International Platform of Registered Systematic Review and Meta-analysis Protocols

INPLASY

Post-traumatic stress disorder and suicide mortality: a systematic review and meta-analysis protocol

INPLASY202650066
doi: 10.37766/inplasy2026.5.0066
Received: 11 May 2026
Published: 11 May 2026

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ADMINISTRATIVE INFORMATION

Support - This research is not supported by external funding.

Review Stage at time of this submission - Preliminary searches.

Conflicts of interest - Matthew Large has provided independent expert evidence on coroner's cases involving PTSD and suicide.

INPLASY registration number: INPLASY202650066

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 11 May 2026 and was last updated on 11 May 2026.

INTRODUCTION

Review question / Objective What is the strength of the association between post-traumatic stress disorder (PTSD) and suicide mortality (death by suicide), compared with those without PTSD, and what may explain observed heterogeneity?

Rationale Suicide is a significant public health concern worldwide. PTSD is prevalent across clinical and community settings, including civilian and military cohorts. It frequently co-occurs with psychiatric comorbidity and adverse social determinants associated with suicide risk. However, the association between PTSD and suicide mortality remains uncertain. Individual studies have reported inconsistent findings, with variation likely reflecting differences in population, PTSD ascertainment, effect measure type, follow-up duration, and covariate adjustment.

A prior synthesis (Akbar et al., 2023) suggested an elevated pooled risk of suicide mortality, but effects diverged markedly across cohorts, including attenuated or inverse findings in psychiatric-comorbidity samples. The small evidence base of only eight studies across two databases, which specifically examined suicide death, limited a formal assessment of publication bias or clinically meaningful subgroup analyses. Heterogeneous effect estimates were pooled across studies, including differing effect-measure types and a mix of adjusted and unadjusted estimates. The review also did not systematically address the extent to which adjustment for psychiatric comorbidity or comparator selection may have attenuated or distorted observed associations. Earlier reviews that included suicide mortality as an endpoint similarly identified few eligible studies and reached limited or inconclusive findings (Krysinska & Lester, 2010), while a recent comprehensive PTSD-mortality meta-analysis excluded suicide deaths entirely (Nilaweera et al., 2023).

We will conduct an updated systematic review and meta-analysis restricted to suicide mortality

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(excluding ideation and attempts), incorporating newer large registry-based and health-system cohort studies (e.g. Sala-Hamrick et al., 2023; Hsu et al., 2026). Three complementary syntheses are planned, designed to address previous methodological limitations. The primary synthesis will pool the most adjusted available estimates that do not adjust for variables plausibly on the causal pathway between PTSD and suicide death, such as psychiatric comorbidity and subsequent self-harm. A crude synthesis will pool each study's unadjusted estimate, characterising the unconditional association across the evidence base. A fully adjusted synthesis will pool each study's most extensively adjusted author-reported estimate regardless of covariate set.

Condition being studied PTSD as an exposure and suicide mortality (death by suicide) as an outcome.

METHODS

Search strategy Electronic searches will be conducted in MEDLINE, Embase and APA PsycInfo, accessed via the Ovid platform, from 1 January 1980 to the date of the final search. The 1980 start date reflects the formal introduction of PTSD as a diagnostic category in DSM-III. For each database, searches combine database specific controlled vocabulary terms with free text terms searched in title, abstract, and keyword fields. Search strategies are conceptually parallel across databases but adapted for differences in controlled vocabulary, field tags, and search syntax across MEDLINE (MeSH), Embase (Emtree), and PsycInfo (APA Thesaurus). Searches are limited to human studies, English language publications, and records from 1980 onwards.

The reference lists of all included studies and relevant review articles will be hand searched for additional eligible records. Forward citation searching of all included studies and key reviews will be performed using Web of Science and Scopus to identify additional eligible studies. The full search strategies for each database are as follows.

MEDLINE (Ovid):
1. exp Stress Disorders, Post-Traumatic/
2. (posttraumatic stress disorder* or post-traumatic stress disorder* or post traumatic stress disorder* or PTSD).ti,ab,kf.
3. 1 or 2
4. exp Suicide/
5. (suicid* or mortalit*).ti,ab,kf.
6. 4 or 5
7. 3 and 6
8. limit 7 to humans
9. limit 8 to english language
10. limit 9 to yr="1980-current"

Embase (Ovid):
1. exp posttraumatic stress disorder/
2. (posttraumatic stress disorder* or post-traumatic stress disorder* or post traumatic stress disorder* or PTSD).ti,ab,kw.
3. 1 or 2
4. exp suicide/
5. (suicid* or mortalit*).ti,ab,kw.
6. 4 or 5
7. 3 and 6
8. limit 7 to human
9. limit 8 to english language
10. limit 9 to yr="1980-current"

APA PsycInfo (Ovid):
1. exp Posttraumatic Stress Disorder/
2. (posttraumatic stress disorder* or post-traumatic stress disorder* or post traumatic stress disorder* or PTSD).ti,ab,id.
3. 1 or 2
4. exp Suicide/
5. (suicid* or mortalit*).ti,ab,id.
6. 4 or 5
7. 3 and 6
8. limit 7 to "human"
9. limit 8 to english language
10. limit 9 to yr="1980-current".

Participant or population Humans of any age and sex in any setting in whom PTSD status is assessed.

Intervention Not applicable (exposure review). Exposure is PTSD (as defined by the original study).

Comparator ndividuals without PTSD as defined by the original study.

Study designs to be included Observational analytic studies that can estimate an association between PTSD and suicide mortality, including prospective or retrospective cohort studies (including registry/administrative record-linkage cohorts) and case-control studies (including nested case-control designs). Where study design labels are unclear or inconsistently used, studies will be classified according to their analytic structure.

Eligibility criteria Inclusion Criteria: Peer-reviewed human observational analytic studies (including cohort, case-control, and nested designs) of any age, sex, or setting (including community, clinical/

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health-system, occupational, military/veteran, population-based cohorts) that: (i) ascertain categorical PTSD status (methods including ICD/DSM diagnosis, structured interview, validated instrument threshold, or administrative coding, or as defined by the study); (ii) include a valid comparator structure, either an explicitly defined no-PTSD comparison group (cohort designs) or a source-population control group with ascertained PTSD status (case-control and nested case-control designs); (iii) report suicide mortality (death by suicide), with deaths separable if other suicidal outcomes are also presented; and (iv) report an extractable relative effect estimate for the association between PTSD and suicide mortality (e.g., hazard ratio [HR], risk ratio [RR], incidence rate ratio [IRR], standardised mortality ratio [SMR], or odds ratio [OR]) with corresponding uncertainty (e.g., 95% confidence interval [CI] or standard error [SE]), or provide sufficient directly reported data (e.g., supplementary material, 2×2 cell counts, or author contact) to derive one.

Exclusion Criteria: Studies will be excluded if they: (i) do not report separable suicide-mortality results (e.g., report suicidal ideation or attempts only, or do not separate suicide mortality from other outcomes); (ii) do not include a valid comparator structure or do not provide extractable or derivable eligible effect estimate data; (iii) report only non-ratio association measures (e.g., beta coefficients, correlations) without sufficient data to derive an eligible relative effect estimate; (iv) report only post-traumatic stress symptoms without a distinguishable PTSD categorisation, or report acute stress disorder, complex PTSD, adjustment disorder, or other trauma-related conditions where PTSD cannot be separated; (v) are non-empirical publications (e.g., reviews, editorials, or commentaries); (vi) are case reports or case series; (vii) are conference abstracts or other grey literature not available as full peer-reviewed articles; or (viii) are duplicate reports or overlapping effect estimates from the same cohort and outcome period, in which case the most complete or most recent report will be included.

Information sources MEDLINE, Embase, and APA PsycInfo will be searched via the Ovid platform. Reference lists of all included studies and relevant review articles will be hand searched for additional eligible records. Forward citation searching of included studies and key reviews will be performed using Web of Science and Scopus. Study authors will be contacted where data essential for inclusion or extraction are missing or unclear.

Main outcome(s) Suicide mortality (death by suicide), as defined by the original study (e.g., death registry/ICD-coded cause of death, coroner determination, or equivalent).

Data management Records will be first imported into a reference manager (e.g., Zotero) for de-duplication and then screened using Rayyan or an equivalent approach. Two reviewers (JB and ML) will independently screen titles and abstracts, then full texts, and extract data using a piloted, standardised extraction form. Disagreements at each stage will be resolved by discussion and consensus. Extracted data will include key study and population characteristics, PTSD and suicide-mortality ascertainment, comparator definition, effect estimates and adjustment level, and where available underlying raw data (e.g., suicide death counts, denominators, person-time or 2×2 tables) to support derivation of effect estimates. Where key statistics are missing, estimates will be derived from available information or may be requested from study authors if essential. Meta-analyses will be performed in Comprehensive Meta-Analysis (CMA), or equivalent software.

As this review examines published peer-reviewed studies only, no patients will be identified or contacted in the course of the work and ethical approval is not required.

Quality assessment / Risk of bias analysis Risk of bias of included observational studies will be assessed independently by two reviewers (JB and ML) using the Newcastle–Ottawa Scale (NOS), applying the cohort or case-control version as appropriate. NOS comparability criteria and relevant exposure and outcome ascertainment items will be operationalised for the PTSD-suicide mortality literature as detailed below. Disagreements will be resolved by discussion and consensus.

In the comparability domain, one star will be awarded to studies that control for key demographic confounders, specifically age and sex (if this is applicable). A second star will be awarded to studies that additionally control for at least one further baseline sociodemographic or structural confounder relevant to the PTSD-suicide mortality association, such as race/ethnicity or socioeconomic position, where applicable. Adjustment for psychiatric comorbidity will not contribute to comparability scoring. In this literature, such variables may function as confounders, modifiers, or mediators of the PTSD–suicide association, and adjustment for psychiatric diagnoses occurring after PTSD ascertainment

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risks attenuating or distorting the total association of interest. Adjustment for psychiatric comorbidity will be instead extracted separately as a prespecified methodological characteristic for use in subgroup and sensitivity analyses.

The overall certainty of the body of evidence will be assessed using the GRADE approach.

Strategy of data synthesis Study characteristics and findings will be summarised descriptively in tables and narrative. Quantitative synthesis will use inverse-variance weighted random-effects meta-analysis where studies are sufficiently comparable.

Three syntheses will be conducted. The primary synthesis will estimate the overall association between PTSD and suicide mortality while minimising attenuation from overadjustment for likely downstream variables. For each study, the primary estimate will be the most adjusted available estimate that doesn't adjust for variables plausibly on the pathway between PTSD and suicide death, such as psychiatric comorbidity, self-harm or suicidal behaviour, where measured after PTSD ascertainment or where temporality is unclear. Adjustment for age, sex, race or ethnicity, socioeconomic characteristics, baseline physical health comorbidity, and similar baseline sociodemographic factors will be considered appropriate. Where no suitable adjusted estimate is available, the crude or unadjusted estimate will be used and identified. Studies reporting only estimates adjusted for likely downstream variables will not contribute to the primary synthesis but will be retained for the fully adjusted synthesis and narrative summary. The covariate set for each selected primary study will be reported in full.

A crude synthesis will pool each study's unadjusted estimate where directly reported or derivable, characterising the unconditional association. A fully adjusted synthesis will pool each study's most extensively adjusted author-reported estimate regardless of covariate set. Presenting these three adjustment levels will show how progressive covariate adjustment influences the observed association.

Effect-measure types will be analysed in two separate meta-analytic pools. The first will comprise hazard ratios and incidence rate ratios, pooled as measures of relative suicide mortality derived from time-to-event or person-time analyses. Although not numerically identical, pooling is considered reasonable given their shared rate-based basis and the rarity of suicide mortality. Standardised mortality ratios, where reported, may also be included in this pool. The second will comprise odds ratios and risk ratios, pooled together under the same rare-outcome assumption. Their numerical distinction is expected to be negligible at the absolute suicide mortality rates observed in this literature. Where studies do not directly report an extractable effect estimate, derivation will be attempted at the crude level only, if sufficient underlying data are available. Crude odds ratios with 95% confidence intervals may be derived where exact event and non-event counts by PTSD exposure group are reported, calculable, or obtainable from study authors. Crude incidence rate ratios may be derived where suicide deaths and person-time are reported by exposure group. Derived estimates will be clearly identified.

Statistical heterogeneity will be assessed using Cochran's Q test and the I^2 statistic, with τ^2 reported where appropriate. Pooled estimates will be presented with 95% confidence intervals, and prediction intervals may be reported to indicate the plausible range of true effects across settings. Where sufficient studies contribute, exploratory meta-regression and mixed-effects subgroup analyses may examine sources of between-study heterogeneity. Outliers may be identified using residual-based diagnostics, and their influence examined through sensitivity analyses. Publication bias and small-study effects may be examined using funnel plots, Egger's regression test, and Duval and Tweedie's trim-and-fill method, where sufficient studies are available.

Subgroup analysis Where sufficient studies are available within a given synthesis, subgroup analyses may be undertaken to examine whether effect estimates vary according to study level characteristics. These may include population type (e.g. population based/community cohorts, clinical/health system cohorts, and military/veteran cohorts), comparator type (e.g. general or lower risk comparison groups versus psychiatric or other high risk clinical comparison groups), and PTSD ascertainment method (e.g. structured interview, administrative or ICD/DSM-coded records, or validated self-report instrument threshold). Where sufficient studies contribute to a given synthesis, exploratory meta-regression and mixed-effects subgroup analysis may also be undertaken.

Sensitivity analysis Where sufficient studies are available within a given synthesis, sensitivity analyses will be considered to assess the robustness of the findings to key methodological decisions. These may include re-analysis restricted to population-based or community cohorts to

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reduce comparator selection influence, excluding studies judged to be at higher risk of bias, or excluding outlier or influential studies identified through influence diagnostics or leave-one-out analyses. Synthesis-specific sensitivities may include exclusion of studies contributing crude fallback estimates from the primary synthesis, progressive exclusion by adjustment level from the fully adjusted synthesis, and exclusion of SMR based estimates from the rate based pool.

Language restriction English language studies only.

Country(ies) involved Australia.

Keywords PTSD; post-traumatic stress disorder; suicide; suicide mortality; death by suicide; systematic review; meta-analysis.

Dissemination plans Results will be submitted to a peer-reviewed journal and presented at relevant conferences.

Contributions of each author

Author 1 - Joshua Brousse de Gersigny - Co-designed the study and led protocol development; will co-screen studies, co-perform data extraction, analysis, and interpretation; and will draft the manuscript.
Email: josh.degersigny@gmail.com
Author 2 - Matthew Large - Co-designed the study; will co-screen studies, co-perform data extraction, analysis, and interpretation; and will review and supervise the final manuscript.
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