the crude rate of suicide deaths among males age 18 to 25 (Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, 2005). Unlike suicide attempts and suicide ideation, the Army's annual incidence rate of suspicious injuries remained stable and was not correlated with any other outcomes. Future examination of suspicious injuries in combination with mental health records may reveal whether these events are relevant to the study of nonfatal suicidal events in the Army or are truly distinct.

Given the increase in suicide fatalities over the same time period considered in the current study, it is unlikely the observed upward trend in nonfatal events was due only to increased awareness (and, therefore, documentation) among health care providers, unit commanders, and peers (e.g., Armed Forces Health Surveillance Center, 2011). Importantly, these Army administrative data are perhaps the most comprehensive database available anywhere for nonhospitalized suicide attempts. In contrast to the CDC, which uses a multistage probability sample to annually survey providers about ambulatory medical encounters in the general population (e.g., Ting, Sullivan, Boudreaux, Miller, & Camargo, 2012), Army administrative records capture all ambulatory visits for suicidal events as long as they were properly coded.

Within each nonfatal event category, univariate analyses found higher odds of suicidal behavior among those who are female, non-Hispanic White, never married, lower ranking enlisted, have less than a high school education, and entered Army service prior to age 21. Despite similar odds for individual predictors across event categories, these sociodemographic associations were statistically different across outcomes for all predictors except race. Inspection of the odds ratios suggests that gender has the largest discrepancy, with females 2.0 to 2.3 times more likely than males to make a suicide attempt but only 1.4 to 1.5 times more likely to have suicide ideation. Additional research will be needed to determine whether these differential associations are of clinical or practical significance. Other specifications based on variables such as deployment status (never, currently, previously deployed) and year of Army service (e.g., first year, first four years, more than four years) will further elucidate subgroups of concentrated risk.

The univariate findings related to gender, marital status, and education are generally consistent with a large body of research on nonfatal suicidal events (Nock et al., 2008), though a recent multivariate analysis of self-reported Army suicide attempts found that previously married soldiers had lower odds than those currently married (Nock et al., 2014). The higher odds associated with lower rank is consistent with research on self-reported suicide attempts (Nock et al., 2014) and most (Bachynski et al., 2012; Bell et al., 2010; Logan, Skopp, Karch, Reger, & Gahm, 2012; Schoenbaum et al., 2014) but not all (Black, Gallaway, Bell, & Ritchie, 2011) recent studies of suicide deaths among soldiers. Although our preliminary finding of increased risk among those entering Army service prior to the age of 21 could have important implications for targeted prevention programs, there is evidence that this finding may not persist in more complex analyses (Nock et al., 2014). Future Army STARRS studies will examine multivariate models to better understand the direct and interactive effects of these sociodemographic variables, as well as additional military characteristics (e.g., military occupational specialty, number of previous deployments, demotions), indicators of prior mental health functioning (e.g., psychiatric diagnoses, treatment history) and other potentially important risk factors among soldiers (see Nock et al., 2013).

Several limitations to the study are worth noting. First, due to variations in the nature and quality of the Army and DoD administrative data systems, we had to make decisions in categorizing nonfatal suicidal events. Although we sought to strike a reasonable balance between over- and under-inclusiveness, alternative categorizations could be justified. For

example, 2008–2009 DoDSER events originally coded as *self-harm (without intent to die)* were categorized as definite suicide attempts due to uncertainty about the procedures and reliability of these coding decisions. This may have somewhat increased total suicide attempts (N = 708). It is also possible that providers might have applied *ICD*-9-CM or STANAG diagnostic codes multiple times for a single event (i.e., during the initial encounter and any follow-up encounters). If these duplications spanned more than one year it would have inflated the annual count and incidence rate of that outcome to an unknown degree. On the other hand, our categorization of E95x codes as probable, rather than definite, suicide attempts may be overly conservative. Several civilian studies have relied on E95x codes as indicators of suicide attempt; however, questions regarding their validity remain (Walkup et al., 2012). There are similar considerations for our categorization of definite and probable suicide ideation.

Second, the 2004–2009 study period includes the time during which the ASER/DoDSER systems were first being implemented. It is therefore likely that they did not capture all nonfatal suicidal events. In addition, the ASER did not have specific coding options for suicide attempts and other non-fatal events until 2007. Third, as in all studies of medically documented suicide deaths and attempts, the degree to which suicide attempts may have been misclassified (e.g., as accidents) is unclear. It has been suggested that misclassification might underestimate the number of suicide deaths in the Army by as much as 21% (Carr, Hoge, Gardner, & Potter, 2004). In addition, these data include only those soldiers who came into contact with the military health care system and, therefore, do not capture suicidal events for which no medical treatment was necessary or sought, and therefore likely reflect only the most severe events (Ramchand, Acosta, Burns, Jaycox, & Pernin, 2011). Previous studies have found that service members reporting mental health problems perceive significantly greater barriers to mental health care and stigma than those without such problems (Hoge et al., 2004). This may include not only soldiers with suicide ideation (Warner et al., 2011) but also those who have made a less severe suicide attempt and choose not to seek medical treatment.

Within the context of these limitations, the current investigation provides important information on recent trends in nonfatal suicidal events within the U.S. Army. Previous research suggests that the individual and organizational burden of suicidal events are substantial. Soldiers hospitalized primarily for psychiatric problems are significantly more likely to be involuntarily separated from the Army than those hospitalized for other medical reasons (Hoge et al., 2005). While hospitalized, soldiers are unable to fulfill their roles and contribute to missions, and additional time and training may be required for other soldiers to function as replacements. Beyond the direct financial costs associated with suicide attempts (e.g., evacuation, hospitalization, treatment) there are also substantial indirect costs (Eibner, Ringel, Kilmer, Pacula, & Diaz, 2008), which may include lost work productivity, medical board evaluation, and administrative and/or legal actions.

An important goal of future research is to identify effective points of intervention with suicidal soldiers. For instance, although mental health–related impairment is associated with increased treatment use among active soldiers (McKibben et al., 2013), a recent study of DoDSER suicide attempt records found evidence of prior inpatient mental health care in

24% of cases and prior outpatient mental health care in 60% of cases (Bush et al., 2013), suggesting that a substantial number of service members have received mental health care and are therefore potentially "reachable." The majority of service members treated for self-inflicted injuries or poisonings do visit primary care in the month preceding the event (Trofimovich et al., 2012), thereby providing yet another potential point of intervention. In recent years, the Army has substantially supported efforts to make primary care a more effective and efficient access point to mental health treatment for problems such as posttraumatic stress disorder (PTSD) and depression (Engel et al., 2008). These efforts may likewise improve the detection and management of suicidality.

Conclusion

The current study provides the most comprehensive picture to date of nonfatal suicidal events in the U.S. Army. The Army STARRS HADS is likely the most inclusive database of medically documented suicidal behaviors available anywhere. Although the DoDSER system has become the primary source for tracking such events and has improved substantially over time, opportunities for continued improvements still exist, particularly in the classification of suicide attempts (e.g., Paniagua, 2010). The results of this study suggest that increased understanding of nonfatal suicidal events in the Army requires examination of multiple data systems. Better integration of administrative databases can enhance surveillance and identification of important risk factors. Better awareness of, and attention to, nonfatal suicidal events may also provide an opportunity for prevention of suicide deaths.

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Table 1

Annual Number of Soldiers and Incidence Rates Within Nonfatal Event Categories Among Active-Duty Regular Army Soldiers in the Army STARRS 2004–2009 Historical Administrative Data Study (HADS) Sample (*n* = 205,566)

I. Annual Number of Soldiers by Event Category[a]

	Soldiers Within Category per Year (*N*)					
Event Category	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Suicide Attempt	885	1,403	1,706	1,949	2,110	2,033
Definite	185	524	712	740	799	695
Probable	738	1,026	1,218	1,461	1,572	1,565
Suspicious Injury	275	280	284	278	318	307
Suicide Ideation	9	189	1,930	2,821	3,737	4,567
Definite	9	29	36	453	759	907
Probable	—	160	1,904	2,515	3,242	3,995

II. Annual Incidence Rate per 100,000 Person-Years by Event Category [b]

	Incidence Rate Within Category per Year						
Event Category	2004	2005	2006	2007	2008	2009	Average Annual Rate
Suicide Attempt	178.8	288.4	341.0	384.5	400.4	369.6	329.0
Definite	37.4	107.7	142.3	146.0	151.6	126.4	119.2
Probable	149.1	210.9	243.5	288.2	298.3	284.5	247.3
Suspicious Injury	55.6	57.6	56.8	54.8	60.3	55.8	56.8
Suicide Ideation[c]	—	—	385.8	556.5	709.1	830.3	702.3
Definite	—	—	—	89.4	144.0	164.9	133.8
Probable	—	—	380.6	496.1	615.2	726.3	615.7

Note. The sample of 205,566 person-months includes all 21,740 regular Army soldiers (i.e., excluding those in the U.S. Army National Guard and Army Reserve) with a suicide attempt, suspicious injury, or suicide ideation in the administrative records during the years 2004–2009 plus a 1:200 stratified probability sample of all other active-duty regular Army person-months in the population exclusive of cases (i.e., soldiers with a suicide attempt, suspicious injury, or suicide ideation) and person-months associated with death (i.e., suicides, combat deaths, homicides, and deaths due to other injuries or illnesses). All records in the 1:200 sample were assigned a weight of 200 to adjust for the undersampling of months not associated with suicide attempt, suspicious injury, or suicide ideation.

[a] Soldiers are unique within each cell (event category by year) but may appear in more than one category and in more than one year within the same category.

[b] Annual incidence rates were calculated based on n_1/n_2, where n_1 is the unique number of soldiers within each category in each year (see part II above) and n_2 is the annual number of person-*years*, not person-*months*, in the population (2004 = 494,909 person-years; 2005 = 486,447; 2006 = 500,251; 2007 = 506,946; 2008 = 526,970; 2009 = 550,056). As noted previously, the 205,566 person-months in the sample represent a 1:200 sample of the 37.0 million person-months (3.08 million person-years) in the population of regular Army soldiers (i.e., excluding those in the U.S. Army National Guard and Army Reserve) on active duty for one or more months in calendar years 2004–2009.

[c] Rates for definite suicide ideation were not calculated for 2004–2006 because suicidal ideation was introduced in the ASER/DoDSER until 2007; rates for probable suicide ideation were not calculated for 2004–2005 because the V62.84 code was not introduced until late 2005; average annual rates for definite and probable suicide ideation were calculated using the annual rates from 2007–2009, the only years when all suicide ideation codes where available.

Table 2

Hierarchical Classification of First Most Severe Event Among Active-Duty Regular Army Soldiers in the Army STARRS 2004–2009 Historical Administrative Data Study (HADS)

	Unique Soldiers Per Year (*N*)						Total Unique Soldiers
Hierarchical Classification	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**(*N*)**
Suicide Attempt	881	1,382	1,652	1,893	2,041	1,942	9,791
Definite	185	522	702	724	786	675	3,594
Probable	696	860	950	1,169	1,255	1,267	6,197
Suspicious Injury	215	231	220	202	237	221	1,326
Suicide Ideation	8	149	1,542	2,255	2,966	3,703	10,623
Definite	8	24	30	386	632	771	1,851
Probable	—	125	1,512	1,869	2,334	2,932	8,772
Total	1,104	1,762	3,414	4,350	5,244	5,866	21,740

Note. Includes all 21,740 active-duty regular Army soldiers (i.e., excluding those in the U.S. Army National Guard and Army Reserve) with a suicide attempt, suspicious injury, or suicide ideation in the administrative records during the years 2004–2009.

Table 3

Sociodemographic Characteristics by Hierarchical Classification of First Most Severe Event Among Active-Duty Regular Army Soldiers in the Army STARRS 2004–2009 Historical Administrative Data Study (HADS) Sample (*n* = 205,566)

	Suicide Attempt						Suicide Ideation					
	Definite		Probable		Suspicious Injury		Definite		Probable		Total Sample	
Demographics	*N*	(%)	*N*	(%)	*N*	(%)	*N*	(%)	*N*	(%)	*N*[c]	(%)
Gender												
Male	2,640	(73.5)	4,663	(75.2)	976	(73.6)	1,493	(80.7)	7,219	(82.3)	31,645	(86.0)
Female	954	(26.5)	1,534	(24.8)	350	(26.4)	358	(19.3)	1,553	(17.7)	5,142	(14.0)
Age at Entry												
< 21	1,147	(31.9)	2,168	(35.0)	436	(32.9)	528	(28.5)	2,545	(29.0)	4,629	(12.6)
21–24	1,277	(35.5)	2,240	(36.1)	464	(35.0)	618	(33.4)	3,060	(34.9)	9,798	(26.6)
25+	1,170	(32.6)	1,789	(28.9)	426	(32.1)	705	(38.1)	3,167	(36.1)	22,360	(60.8)
Race												
White	2,528	(70.3)	4,373	(70.6)	937	(70.7)	1,293	(69.9)	6,288	(71.7)	22,818	(62.0)
Black	535	(14.9)	900	(14.5)	196	(14.8)	290	(15.7)	1,258	(14.3)	7,774	(21.1)
Hispanic	379	(10.5)	611	(9.9)	130	(9.8)	180	(9.7)	814	(9.3)	3,906	(10.6)
Asian	96	(2.7)	197	(3.2)	41	(3.1)	62	(3.3)	285	(3.2)	1,501	(4.1)
Other	56	(1.6)	115	(1.9)	21	(1.6)	26	(1.4)	127	(1.4)	781	(2.1)
Education												
High School[b]	1,021	(28.4)	1,871	(30.2)	350	(26.4)	517	(27.9)	2,565	(29.2)	3,980	(10.8)
High School	2,345	(65.2)	4,039	(65.2)	884	(66.7)	1,200	(64.8)	5,650	(64.4)	23,872	(64.9)
Some College	91	(2.5)	103	(1.7)	35	(2.6)	51	(2.8)	186	(2.1)	1,922	(5.2)
≥ College	137	(3.8)	184	(3.0)	57	(4.3)	83	(4.5)	371	(4.2)	7,013	(19.1)
Marital Status												
Never	1,987	(55.3)	3,507	(56.6)	764	(57.6)	971	(52.5)	4,550	(51.9)	14,097	(38.3)
Previous	106	(2.9)	136	(2.2)	37	(2.8)	43	(2.3)	233	(2.7)	1,564	(4.3)
Current	1,501	(41.8)	2,554	(41.2)	525	(39.6)	837	(45.2)	3,989	(45.5)	21,126	(57.4)
Rank												
E1–E2	1,320	(36.7)	2,402	(38.8)	472	(35.6)	670	(36.2)	3,173	(36.2)	3,797	(10.3)

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	Suicide Attempt						Suicide Ideation					
	Definite		Probable		Suspicious Injury		Definite		Probable		Total Sample	
Demographics	***N***	**(%)**	***N***	**(%)**	***N***	**(%)**	***N***	**(%)**	***N***	**(%)**	***N*[c]**	**(%)**
E3	755	(21.0)	1,341	(21.6)	274	(20.7)	365	(19.7)	1,684	(19.2)	4,373	(11.9)
E4	906	(25.2)	1,554	(25.1)	335	(25.3)	473	(25.6)	2,249	(25.6)	8,499	(23.1)
E5–E8	545	(15.2)	827	(13.3)	206	(15.5)	300	(16.2)	1,468	(16.7)	14,058	(38.2)
Warrant Officer	8	(0.2)	7	(0.1)	9	(0.7)	6	(0.3)	26	(0.3)	966	(2.6)
Officer	60	(1.7)	66	(1.1)	30	(2.3)	37	(2.0)	172	(2.0)	5,094	(13.9)

Note. The sample of 205,566 person-months includes all 21,740 regular Army soldiers (i.e., excluding those in the U.S. Army National Guard and Army Reserve) with a suicide attempt, suspicious injury, or suicide ideation in the administrative records during the years 2004–2009 plus a 1:200 stratified probability sample of all other active-duty regular Army person-months in the population exclusive of cases (i.e., soldiers with a suicide attempt, suspicious injury, or suicide ideation) and person-months associated with death (i.e., suicides, combat deaths, homicides, and deaths due to other injuries or illnesses). All records in the 1:200 sample were assigned a weight of 200 to adjust for the undersampling months not associated with suicide attempt, suspicious injury, or suicide ideation.

[a]Includes general educational development (GED) credential and alternative education.

[b]Weighted person-months in thousands in the population.

Table 4

Distribution of Risk by Sociodemographic Characteristics and Hierarchical Classification of First Most Severe Event Among Regular Army Soldiers in the Army STARRS 2004–2009 Historical Administrative Data Study (HADS) Sample (*n* = 205,566)

	Suicide Attempt						Suicide Ideation			
	Definite		Probable		Suspicious Injury		Definite		Probable	
Demographics	**Rate[a]**	**(n_1/n_2)[b]**	**Rate**	**(n_1/n_2)**	**Rate**	**(n_1/n_2)**	**Rate**	**(n_1/n_2)**	**Rate**	**(n_1/n_2)**
Gender										
Male	100.2	(2,640/2,636)	176.9	(4,663/2,636)	37.0	(976/2,635)	56.6	(1,493/2,636)	273.8	(7,219/2,636)
Female	222.8	(954/428)	358.2	(1,534/428)	81.8	(350/428)	83.6	(358/428)	362.7	(1,553/428)
Age at Entry										
<21	297.9	(1,147/385)	562.5	(2,168/385)	113.2	(436/385)	137.1	(528/385)	660.3	(2,545/385)
21–24	156.5	(1,277/816)	274.5	(2,240/816)	56.9	(464/816)	75.7	(618/816)	375.0	(3,060/816)
25+	62.8	(1,170/1,863)	96.0	(1,789/1,863)	22.9	(426/1,863)	37.8	(705/1,863)	170.0	(3,167/1,862)
Race										
White	133.1	(2,528/1,900)	230.1	(4,373/1,900)	49.3	(937/1,900)	68.0	(1293/1,900)	330.8	(6,288/1,901)
Black	82.6	(535/648)	139.0	(900/648)	30.3	(196/648)	44.8	(290/648)	194.2	(1,258/648)
Hispanic	116.6	(379/325)	187.8	(611/325)	40.0	(130/325)	55.3	(180/325)	250.1	(814/325)
Asian	76.8	(96/125)	157.6	(197/125)	32.8	(41/125)	49.6	(62/125)	228.0	(285/125)
Other	86.2	(56/65)	176.9	(115/65)	32.3	(21/65)	40.0	(26/65)	195.4	(127/65)
Education										
< High School [c]	308.5	(1,021/331)	564.7	(1,871/331)	105.7	(350/331)	156.1	(517/331)	774.1	(2,565/331)
High School	118.0	(2,345/1,988)	203.1	(4,039/1,989)	44.5	(884/1,988)	60.4	(1200/1,988)	284.1	(5,650/1,988)
Some College	56.9	(91/160)	64.3	(103/160)	21.9	(35/160)	31.9	(51/160)	116.2	(186/160)
≥ College	23.5	(137/584)	31.5	(184/584)	9.8	(57/584)	14.2	(83/584)	63.5	(371/584)
Marital Status										
Never	169.3	(1,987/1,174)	298.7	(3,507/1,174)	65.1	(764/1,174)	82.7	(971/1,174)	387.5	(4,550/1,174)
Previous	13.6	(106/782)	104.4	(136/130)	28.4	(37/130)	33.0	(43/130)	178.8	(233/130)
Current	85.3	(1,501/1,760)	145.1	(2,554/1,760)	29.8	(525/1,760)	47.6	(837/1,760)	226.6	(3,989/1,760)
Rank										
E1–E2	417.7	(1,320/316)	760.2	(2,402/316)	149.5	(472/315)	212.1	(670/316)	1004.0	(3,173/316)

Demographics	Suicide Attempt: Definite Rate[a]	Suicide Attempt: Definite (n_1/n_2)[b]	Suicide Attempt: Probable Rate	Suicide Attempt: Probable (n_1/n_2)	Suspicious Injury Rate	Suspicious Injury (n_1/n_2)	Suicide Ideation: Definite Rate	Suicide Ideation: Definite (n_1/n_2)	Suicide Ideation: Probable Rate	Suicide Ideation: Probable (n_1/n_2)
E3	207.4	(755/364)	368.3	(1,341/364)	75.3	(274/364)	100.3	(365/364)	462.4	(1,684/364)
E4	128.0	(906/708)	219.5	(1,554/708)	47.3	(335/708)	66.8	(473/708)	317.7	(2,249/708)
E5–E8	46.5	(545/1,171)	70.6	(827/1,171)	17.6	(206/1,171)	25.6	(300/1,171)	125.3	(1,468/1,171)
Warrant Officer	9.9	(8/81)	8.7	(7/81)	11.2	(9/80)	7.5	(6/81)	32.3	(26/80)
Officer	14.2	(60/424)	15.5	(66/424)	7.1	(30/424)	8.7	(37/424)	40.5	(172/424)
All Soldiers	117.3	(3,594/3,064)	202.2	(6,197/3,064)	43.3	(1,326/3,064)	60.4	(1,851/3,064)	286.2	(8,772/3,064)
	319.5		(9,791/3,064)				346.7		(10,623/3,064)	

Note. The sample of 205,566 person-months includes all 21,740 regular Army soldiers (i.e., excluding those in the U.S. Army National Guard and Army Reserve) with a suicide attempt, suspicious injury, or suicide ideation in the administrative records during the years 2004–2009 plus a 1:200 stratified probability sample of all other active-duty regular Army person-months in the population exclusive of cases (i.e., soldiers with a suicide attempt, suspicious injury, or suicide ideation) and person-months associated with death (i.e., suicides, combat deaths, homicides, and deaths due to other injuries or illnesses). All records in the 1:200 sample were assigned a weight of 200 to adjust for the undersampling of months not associated with suicide attempt, suspicious injury, or suicide ideation.

[a] Rate per 100,000 person-years.

[b] n_1 = number of soldiers with a suicide attempt, suspicious injury, or suicide ideation; n_2 = number of person-*years*, not person-*months*, in thousands in the population. As noted previously, the 205,566 person-months in the sample represent a 1:200 sample of the 37.0 million person-months (3.08 million person-years) in the population of regular Army soldiers (i.e., excluding those in the U.S. Army National Guard and Army Reserve) on active duty for one or more months in calendar years 2004–2009.

[c] Includes general educational development (GED) credential and alternative education.

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Table 5

Univariate Associations Between Sociodemographic Characteristics and Hierarchical Classification of First Most Severe Event among Active-Duty Regular Army Soldiers in the Army STARRS 2004–2009 Historical Administrative Data Study (HADS) Sample (*n* = 205,566)

	Suicide Attempt						Suicide Ideation			
	Definite		Probable		Suspicious Iujury		Definite		Probable	
Demographics	**OR**	**(95% CI)**	**OR**	**(95% CI)**	**OR**	**(95% CI)**	**OR**	**(95% CI)**	**OR**	**(95% CI)**
Gender**										
Male	1.0		1.0		1.0		1.0		1.0	
Female	2.3*	(2.1–2.4)	2.0*	(1.9–2.2)	2.2*	(2.0–2.5)	1.5*	(1.4–1.7)	1.4*	(1.3–1.4)
χ^2_1	464.3*		589.3*		161.2*		53.7*		126.8*	
Age at Entry**										
<21	1.9*	(1.8–2.1)	2.1*	(2.0–2.2)	2.0*	(1.7–2.3)	1.9*	(1.7–2.2)	1.8*	(1.7–1.9)
21–24	1.0		1.0		1.0		1.0		1.0	
25+	0.4*	(0.4–0.4)	0.3*	(0.3–0.4)	0.4*	(0.4–0.5)	0.5*	(0.4–0.5)	0.4*	(0.4–0.5)
χ^2_2	1,463.0*		3,136.6		*	553.1*		587.8*		2,943.8*
Race										
White	1.0		1.0		1.0		1.0		1.0	
Black	0.6*	(0.6–0.7)	0.6*	(0.6–0.7)	0.6*	(0.5–0.7)	0.7*	(0.6–0.8)	0.6*	(0.6–0.7)
Hispanic	0.9*	(0.8–1.0)	0.8*	(0.7–0.9)	0.8*	(0.7–1.0)	0.8*	(0.7–0.9)	0.7*	(0.7–0.8)
Asian	0.7*	(0.5–0.9)	0.7*	(0.6–0.8)	0.7*	(0.5–0.9)	0.7*	(0.6–0.9)	0.7*	(0.6–0.8)
Other	0.6*	(0.5–0.7)	0.8*	(0.6–0.9)	0.7	(0.4–1.0)	0.6*	(0.4–0.9)	0.6*	(0.5–0.7)
χ^2_4	120.1*		207.2*		46.9*		42.2*		320.3*	
Education**										
< High School[a]	1.0		1.0		1.0		1.0		1.0	
High School	0.4*	(0.4–0.4)	0.4*	(0.3–0.4)	0.4*	(0.4–0.5)	0.5*	(0.4–0.5)	0.4*	(0.4–0.4)
Some College	0.2*	(0.2–0.2)	0.1*	(0.1–0.1)	0.2*	(0.1–0.3)	0.2*	(0.2–0.3)	0.2*	(0.2–0.2)
≥ College	0.1*	(0.1–0.1)	0.1*	(0.0–0.1)	0.1*	(0.1–0.1)	0.1*	(0.1–0.1)	0.1*	(0.1–0.1)

	Suicide Attempt						Suicide Ideation			
	Definite		Probable		Suspicious Iujury		Definite		Probable	
Demographics	**OR**	**(95% CI)**	**OR**	**(95% CI)**	**OR**	**(95% CI)**	**OR**	**(95% CI)**	**OR**	**(95% CI)**
χ^2_3	1,147.2*		2,304.6*		389.1*		476.0*		2,663.0*	
Marital Status**										
Never	2.0*	(1.9–2.2)	2.1*	(2.0–2.2)	2.2*	(2.0–2.4)	1.9*	(1.7–2.1)	1.8*	(1.8–1.9)
Previous	1.0	(0.8–1.2)	0.7*	(0.6–0.9)	1.0	(0.7–1.3)	0.7*	(0.5–1.0)	0.8*	(0.7–0.9)
Current	1.0		1.0		1.0		1.0		1.0	
χ^2_2	453.5*		884.6*		198.0*		206.4*		846.3*	
Rank**										
E1–E2	3.2*	(3.0–3.5)	3.5*	(3.2–3.7)	3.2*	(2.7–3.6)	3.2*	(2.9–3.6)	3.2*	(3.0–3.3)
E3	1.6*	(1.5–1.8)	1.7*	(1.6–1.8)	1.6*	(1.4–1.9)	1.5*	(1.3–1.7)	1.5*	(1.4–1.6)
E4	1.0		1.0		1.0		1.0		1.0	
E5–E8	0.4*	(0.3–0.4)	0.3*	(0.3–0.3)	0.4*	(0.3–0.4)	0.4*	(0.3–0.4)	0.4*	(0.4–0.4)
Warrant Officer	0.1*	(0.0–0.2)	0.0*	(0.0–0.1)	0.2*	(0.1–0.5)	0.1*	(0.0–0.2)	0.1*	(0.1–0.1)
Officer	0.1*	(0.1–0.1)	0.1*	(0.1–0.1)	0.1*	(0.1–0.2)	0.1*	(0.1–0.2)	0.1*	(0.1–0.2)
χ^2_5	2,497.0*		4,617.4*		894.2*		1,266.3*		5,844.3*	

Note. The sample of 205,566 person-months includes all 21,740 active duty Regular Army soldiers (i.e., excluding those in the U.S. Army National Guard and Army Reserve) with a suicide attempt, suspicious injury, or suicide ideation in the administrative records during the years 2004-2009 plus a 1:200 stratified probability sample of all other active duty Regular Army person-months in the population exclusive of cases (i.e., soldiers with a suicide attempt, suspicious injury, or suicide ideation) and person-months associated with death (i.e., suicides, combat deaths, homicides, and deaths due to other injuries or illnesses). All records in the 1:200 sample were assigned a weight of 200 to adjust for the under-sampling months not associated with suicide attempt, suspicious injury, or suicide ideation. All analyses included a dummy predictor variable for calendar month and year to control for secular trends.

[a] Includes general educational development (GED) credential and alternative education.

* $p < .05$;

** Indicates predictors with univariate ORs that differ (ps < .05) across the five hierarchical classification categories of the first most severe event.