

APPENDIX A. SEARCH STRATEGIES

OID MEDLINE, EMBASE AND PSYCINFO

1	Suicide/ or Suicide, Attempted/ or suicide.mp.
2	(suicide\$1 or suicidal or suicidality).ti, ab.
3	(suicide\$1 adj (prevent or prevention or preventing or prevents)).ti,ab.
4	Or/1-3
5	Risk Factors/
6	Risk.mp.
7	5 or 6
8	Veterans/ or Military Personnel/
9	Veteran\$1 or (military adj person*).ti,ab.
10	8 or 9
11	4 and 7 and 10
12	Limit 11 to English language
13	Limit 12 to yr="2011-current"
14	Limit 13 to (case reports or clinical conference of comment or editorial or letter or news or newspaper article)
15	13 not 14
16	(child8 or adolescen*).ti,ab.
17	15 not 16
18	Limit 17 to humans
19	Remove duplicates from 18

SOCIOLOGICAL ABSTRACTS

((mainsubject.Exact("veterans" OR "veteran/veterans" OR "military" OR "military personnel")) or (ab(veteran OR military) OR ti(veteran OR military))) and (mainsubject.Exact("suicides & suicide attempts" OR "suicide, attempted" OR "suicide" OR "suicide/suicides/suicidal") OR ab(suicide OR suicidality OR suicidal) OR ti(suicide OR suicidality OR suicidal)) and (mainsubject.Exact("risk factors") OR ab(RISK FACTOR) OR ti(RISK FACTOR))

APPENDIX B. QUALITY ASSESSMENT FOR ELIGIBLE PUBLICATIONS

Study, Year	Study Participation	Study Attrition	Prognostic Factor Measurement	Outcome Measurement	Study Confounding	Statistical Analysis and Reporting	Overall Risk of Bias
Alexander, 2014 ⁶⁷	High	Moderate	Low	Low	High	Low	High
Barry, 2018 ⁴¹	Low	NA	Low	Low	Low	Low	Low
Barth, 2016 ³¹	Low	NA	Moderate	Low	Moderate	Low	Moderate
Bernecker, 2019 ⁶	Moderate	Moderate	Low	Moderate	Moderate	Moderate	Moderate
Bishop, 2020 ⁴⁹	Low	NA	Moderate	Moderate	Low	Low	Moderate
Black, 2011 ⁶⁸	Moderate	NA	High	Low	Moderate	Moderate	High
Blow, 2012 ⁵⁰	Low	NA	Low	Low	Moderate	Low	Moderate
Bohnert, 2014 ⁷	Low	Low	Low	Low	Low	Low	Low
Bohnert, 2017 ⁴²	Low	NA	Low	Low	Low	Low	Low
Bullman, 2018 ¹²	Low	NA	Low	Low	Moderate	Low	Moderate
Bullman, 2019 ⁵¹	Low	NA	Low	Low	Moderate	Low	Moderate
Chu, 2020 ⁸	Moderate	Moderate	Moderate	Moderate	Low	Low	Moderate
Conner, 2013 ⁵²	Low	NA	Low	Low	Moderate	Low	Moderate
Cooper, 2020 ⁴³	Low	NA	Low	Low	Low	Low	Low
Cusack, 2020 ³⁰	Low	NA	Low	Low	Low	Low	Low
Dempsey, 2019 ⁵³	Low	Moderate	Low	Low	Low	Low	Moderate
Dobscha, 2014 ¹³	Low	NA	Moderate	Moderate	Low	Low	Moderate
Doran, 2016 ¹⁴	Low	NA	Low	Low	High	Moderate	Moderate
Finley, 2015 ¹⁵	Low	NA	Low	Low	Moderate	Moderate	Moderate
Goodin, 2019 ¹⁶	Low	NA	Low	Low	Moderate	Low	Moderate
Gradus, 2013 ⁶⁹	Low	High	Low	Moderate	High	Low	High
Griffith, 2017 ¹⁷	Low	NA	Low	Low	Moderate	Low	Moderate
Hoffmire, 2015 ⁵⁴	Moderate	NA	Low	Low	High	Moderate	Moderate
Hostetter, 2019 ⁵⁵	Low	NA	Low	Low	Moderate	Low	Moderate
Hyman, 2012 ¹⁸	Low	Low	Low	Low	Moderate	High	Moderate
Ilgen, 2012 ³⁶	Low	NA	Low	Low	Low	Low	Low
Ilgen, 2013 ⁵⁶	Low	NA	Low	Low	Moderate	Low	Moderate
Kang, 2015 ¹⁹	Low	NA	Low	Low	Moderate	Low	Moderate

Study, Year	Study Participation	Study Attrition	Prognostic Factor Measurement	Outcome Measurement	Study Confounding	Statistical Analysis and Reporting	Overall Risk of Bias
Katz, 2012 ⁵⁷	Moderate	NA	Low	Moderate	High	Moderate	Moderate
Kimerling, 2016 ²⁰	Low	NA	Low	Low	Moderate	Low	Moderate
LeardMann, 2013 ⁹	Moderate	Low	Low	Low	Low	Low	Moderate
Louzon, 2016 ³⁵	Low	NA	Low	Low	Low	Low	Low
Lynch, 2020 ⁴⁴	Low	NA	Moderate	Low	Moderate	Low	Moderate
Martz, 2018 ⁵⁸	Low	NA	Low	Low	Moderate	Low	Moderate
McCarthy, 2014 ⁵⁹	Moderate	NA	Low	Low	Moderate	Low	Moderate
McCarthy, 2019 ⁷⁰	Low	NA	High	Low	High	Low	High
Naifeh, 2017 ¹⁰	Low	Moderate	Low	Low	Moderate	Low	Moderate
Nock, 2017 ⁷¹	Moderate	Moderate	High	Low	High	Low	High
Palframan, 2020 ²⁷	Low	NA	Low	Low	Low	Low	Low
Phillips, 2017 ¹¹	Low	Low	Low	Low	Low	Low	Low
Ravindran, 2020 ⁶⁰	Low	NA	Low	Low	Moderate	Low	Moderate
Reger, 2015 ⁴⁵	Low	NA	Low	Low	Low	Low	Low
Reger, 2017 ⁷²	Moderate	NA	Moderate	Low	High	Moderate	High
Riberiro, 2017 ⁶¹	Low	NA	Low	Low	Moderate	Moderate	Moderate
Rosellini, 2017 ²¹	Moderate	NA	Low	Low	Low	Low	Moderate
Ryan, 2020 ⁶²	Low	NA	Low	Low	Moderate	Low	Moderate
Schinka, 2016 ⁶³	Moderate	NA	Moderate	Low	High	Low	Moderate
Schinka, 2018 ⁶⁴	Moderate	NA	Moderate	Low	High	Moderate	Moderate
Shen, 2016 ²⁸	Low	NA	Low	Low	Low	Low	Low
Shiner, 2020 ⁴⁶	Low	NA	Low	Low	Low	Low	Low
Skopp, 2016 ²²	Low	NA	Moderate	Low	High	Moderate	Moderate
Thomsen, 2011 ⁷³	Moderate	Moderate	High	High	Low	Low	High
Trofimovich, 2013 ⁴⁷	Low	NA	Low	Low	Low	Low	Low
Ursano, 2015 ⁶⁵	Low	NA	Low	Moderate	Low	Low	Moderate
Ursano, 2016 ⁶⁶	Low	NA	Low	Moderate	Low	Low	Moderate
Ursano, 2017a ⁴⁸	Low	NA	Low	Low	Low	Low	Low
Ursano, 2017b ³³	Low	NA	Low	Moderate	Low	Low	Moderate
Ursano, 2017c ³²	Low	NA	Moderate	Moderate	Low	Low	Moderate

Study, Year	Study Participation	Study Attrition	Prognostic Factor Measurement	Outcome Measurement	Study Confounding	Statistical Analysis and Reporting	Overall Risk of Bias
Ursano, 2018a ²³	Low	NA	Low	Moderate	Low	Low	Moderate
Ursano, 2018b ²⁵	Low	NA	Low	Moderate	High	Low	Moderate
Ursano, 2018c ²⁴	Low	NA	Low	Moderate	Low	Low	Moderate
Ursano, 2018d ²⁶	Low	NA	Moderate	Moderate	Low	Low	Moderate
Zuromski, 2019 ⁷⁴	Moderate	Moderate	High	Low	Low	Moderate	High

APPENDIX C. PEER REVIEW COMMENTS/AUTHOR RESPONSES

Question Text	Reviewer Number	Comment	Author Response
Are the objectives, scope, and methods for this review clearly described?	1	Yes	Thank you.
	2	Yes	
	3	Yes	
	4	Yes	
	5	Yes	
	6	Yes	
	7	Yes	
	8	Yes	
	9	Yes	
Is there any indication of bias in our synthesis of the evidence?	1	No	Thank you.
	2	No	
	3	No	
	4	No	
	5	No	
	6	No	
	7	No	
	8	No	
	9	No	
Are there any <u>published</u> or <u>unpublished</u> studies that we may have overlooked?	1	No	Thank you.
	2	No	
	3	No	
	4	No	
	5	Yes - Two articles available here: https://onlinelibrary.wiley.com/doi/abs/10.1111/sltb.12511 and https://www.sciencedirect.com/science/article/abs/pii/S0165032718327757?via%3Dihub	Monteith et al. was excluded from this review as it was conducted in a sub-population; included studies had to investigate risk factors within a general Veteran/armed forces population. Barnes et al. was excluded at abstract level as developing predictive models was outside of the scope of this review.
	6	No	Thank you.
	7	No	

	8	No	
	9	Yes - Montgomery, A. E., Dichter, M. E., Byrne, T. H., & Blosnich, J. R. (2021). Intervention to address homelessness and all-cause and suicide mortality among unstably housed U.S. Veterans, 2012–2016. <i>Journal of Epidemiology and Community Health</i>, 75, 380–386. doi:10.1136/jech-2020-214664 Montgomery, A. E., Dichter, M. E., & Blosnich, J. R. (2021). Gender differences in the predictors of suicide-related morbidity among Veterans reporting current housing instability. <i>Medical Care</i>, 59, S36–S41. doi:10.1097/MLR.0000000000001422 Cusack, M. C., Montgomery, A. E., Cashy, J., Dichter, M. E., Byrne, T. H., & Blosnich, J. R. Examining Veteran housing instability and mortality by homicide, suicide, and unintentional injury. (2020). <i>Journal of Social Distress and Homelessness</i>, online ahead of print. doi:10.1080/10530789.2020.1801020	Montgomery et al. was excluded as intervention studies were explicitly excluded from this review. Montgomery et al. was excluded from this review as it was conducted in a sub-population; included studies had to investigate risk factors within a general Veteran/armed forces population. Thank you, the Cusack et al. was not identified by our search and we have included this article and updated our report to reflect this.
Additional suggestions or comments can be provided below. If applicable, please indicate the page and line numbers from the draft report.	1	Under the individual section a rich data resource from VA is described. - this is an important note to consider how much information is available APA shows Posttraumatic stress disorder (PTSD) as the way it is presented (no hyphen, not 2 words) p4, line 36-37, mentioned diverse categorization of deployment status - since this seems foundational information, is it a PI generated issue in what information was collected or another issue in terms of not having common data elements, etc.? At the individual level a description of the	Thank you. We have updated all instances of this throughout the report to remove the hyphen. Many authors defined their deployment variables differently, ie, some used currently vs. previously deployed, while others used ever vs. never and some broke this down further by number of deployments. We have added information into the report for clarity.

		studies were presented but not for the other levels. this could be a bolstered description to help from level to level, e.g., retrospective data analysis based upon VHA records, vs original prospective data collection, etc. ???what is it we can conclude about PTSD and suicide??? I am unsure the order of presentation of tables and figures - not alphabetical and not by frequency - mentioning it for considering the best way to present the list of factors on the Y axes.	We've reorganized our report slightly to include these more detailed descriptions in the corresponding sections (ie, low risk of bias or prospective studies). The following sentence was added to the report: Post-traumatic stress disorder (PTSD) was consistently shown to be a risk factor for suicide attempts but results were inconsistent for suicide. We thank the author for the suggestion, we grouped factors by socioecological model domains, and within those domains we tried to group like factors near each other. We initially thought we might subcategorize, but there was no foundational framework to do so.
	2	page line 40 - change to "...than 100,000 individuals, 10 studies enrolled Veterans...." on page 13, line 50; I feel the description of ROB needs more; is there a way to provide any kind of examples in the text (and some in the Executive Summary, too)? It is not clear to me how all of these prognostic factors might indicate bias in a study of suicide prevention. What kind of bias was found within the research that was screened? Knowing that may help inform investigators and improve our new research studies moving forward. page 18, line 27: this sentence was hard to read, could some commas be added? "Other factors at the individual, community or relational level while sometimes found to be associated with suicide and attempts were reported in only 1 or 2 studies thus limiting conclusions."	Thank you, this has been corrected. The prognostic factors themselves do not create bias, it's the methodological decisions made by the authors that may introduce bias into a study. We discuss limitations of study quality in the Limitations section. We also have discussed the issues of risk of bias in our future research needs section: "More refined analytic methods to adjust for known and potential confounders is important and a better understanding of whether results are due to exploratory analyses, chance, or limited statistical power. Additional work is needed to validate and harmonize how factors and confounders are operationalized, measured, and reported as well as the analytic models used." This sentence has been edited to for clarity. "Community-level, relational-level, and other individual-level factors were reported in only 1 or 2 studies. These factors were sometimes associated with suicide and attempts, but the few studies limited confidence. Thus, further exploration of factors such as firearm status, marital status, and various forms of interpersonal violence is warranted."

	3 Page 2 says studies of “nontraditional” risk or protective factors were included, which doesn’t align with Table 2 of inclusion/exclusion criteria. These should be aligned, and if the inclusion criteria of “studies of ‘nontraditional’ risk or protective factors” is retained, it should be clarified/specified. Homelessness is not a community level factor. Individual experience of homelessness (i.e., being homeless) is an individual-level factor. If the studies included were indeed evaluating the degree of homelessness in the community as an exposure variable, then this should be specified as such. If they were assessing the association between being homeless and suicide risk, then these studies should be re-categorized into the individual level group. It seems overly simplistic to state that the converse of a risk factor could be interpreted as a protective factor (page 8). Protective factors should ideally operate as a buffer – reducing risk despite/in the context of harmful experiences. Recommend removing this statement. When the data source is specified as “VHA” and “DoD” are these all administrative data? It would be good to specify this so that people know it is admin data vs. simply the study took place at VHA. Specifically Table 3 could say “VHA administrative databases” or similar.	We’ve changed the term “nontraditional” to “modifiable”. Due to the large amounts of research available on sex, race and age as risk factors for suicidal behaviors, we focused our report on other factors that have the potential to be modified, to align with VAs mission to reduce suicidal behaviors. We agree with the reviewer and have moved homelessness to the individual domain. We agree and have removed this statement. Thank you, we’ve added to Table 3 to clarify that this refers to VHA or DoD administrative data.
	4 There is some discussion related to standardization of risk factors/modeling adjustments -- am wondering if it is worthwhile to mention efforts made by NIH and other mechanisms that fund suicide prevention research to use common data elements	We agree. While not specifically mentioning efforts by NIH we note that future research would benefit from common data elements including measures of risk factors.

	(including measure of risk factors) to increase comparability across studies	
5	This report is excellent. Some minor comments are noted below. Excluding studies of populations known to be at high risk by virtue of mental health diagnoses or past suicide attempts likely limits the implications regarding risk and protective factors for those at heightened chronic suicide risk. This may be important to note outright. More description of the operationalization used to define “nontraditional” risk or protective factors and the rationale for excluding these from the review would be useful to include. Also, demographics were listed in Table 4, but weren’t these excluded due to being “nontraditional”? For the domains categorized under community-level, it would be helpful to state the rationale for categorizing in this way, particularly for homelessness, which seems to be an individual level factor and also which isn’t necessarily bound to a certain region or area. Table 1. Several of the examples would benefit from clarification or additional detail to ensure accurate categorization. For example, the “barriers to health care” example could be revised to ensure it is specific to the community; otherwise, such barriers would likely be at the individual level (e.g., personal stigma, lack of insurance) or societal level (e.g.,	Thank you. We agree that it limits broader implications, the intent was to review risk factors in broad populations, not to look at groups that were otherwise known to be at high-risk. Our goal was to see, in general populations, what risk factors were identified. Language has been added to the report in an attempt to make this more clear. We’ve changed the term “nontraditional” to “modifiable”. Due to the large amounts of research available on sex, race and age as risk factors for suicidal behaviors, we focused our report on other factors that have the potential to be modified. Studies which only reported sex, age, or race were not included in the report. However, if a study reporting other factors also reported sex, race, age, we tallied those up but did not go into detail discussing results of these factors in this report. Categorizing factors was a difficult process as many factors could conceptually fit into multiple categories. The study team, along with content experts and Technical Expert Panel members categorized each factor as best they could, given definitions provided by study authors. We agree with the reviewer and have moved homelessness to the individual domain. We agree, and if specific barriers were judged to be at an individual level, that is where we categorized it in the evidence tables for the review. Table 1 was meant to provide a broad overview of the types of factors that exist, and how they could be categorized based on the Social-Ecological Model. These examples were derived from another systematic review. We have added a footnote to the table to cite where the examples came from.

	societal norms regarding help-seeking). Similarly, it would be worth specifying for “cultural and religious beliefs” that these are within the community. The societal level examples would also benefit from being refined accordingly (e.g., for stigma and lethal means access, this would presumably be more about broad norms or laws that enable these). Table 2, timing- were studies excluded if it was unclear if the risk factor preceded the suicide/suicide attempt? How was quality of the assessment methods of suicide attempt and suicide factored into the risk of bias ratings? Could this information be provided outright for future reviews?	Yes. We used the QUIPS tool for prognostic studies to rate risk of bias, which does include a domain for outcome assessment. Specifically, the tool asks: <i>“A clear definition of outcome is provided; The method of outcome measurement used is adequately valid and reliable to limit misclassification bias; The method and setting of outcome measurement is the same for all study participants.”</i>
6	• Odd wording p10 ““feeling others’ would be better off I was dead”, probably easiest fix would be removing the apostrophe for others as it is not possessive and adding and if- “better off if I was dead” • The first 3 paragraphs on page 11 start with the same structure. It would read better if it did not count the number of studies in each but led with the constructs of interest for each. • The first time STARRS is mentioned (p 11), there is no full title and no description. Will the reader know what this is? • STARRS is not included in the acronyms list (p 16) • I would suggest you separate out risk from protective factors in table 4 (p 26) as it is	This was a typo that has been edited. Thank you for the suggestion. This has been edited to spell out acronym and describe the STARRS study briefly. Thank you, this has been added to the table.

	confusing to try to quickly determine which variables might be considered risk and which are protective • Love appendix C (p 46) but probably needs editing	This table is intended to show a summary of what was reported. It was often uncertain if a factor was a risk or protective factor, as many results were mixed. Thank you, you may be the first reviewer to have noticed our template placeholder language (or at least comment on it). Appendix has been edited.
7	Inconsistent use of 'risk of bias' and 'ROB', not sure it matters, just wanted to point out. some minor grammar issues (see highlights) - pg 3 line 51 - 'better of IF I was dead'. pg 5 line 26 - 'history OF TBI'. pg 6 line 38 - unclear verbiage. pg 7 line 50 - accompany used as adjective here so consider 'accompanying evidence map'; verb tense; 'as well AS'. pg 19 line 10 - perhaps a misplaced 'I'. pg 20 - consider adding box for 'societal level' and denoting 0 studies. pg 26 line 5 - BMI, consider clarify body mass index, only clarified in footnote of table.	Thank you, all of these corrections have been made.
8	The review is comprehensive and analysis excellent. I had the following questions/comments: 1) what is the rationale for limiting the studies to the past 10 years? Especially as this will bias results towards studies of OEF/OIF Veterans/soldiers. Valuable information for other cohorts (e.g. Vietnam; which are especially at high risk for suicide death/attempts) may not be fully captured within this time frame 2) some of the designations for individual, social and community were not clear to me. For example: In the initial description of the model, social isolation is listed as an example of an "individual" factor (pg 10) but in the listing on table 4, is now under social category. Similarly, not sure how homelessness is under	Thank you. We limited our search from 2011 because VA ESP conducted a review on suicide risk factors which was published in 2012, which used similar inclusion criteria to this review. Our report does include Veterans from many different service-eras, as age of participants was not an exclusion criterion. Thank you for pointing out these discrepancies. Categorizing factors was a difficult process as many factors could conceptually fit into multiple categories. The study team, along with content experts and the Technical Expert Panel members categorized each factor as best they could given the definition provided by study authors. Table 1 is just an example of how factors <i>could</i> be categorized. We've

		community as housing problems seems closer to legal and financial problems; which are individual factors. 3) I struggled conceptually with the decision to limit the review to general population and decision to not include individuals known to be at heightened risk (e.g. depression, mental illness and suicide history). However, the report contains much data exactly on these individuals. For example on, pg 18, "10 studies examined the association of previous suicide attempts or ideation with future attempt or suicide". Plus in table 4, 22 studies looked at "other mental illness". A better clarification of why these studies were included in needed. In essence, the review's finding confirm what we knew about elevated suicide risk pertaining to history of mental illness and previous attempt. I think there needs to be a better synthesis of the findings with what is already known and the decision to exclude these individuals in the review. Also, perhaps its a separate question, but would be extremely important to know what are the risk and protective factors of individuals at risk for suicide (not just general population)... as these are the individuals likely to have suicide event(s). 4) I completely agree with the need for studies examining combination of factors.	added some clarity to the report to indicate that Table 1 is just an example. In our report, the 1 study that reported on "social isolation" grouped it together with "perceived burdensomeness" and "thwarted belongingness"; therefore, we categorized it as a relational factor in this instance. We agree with the reviewer and have move homelessness to the individual domain. We were tasked with identifying risk or protective factors in a general population (eg, <50% were already at elevated risk for suicide). However, previous suicide attempt or other well-known risk factors were still reported within the general population, which is why they were included in the review as identified factors. We agree, that it is important to understand risk and protective factors of at-risk individuals, however, that was outside the scope of this review. Thank you.
	9	Page 1, line 20 (and throughout): Social-Ecological Model vs. Socio-Ecological Framework. I'm assuming these are the same?	These are the same, we have edited the report to reference the Social-Ecological Model for consistency.

	Page 4: It should be mentioned (and it may be in the body of the report) that homelessness is the result of both individual and structural factors and can be classified as both an individual- and community-level risk factor (depending on how it is conceptualized in the research). In addition, I think it would be useful to define the societal level of the SEM even if there are no studies that report on this factor. Page 18, line 25: PTSD was not consistently associated with suicide, meaning sometimes it was and sometimes it was not? Page 19, line 10: A word seems to be missing? Page 19, lines 25-28: I do not understand this sentence. Page 19, Table 4: The authors mention in Table 2 that “studies including >50% participants with increased risk of suicide due to prior suicide attempters or with specific mental or physical health conditions known to increase suicide risk” are excluded. But, clearly, previous suicide attempt/suicidal ideation is an individual-level risk factor included in 10 studies. So, just to be clear: if less than 50% of the sample had that indicator, the study was included; if more than 50%, the study was excluded? Table 5 provides a nice snapshot of the results! Page 28, line 24: The brief description here of the societal level of the SEM addresses my comment on page 4. Table 6: I find it interesting that tobacco use	This is described in the report, as you have noted in your following comment. Correct. Results were mixed. Thank you, this was corrected. This sentence was edited for clarity. Correct, we were tasked with identifying risk or protective factors in a general population (eg, <50% were already at elevated risk for suicide). However, previous suicide attempt or other well-know risk factors were still reported, which is why they were included in the review as identified factors. Thank you! Thank you.
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	shows up as particularly “risky” for suicide-related outcomes. I wonder if it would be useful to break out alcohol, tobacco, and other drug use into 3 categories so readers can see which substances are associated with risk as that seems to vary across studies (and certainly has different implications for interventions or explanations/theories for increased suicide risk). Page 32, line 54: I wonder if it would be useful to provide a summary of how the outcomes—suicide death and suicide attempt—were reported. Or, at least note what the differences were (e.g., timing of the event, data used to assess the event, etc.). This could be useful for researchers in determining the appropriate way to assess such outcomes in future work. Page 35, lines 52-54: When the authors discuss “factor classifications and definitions,” are they referring to risk factors? So, are the authors suggesting that there may need to be a more uniformly agreed upon way to code or categorize variables that may predict suicide? I agree and, if that is the authors’ intent, I think it would be useful to state that in a more concrete and explicit way.	We agree, it would be useful to break out into separate categories, unfortunately, several included studies grouped these together as a generic “substance abuse” or used diagnostic codes for Substance Abuse Disorder, and we didn’t have enough information to make this more granular. The vast majority of included studies used administrative data for suicide death (NDI, VA, etc.); suicide attempts were most often captured via self-report survey data. Thank you, we have elaborated on this sentence in the report to adequately convey this thought.
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APPENDIX D. EVIDENCE TABLE

Appendix Table D1. Study Characteristics and Outcomes for All Low and Moderate Risk of Bias Studies (k=54)

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Risk Factors Reported	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
Barry, 2018 ⁴¹ Retrospective Cohort Low	Veteran 10,000-99,999 VHA, CMS, VA SPAN, SDR	Transition from prison to civilian life (Reentry vs never incarcerated)	↔	↑	Homelessness, sum of 13 medical conditions, TBI, and any psychiatric disorder
Barth, 2016 ³¹ Retrospective Cohort Moderate	Veteran (Gulf War) ≥100,000 VHA, DoD, NDI, Social Security	Exposure to nerve gas (1- or 2-days vs no/unknown exposure)	↔	NR	Race, branch of service, type of unit, and age
		Gulf War Veteran status (compared to non-Gulf War Veterans)	↔	NR	
Bernecker, 2019 ⁶ Prospective Cohort Moderate	Active Military 10,000-99,999 DoD, STARRS, MHSDR	Ever bullied by unit	NR	↑	Predictors with significant univariate associations with SA were combined to generate within-category multivariate models, which were then trimmed to exclude nonsignificant predictors. The predictors in each of these within-category multivariate models were then combined into a final second-stage model. Also adjusted for seasonality and months since survey.
		Recent interpersonal problems	NR	↔	
		Any lifetime mental disorder	NR	↔	
		More-than-mild TBI in past 5 years	NR	↔	
		Any other TBI	NR	↔	
		Spent time in jail	NR	↔	
		Responsible for death of an enemy	NR	↑	
		Recent general stressors	NR	↔	
		Enlisted rank	NR	↔	
Bishop, 2020 ⁴⁹ Case-control Moderate	Veteran 10,000-99,999 VHA	Depression	NR	↑	Sleep-related breathing disorders, insomnia, nightmares, PTSD, depression, anxiety, schizophrenia, bipolar disorder,
		Anxiety	NR	↑	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Risk Factors Reported	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
		Bipolar	NR	↑	SUD, medical comorbidity, obesity, number of sleep medicine visits in the 180 days prior to the index date
		Schizophrenia	NR	↑	
		PTSD	NR	↑	
		Substance use disorder	NR	↑	
		Insomnia or nightmares	NR	↑	
		Obesity	NR	↓	
Blow, 2012 ⁵⁰ Retrospective Cohort Moderate	Veteran ≥100,000 VHA, NDI	VHA users (compared to general population)	↑	NR	Age
Bohnert, 2017 ⁴² Retrospective Cohort Low	Veteran ≥100,000 VHA, NDI	Any SUD	Male ↑ Female ↑	NR	Age, Charlson Comorbidity Index, and psychiatric diagnoses Covariance sandwich estimators were used to adjust for clustering within VHA facilities
		Alcohol use disorder	Male ↑ Female ↑	NR	
		Cocaine use disorder	Male ↑ Female ↔	NR	
		Cannabis use disorder	Male ↑ Female ↔	NR	
		Opioid use disorder	Male ↑ Female ↑	NR	
		Amphetamine or other psychostimulant use disorder	Male ↑ Female ↔	NR	
		Sedative, hypnotic, or anxiolytic use disorder	Male ↑ Female ↔	NR	
Bohnert, 2014 ⁷ Prospective Cohort Low	Veteran ≥100,000 VHA, NDI	Tobacco use disorder	↑	NR	Age group, sex, Charlson score, VHA service connection, substance use disorder, bipolar disorder, depression, other anxiety disorder, posttraumatic stress disorder, and schizophrenia

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Risk Factors Reported	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
Bullman, 2018 ¹² Retrospective Cohort Moderate	Veteran (OEF/OIF) ≥100,000 DoD, SDR, NDI	Single (compared to married)	↑	NR	Race, sex, age at entry to follow-up, and year of death
		Enlisted rank	↑	NR	
		Army/Marines (compared to others)	↑	NR	
		Active duty (compared to reserves)	↔	NR	
		In first year since discharge	↑	NR	
Bullman, 2019 ⁵¹ Retrospective Cohort Moderate	Veteran ≥100,000 VHA, DoD, SDR, NDI	Deployment to Bosnia/Kosovo	↓	NR	Age of entry, race, and sex
Chu, 2020 ⁸ Prospective Cohort Moderate	Active Military 1,000-9,999 STARRS, Survey	Perceived burdensomeness	NR	↔	Sociodemographic and Army career characteristics, months in, and survey completion
		Thwarted belongingness	NR	↔	
		Hopelessness	NR	↔	
Conner, 2013 ⁵² Retrospective Cohort Moderate	Veteran ≥100,000 VHA, DNI	PTSD	↑	NR	Age
		Bipolar	↑	NR	
		Depression	↑	NR	
		Anxiety	↑	NR	
		Schizophrenia	↑	NR	
		Substance use disorder	↑	NR	
Cooper, 2020 ⁴³ Retrospective Cohort Low	Veteran ≥100,000 VHA, DoD	Positive score on PC-PTSD screen	↑	NR	Demographic characteristics, mental health diagnoses, treatment, and suicide attempts
Dempsey, 2019 ⁵³ Case-control Moderate	Active Military <1,000 STARRS, SHOS-B	Own working gun	↔	NR	Deployment status (never vs previously) and the number of years of active service (1-4, 5-8, or ≥ 9 years)
		Storing a loaded firearm at home	↑	NR	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Risk Factors Reported	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
		Carrying a personal gun in public	↑	NR	
Cusack, 2020 ³⁰ Cross-sectional Low	Veteran ≥100,000 VHA, NDI	Housing instability	↑	NR	Age, sex, race, ethnicity, medical co-morbidity, service-connected disability status, and experience of military sexual trauma
		Military sexual trauma	↑	NR	
		Service-connected disability (50-100%)	↑	NR	
Dobscha, 2014 ¹³ Case-control Moderate	Veteran <1,000 VHA	Endorsed thoughts or attempts at suicide	↑	NR	Specific adjustments to model not reported
		Major depressive disorder	↑	NR	
		Anxiety disorder	↑	NR	
		Bipolar disorder	↔	NR	
		Anger	↔	NR	
		Alcohol or substance use disorder	↔	NR	
		Relationship problems	↔	NR	
		Married	↔	NR	
		Isolation	↔	NR	
		Grief or loss of a loved one	↔	NR	
		Sleep problems	↔	NR	
		Functional decline	↑	NR	
		Legal problems	↔	NR	
		Financial problems	↔	NR	
		Job or school problems	↔	NR	
		Recently moved or plans to move	↔	NR	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Risk Factors Reported	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
		Service connected	↓	NR	
Doran, 2016 ¹⁴ Retrospective Cohort Moderate	Veteran (Vietnam, Gulf War) 1,000-9,999 VHA, Survey	History of sexual abuse	NR	↔	Age, period of service, and diagnosis (depression, anxiety disorders other than PTSD, and SUDs)
		History of physical abuse	NR	↔	
		Previous suicide attempt	NR	↑	
		Previous self-harm	NR	↑	
		Depression/anxiety	NR	↔	
		Motivated for treatment	NR	↑	
		Good coping skills	NR	↓	
		Hopelessness	NR	↑	
		Substance use disorder	NR	↔	
Finley, 2015 ¹⁵ Retrospective Cohort Moderate	Veteran (OEF/OIF) ≥100,000 VHA	Suicide related behavior	NR	↑	Specific adjustments to model not reported
		Depression	NR	↑	
		Anxiety disorder	NR	↑	
		Bipolar disorder	NR	↑	
		Schizophrenia	NR	↔	
		PTSD	NR	↑	
		Psychiatric hospitalization	NR	↔	
		Charlson Comorbidity Index score	NR	↔	
		Insomnia	NR	↔	
		TBI	NR	↔	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Risk Factors Reported	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
Goodin, 2019 ¹⁶ Case-control Moderate	Active Military <1,000 DoD	Chronic pain	NR	↔	Age, sex, education, race/ethnicity, marital status, rank, and time since last deployment
		Enlisted rank	NR	↑	
		Service component (guard or reserve compared to active duty)	NR	↑	
		Failed or failing intimate relationship	↑	↑	
		Prior self-harm or attempt	↔	↑	
		DSM-IV diagnosed mood disorder	↑	↑	
		Substance abuse	↑	↑	
		Court proceedings, nonjudicial punishment, or a civil legal problem (eg, child custody dispute, other litigation)	↔	↔	
		Excessive debt or bankruptcy	↔	↔	
Griffith, 2017 ¹⁷ Case-control Moderate	Active Military 1,000-9,999 Army & National Guard Personnel System	Unmarried	↔	NR	Specific adjustments to model not reported
		Military occupation	↔	NR	
		Enlisted rank	↑	NR	
		Deployment	↔	NR	
		Less time in service	↑	NR	
		Part time military status (compared to full-time)	↑	NR	
Hoffmire, 2015 ⁵⁴ Cross-sectional Moderate	Veteran ≥100,000	VHA utilization (compared to Veterans who do not use VHA)	↓	NR	Age, gender

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Risk Factors Reported	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
	VHA, DoD, State death certificate records				
Hostetter, 2019 ⁵⁵ Retrospective Cohort Moderate	Veteran ≥100,000 VA, DoD, SDR, NDI	Traumatic brain injury	↑	NR	Age, gender, psychiatric conditions, comorbidities, and other chronic conditions
Hyman, 2012 ¹⁸ Cross-sectional Moderate	Active Military (OEF/OIF) ≥100,000 DoD, SDR	Marital change (got married or divorced)	↔	NR	Any mental health diagnosis, number of deployments to OEF/OIF, and selective serotonin reuptake inhibitor prescriptions
		Prior attempt	↑	NR	
		Mental health diagnosis	↑	NR	
		PTSD	↑	NR	
		Mental health visit	↑	NR	
		Substance misuse diagnosis	↑	NR	
		TBI diagnosis	↑	NR	
		Sleep aid prescription	↑	NR	
		Change in rank (demotion)	↑	NR	
		Enlisted rank	↑	NR	
		Number of deployments	↑	NR	
		Selective serotonin reuptake inhibitor prescriptions	↑	NR	
Ilgen, 2012 ³⁶ Retrospective Cohort Low	Veteran (OEF/OIF) ≥100,000 VHA, NDI	Any psychiatric condition	↑	NR	Cox proportional hazards survival model for time to suicide, controlling for sex, age, and Veterans Integrated Service Networks, adjusted for clustering at the
		Substance use disorder	↑	NR	
		Depression	↑	NR	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Risk Factors Reported	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
		Schizophrenia	↑	NR	facility level using the covariance sandwich estimator. Separate survival models for each psychiatric diagnosis.
Ilgen, 2013 ⁵⁶ Retrospective Cohort Moderate	Veteran ≥100,000 VHA, NDI	Arthritis	↔	NR	Age, sex, Charlson score, and concomitant psychiatric conditions
		Back pain	↑	NR	
		Migraine	↑	NR	
		Neuropathy	↔	NR	
		Headache or tension headache	↔	NR	
		Fibromyalgia	↔	NR	
		Psychogenic pain	↑	NR	
Kang, 2015 ¹⁹ Retrospective Cohort Moderate	Veteran (OEF/OIF) ≥100,000 VHA, DoD, NDI	Deployment	↓	NR	Age at the start of follow-up, race, gender, marital status, service branch (Army, Marines/Air Force, and Navy), and rank (enlisted/officer)
		Ground troops (Army/Marine compared to others)	↔	NR	
		Enlisted rank	↑	NR	
		Time since discharge	↔	NR	
		Unmarried	↑	NR	
Katz, 2012 ⁵⁷ Retrospective Cohort Moderate	Veteran ≥100,000 VHA, NDI, National Violent Death Reporting System	VHA utilization for men under 30	↓	NR	Age, gender
Kimerling, 2016 ²⁰ Retrospective Cohort Moderate	Veteran ≥100,000 VHA, NDI	Military sexual trauma	↑	NR	Age, sex, medical morbidity, rurality, and mental health diagnoses
LeardMann, 2013 ⁹		Depression	↑	NR	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Risk Factors Reported	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
Prospective Cohort Moderate	Veteran, Active Military ≥100,000 DoD, NDI, Millennium Cohort Study, Armed Forces Health Surveillance Center	Manic depressive disorder	↑	NR	Age, sex, depression, manic-depressive disorder, heavy or binge drinking, alcohol-related problems
		Panic or other anxiety disorder	↑	NR	
		PTSD	↔	NR	
		Alcohol related problems	↑	NR	
		Physical component score	↔	NR	
		Life stressors	↔	NR	
		Military occupation	↔	NR	
		Military rank	↔	NR	
		Deployed	↔	NR	
		Deployed with combat	↔	NR	
		Number deployments	↔	NR	
		Service branch	↔	NR	
		Service component	↔	NR	
		Time deployed	↓	NR	
		Veteran status	↔	NR	
Louzon, 2016 ³⁵ Retrospective Cohort Low	Veteran ≥100,000 VHA, NDI	Suicidal ideation (PHQ9 item 9)	↑	NR	Age, sex, and psychiatric diagnoses, PHQ9 items 1-8
		Anxiety	↔	NR	
		PTSD	↓	NR	
		Substance use disorder	↑	NR	
		Depression	↔	NR	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Risk Factors Reported	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
		Depressive severity	↑	NR	
		Type of encounter in which PHQ9 administered	↔	NR	
Lynch, 2020 ⁴⁴ Retrospective Cohort Moderate	Veteran 10,000-99,999 VHA	Sexual minority status	↑	NR	Age
Martz, 2018 ⁵⁸ Retrospective Cohort Moderate	Veteran ≥100,000 (OEF/OIF) VHA, DoD, NDI, DMDC	Tinnitus diagnosis	↓	NR	Tinnitus diagnosis, attempted self-harm encounters, audiology or mental-health clinic visits, co-occurring health conditions, and age at first health encounter
		Previous attempt or self-harm	↑	NR	
		Tinnitus with depression and/or anxiety	↓	NR	
		Audiology or mental health clinic visit	↑	NR	
McCarthy, 2014 ⁵⁹ Retrospective Cohort Moderate	Veteran ≥100,000 VHA, NDI	Major depressive disorder	↑	NR	BMI categories, VHA regional network, sociodemographic measures, and remaining study covariates
		Other depression	↑	NR	
		PTSD	↓	NR	
		Non-PTSD anxiety	↑	NR	
		Bipolar disorder	↑	NR	
		Schizophrenia	↑	NR	
		Eating disorder	↔	NR	
		Dementia	↔	NR	
		Any VHA mental health treatment	↑	NR	
		Substance use disorder	↑	NR	
		COPD	↑	NR	
		Head cancer	↑	NR	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Risk Factors Reported	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
		Hypertension	↓	NR	
		Diabetes	↓	NR	
		Autoimmune disease	↔	NR	
		Hemi/paraplegia	↔	NR	
		Overweight/obese (compared to normal body mass index)	↓	NR	
Naifeh, 2017 ¹⁰ Prospective Cohort Moderate	Active Military 10,000-99,999 DoD, STARRS, MHSDR, Theater Medical Data Store, TRANSCOM	General neurocognitive factor score	↑	↑	Gender, age at neurocognitive testing, education, race/ethnicity, and history of mental health diagnosis at testing
Palframan, 2020 ²⁷ Retrospective Cohort Low	Veteran ≥100,000 VHA, DoD, NDI	Use of Health Care for Reentry Veterans	↔	↔	Demographic and clinical characteristics
		Use of Veterans Justice Outreach	↔	↔	
		Unmarried/single/divorced	↑	↑	
		Homelessness	↔	↑	
		Prior attempt	↑	↑	
		Alcohol and/or drug use	↑	↑	
		Anxiety	↑	↑	
		Bipolar	↑	↑	
		Depression	↑	↑	
		PTSD	↑	↑	
		Schizophrenia	↑	↑	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Risk Factors Reported	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
Phillips, 2017 ¹¹ Prospective Cohort Low	Active Military (OEF/OIF) ≥100,000 DoD, MHSDR, DMDC, Recruit Assessment Program survey	High school nongraduate	↑	NR	“Given the interest in mental health conditions (depression, PTSD, and adjustment disorder) and deployment, these were maintained a priori in the final main model. All other factors were manually removed sequentially until the final model included only those that were significant (P < 0.05) or that caused a change in the hazard ratio (10% or greater) for the main exposure, TBI.”
		Smoking	↑	NR	
		Military occupation (in-service)	↑	NR	
		TBI	↑	NR	
		Depression	↑	NR	
		Relationship counseling	↑	NR	
		PTSD	↓	NR	
		Time deployed	↑	NR	
		Adverse Childhood Experiences score	↑	NR	
		No social support	↑	NR	
Ravindran, 2020 ⁶⁰ Retrospective Cohort Moderate	Veteran ≥100,000 DoD	Army/Marines (compared to others)	↑	NR	Sex, age, race, and ethnicity
		Service component (active duty compared to reserves/guard)	↑	NR	
		Shorter time in service	↑	NR	
Reger, 2015 ⁴⁵ Retrospective Cohort Low	Veteran (OEF/OIF) Active Military ≥100,000 DoD, NDI	Characterization of service at separation (not honorable or uncharacterized)	↑	NR	Sex, age at cohort entry, educational attainment at cohort entry, race/ethnicity, and service branch at cohort entry
		Shorter time since separation from military service	↑		
Riberiro, 2017 ⁶¹ Retrospective Cohort Moderate	Active Military 1,000-9,999 STARRS	Inpatient, outpatient, or specialist mental health encounters 52 and 4 weeks prior to death	↑	NR	Specific adjustments to model not reported

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Risk Factors Reported	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
Rosellini, 2017 ²¹ Retrospective Cohort Moderate	Active Military 10,000-99,999 STARRS	Sexual assault victim status	NR	↑	Number of follow-up months between the month of the assault and the month of starting treatment
Ryan, 2020 ⁶² Case-control Moderate	Active Military 1,000-9,999 DoD	Depression or bipolar disorder	↑	NR	Bipolar disorders, depression disorders, adjustment disorders and unspecified mental disorders
		≥ 1 outpatient or inpatient encounter	↑	NR	
Schinka, 2016 ⁶³ Retrospective Cohort Moderate	Veteran 10,000-99,999 VHA, NDI	Homelessness	↑	NR	Specific adjustments to model not reported
Schinka, 2018 ⁶⁴ Retrospective Cohort Moderate	Veteran 10,000-99,999 VHA, NDI	Homelessness	↑	NR	Diagnosed medical and psychiatric comorbidities, substance abuse, and use of VA
Shen, 2016 ²⁸ Retrospective Cohort Low	Veteran (OEF/OIF) Active Military ≥100,000 NDI, TRICARE, DMDC	Recently divorced	↑	NR	All variables in table, plus sex, race, age, marital status, dependent quantity, rank, Armed Forces Qualifying Test percentile, and military occupational specialty
		Prior self-inflicted injuries	↑	NR	
		Major depression	↑	NR	
		Bipolar disorder	↑	NR	
		Anxiety disorder	↑	NR	
		Other psychotic disorder	↑	NR	
		PTSD	↓	NR	
		Substance use disorder	↑	NR	
		Major non-drug related offense	↑	NR	
		Demotion	↑	NR	
		Military rank	↔	NR	
		Deployed	↑	NR	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Risk Factors Reported	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
		Service branch	↔	NR	
		Service component (reserves vs active duty)	↓	NR	
		Time since separation from service	↑	NR	
Shiner, 2020 ⁴⁶ Retrospective Cohort Low	Veteran (Vietnam, OEF/OIF) ≥100,000 VHA, DoD, NDI	Demographics (age, sex, race, rurality)	↔	NR	Age, race, sex rurality
Skopp, 2016 ²² Case-control Moderate	Active Military 10,000-99,999 DoD	Failed intimate relationship w/in last 90 days	↑	↑	Age, sex, education, race/ethnicity, marital status, rank, year, deployment to Iraq, deployment to Afghanistan, duration of last deployment, and time since last deployment
		Prior history of self-harm, anytime in the past	↔	↑	
		Any DSM-IV mood disorder any time in the past	↑	↑	
		History of substance abuse, last 90 days	↑	↑	
		Military or civilian legal problems, last 90 days	↑	↔	
Trofimovich, 2013 ⁴⁷ Retrospective Cohort Low	Active Military (OEF/OIF) 1,000-9,999 DoD, DMDC	Combined infantry, gun crews, and seamanship specialists	↑	NR	Sex, age group, and history of deployment to OEF/OIF
Ursano, 2015 ⁶⁵ Retrospective Cohort Moderate	Active Military (OEF/OIF) ≥100,000 DoD, STARRS	Gender (female)	NR	↑	Sociodemographic characteristics (sex, age at entry into Army service, current age, race, educational level, and marital status) with suicide attempts, followed by separate models evaluating incremental predictive effects of the length of service,
		Age at Army entry (≥ 25 years)	NR	↑	
		Current age (< 21)	NR	↑	
		Education level (< high school)	NR	↑	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Risk Factors Reported	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
		Length of service (1-2 years)	NR	↑	deployment status, and the presence or recency of a mental health diagnosis
		Deployment status (never or previously)	NR	↑	
		Time since most recent mental health diagnosis (1 month)	NR	↑	
Ursano, 2016 ⁶⁶ Retrospective Cohort Moderate	Active Military (OEF/OIF) ≥100,000 DoD, STARRS	Gender (female)	NR	↑	Logistic regression models included a dummy predictor for calendar month and year to control for increasing rates of suicide attempt from 2004 to 2009. Coefficients of other predictors were averaged within-month associations based on the assumption that effects of other predictors do not vary over time.
		Education (< high school)	NR	↑	
		Time in Service (1-2, 3-4 years)	NR	↑	
		Mental health diagnosis (depression, PTSD, SUD)	NR	↑	
Ursano, 2017a ⁴⁸ Retrospective Cohort Low	Active Military ≥100,000 VHA, DoD, STARRS	Combat arms or combat medic	↑	NR	Logistic regression models include gender, age, age at Army entry, current age, race/ethnicity, education, marital status, time in service (≤ 1 year, 2 years, 3-4 years, 5-10 years, > 10 years), deployment status (never, currently, or previously deployed), and military occupation. The model also included a dummy predictor variable for calendar month and year to control for secular trends
Ursano, 2017b ³³ Retrospective Cohort Moderate	Active Military 10,000-99,999 DoD, STARRS	Military occupation (combat arms)	NR	↑	Logistic regression models that included basic sociodemographic and service-related variables (sex, age at entry into the Army, current age, race/ethnicity, educational level, marital status, time in service, deployment status, unit size, and number of past-suicide attempts) and included a dummy predictor variable for calendar month and year to control for secular trends
		Unit suicide attempts in the past year (>1)	NR	↑	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Risk Factors Reported	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
Ursano, 2017c ³² Retrospective Cohort Moderate	Active Military (OEF/OIF) ≥100,000 DoD, STARRS	IED frequency per month	NR	↑	The multivariate model included sociodemographic variables (gender, current age, race, education, marital status), service-related variables (rank, time in service, deployment status), historical time (January 2004 to May 2007 vs June 2007 to December 2009), and combat operational variables (IED frequency [scaled in multiples of 1,000], combat deaths and injuries [scaled in multiples of 100], soldiers deployed and redeployed [scaled in multiples of 100,000]).
		Deployment status (never)	NR	↑	
		Time in service (< 2 years)	NR	↑	
Ursano, 2018a ²³ Retrospective Cohort Moderate	Active Military ≥100,000 DoD, STARRS	Gender (female)	NR	↑	Each 2-way interaction was examined separately in a model that included all of the sociodemographic and service-related variables but not the other 2-way interactions
		Education (< High school)	NR	↑	
		Age at army entry (< 21)	NR	↑	
		Time in service (1, 2, 3-4 years)	NR	↑	
		Deployment status (never or previously deployed)	NR	↑	
		Delayed Promotion (late)	NR	↑	
		Demotion in past year	NR	↑	
		Military occupation (combat arms or combat medic)	NR	↑	
		Marital Status	NR	↔	
Ursano, 2018b ²⁵ Retrospective Cohort Moderate	Active Military 10,000-99,999 STARRS	Marital status (never married)	NR	↑	Univariate associations
		Education (high school, some college, and ≥ college)	NR	↓	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Risk Factors Reported	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
Ursano, 2018c ²⁴ Retrospective Cohort Moderate	Active Military 10,000-99,999 DoD, STARRS	Race (black, Hispanic, Asian, and other)	NR	↓	Sociodemographic characteristics (sex, race/ethnicity, educational level, and marital status), age at US Army entry, time in service before first deployment, duration of first deployment, dwell time, a dummy predictor variable for calendar month and year to control for secular trends, deployment status, and previous mental health diagnosis before second deployment
		Military Rank (E1 – E2, E3)	NR	↑	
		Never or previously married	NR	↔	
		Previously deployed	NR	↑	
		Previous mental health diagnosis before second deployment	NR	↑	
		Duration of first deployment, >13 months	NR	↑	
		Dwell Time, <6 months	NR	↑	
		Deployment status (previously deployed)	NR	↑	
Ursano, 2018d ²⁶ Retrospective Cohort Moderate	Active Military ≥100,000 DoD, STARRS	Time in service before first deployment (≤ 12 months)	NR	↑	Socio-demographics (current age, race/ethnicity, education, marital status) and service-related variables (age at Army entry, time in service [1-2 years, 3-4 years, 5+ years], deployment status [never, currently, or previously deployed], and military occupation [combat arms vs. others]). Models also included a dummy predictor variable for calendar month and year to control for secular trends.
		Any history of family violence	NR	↑	

CMS=Centers for Medicare and Medicaid Services; DMDC= Defense Manpower Data Center; DoD=Department of Defense; IED=improvised explosive device; NDI=National Death Index; OEF/OIF=Operation Enduring Freedom/Operation Iraqi Freedom; MHSDR=Military Health System Data Repository; NR=not reported; PC-PTSD=Primary Care Posttraumatic Stress Disorder Screen; PTSD=Posttraumatic Stress Disorder; SHOS-B=Soldiers Health Outcomes Study; STARRS=Study to Assess Risk and Resilience in Servicemembers; SDR=VA/DoD National Suicide Data Repository; TBI=traumatic brain injury; VHA=Veteran's Health Administration; VA SPAN=Veteran's Administration's Suicide Prevention Applications Network

Appendix Table D2. Study Characteristics and Outcomes Related to Military Occupation as a Risk Factor Among Low and Moderate Risk of Bias Studies (k=7)

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Military Occupational Categories (Risk Factor)	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
Griffith, 2017¹⁷ Case-control Moderate	Active Military 1,000-9,999 Army & National Guard Personnel System	Combat military occupation (yes/no)	↔	NR	Specific adjustments to model not reported
LeardMann, 2013⁹ Prospective Cohort Moderate	Veteran, Active Military ≥100,000 DoD, NDI, Millennium Cohort Study, Armed Forces Health Surveillance Center	Combat specialist	↔	NR	Age, sex, depression, manic- depressive disorder, heavy or binge drinking, alcohol-related problems
		Health care	↔	NR	
		Functional support, service and supply	↔	NR	
		Mechanical or electrical repair	↔	NR	
		Other	↔	NR	
Phillips, 2017¹¹ Prospective Cohort Low	Active Military (OEF/OIF) ≥100,000 DoD, MHSDR, DMDC, Recruit Assessment Program survey	Occupational Grade E01 – E03 (reference group)	↔	NR	“Given the interest in mental health conditions (depression, PTSD, and adjustment disorder) and deployment, these were maintained a priori in the final main model. All other factors were manually removed sequentially until the final model included only those that were significant (P < 0.05) or that caused a change in the hazard ratio (10% or greater) for the main exposure, TBI.”
		Occupational Grade E04 – E07	↓	NR	
Trofimovich, 2013⁴⁷ Retrospective Cohort Low	Active Military (OEF/OIF) 1,000-9,999 DoD, DMDC	Infantry, gun crews, and seamanship specialists	↔	NR	Sex, age group, and history of deployment to OEF/OIF
		Electrical/mechanical equipment repairers	↔	NR	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Military Occupational Categories (Risk Factor)	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
		Functional support and administration	↔	NR	
		Service and supply handlers	↔	NR	
		Communications and intelligence specialists	↔	NR	
		Electronic equipment repairers	↔	NR	
		Health care specialists	↔	NR	
		Other technical and allied specialists	↔	NR	
		Craftworkers	↔	NR	
		Tactical operations officers	↔	NR	
		Health care officers	↔	NR	
		Groups with < 25	↔	NR	
Ursano, 2017a ⁴⁸ Retrospective Cohort Low	Active Military ≥100,000 VHA, DoD, STARRS	Combat arms	↑	NR	Logistic regression models include gender, age, age at Army entry, current age, race/ethnicity, education, marital status, time in service (≤ 1 year, 2 years, 3-4 years, 5-10 years, >10 years), deployment status (never, currently, or previously deployed), and military occupation. The model also included a dummy predictor variable for calendar month and year to control for secular trends.
		Special Forces	↔	NR	
		Combat medic	↑	NR	
		Other	↔	NR	
Ursano, 2017b ³³	Active Military	Combat arms	NR	↑	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Military Occupational Categories (Risk Factor)	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
Retrospective Cohort Moderate	10,000-99,999 DoD, STARRS	Other	NR	↔	Logistic regression models that included basic sociodemographic and service-related variables (sex, age at entry into the Army, current age, race/ethnicity, educational level, marital status, time in service, deployment status, unit size, and number of past-suicide attempts) and included a dummy predictor variable for calendar month and year to control for secular trends
Ursano, 2018a ²³ Retrospective Cohort Moderate	Active Military ≥100,000 DoD, STARRS	Combat arms	NR	↑	Each 2-way interaction was examined separately in a model that included all of the sociodemographic and service-related variables but not the other 2-way interactions
		Special forces	NR	↔	
		Combat medic	NR	↑	
		Other	NR	↔	

DMDC= Defense Manpower Data Center; DoD=Department of Defense; NDI=National Death Index; OEF/OIF=Operation Enduring Freedom/Operation Iraqi Freedom; MHSDR=Military Health System Data Repository; NR=not reported; PTSD=Posttraumatic Stress Disorder; STARRS=Study to Assess Risk and Resilience in Servicemembers; TBI=traumatic brain injury; VHA=Veteran's Health Administration;

Appendix Table D3. Study Characteristics and Outcomes Related to Deployment Status Among Low and Moderate Risk of Bias Studies (k=14)

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Deployment Status Variable (study categories)	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
Barth, 2016 ³¹ Retrospective Cohort Moderate	Veteran (Gulf War) ≥100,000 VHA, DoD, NDI, Social Security	Gulf War Veteran status (compared to non-Gulf War Veterans)	↔	NR	Race, branch of service, type of unit, and age
Bernecker, 2019 ⁶ Prospective Cohort Moderate	Active Military 10,000-99,999 DoD, STARRS, MHSDR	Number of prior deployments (range 0 – 4)	NR	↑	Predictors with significant univariate associations with SA were combined to generate within-category multivariate models, which were then trimmed to exclude nonsignificant predictors. The predictors in each of these within-category multivariate models were then combined into a final second-stage model. Also adjusted for seasonality and months since survey.
Bullman, 2019 ⁵¹ Retrospective Cohort Moderate	Veteran ≥100,000 VHA, DoD, SDR, NDI	Deployment to Bosnia/Kosovo (never deployed is referent)	↓	NR	Age of entry, race, and sex
Griffith, 2017 ¹⁷ Case-control Moderate	Active Military 1,000-9,999 Army & National Guard Personnel System	Deployed (yes/no)	↔	NR	Specific adjustments to model not reported
Hyman, 2012 ¹⁸ Cross-sectional Moderate	Active Military (OEF/OIF) ≥100,000 DoD, SDR	Number of deployments to OEF/OIF: 0	↔	NR	Any mental health diagnosis, number of deployments to OEF/OIF, and selective serotonin reuptake inhibitor prescriptions
		Number of deployments to OEF/OIF: 1	↑	NR	
		Number of deployments to OEF/OIF: ≥ 2	↑	NR	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Deployment Status Variable (study categories)	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
Ilgen, 2012 ³⁶ Retrospective Cohort Low	Veteran (OEF/OIF) ≥100,000 VHA, NDI	Deployment to OEF/OIF (yes/no) (no referent group)	↑	NR	Cox proportional hazards survival model for time to suicide, controlling for sex, age, and Veterans Integrated Service Networks, adjusted for clustering at the facility level using the covariance sandwich estimator. Separate survival models for each psychiatric diagnosis.
Kang, 2015 ¹⁹ Retrospective Cohort Moderate	Veteran (OEF/OIF) ≥100,000 VHA, DoD, NDI	Deployment (yes/no) (no referent group)	↓	NR	Age at the start of follow-up, race, gender, marital status, service branch (Army, Marines/Air Force, and Navy), and rank (enlisted/officer)
LeardMann, 2013 ⁹ Prospective Cohort Moderate	Veteran, Active Military ≥100,000 DoD, NDI, Millennium Cohort Study, Armed Forces Health Surveillance Center	OEF/OIF not deployed (referent)		NR	Age, sex, depression, manic-depressive disorder, heavy or binge drinking, alcohol-related problems
		OEF/OIF deployed without combat	↔	NR	
		OEF/OIF deployed with combat	↔	NR	
		Number of deployments: 0 (referent)	↔	NR	
		Number of deployments: 1	↔	NR	
		Number of deployments: >1	↔	NR	
Phillips, 2017 ¹¹ Prospective Cohort Low	Active Military (OEF/OIF) ≥100,000 DoD, MHSDR, DMDC, Recruit Assessment Program survey	OIF/OEF deployment: never (referent)		NR	"Given the interest in mental health conditions (depression, PTSD, and adjustment disorder) and deployment, these were maintained a priori in the final main model. All other factors were manually removed sequentially until the final model included only those that were significant (P < 0.05) or that caused a change in the hazard ratio (10% or greater) for the main exposure, TBI."
		OIF/OEF deployment: deployed	↓	NR	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Deployment Status Variable (study categories)	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
Shen, 2016 ²⁸ Retrospective Cohort Low	Veteran (OEF/OIF) Active Military ≥100,000 NDI, TRICARE, DMDC	Not deployed (referent)		NR	All variables in table, plus sex, race, age, marital status, dependent quantity, rank, Armed Forces Qualifying Test percentile, and military occupational specialty
		Deployed during the current quarter	↓	NR	
		Deployed in the previous 3 quarters	↑	NR	
		Deployed in the previous 4 to 7 quarters	↑	NR	
		Deployed in the previous 8 to 11 quarters	↑	NR	
		Deployed in the previous 12 to fifteen quarters	↑	NR	
		Deployed in the previous 16 or more quarters	↔	NR	
Ursano, 2015 ⁶⁵ Retrospective Cohort Moderate	Active Military (OEF/OIF) ≥100,000 DoD, STARRS	Deployment status: never	NR	↑	Sociodemographic characteristics (sex, age at entry into Army service, current age, race, educational level, and marital status) with suicide attempts, followed by separate models evaluating incremental predictive effects of the length of service, deployment status, and the presence or recency of a mental health diagnosis
		Deployment status: currently (referent)	NR		
		Deployment status: previously	NR	↑	
Ursano, 2017c ³² Retrospective Cohort Moderate	Active Military (OEF/OIF) ≥100,000 DoD, STARRS	Never deployed	NR	↑	The multivariate model included sociodemographic variables (gender, current age, race, education, marital status), service-related variables (rank, time in service, deployment status), historical time (January 2004 to May 2007 vs June 2007 to December 2009), and combat operational variables (IED frequency [scaled in
		Currently deployed (referent)	NR		
		Previously deployed	NR	↑	

Author, Year Study Design Sample Size	Population Sample Size Data Source(s)	Deployment Status Variable (study categories)	Outcome and Direction of Effect*		Adjustments to Model
			Deaths	Attempts	
					multiples of 1,000], combat deaths and injuries [scaled in multiples of 100], soldiers deployed and redeployed [scaled in multiples of 100,000].
Ursano, 2018a ²³ Retrospective Cohort Moderate	Active Military ≥100,000 DoD, STARRS	Deployment status: Never	NR	↑	Each 2-way interaction was examined separately in a model that included all of the sociodemographic and service-related variables but not the other 2-way interactions
		Deployment status: currently (referent)	NR		
		Deployment status: previously deployed	NR	↑	
Ursano, 2018c ²⁴ Retrospective Cohort Moderate	Active Military 10,000-99,999 DoD, STARRS	Currently deployed (referent)	NR		Sociodemographic characteristics (sex, race/ethnicity, educational level, and marital status), age at US Army entry, time in service before first deployment, duration of first deployment, dwell time, a dummy predictor variable for calendar month and year to control for secular trends, deployment status, and previous mental health diagnosis before second deployment
		Previously deployed	NR	↑	

DMDC=Defense Manpower Data Center; DoD=Department of Defense; IED=improvised explosive device; NDI=National Death Index; OEF/OIF=Operation Enduring Freedom/Operation Iraqi Freedom; MHSDR=Military Health System Data Repository; NR=not reported; PTSD=Posttraumatic Stress Disorder; STARRS=Study to Assess Risk and Resilience in Servicemembers; SDR=VA/DoD National Suicide Data Repository; TBI=traumatic brain injury; VHA=Veteran's Health Administration