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## Suicidal ideation among young Afghanistan/Iraq War Veterans and civilians: Individual, social, and environmental risk factors and perception of unmet mental healthcare needs, United States, 2013

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### Abstract

Suicidal Ideation among Afghanistan/Iraq War Veterans remains a health concern. As young Veterans adjust to civilian life, new risk factors might emerge and manifest differently in this group versus those in the general population. We explored these differences. With 2013 National Survey on Drug Use and Health data, we examined differences in risk of past-year suicidal ideation between Veterans of the Afghanistan/Iraq War periods aged 18–34 years (N=328) and age-comparable civilians (N=23,222). We compared groups based on individual and socio-environmental risk factors as well as perceptions of unmet mental healthcare needs. We report adjusted rate ratios (aRRs); interaction terms tested for between-group differences. PY suicidal ideation rates for Veterans and civilians did not differ (52 versus 59 per 1,000,  $p=0.60$ ) and both groups shared many risk factors. However, drug problems and perceived unmet mental health care needs were vastly stronger risk factors among Veterans versus civilians (interaction terms indicated that the aRRs were 3.8–8.0 times higher for Veterans versus civilians). Other differences were discovered as well. Past-year suicidal ideation rates did not differ by Veteran status among young adults. However, different risk factors per group were detected, which can inform Veteran suicide prevention efforts.

### Keywords

Suicide; Veterans; Socio-ecological model; Health care needs; Surveillance

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#### Conflict of interest

None of the authors have a conflict of interest in regard to this manuscript or the research on which it was based.

#### Disclaimer

The findings and conclusions in this manuscript are those of the author(s) and do not necessarily represent the official position of the Centers for Disease Control and Prevention or the Veterans Health Administration.

## 1. Introduction

The suicide rate among active duty Army personnel nearly doubled from 2001 to 2010 (Bachynski et al., 2012; Schoenbaum et al., 2014), during the Afghanistan and Iraq wars, Operations Enduring Freedom (OEF) and Iraqi Freedom (OIF) (Torreon, 2015). Non-fatal suicidal behavior among military populations was frequently documented as well (Bush et al., 2013). For example, Bush and colleagues (2013) reported there were 1514 suicide attempts among Army personnel during 2008–2010 (Bush et al., 2013). The Veteran Health Administration (VHA) also reported similar increases in suicide rates among some OEF/OIF Veteran groups (Hoffmire et al., 2015; Kang et al., 2015; U.S. Department of Veterans Affairs, 2016). In 2014, the suicide rate among young VHA service users aged 18–24 years was still high at 110 deaths per 100,000 population, which is over eight times higher than the rate for the general population of similar age (Centers for Disease Control and Prevention, *WISQARS*; U.S. Department of Veterans Affairs, 2016). Therefore, suicide-related outcomes including ideation (i.e. having thoughts of suicide) remain critical aspects of health and well-being among military personnel and Veterans of the Afghanistan/Iraq war periods (National Research Action Plan, 2013; Castro and Kintzle, 2014).

Research has sought to understand the causes of suicide-related outcomes among persons who served during the Afghanistan and Iraq wars (Castro and Kintzle, 2014) and many risk factors have been discovered. Men are at increased risk of fatal suicidal behavior (Luxton et al., 2012; Bush et al., 2013; Schoenbaum et al., 2014; Logan et al., 2015) and women are at increased risk of nonfatal behavior (Lemaire and Graham, 2011; Ursano et al., 2015). Risk factors for most suicide-related outcomes have included: non-Hispanic white race/ethnicity (Luxton et al., 2012; Bush et al., 2013; Schoenbaum et al., 2014; Logan et al., 2015); under 25 years old (among active duty) (Luxton et al., 2012; Bush et al., 2013; Schoenbaum et al., 2014; Logan et al., 2015); enlisted rank of E1–E5 (among active duty) (Bachynski et al., 2012; Hyman et al., 2012; Luxton et al., 2012; Bush et al., 2013; Schoenbaum et al., 2014; Logan et al., 2015); sexual minority status (Blosnich et al., 2013, 2014); pre-enlisted and/or current mental health conditions (Ilgen et al., 2010a; Guerra and Calhoun, 2011; Lemaire and Graham, 2011; Bachynski et al., 2012; Hyman et al., 2012; Skopp et al., 2012; Conner et al., 2013; Luxton et al., 2013; Nock et al., 2014; Ramsawh et al., 2014, 2015; Ramchand et al., 2015); a history of self-directed violence (Lemaire and Graham, 2011; Weiner et al., 2011; Bryan et al., 2015b); substance use problems (Mansfield et al., 2011; Bachynski et al., 2012; LeardMann et al., 2013; Alexander et al., 2014); poor physical health and functionality (e.g., bodily pain, traumatic brain injury) (Ilgen et al., 2010c; Brenner et al., 2011; Magruder et al., 2012; Dobscha et al., 2014); recent disciplinary action from a commanding officer (i.e., Article 15), a demotion, a dishonorable discharge, or recent denial for promotion (among active duty) (Hyman et al., 2012; Schoenbaum et al., 2014; Reger et al., 2015); and intimate partner problems (Hyman et al., 2012; Skopp et al., 2012; Alexander et al., 2014). Suicidal ideation is also associated with lack of social support (Pietrzak et al., 2010; Monteith et al., 2013; Monteith et al., 2015), sexual trauma (Lemaire and Graham, 2011; Lutwak and Dill, 2013), and sleep deprivation (Luxton et al., 2011; Ribeiro et al., 2012). Some evidence has suggested that suicide-related outcomes are associated with deployment and combat exposure (Schoenbaum et al., 2014; Bryan et al., 2015a); however,

study results have been mixed (Kang et al., 2015; Reger et al., 2015). Collectively, these risk factors have informed public health prevention efforts and clinical efforts including suicide screening, risk assessment, and mental health treatment (Logan et al., 2011b; Pringle et al., 2013; Castro, 2014; McCarthy et al., 2015).

Updated rates of suicide-related outcomes and related risk factors among Veterans of the Afghanistan/Iraq wars are still needed. As many OEF/OIF military personnel discharge from service and adjust to civilian life, different risk factors might emerge. This transition period can be a difficult time accompanied by frustration with gaining employment, anger or reckless behavior, and substance abuse (Make the Connection; Shared Experiences and Support for Veterans).

Additionally, an updated assessment of risk factors framed within the socio-ecological model is needed. This model examines risk in relation to individuals and their environments and organizes factors into multiple levels: individual characteristics; interpersonal relationships; community/environmental exposures; and societal influences (Centers for Disease Control and Prevention, *The Social-Ecological Model*; Dahlberg and Krug, 2002). This model is also the paradigm used for studying the etiology of suicide by leading public health agencies such as the Centers for Disease Control and Prevention. By using this model, the present study expanded the assessment of risk to include important factors that have not been thoroughly examined among military and Veteran populations. For example, suicide-related outcomes have been heavily studied in relation to interpersonal violence perpetration among young civilian groups (Swahn et al., 2008; Logan et al., 2011b) but not as much among young Veterans. Perpetration of interpersonal and self-directed violence has been found to be correlated among some youth and adults (Swahn et al., 2008; Ilgen et al., 2010b) making interpersonal violence a potential factor that can help screen for suicidal ideation and behavior. Also, while individual mental health conditions have been assessed as suicide-related risk factors in great detail among military personnel and Veterans, perceptions of unmet mental healthcare needs has not, which may reflect the mental health services available among those who need them.

Finally, an updated comparison of rates of suicide-related outcomes and associated risk factors between Veterans of the Afghanistan and Iraq wars and civilians is needed. Past comparisons between Veterans and civilians with regard to suicide-related outcomes have not been without controversy with similar studies reaching different conclusions (Kaplan et al., 2007; Miller et al., 2012a, 2012b). An updated comparison can help determine whether new risk factors have emerged differently between these two groups.

Using national data provided by the Substance Abuse and Mental Health Services Administration (SAMHSA), we explored these areas of research to help advance Veteran suicide prevention research.

## 2. Methods

### 2.1. Data source and study population

This study used 2013 data from the National Survey on Drug Use and Health (NSDUH) (Substance Abuse and Mental Health Services Administration, 2013 (SAMHSA)). Details on NSDUH survey methods are reported elsewhere (Jones, 2013; Muhuri et al., 2013; SAMHSA, 2014). To summarize, SAMHSA employed a state-based sampling design for NSDUH that uses independent, multistage area probability sampling within each state and the District of Columbia. Approximately 3600 respondents were sampled from each of the eight states with the largest populations (California, Florida, Illinois, Michigan, New York, Ohio, Pennsylvania, and Texas) and 900 respondents were sampled from each of remaining 42 States and the District of Columbia. The design oversampled young adults; each state's sample was approximately equally distributed among three age groups: 12–17 years; 18–25 years; and 26 years or older. The weighted response rates for the 2013 household screens and interviews were 84% and 72%. Surveys are implemented through computer-assisted interviewing.

We selected adults of ages 18–34 years. Respondents were considered Veterans of the Afghanistan/Iraq war period if they reported serving on active duty from 2001 or later (N = 328). Civilian respondents were those who reported never serving in the military (N=23,222). Fig. 1 illustrates the inclusion and exclusion criteria.

### 2.2. Variables of interest

Variable definitions are provided in the online materials. Suicidal ideation (i.e., having suicidal thoughts within the past year) was the outcome variable. The risk factors assessed spanned multiple levels of the socio-ecological model: individual characteristics; interpersonal relationship factors; perceptions of community/environmental exposures (Centers for Disease Control and Prevention, *The Social-Ecological Model*).<sup>1</sup>

Individual characteristics included sex, age, race/ethnicity, employment status, and reports of past-year: major depression diagnosis; anxiety diagnosis; psychological distress; perceptions of general health; and substance abuse/dependence involving alcohol, marijuana, cocaine, opioid pain relievers, other psychotherapeutic drugs, and heroin. We also examined perceptions of past-year unmet mental health care needs.

Interpersonal relationship characteristics is limited in NSDUH; however, we were able to examine marital status and one variable that captured past-year interpersonal violence (i.e., “attacked someone with intent to seriously hurt them”).

For community/environmental exposures, we included geographical location (i.e., residing in core based statistical areas with 1 million persons versus other areas) to determine if there were differences in suicidal ideation between respondents in large metropolitan areas versus those in less populated areas. Among Veterans, we also examined suicidal ideation in

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<sup>1</sup>It should be noted that we analyzed the survey respondents' personal perceptions of their individual, relationship, and environmental characteristics as opposed to linking our individual-level data to community-level data, which is often found in multi-level analyses.

relation to combat exposure. While this exposure was not recent for many OEF/OIF Veterans, it could still have long-term mental health consequences.

### 2.3. Analytic plan

Weights were used to obtain national estimates of the outcome in the population(s) represented. Weights adjust for unequal probability of selection, nonresponse, and coverage bias. The final person-level weights in the 2013 NSDUH data were used to calculate weighted Ns and provide the population estimates for rate calculations as advised in the 2013 NSDUH codebook (Center for Behavioral Health Statistics and Quality, 2014).

Rates of suicidal ideation per 1000 with 95% confidence intervals (95% CIs) were estimated for Veterans and civilians overall and stratified by each variable of interest. Crude comparisons between the two groups were conducted using Pearson chi-square tests for independence.

We used multivariable Poisson regression models incorporating all variables simultaneously to report adjusted rate ratios (aRRs) and 95% CIs for each variable. These analyses also used weighted data to account for the complex sample design; analyses were conducted using Stata Version 12.1©. Separate models were conducted for Veterans and civilians. A third model included all respondents and variables, minus combat exposure. Interaction terms were used to detect differences in the associations by Veteran status. Tests for collinearity among predictor variables were conducted using variance inflation factor (VIF) scores, with a value of 2.0 as the threshold for detecting multiple collinearity. All VIF scores fell below this threshold.

## 3. Results

The 2013 past-year suicidal ideation rate for Afghanistan/Iraq War Veterans of ages 18–34 years was 52 (95% CI: 30–69) per 1000 persons (Table 1). The overall rate for civilians of ages 18–34 years did not significantly differ and was estimated at 59 (95% CI: 56–62) per 1000 population.

Per individual-level characteristic for the Veteran group, suicidal ideation rates per 1000 population were highest among those with past-year: drug problems (498, 95% CI: 143–597); unmet mental healthcare needs (368, 95% CI: 199–421); major depression (285, 95% CI: 191–312); severe psychological distress (285, 95% CI: 194–321); alcohol problems (201, 95% CI: 81–240); and anxiety diagnosis (190, 95% CI: 96–215) (Table 1). These characteristics were considered to be associated with the outcome based on non-overlapping 95% CIs. Severe psychological distress was present in over two-thirds (72%) of Veterans who reported suicidal ideation.

Among civilians, suicidal ideation rates were highest among groups with these characteristics as well. These characteristics were also associated with the outcome based on non-overlapping 95% CIs (Table 1). When comparing crude rates between Veterans and civilians, the suicidal ideation rate was twice as high for Veterans versus civilians among

those of ages 18–25 years (136 versus 74 per 1000 population,  $p=0.05$ ) and those with drug problems (497 versus 203 per 1000,  $p=0.02$ ).

Suicidal ideation was only associated with two interpersonal/ relationship characteristics among civilians in the bivariate analysis (Table 1). The suicidal ideation rate per 1000 population was higher for those who were never married (70, 95%CI: 67–73) compared to those who were ever married (37, 95%CI: 26–48). The rate was also higher for those who committed assault within the past year (218, 95%CI: 184–244) compared to those who did not (55, 95%CI: 52–58).

No significant associations between the outcome and the reported community/environment-level exposures were found per group in the bivariate analyses (Table 1). Among Veterans, we also did not find significantly different rates by history of combat exposure.

The aRRs and 95% CIs estimated are presented in Table 2. Among Veterans, the suicidal ideation rate was directly associated with being of ages 18–25 years (versus 26–34 years), and having past-year clinical depression, drug problems, and perceived unmet mental healthcare needs, after adjusting for all characteristics. We also found among Veterans that the suicidal ideation rate was lower among non-Hispanic whites versus other race/ethnic groups in the adjusted analysis.

Among civilians, the suicidal ideation rate was also directly associated with being of ages 18–25 years (versus 26–34 years), and having past-year clinical depression, drug problems, and perceived unmet mental healthcare needs in the adjusted analysis. Additionally, for civilians, the adjusted rate was directly associated with having serious psychological distress, never being married, and having past-year assaults. The adjusted suicidal ideation rate was also lower among civilians reporting past-year excellent/very good health compared to civilians reporting good/fair/poor health.

Table 2 also presents results on differential associations between Veterans and civilians. The suicidal ideation rate was not significantly different between Veterans and civilians after adjusting for all factors. However, different associations between the groups were evident for race, drug problems, and perceived unmet mental health care needs. Specifically, the aRRs for the interaction terms associated with drug problems (aRR: 8.0, 95%CI: 2.3–28.3), and perceived unmet mental healthcare needs (aRR: 3.9, 95%CI: 1.4–11.1) indicated that these factors were more strongly associated with the outcome for Veterans compared to civilians. The interaction term for non-Hispanic white race/ethnicity (aRR: 0.3, 95%CI: 0.1–0.8) showed that the negative association between this characteristic and ideation for Veterans was significantly different from the null association found among civilians.

#### 4. Discussion

We sought to compare risk of having suicidal thoughts between young Veterans of the Afghanistan/Iraq wars and civilians. A strength of this study is the use of recent large, nationally representative, data. The breadth of the NSDUH data allowed us to examine risk simultaneously accounting for self-reports of individual, social, and environmental characteristics and factors.

The 2013 past-year suicidal ideation rates did not differ between Veterans and civilians of ages 18–34 years and both groups shared many risk factors, including mental health and substance abuse problems. Similar findings were observed in other reports (White et al., 2011; Bachynski et al., 2012; Bush et al., 2013; Schoenbaum et al., 2014; Logan et al., 2015). However, our analyses did unveil some noteworthy differences between these two groups.

In both groups, adults of ages 18–25 years versus those of ages 26–34 years were at greater risk of suicidal ideation. This association was stronger among Veterans versus civilians in the bivariate analysis but not in the adjusted analysis. However, further analysis on adults of ages 18–25 years alone revealed that Veterans versus civilians were seven times (95%CI: 1.2–42.6) at greater risk of suicidal ideation after adjusting for all other factors minus combat exposure (data not shown). This means that while young adult age was not a stronger risk factor for suicidal ideation among Veterans versus civilians, Veteran status was deemed a strong risk factor for the outcome among young adults of ages 18–25 years. These results suggest that Veterans versus civilians might need extra attention when implementing suicide prevention strategies intended to reach young adults.

Suicidal ideation rates by race/ethnic groups also differed by Veterans status. Among Veterans, the adjusted rate was significantly lower among non-Hispanic whites versus other race/ethnic groups, which was not observed in the civilian group. Rates of suicide-related outcomes have typically been higher among non-Hispanic whites in the general population (Centers for Disease Control and Prevention, WISQARS; Crosby et al., 2011) but this was not the case in this young adult population. Military and Veteran suicide prevention strategies may need to be culturally appropriate to ensure they reach those at risk.

Major depression and/or psychological distress were risk factors for suicidal ideation in both groups, which also has been found in other military, Veteran, and civilian studies (Ilgen et al., 2010a; Logan et al., 2011b; Hyman et al., 2012, 2012; Ireland et al., 2012; Kessler et al., 2014; Nock et al., 2014). However, our finding that perception of unmet mental health care needs was a much stronger risk factor for suicidal ideation among Veterans versus civilians was novel. We were unable to determine whether unmet mental healthcare needs resulted in a worsening of symptoms until suicidal thoughts developed, or that VHA respondents with suicidal thoughts were more likely to perceive that their treatment needs were unmet, regardless of actual treatment utilization. However, this finding should be placed in the context that availability of mental health services is facilitated for Veterans through Veterans Health Administration (VHA) health benefits. Thus, there are several additional possible explanations of this association, including actual variability in delays for accessing VHA mental health care, factors that prohibit access to VHA benefits (e.g., dishonorable discharge), and other internal barriers to accessing mental health treatment. Despite the several possible interpretations, assessing perception of access could help identify Veterans at risk of suicide. Future research should explore Veteran characteristics associated with perceived unmet need and seek to better understand this relationship using study designs that allow for etiologic interpretations.

Research is advancing innovative approaches to deliver therapies to better prevent suicidal outcomes among military and Veteran populations. Advancements have been made within the realm of telehealth/telemedicine, suicide-related screening, risk assessment, and treatment (Warner et al., 2011; Haney et al., 2012; Conner and Simons, 2015; McCarthy et al., 2015; Rudd et al., 2015). Fear of stigma and concerns of social isolation, discharge, or demotion might be some reasons why military personnel and Veterans do not seek care (Conner and Simons, 2015). We must continue to overcome these challenges because untreated mental health conditions can elevate risk of suicidal ideation directly as well as precipitate other risk factors at different levels of the social ecology, such as relationship problems, poverty, and working low wage paying jobs (Treatment Advocacy Center).

Studies on the role of alcohol use in suicidal behavior have shown mixed results. Recent evidence has suggested that alcohol plays a smaller role in suicide risk than previously believed. Anestis et al. (2014) reviewed 92 studies on alcohol use and suicide and found that while 27% of suicide decedents used alcohol before death, not all of these decedents were considered intoxicated. In our study population of young adults, we found that 24% of civilians and 43% of Veterans who reported past-year suicidal ideation also reported past-year alcohol problems. However, alcohol problems did not predict suicidal ideation in either population after adjusting for all other characteristics. Alcoholism is often co-morbid with mental health conditions; therefore, the association between alcohol dependence and suicidal ideation could have been reduced after we adjusted for depression and anxiety.

In contrast, drug problems are significant risk factors, particularly among Veterans. In the Veteran group, the adjusted suicidal ideation rate was 9.3 times higher for those with drug problems than those without. This rate ratio was vastly higher (eight times) than the one reported for civilians. Drug problems mostly involved marijuana abuse (data not shown). Coping with post-traumatic stress, managing chronic pain conditions related to injury from war, or adjusting to civilian life can lead to mal-adapting coping mechanisms such as drug abuse and increase risk of dependence. These factors can also increase risk of suicidal outcomes (Boscarino, 2006; Ilgen et al., 2010c) and therefore could somewhat confound the association between drug problems and suicidal ideation that was discovered in this study. Nevertheless, services that help treat substance abuse and the potential underpinnings of substance abuse might especially benefit young Veteran populations (Chen et al., 2015; Love et al., 2015).

An exploration into interpersonal violence perpetration as a risk factor for suicidal ideation is still relatively new to the literature on suicide among Veterans. Reports of past-year assaults did not predict the outcome among the Veteran group; however, this association did exist among the civilian group. The linkage between self-directed and perpetration of interpersonal violence has been shown in other young civilian populations (Ilgen et al., 2010b; Logan et al., 2011a, 2011b). Having a history of violence perpetration might help identify risk of suicide in this civilian group. More work is still needed to explore this association among Veterans. Despite showing a lack of correlation between self-directed and interpersonal violence among Veterans, there is evidence to suggest that both forms of violence can potentially be impacted by programs that address shared risk factors even if those who engage in self-directed violence and those who perpetrate interpersonal violence



are two separate populations. For example, Knox et al. (2003) evaluated the US Air Force Suicide Prevention program and not only found a 33% reduction in suicide but also a 51% reduction in homicide and a 54% reduction in severe family violence in the 6-year period after the program was implemented compared to the 7-year period before implementation.

The association between combat exposure and suicidal ideation can be a complex one to examine. Similar to other studies that explored combat exposure, in general, in relation to suicidal outcomes, this study did not find an association (Bryan et al., 2015a). In contrast, Bryan and colleagues conducted a meta-analysis of 22 published articles looking at the relationship between deployment, combat exposure, and suicidal outcomes and found that the strongest positive correlation between suicidal outcomes and combat exposure were among Veterans who were exposed to death or killing and/or killed others. Such experiences can sometimes result in “moral injury,” or an “act of transgression, which shatters moral and ethical expectations” which can evoke emotional responses of shame and guilt that can manifest into self-harming behavior (U.S. Department of Veterans Affairs). The present study was unable to assess details of the combat experiences or measures of moral injury. Also, a considerable amount of time between discharge and the NSDUH survey might have elapsed, potentially weakening the association if there is a critical time period.

Some study limitations should be considered when reviewing our findings. First, we limited our suicide-related outcome to past-year suicidal ideation. Small samples precluded us from analyzing suicidal behavior. However, the prevention of ideation is still important among military personnel and Veterans (National Research Action Plan, 2013). Second, we cannot infer causality between the risk factors examined and suicidal ideation. Third, relationship variables were limited in the NSDUH data. More research is needed to assess relationship strengths/problems simultaneously with individual and community-level characteristics to further understand their unique role in suicide risk among Veterans. Fourth, we could not link NSDUH’s individual-level data to community-level data and conduct multi-level analyses, which would offer another perspective on how community factors might influence suicidal ideation among these groups. Fifth, NSDUH survey data are from self-reports. Some respondents might not disclose suicidality. Finally, we were unable to identify protective factors, which represents a sizeable gap in the Veteran suicide literature (Conner and Simons, 2015).

#### 4.1. Conclusion

Suicidal ideation rates did not differ between young Veterans of the Afghanistan/Iraq war periods and civilians overall; however, some risk factors differ between these two groups. Drug problems and perceptions of unmet mental healthcare were risk factors that set Veterans apart from civilians. These predictors can be critical to screening for suicide and other suicide prevention efforts for Veterans of recent conflicts.

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## References

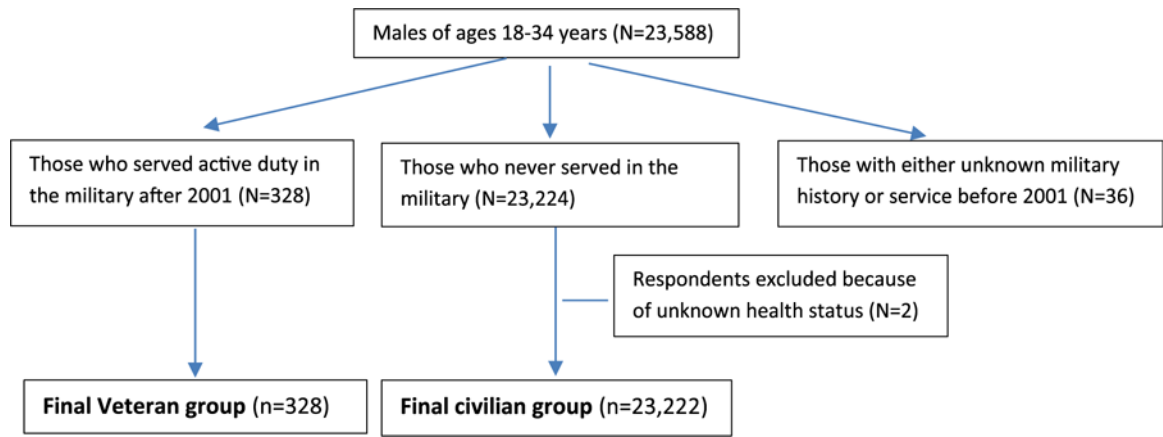
- Alexander CL, Reger MA, Smolenski DJ, Fullerton NR. Comparing U.S. Army suicide cases to a control sample: initial data and methodological lessons. *Mil Med.* 2014; 179(10):1062–1066. [PubMed: 25269121]
- Anestis MD, Joiner T, Hanson JE, Gutierrez PM. The modal suicide decedent did not consume alcohol just prior to the time of death: an analysis with implications for understanding suicidal behavior. *J Abnorm Psychol.* 2014; 123(4):835–840. [PubMed: 25286371]
- Bachynski KE, Canham-Chervak M, Black SA, Dada EO, Millikan AM, Jones BH. Mental health risk factors for suicides in the US Army, 2007–8. *Inj Prev.* 2012; 18(6):405–412. [PubMed: 22398362]
- Blosnich JR, Brown GR, Shipherd Phd JC, Kauth M, Piegari RI, Bossarte RM. Prevalence of gender identity disorder and suicide risk among trans-gender veterans utilizing veterans health administration care. *Am J Public Health.* 2013; 103(10):e27–32.
- Blosnich JR, Mays VM, Cochran SD. Suicidality among veterans: implications of sexual minority status. *Am J Public Health.* 2014; 104(Suppl 4):S535–537. [PubMed: 25100418]
- Boscarino JA. Posttraumatic stress disorder and mortality among US Army veterans 30 years after military service. *Ann Epidemiol.* 2006; 16(4):248–256. [PubMed: 16099672]
- Brenner LA, Ignacio RV, Blow FC. Suicide and traumatic brain injury among individuals seeking Veterans Health Administration services. *J Head Trauma Rehabil.* 2011; 26(4):257–264. [PubMed: 21734509]
- Bryan CJ, Griffith JH, Pace BT, Hinkson K, Bryan AO, Clemans TA, Imel ZE. Combat exposure and risk for suicidal thoughts and behaviors among military personnel and veterans: a systematic review and meta-analysis. *Suicide Life Threat Behav.* 2015a Apr 8. 2015 Epub ahead of print.
- Bryan CJ, Rudd MD, Wertenberger E, Young-McCaughon S, Peterson A. Nonsuicidal self-injury as a prospective predictor of suicide attempts in a clinical sample of military personnel. *Compr Psychiatry.* 2015b; 59:1–7. [PubMed: 25749478]
- Bush NE, Reger MA, Luxton DD, Skopp NA, Kinn J, Smolenski D, Gahm GA. Suicides and suicide attempts in the U.S. *Military*, 2008–2010. *Suicide Life Threat Behav.* 2013; 43(3):262–273. [PubMed: 23330611]
- Castro CA. The US framework for understanding, preventing, and caring for the mental health needs of service members who served in combat in Afghanistan and Iraq: a brief review of the issues and the research. *Eur J Psychotraumatol.* 2014; 5
- Castro CA, Kintzle S. Suicides in the military: the post-modern combat veteran and the Hemingway effect. *Curr Psychiatry Rep.* 2014; 16(8):460. [PubMed: 24930521]
- Centers for Disease Control and Prevention. The social-ecological model: A framework for prevention. Viewed 8/11/15 at <http://www.cdc.gov/violenceprevention/overview/social-ecologicalmodel.html>
- Centers for Disease Control and Prevention. Web-based injury statistics query and reporting system (WISQARS). Viewed 8/16/16 at <http://www.cdc.gov/injury/wisqars/dataandstats.html>
- Center for Behavioral Health Statistics and Quality, 2014–2013. National Survey on Drug Use and Health public use file codebook. Substance Abuse and Mental Health Services Administration; Rockville, MD:
- Chen YL, Pan AW, Hsiung PC, Chung L, Lai JS, Shur-Fen Gau S, Chen TJ. Life Adaptation Skills Training (LAST) for persons with depression: a randomized controlled study. *J Affect Disord.* 2015; 185:108–114. [PubMed: 26162281]
- Conner KR, Bohnert AS, McCarthy JF, Valenstein M, Bossarte R, Ignacio R, Lu N, Ilgen MA. Mental disorder comorbidity and suicide among 2.96 million men receiving care in the Veterans Health Administration health system. *J Abnorm Psychol.* 2013; 122(1):256–263. [PubMed: 23088376]
- Conner KR, Simons K. State of innovation in suicide intervention research with military populations. *Suicide Life Threat Behav.* 2015; 45(3):281–292. [PubMed: 25348613]
- Crosby AE, Han B, Ortega LA, Parks SE, Gfroerer J. Suicidal thoughts and behaviors among adults aged ≥ 18 years—United States, 2008–2009. *MMWR Surveill Summ.* 2011; 60(13):1–22.

- Dahlberg, LL., Krug, EG. Violence-a global public health problem. In: Krug, EG.Dahlberg, LL.Mercy, JA.Zwi, AB., Lozano, R., editors. World Report on Violence and Health 2002. World Health Organization; Geneva, Switzerland: 2002. p. 1-56.
- Dobscha SK, Denneson LM, Kovas AE, Teo A, Forsberg CW, Kaplan MS, Bossarte R, McFarland BH. Correlates of suicide among veterans treated in primary care: case-control study of a nationally representative sample. *J Gen Intern Med.* 2014; 29(Suppl 4):S853–S860.
- Guerra VS, Calhoun PS. Examining the relation between posttraumatic stress disorder and suicidal ideation in an OEF/OIF veteran sample. *J Anxiety Disord.* 2011; 25(1):12–18. [PubMed: 20709493]
- Haney, EM., O’Neil, ME., Carson, S., Low, A., Peterson, K., Denneson, LM., Oleksiewicz, C., Kansagara, D. Suicide risk factors and risk assessment tools: A systematic review. Washington DC: Department of Veterans Affairs; 2012.
- Hoffmire CA, Kemp JE, Bossarte RM. Changes in suicide mortality for Veterans and nonveterans by gender and history of VHA service use, 2000–2010. *Psychiatr Serv.* 2015; 66(9):959–965. [PubMed: 25930036]
- Hyman J, Ireland R, Frost L, Cottrell L. Suicide incidence and risk factors in an active duty US military population. *Am J Public Health.* 2012; 102(Suppl 1):S138–S146. [PubMed: 22390588]
- Ilgen MA, Bohnert AS, Ignacio RV, McCarthy JF, Valenstein MM, Kim HM, Blow FC. Psychiatric diagnoses and risk of suicide in veterans. *Arch Gen Psychiatry.* 2010a; 67(11):1152–1158. [PubMed: 21041616]
- Ilgen MA, Burnette ML, Conner KR, Czyz E, Murray R, Chermack S. The association between violence and lifetime suicidal thoughts and behaviors in individuals treated for substance use disorders. *Addict Behav.* 2010b; 35(2):111–115. [PubMed: 19800173]
- Ilgen MA, McCarthy JF, Ignacio RV, Bohnert AS, Valenstein M, Blow FC, Katz IR. Psychopathology, Iraq and Afghanistan service, and suicide among Veterans Health Administration patients. *J Consult Clin Psychol.* 2012; 80(3):323–330. [PubMed: 22545742]
- Ilgen MA, Zivin K, Austin KL, Bohnert AS, Czyz EK, Valenstein M, Kilbourne AM. Severe pain predicts greater likelihood of subsequent suicide. *Suicide Life Threat Behav.* 2010c; 40(6):597–608. [PubMed: 21198328]
- Ireland RR, Kress AM, Frost LZ. Association between mental health conditions diagnosed during initial eligibility for military health care benefits and subsequent deployment, attrition, and death by suicide among active duty service members. *Mil Med.* 2012; 177(10):1149–1156. [PubMed: 23113440]
- Jones CM. Heroin use and heroin use risk behaviors among nonmedical users of prescription opioid pain relievers - United States, 2002–2004 and 2008–2010. *Drug Alcohol Depend.* 2013; 132(1–2): 95–100. [PubMed: 23410617]
- Kang HK, Bullman TA, Smolenski DJ, Skopp NA, Gahm GA, Reger MA. Suicide risk among 1.3 million veterans who were on active duty during the Iraq and Afghanistan wars. *Ann Epidemiol.* 2015; 25(2):96–100. [PubMed: 25533155]
- Kaplan MS, Huguet N, McFarland BH, Newsom JT. Suicide among male veterans: a prospective population-based study. *J Epidemiol Community Health.* 2007; 61(7):619–624. [PubMed: 17568055]
- Kessler RC, Heeringa SG, Stein MB, Colpe LJ, Fullerton CS, Hwang I, Naifeh JA, Nock MK, Petukhova M, Sampson NA, Schoenbaum M, Zaslavsky AM, Ursano RJ. Thirty-day prevalence of DSM-IV mental disorders among nondeployed soldiers in the US Army: results from the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). *JAMA Psychiatry.* 2014; 71(5):504–513. [PubMed: 24590120]
- Knox KL, Litts DA, Talcott GW, Feig JC, Caine ED. Risk of suicide and related adverse outcomes after exposure to a suicide prevention programme in the US Air Force: cohort study. *Br Med J.* 2003; 13(327(7428)):1376. Clinical research ed.
- LeardMann CA, Powell TM, Smith TC, Bell MR, Smith B, Boyko EJ, Hooper TI, Gackstetter GD, Ghamsary M, Hoge CW. Risk factors associated with suicide in current and former US military personnel. *J Am Med Assoc.* 2013; 310(5):496–506.

- Lemaire CM, Graham DP. Factors associated with suicidal ideation in OEF/OIF veterans. *J Affect Disord.* 2011; 130(1–2):231–238. [PubMed: 21055828]
- Logan JE, Crosby AE, Hamburger ME. Suicidal ideation, friendships with delinquents, social and parental connectedness, and differential associations by sex: findings among high-risk pre/early adolescent population. *Crisis.* 2011a; 32(6):299–309. [PubMed: 21940255]
- Logan JE, Hall J, Karch DL. Suicide categories by patterns of known risk factors: a latent class analysis. *Arch Gen Psychiatry.* 2011b; 68(9):935–941. [PubMed: 21893660]
- Logan JE, Skopp NA, Reger MA, Gladden M, Smolenski DJ, Floyd CF, Gahm GA. Precipitating Circumstances of Suicide among Active Duty U.S. Army Personnel Versus U.S. Civilians, 2005–2010. *Suicide Life Threat Behav.* 2015; 45(1):65–77. [PubMed: 25093259]
- Love AR, Morland LA, Menez U, Taft C, MacDonald A, Mackintosh MA. “Strength at Home” intervention for male Veterans perpetrating intimate partner aggression: perceived needs survey of therapists and pilot effectiveness study. *J Inter Violence.* 2015; 30(13):2344–2362.
- Lutwak N, Dill C. Military sexual trauma increases risk of post-traumatic stress disorder and depression thereby amplifying the possibility of suicidal ideation and cardiovascular disease. *Mil Med.* 2013; 178(4):359–361. [PubMed: 23707816]
- Luxton DD, Greenburg D, Ryan J, Niven A, Wheeler G, Mysliwiec V. Prevalence and impact of short sleep duration in redeployed OIF soldiers. *Sleep.* 2011; 34(9):1189–1195. [PubMed: 21886356]
- Luxton, DD., Skopp, NA., Kinn, JT., Bush, NE., Reger, MA., Gahm, GA. Department of Defense suicide event report (DoDSER): Calendar year 2009 annual report National Center for Telehealth & Technology, Defense Centers of Excellence for Psychological Health & TBI (DCoE). 2012. Viewed 7/30/15 at ([http://www.t2health.org/sites/default/files/2009\\_DoDSER\\_Annual\\_Report.pdf](http://www.t2health.org/sites/default/files/2009_DoDSER_Annual_Report.pdf))
- Luxton DD, Trofimovich L, Clark LL. Suicide risk among US Service members after psychiatric hospitalization, 2001–2011. *Psychiatr Serv.* 2013; 64(7):626–629. [PubMed: 23677509]
- Magruder KM, Yeager D, Brawman-Mintzer O. The role of pain, functioning, and mental health in suicidality among Veterans Affairs primary care patients. *Am J Public Health.* 2012; 102(Suppl 1):S118–S124. [PubMed: 22390584]
- Make the Connection Shared experiences and support for Veterans. Viewed 08/10/15 at (<http://maketheconnection.net/conditions/all.aspx>)
- Mansfield AJ, Bender RH, Hourani LL, Larson GE. Suicidal or self-harming ideation in military personnel transitioning to civilian life. *Suicide Life Threat Behav.* 2011; 41(4):392–405. [PubMed: 21599725]
- McCarthy JF, Bossarte RM, Katz IR, Thompson C, Kemp J, Hannemann CM, Nielson C, Schoenbaum M. Predictive modeling and concentration of the risk of suicide: implications for preventive interventions in the US Department of Veterans Affairs. *Am J Public Health*, Published online ahead of print June. 2015; 11:2015. Viewed 6/12/15 at (<http://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.2015.302737>).
- Miller M, Azrael D, Barber C, Mukamal K, Lawler E. A call to link data to answer pressing questions about suicide risk among veterans. *Am J Public Health.* 2012a; 102(Suppl 1):S20–S22. [PubMed: 22390593]
- Miller M, Barber C, Young M, Azrael D, Mukamal K, Lawler E. Veterans and suicide: a reexamination of the National Death Index-linked National Health Interview Survey. *Am J Public Health.* 2012b; 102(Suppl 1):S154–S159. [PubMed: 22390591]
- Monteith LL, Menefee DS, Pettit JW, Leopoulos WL, Vincent JP. Examining the interpersonal-psychological theory of suicide in an inpatient veteran sample. *Suicide Life Threat Behav.* 2013; 43(4):418–428. [PubMed: 23556542]
- Monteith LL, Pease JL, Forster JE, Homaifar BY, Bahraini NH. Values as moderators of the association between interpersonal-psychological constructs and suicidal ideation among Veterans. *Arch Suicide Res.* 2015; 19(4):422–434. [PubMed: 25856250]
- Muhuri, PK., Gfroerer, JC., Davies, MC. Associations of nonmedical pain reliever use and initiation of heroin use in the United States CBHSQ Data Review. 2013. Viewed 2/6/15 at (<http://www.samhsa.gov/data/sites/default/files/DR006/DR006/nonmedical-pain-reliever-use-2013.htm>)

- National Research Action Plan. Responding to the executive order: Improving access to mental health services for Veterans, service members, and military families (August 31 2012). 2013. Viewed 10/2/15 at ([https://www.whitehouse.gov/sites/default/files/uploads/nrap\\_for\\_eo\\_on\\_mental\\_health\\_august\\_2013.pdf](https://www.whitehouse.gov/sites/default/files/uploads/nrap_for_eo_on_mental_health_august_2013.pdf))
- Nock MK, Stein MB, Heeringa SG, Ursano RJ, Colpe LJ, Fullerton CS, Hwang I, Naifeh JA, Sampson NA, Schoenbaum M, Zaslavsky AM, Kessler RC. Prevalence and correlates of suicidal behavior among soldiers: results from the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). *JAMA Psychiatry*. 2014; 71(5):514–522. [PubMed: 24590178]
- Nock, MK., Ursano, R.J., Heeringa, S.G., Stein, M.B., Jain, S., Raman, R., Sun, X., Chiu, W.T., Colpe, L.J., Fullerton, C.S., Gilman, S.E., Hwang, I., Naifeh, J.A., Rosellini, A.J., Sampson, N.A., Schoenbaum, M., Zaslavsky, A.M., Kessler, R.C. Mental disorders, comorbidity, and pre-enlistment suicidal behavior among new soldiers in the U.S. Army: results from the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). *Suicide Life Threat Behav*. 2015. <http://dx.doi.org/10.1111/sltb.12153> (Epub ahead of print)
- Pietrzak RH, Goldstein MB, Malley JC, Rivers AJ, Johnson DC, Southwick SM. Risk and protective factors associated with suicidal ideation in Veterans of Operations Enduring Freedom and Iraqi Freedom. *J Affect Disord*. 2010; 123(1–3):102–107. [PubMed: 19819559]
- Pringle B, Colpe LJ, Heinssen RK, Schoenbaum M, Sherrill JT, Claassen CA, Pearson JL. A strategic approach for prioritizing research and action to prevent suicide. *Psychiatr Serv*. 2013; 64(1):71–75. [PubMed: 23280458]
- Ramchand R, Rudavsky R, Grant S, Tanielian T, Jaycox L. Prevalence of, risk factors for, and consequences of posttraumatic stress disorder and other mental health problems in military populations deployed to Iraq and Afghanistan. *Curr Psychiatry Rep*. 2015; 17(5):37. [PubMed: 25876141]
- Ramsawh HJ, Fullerton CS, Mash HB, Ng TH, Kessler RC, Stein MB, Ursano RJ. Risk for suicidal behaviors associated with PTSD, depression, and their comorbidity in the U.S. Army. *J Affect Disord*. 2014; 161:116–122. [PubMed: 24751318]
- Reger MA, Smolenski DJ, Skopp NA, Metzger-Abamukang MJ, Kang HK, Bullman TA, Perdue S, Gahm GA. Risk of suicide among US military service members following Operation Enduring Freedom or Operation Iraqi Freedom deployment and separation from the US military. *JAMA Psychiatry*. 2015; 72(6):561–569. [PubMed: 25830941]
- Ribeiro JD, Pease JL, Gutierrez PM, Silva C, Bernert RA, Rudd MD, Joiner TE Jr. Sleep problems outperform depression and hopelessness as cross-sectional and longitudinal predictors of suicidal ideation and behavior in young adults in the military. *J Affect Disord*. 2012; 136(3):743–750. [PubMed: 22032872]
- Rudd MD, Bryan CJ, Wertenberger EG, Peterson AL, Young-McCaughan S, Mintz J, Williams SR, Arne KA, Breitbach J, Delano K, Wilkinson E, Bruce TO. Brief cognitive-behavioral therapy effects on post-treatment suicide attempts in a military sample: results of a randomized clinical trial with 2-year follow-up. *Am J Psychiatry*. 2015; 172(5):441–449. [PubMed: 25677353]
- Schoenbaum M, Kessler RC, Gilman SE, Colpe LJ, Heeringa SG, Stein MB, Ursano RJ, Cox KL. Predictors of suicide and accident death in the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS): results from the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). *JAMA Psychiatry*. 2014; 71(5):493–503. [PubMed: 24590048]
- Skopp NA, Trofimovich L, Grimes J, Oetjen-Gerdes L, Gahm GA. Relations between suicide and traumatic brain injury, psychiatric diagnoses, and relationship problems, active component, U.S. *Armed Forces*, 2001–2009. *MSMR*. 2012; 19(2):7–11.
- Substance Abuse and Mental Health Services Administration. Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings. Substance Abuse and Mental Health Services Administration; Rockville, MD: 2014. NSDUH Series H-48, HHS Publication No. (SMA) 14-4863
- Substance Abuse and Mental Health Services Administration. National Survey on Drug Use and Health. Services USDoHaH; 2013. Viewed 7/16/15 at (<http://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/35509>)

- Swahn MH, Simon TR, Hertz MF, Arias I, Bossarte RM, Ross JG, Gross LA, Iachan R, Hamburger ME. Linking dating violence, peer violence, and suicidal behaviors among high-risk youth. *Am J Prev Med.* 2008; 34(1):30–38. [PubMed: 18083448]
- Torreón, BS. U.S. periods of war and dates of recent conflicts; Congressional Research Service. 2015. p. 7-5700. Viewed 8/6/15 at [www.crs.gov](http://www.crs.gov)
- Treatment Advocacy Center Eliminating barriers to the treatment of mental illness. Viewed 8/14/15 at <http://www.treatmentadvocacycenter.org/resources/consequences-of-lack-of-treatment/violence/1384>
- Ursano RJ, Heeringa SG, Stein MB, Jain S, Raman R, Sun X, Chiu WT, Colpe LJ, Fullerton CS, Gilman SE, Hwang I, Naifeh JA, Nock MK, Rosellini AJ, Sampson NA, Schoenbaum M, Zaslavsky AM, Kessler RC. Prevalence and correlates of suicidal behavior among new soldiers in the U.S. Army: results from the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS). *Depress Anxiety.* 2015; 32(1):3–12. [PubMed: 25338964]
- U.S. Department of Veterans Affairs. National Center for PTSD Moral injury in the context of war. Viewed 6/14/16 at [http://www.ptsd.va.gov/professional/co-occurring/moral\\_injury\\_at\\_war.asp](http://www.ptsd.va.gov/professional/co-occurring/moral_injury_at_war.asp)
- U.S. Department of Veterans Affairs. Office of Suicide Prevention. Suicide among Veterans and other Americans 2001-2014. 3 August 2016. Viewed 8/15/16 at <http://www.mentalhealth.va.gov/docs/2016suicidedatareport.pdf>
- Warner CH, Appenzeller GN, Parker JR, Warner CM, Hoge CW. Effectiveness of mental health screening and coordination of in-theater care prior to deployment to Iraq: a cohort study. *Am J Psychiatry.* 2011; 168(4):378–385. [PubMed: 21245086]
- Weiner J, Richmond TS, Conigliaro J, Wiebe DJ. Military Veteran mortality following a survived suicide attempt. *BMC Public Health.* 2011; 11:374. [PubMed: 21605448]
- White R, Barber C, Azrael D, Mukamal KJ, Miller M. History of military service and the risk of suicidal ideation: findings from the 2008 national survey on drug use and health. *Suicide Life Threat Behav.* 2011; 41(5):554–561. [PubMed: 21883410]



**Fig. 1.** Study group inclusion and exclusion criteria (unweighted).

**Table 1**

Rates of suicidal ideation by individual, relationship, and community/environmental characteristics among Veterans of the Afghanistan/Iraq War periods and civilians of Ages 18–34 years, United States, 2013 (weighted).

Characteristic	Veterans			Civilians			p-value				
	Weighted No. (%)	Weighted Population	Rate <sup>a</sup>	Weighted No. (%)	Weighted Population	Rate <sup>a</sup>					
Past-year suicidal ideation	69,288 (100.0)	1,331,215	52.0	30.0	68.5	4,158,455 (100.0)	70,554,099	58.9	55.7	62.0	0.60
<b>Individual demographic characteristics</b>											
Sex											
Male	53,132 (76.7)	1,104,391	48.1	23.4	66.2	1,840,902 (44.3)	34,619,006	53.2	48.2	57.8	0.75
Female	16,156 (23.3)	226,824	71.2	0.0	106.1	2,317,554 (55.7)	35,935,094	64.5	59.8	68.8	0.84
Age											
18–25 years	38,609 (55.7)	283,152	136.4	60.4	186.5	2,553,324 (61.4)	34,492,520	74.0	71.1	76.8	0.05
26–34	30,679 (44.3)	1,048,063	29.3	6.1	45.4	1,605,132 (38.6)	36,061,579	44.5	38.4	50.1	0.32
Race/ethnicity											
Non-Hispanic white	41,040 (59.2)	886,036	46.3	19.9	64.6	2,543,393 (61.2)	40,062,687	63.5	59.7	67.0	0.30
Other <sup>b</sup>	28,248 (40.8)	445,179	63.5	20.2	90.0	1,615,063 (38.8)	30,491,412	53.0	47.2	58.3	0.64
Employment status											
Employed full time	31,477 (45.4)	823,419	38.2	14.7	54.1	1,609,219 (38.7)	37,087,503	43.4	38.3	48.0	0.73
Other (employed part-time, unemployed, other)	37,811 (54.6)	507,796	74.5	30.6	97.9	2,549,236 (61.3)	33,466,596	76.2	70.7	81.3	0.94
<b>Individual health-related characteristics (past-year)</b>											
Diagnosis for major depression											
No	37,433 (54.0)	1,210,398	30.9	10.0	46.2	2,845,465 (68.4)	64,522,664	44.1	41.1	46.9	0.32
Yes	31,855 (46.0)	111,925	284.6	190.6	311.7	1,270,601 (30.6)	4,941,933	257.1	241.5	270.4	0.78
Diagnosis for anxiety											
No	46,697 (67.4)	1,203,123	38.8	15.6	55.6	3,038,230 (73.1)	64,063,985	47.4	44.0	50.7	0.59
Yes	22,591 (32.6)	119,201	189.5	95.8	214.8	1,078,630 (25.9)	5,415,765	199.2	183.1	212.6	0.90
Serious psychological distress											
No	19,379 (28.0)	1,156,195	16.8	2.8	27.0	1,378,092 (33.1)	59,098,235	23.3	20.1	26.3	0.46
Yes	49,910 (72.0)	175,020	285.2	193.8	320.6	2,780,363 (66.9)	11,455,865	242.7	234.2	250.3	0.61



Characteristic	Veterans			Civilians			p-value
	Weighted No. (%)	Weighted Population	Rate <sup>a</sup>	Weighted No. (%)	Weighted Population	Rate <sup>a</sup>	
Perceived health							
Excellent, very good	31,231 (45.1)	896,173	34.8	52.7	2,227,002 (53.6)	46.0	124.0 0.48
Good, fair, poor	38,057 (54.9)	435,043	87.5	114.2	1,931,453 (46.4)	87.4	94.4 1.00
Alcohol Problems							
No	39,402 (56.9)	1,182,397	33.3	46.9	3,164,357 (76.1)	51.0	53.7 0.17
Yes	29,886 (43.1)	148,818	200.8	239.8	994,098 (23.9)	117.2	127.9 0.20
Drug problems <sup>c</sup>							
No	38,754 (55.9)	1,269,823	30.5	41.2	3,341,744 (80.4)	50.2	53.5 0.07
Yes	30,535 (44.1)	61,392	497.4	597.3	816,712 (19.6)	203.2	219.6 0.02
Perceived unmet mental healthcare needs							
No	32,523 (46.9)	1,228,324	26.5	39.1	2,621,482 (63)	40.3	43.5 0.20
Yes	36,765 (53.1)	99,831	368.3	421.4	1,511,305 (36.3)	289.7	298.0 0.49
<b>Relationship characteristics and interpersonal conflicts</b>							
Marital Status							
Never married	47,037 (67.9)	507,775	92.6	42.4	3,314,023 (79.7)	69.8	72.9 0.41
Ever Married	22,251 (32.1)	823,440	27.0	56.4	844,432 (20.3)	36.5	48.3 0.46
Past-year violent assaults							
No	49,082 (70.8)	1,283,295	38.2	64.3	3,795,018 (91.3)	55.1	58.2 0.19
Yes	20,206 (29.2)	47,920	421.7	509.4	363,437 (8.7)	217.5	243.8 0.14
<b>Community/environmental exposures</b>							
Geography							
Residing in CBSA <sup>d</sup> with 1 million persons	41,092 (59.3)	530,508	77.5	105.1	2,241,463 (53.9)	57.4	61.8 0.42
Residing in other area	28,196 (40.7)	800,707	35.2	48.4	1,916,992 (46.1)	60.9	65.5 0.08
Prior combat exposure							
No	20,221 (29.2)	419,578	48.2	77.9			
Yes	49,067 (70.8)	907,550	54.1	70.2			

<sup>a</sup>Rate is per 1000 population of each analytic group.

<sup>b</sup>“Other” race/ethnic group includes those of Hispanic ethnicity and those of other non-Hispanic non-white races.

Drugs included marijuana, cocaine, opioid pain reliever, other psychotherapeutic B, or heroin.

<sup>d</sup>CBSA= Core Based Statistical Area.

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**Table 2**

Adjusted rate ratios and 95% confidence intervals for predictors of suicidal ideation for Veterans of the Afghanistan/Iraq War periods and civilians of ages 18–34 Years, United States, 2013 (weighted).

Characteristics	Veterans Alone	Civilians Alone	Total Population <sup>a</sup>	Interaction Term between Veteran Status and Characteristic <sup>b</sup>
<b>Veteran Status</b>				
Yes			0.81 (0.12–5.64)	
No			Referent	
<b>Individual demographic characteristics</b>				
Sex				
Male	0.91 (0.16–5.02)	1.13 (0.99–1.29)	1.13 (0.99–1.30)	0.86 (0.17–4.38)
Female	Referent	Referent	Referent	
Age				
18–25 years	3.59 (1.22–10.59) <sup>*</sup>	1.35 (1.13–1.62) <sup>*</sup>	1.35 (1.13–1.62) <sup>*</sup>	2.50 (0.83–7.52)
26–34	Referent	Referent	Referent	
Race/ethnicity				
Non-Hispanic white	0.26 (0.10–0.68) <sup>*</sup>	0.99 (0.81–1.16)	0.97 (0.81–1.16)	0.27 (0.09–0.78) <sup>*</sup>
Other <sup>c</sup>	Referent	Referent	Referent	
Employment status				
Employed full time	1.09 (0.55–2.15)	0.86 (0.73–1.01)	0.86 (0.73–1.01)	1.22 (0.59–2.54)
Other (employed par-time, unemployed, other)	Referent	Referent	Referent	
<b>Individual past-year health-related characteristics<sup>d</sup></b>				
Diagnosis for major depression	7.68 (1.60–36.89) <sup>*</sup>	1.64 (1.34–2.01) <sup>*</sup>	1.64 (1.34–2.01) <sup>*</sup>	5.04 (0.90–28.34)
Diagnosis for anxiety	1.04 (0.19–5.57)	1.10 (0.87–1.38)	1.10 (0.87–1.38)	1.00 (0.15–6.65)
Serious psychological distress	2.15 (0.33–13.84)	5.87 (4.70–7.34) <sup>*</sup>	5.87 (4.70–7.34) <sup>*</sup>	0.30 (0.03–2.63)
Perceived excellent/very good health	0.71 (0.27–1.86)	0.79 (0.66–0.95) <sup>*</sup>	0.79 (0.66–0.95) <sup>*</sup>	0.95 (0.37–2.43)
Alcohol Problems	0.44 (0.10–1.99)	1.04 (0.86–1.27)	1.04 (0.86–1.27)	0.43 (0.10–1.89)
Drug problems <sup>e</sup>	9.32 (2.82–30.78) <sup>*</sup>	1.30 (1.05–1.60) <sup>*</sup>	1.30 (1.05–1.60) <sup>*</sup>	8.03 (2.28–28.30) <sup>*</sup>
Perceived unmet mental healthcare needs	7.10 (2.74–18.41) <sup>*</sup>	2.10 (1.64–2.59) <sup>*</sup>	2.07 (1.65–2.59) <sup>*</sup>	3.88 (1.36–11.05) <sup>*</sup>
<b>Relationship characteristics and interpersonal conflicts</b>				
Marital Status				
Never married	1.35 (0.44–4.18)	1.29 (1.01–1.64) <sup>*</sup>	1.29 (1.02–1.64) <sup>*</sup>	1.05 (0.18–5.93)
Ever Married	Referent	Referent	Referent	
Past-year violent assaults				
Yes	0.76 (0.15–3.92)	1.60 (1.28–1.99) <sup>*</sup>	1.60 (1.28–1.99) <sup>*</sup>	0.48 (0.09–2.59)
No	Referent	Referent	Referent	
<b>Community/environmental exposures</b>				
Geography				

Characteristics	Veterans Alone	Civilians Alone	Total Population <sup>a</sup>	Interaction Term between Veteran Status and Characteristic <sup>b</sup>
Residing in CBSA <sup>f</sup> with 1 million persons	0.99 (0.41–2.38)	0.92 (0.78–1.10)	0.92 (0.78–1.10)	1.02 (0.39–2.67)
Residing in other area	Referent	Referent	Referent	
Prior combat exposure				
Yes	1.02 (0.99–1.04)			
No	Referent			

\* Significant at  $p < 0.05$

<sup>a</sup> Model includes both populations. Values also adjust for the interaction terms.

<sup>b</sup> Lists the interaction term values between Veteran status and the listed characteristic for the full model.

<sup>c</sup> “Other” race/ethnic group includes those of Hispanic ethnicity and those of other non-Hispanic non-white races.

<sup>d</sup> Referent group for each health characteristic are those who reported “no” for that characteristic.

<sup>e</sup> Drugs included marijuana, cocaine, opioid pain reliever, other psychotherapeutic B, or heroin.

<sup>f</sup> CBSA= Core Based Statistical Area