MULTIPLE APPROACHES TO MEASURING SUICIDE RESEARCH PROGRESS: UPDATES FROM THE NATIONAL RESEARCH ACTION PLAN & THE PRIORITIZED SUICIDE RESEARCH AGENDA PORTFOLIO ANALYSES

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Katherine Nassauer, Ph.D. DoD
Lisa Brenner, Ph.D. VA

Discussants: Phil Satow, MA
Carl Castro, Ph.D.

American Association of Suicidology Meeting, April 10, 2014
THE PRIORITIZED RESEARCH AGENDA FOR SUICIDE PREVENTION PORTFOLIO ANALYSIS

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Research Prioritization Task Force
National Action Alliance for Suicide Prevention
Chair, Suicide Research Consortium
Division of Services and Intervention Research
NIMH
Presenter Disclosure

Jane Pearson

The following personal financial relationships with commercial interests relevant to this presentation exist:

No relationships to disclose
Overall U.S. rates of suicide deaths have not decreased appreciably in 50 years. Each year, over 678,000 individuals report that they received medical attention for a suicide attempt; each year, more than 30,000 individuals die by suicide.

RPFT Goal: To develop an agenda for research that has the potential to reduce morbidity (attempts) and mortality (deaths) each, by at least 20% in 5 years, and 40% or greater in 10 years, if implemented successfully.
Research Prioritization Task Force

Agenda Development Process

- Process Designed
- Burden of Suicide Deaths and Attempts Identified
- Expert Consultants
- Research Agenda Development (short- and long-term objectives)
- Stakeholder Survey and Delphi Process
- Selection of Aspirational Goals
- Models of Potential Attempts Averted and Lives Saved
- NIH Request for Information (methodological roadblocks and proposed new paradigms)
- Literature Review and Portfolio Analysis
- Dissemination of Agenda
- Maintenance, Updating

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Suicide Research Portfolio Analysis: Goals

- Promote research collaborations
- Consider how future studies can leverage existing efforts
- Identify investigators of funded studies to promote knowledge sharing early in the research process
- Determine where research investments have already been made
- Determine research gaps
6 Key Questions & 12 Aspirational Goals (AGs)

Question 1: Why Do People Become Suicidal?
   **Aspirational Goal 1:** Know what leads to, or protects against, suicidal behavior, and learn how to change those things to prevent suicide.

Question 2: How Can We More Optimally Detect/Predict Risk?
   **Aspirational Goal 2:** Determine the degree of suicide risk (e.g., imminent, near-term, long-term) among individuals in diverse populations and in diverse settings through feasible and effective screening and assessment approaches.
   **Aspirational Goal 3:** Assess who is at risk for attempting suicide in the immediate future.

Question 3: What Interventions Prevent Individuals From Engaging in Suicidal Behavior?
   **Aspirational Goal 4:** Ensure that people who are thinking about suicide but have not yet attempted, receive interventions to prevent suicidal behavior.
   **Aspirational Goal 5:** Find new biology treatments and better ways to use existing treatments to prevent suicidal behavior.
   **Aspirational Goal 6:** Ensure that people who have attempted suicide can get effective interventions to prevent further attempts.
Question 4: What Services Are Most Effective for Treating the Suicidal Person and Preventing Suicidal Behavior?

Aspirational Goal 7: Ensure that health care providers and others in the community are well trained in how to find and treat those at risk.

Aspirational Goal 8: Ensure that people at risk for suicidal behavior can access affordable care that works, no matter where they are.

Aspirational Goal 9: Ensure that people getting care for suicidal thoughts and behaviors are followed throughout their treatment so they don’t fall through the cracks.

Aspirational Goal 10: Increase help-seeking and referrals for at-risk individuals by decreasing stigma.

Question 5: What Other Types of Preventive Interventions (Outside Health Care Settings) Reduce Suicide Risk?

Aspirational Goal 11: Prevent the emergence of suicidal behavior by developing and delivering the most effective prevention programs to build resilience and reduce risk in broad-based populations.

Aspirational Goal 12: Reduce access to lethal means that people use to attempt suicide.

Question 6: What Existing Infrastructure Can Be Better Utilized, and What New Infrastructure Needs Must Be Met In Order to Further Reduce Suicidal Behavior in the United States?
Plan for Initial Portfolio Analysis

- Initial report will include coding based on Key Questions and Research Objectives
  - Will track progress by number of studies per Research Objectives (similar to how the IACC does it for Autism research)

- Create and post online a searchable Excel table for 2008–2013 studies, including:
  - Project Title
  - Principal Investigator Name
  - Project Abstract
  - Funder
  - Total Funding Amount
  - Associated Key Question
  - Associated Short- and Long-term Objective

- Capacity to search studies
Status of Coding and Memorandums of Agreement (MOAs)

**UNDER DISCUSSION**

Key Questions 1–5 coded for all unique suicide studies (grants, contracts, cooperative agreements, intramural research) with funding through 2013 among the following:

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Total: Over 350
U.S. Suicide Research Investments (2008-2012)
(Partial List; 2013 data still being compiled)

IN DEVELOPMENT

* Percentage of total studies are reported along with total number of studies. These figures do not include AFSP awards from 2008–2009 and VA, AHRQ, DOT, NIJ, DARPA and NSF grants for all years. Total costs are reported. ARRA funds are included.

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U.S. Suicide Research Investments by Key Questions 1-5 (*Partial List; 2013 data still being compiled*)

* Percentage of total studies are reported along with total number of studies. These figures do not include AFSP awards from 2008–2009 and VA, AHRQ, DOT, NIJ, DARPA and NSF grants for all years. Total costs are reported. ARRA funds are included.
* The figures do not include grants from DoD (N=32) or VA, AHRQ, DOT, NIJ, DARPA, and NSF for all years, and AFSP from 2008–2009. Infrastructure categories are not mutually exclusive. Percentage of total studies are reported along with total number of studies. Total costs are reported. ARRA funds are included.
Goal for future reports: Link Portfolio Analysis to PFC Survey Database allowing viewers to determine searches of interest based on over 70 variables. Example categories include:

- Demographic Characteristics of Study Population
- Methodology
- Assessment Tools
- DSM Diagnosis
- Individual and Social Risk and Protective Factors
- Intervention Strategies (treatment and prevention) and Settings
- Services Research Topics
- Infrastructure
71 questions for each study to be coded

- These questions align with *A Prioritized Research Agenda for Suicide Prevention: An Action Plan to Save Lives* and can be queried for other purposes, e.g., National Research Action Plan
Sample Questions from PFC Online Tool

- If this study involves the use of human subjects, what variables related to suicide are used?
- Does this study include and collect information on former military personnel?
- Does this study include and collect information on active duty military?
- Does this study include measures to assess if participants meet criteria for a DSM psychiatric diagnosis?
- Does this study collect data on life events?
- As an aim or hypothesis, does this study address surveillance of suicide deaths (e.g., quality of data; rapid estimates of subpopulations; bias of collection methods)?
- Is one of the primary aims investigating risk factors for suicidal behavior?
- Is one of the primary aims to investigate factors that prevent or reduce the risk of suicide (protective factors)?
- Is one of the primary aims to improve access to suicide prevention services?
Ultimate Goal of a Prioritized Research Agenda for Suicide Prevention

Annual U.S. Suicide Rates, 2002-2010 & Projected Impact of Research Informed Prevention Strategies

Projected suicide rate given 20% decrease in 5 years
Projected suicide rate given 40% decrease in 10 years

Meeting Short-term and Long-term Objectives in a Research Agenda Have Potential to Reduce Suicide Burden
Possible Intermediate Outcomes of Progress

- Reducing gaps in prioritized research areas
- Increased use of common data elements
- Increased banking and sharing of data
- Actions by federal and private organizations that are consistent with the *Prioritized Research Agenda* (e.g., more states tracking suicide attempts in substance use and mental health service provision data)
- Increase in federal agencies and/or professional guilds using research-informed (if not empirically based) training/interventions in suicide prevention
- Collaborative/complementary efforts among research funders
- Research/donation interest by additional funders
Research Prioritization Task Force

www.suicide-research-agenda.org

The Research Prioritization Task Force meeting following the National Action Alliance for Suicide Prevention Executive Committee (EXCOM) February meeting at the Key Bridge Marriott in Arlington, Virginia. Members and staff pictured include, clockwise from upper left: Ira Katz, Kathy O’Leary, Gemma Weiblunger, Jane Pearson, Mary Durham, Robert Mays, Sherry Molock, Beverly Pringie, Dan Reidenberg, Chelsea Booth, Cynthia Claassen, Lanny Berman, Philip Batow.

The National Action Alliance for Suicide Prevention Research Prioritization Task Force (RTF) was initiated in November 2010. The RTF is comprised of 11 organizations, representing the public and private sectors in research, advocacy, and practice.
DoD Suicide Prevention Research And the National Research Action Plan

Presented to
The American Association of Suicidology

Kate Nassauer, Ph.D.
Psychological Health and Resilience Portfolio Manager
US Army Medical Research and Materiel Command,
Military Operational Medicine (MOM) Research Program

April 10, 2014

The views expressed in this presentation are those of the presenter and do not represent the official policy or position of the U.S. Army Medical Command or the Department of Defense.
FOUNDATIONAL AND CLINICAL RESEARCH: PAVING THE WAY FOR PREVENTION, RECOVERY AND CURE ACROSS THE MILITARY LIFESPAN

- Treat Casualties
  DoD/NIH/VA
- Re-Deployment
  DoD-DHP
- Employment
  DoD-DHP
- Mobilization
  DoD-DHP
- Separation
  DoD/VA
- Post-Military Surveillance
  DoD/NIH/VA/ED
- Reset
- Post-Deployment
  DoD-DHP
- Reconstitution
  DoD-DHP
- Basic Training
  DoD-DHP
- Readiness
  DoD-DHP
- K-12 thru Accession
  NIH/ED

U.S. Army Medical Research and Materiel Command
Active DoD PH Research (2007-present) by Portfolio

Total Active DoD PH Funding
$743,826,359*
347* Active Studies

* Estimates including studies pending award

Data do not represent official DoD estimates and are not GAO auditable
Highlighted DoD Efforts

Army Study to Assess Risk and Resilience in Service members (Army STARRS)
- Largest study of suicide among military personnel (>100,000 Soldiers enrolled)

Military Suicide Research Consortium (MSRC)
- 22 research studies aimed at delivering evidence-based prevention interventions
- Actionable findings anticipated within 1-2 years; pilot work has led to larger trials

Suicide Treatment Research
- Other Screening and Intervention/Treatment studies

Defense Suicide Prevention Office (DSPO)
- Translation Implementation of Evaluation and Research Studies (TIERS)
- DSPO, USAMRMC, Military Services, VA, NIMH collaboration
## Interagency Psychological Health Research Continuum

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<td><strong>Etiology</strong></td>
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<td>Basic discovery science</td>
<td>Population-level (to include at-risk) descriptive and characterization in nature; the study of the distribution of associations between health related states</td>
<td>Neurobiological mechanisms of the disease to include possible causes of disorder</td>
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</table>
### Suicide Prevention Integrated Research Approach

#### Foundational Science
- Genomic, molecular modeling, & neuro-imaging detection
- Focus on precursors of healthy functioning

#### Epidemiology
- Risk factors & measures of underlying dysfunction
- Developmental pathways, mediating & moderating factors
- Impact of deployment
- Integrated surveillance database

#### Etiology
- Neurobiological mechanisms of suicide process(es) & possible precursors
- Risk factors & risk estimation

#### Prevention and Screening
- Risk Reduction
- Resilience Development
- Effective prevention education and training
- Efficient, effective, coordinated screening and assessment across varied settings
- Validated leader training

#### Treatment
- Novel, rapidly delivered interventions for varied settings
- Medications to reduce suicidal thoughts & behaviors
- Related Comorbidities
- Effective Inpatient & Outpatient Psychotherapy
- Follow-up & Postvention Protocols
- Recovery and Return-to-duty Standards
- Collaborative Case Management
- Rescreening and Outpatient Care

#### Services Research
- Coordination & consistency of clinical treatment
- Ongoing process & research Improvement
- Ongoing evaluation of care
- Valid training tools for in service, VA and community providers

#### Agencies Objectives

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<td>31/11</td>
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Sec. 5. Improved Research and Development

– DoD, VA, HHS, and Dept of Ed in coordination with OSTP shall establish a National Research Action Plan to improve the coordination of agency research on TBI, PTSD, and other mental health conditions to reduce the number of affected men and women through better prevention, diagnosis, and treatment.

Vision to Advance Suicide Prevention Research

– Achieve a significant reduction in attempted and completed suicides through evidence-based prevention and treatment advances
National Research Action Plan* (NRAP) Action Items

- Enhanced understanding of mechanisms → new treatments
- Biomarker focus--Consortium to Alleviate PTSD (CAP)
- Improve data sharing
  - DoD use of eRA commons → pilot feasibility effort
  - Common Data Elements
  - Biorepository data
  - Make use of Electronic Health Records for research
- Strategies supporting collaborative suicide prevention research
  - Army STARRS and MSRC

* www.whitehouse.gov
Search for NRAP and Interagency Task Force on Military and Veterans Mental Health
NRAP and NAASP Alignment

NRAP Approach

- Foundational Science
- Epidemiology
- Etiology
- Prevention & Screening
- Treatment
- Follow-up Care
- Services Research

NAASP Approach

1. Why Do People Become Suicidal?
2. How Can We More Optimally Detect/Predict Risk?
3. What Interventions Prevent Suicidal Behavior?
4. What Services Are Most Effective for Treating the Suicidal Person and Preventing Suicidal Behavior?
5. What Preventive Interventions (Outside Health Care Settings) Reduce Suicide Risk?

6. What Existing Infrastructure Can Be Better Utilized, and What New Infrastructure Needs Must Be Met In Order to Further Reduce Suicidal Behavior in the United States?
Suicide Prevention Research
Measuring Success

- Fewer Attempts and Suicides
- Interventions that Impact attempts, deaths, and proxy outcomes
- Robust Comprehensive Research Portfolio
- Identified Capability Gaps
Funded Award Information

• Defense Technical Information Center (DTIC)- DoD award technical reports
  ⚫ http://www.dtic.mil/dtic/search/advanced_search.html

• Congressionally Directed Medical Research Program- funded awards

• NIH RePORTER- NIH and VA awards
  ⚫ http://projectreporter.nih.gov/reporter.cfm

• Military Suicide Research Consortium
  ⚫ https://msrc.fsu.edu/

• Army STARRS
  ⚫ http://www.armystarrs.org/

• Military Health System Research Symposium (MHSRS)- annual
  ⚫ https://mhsrs.amedd.army.mil/SitePages/Home.aspx
USAMRMC Funding Opportunities

- Periodic Funding Opportunities
  - www.grants.gov, enter 12.420 in the CFDA field under the basic search option

- USAMRMC Open Broad Agency Announcement (Open BAA)

- FED BIZ OPPS
  - https://www.fbo.gov

- Small Business Innovation Research & Small Business Technology Transfer (SBIR/STTR)
More Questions?

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Multiple Approaches to Measuring Suicide: Research Progress

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AAS 2014
Disclosure

This presentation is based on work supported, in part, by the Department of Veterans Affairs, but does not necessarily represent the views of the Department of Veterans Affairs or the United States Government.
Executive Summary

On August 31, 2012, President Obama issued an Executive Order (the Order) directing the Departments of Defense (DoD), Veterans Affairs (VA), Health and Human Services (HHS), and Education (henceforth referred to as “the agencies”), to develop a National Research Action Plan (NRAP) on posttraumatic stress disorder (PTSD), other mental health conditions, and Traumatic Brain Injury (TBI) “to improve the coordination of agency research into these conditions and reduce the number of affected men and women through better prevention, diagnosis, and treatment.”
Prevention, Treatment, Minimize Symptoms, Maximize Health and Function
Currently Symptomatic: Onset of Symptoms (n = 844)

Potential Clinical Presentation

PTSD
- Flashbacks
- Nightmares

TBI
- Headaches
- Dizziness

Intersection:
- Attentional problems
- Depression
- Anxiety
- Irritability
Case Example: Co-Occurring PTSD and mTBI

- Deployed to Iraq
- Exposed to traumatic stressor
- Sustained mild blast TBI with mTBI symptoms (headache, irritability, etc.)
- Return to the United States
  - Still experiencing mTBI related symptoms which seem to be getting worse
  - Screens negative for PTSD
- Diagnosed with PTSD and receives treatment (medication)
- Redeployed to Iraq
- Suicide Attempt

Timeline:
- March 2004
- July 2004
- November 2004
- March 2005
- July 2005
- November 2005
- March 2006
- July 2006
Suicidal Ideation and Behaviours after Traumatic Brain Injury: A Systematic Review

Naznin H. Bahrami,1,2 Graham K. Simpson,2,4 Lisa A. Brenner,1,2 Adam S. Hoffberg,5 and Alexandra L. Schneider4

1 Veterans Integrated Service Network (VISN) 19 Mental Illness Research, Education and Clinical Center (MIRECC), Denver, Colorado, USA
2 University of Colorado, School of Medicine, Aurora, Colorado, USA
3 Liverpool Brain Injury Rehabilitation Unit, Liverpool Hospital, Sydney, Australia
4 Rehabilitation Studies Unit, Sydney School of Medicine, University of Sydney, Australia

Traumatic brain injury (TBI) is prevalent among many populations and existing data suggest that those with TBI are at increased risk for death by suicide. This systematic review serves as an update to a previous review, with the aim of evaluating the current state of evidence regarding prevalence and risk of suicide deaths, post-TBI suicidal ideation and suicide attempts, and treatments to reduce suicide-related outcomes among TBI survivors. Review procedures followed the PRISMA statement guidelines. In all, 1014 abstracts and 83 full-text articles were reviewed to identify 16 studies meeting inclusion criteria. Risk of bias for individual studies ranged from low to high, and very few studies were designed to examine a priori hypotheses related to suicide outcomes of interest. Overall, findings from this systematic review supported an increased risk of suicide among TBI survivors compared to those with no history of TBI. Evidence pertaining to suicidal thoughts and attempts was less clear, mainly due to heterogeneity of methodological quality across studies. One small randomized controlled trial was identified that targeted suicide prevention in TBI survivors. Further research is needed to identify the prevalence of post-TBI ideation and attempts, and to establish evidence-based suicide prevention practices among TBI survivors.

Keywords: suicide, suicide attempt, suicide ideation, traumatic brain injury, systematic review

Suicide is a rare but devastating outcome post traumatic brain injury (TBI). However, death by suicide is only the tip of the iceberg, as much larger numbers of people with TBI make suicide attempts or report suicidal ideation. Historically, suicides after TBI were first documented among brain-injured veterans from the First and Second World Wars (e.g., Russell, 1951). Early reports of civilian suicides were contained in broader TBI outcome studies conducted in the United Kingdom and Europe (e.g., Heiskanen & Sipponen, 1970; Lewin, Marshall, & Roberts, 1979). Since then, continued efforts to empirically investigate the prevalence of suicide and the impact of TBI on suicide risk have contributed to a growing body of literature on suicide-related outcomes among TBI survivors. Although studies examining prevalence of suicidal ideation, behaviour and death by suicide are lacking, they are essential for developing effective interventions and policies to address suicide risk in TBI survivors.

KQ1. Among adult survivors of TBI, what is the association between history of TBI and post-TBI death by suicide, suicide attempts or suicidal ideation? KQ1 specifically investigated the prevalence of the suicidal behaviours (i.e., death by suicide, suicide attempts and suicidal ideation) and the extent to which the presence of TBI increased risk for suicidal thoughts and behaviours.

KQ2. What interventions are effective in reducing suicide-related outcomes in adult survivors of TBI?
January 2007 – October 2012

1014 Abstracts
83 Full Text

16 studies
n=5 death
n=8 SA/SI
n=3 treatment
Suicide

5 Studies
Purposes of the studies varied
Individuals who received care between FY 01 and 06

Analyses included all patients with a history of TBI (n = 49,626) plus a 5% random sample of patients without TBI (n = 389,053)

Suicide - National Death Index (NDI) compiles death record data for all US residents from state vital statistics offices

TBI diagnoses of interest were similar to those used by Teasdale and Engberg
Suicide by TBI Severity – VHA Users FY 01-06

- 12,159 with concussion or cranial fracture, of which 33 died by suicide
- 39,545 with cerebral contusion/traumatic intracranial hemorrhage of which 78 died by suicide
- Of those with a history of TBI, 105 died by suicide

Challenges associated with this type of research and need for collaboration (~8 million records reviewed)
Cox proportional hazards survival models for time to suicide, with time-dependent covariates, were utilized. Covariance sandwich estimators were used to adjust for the clustered nature of the data, with patients nested within VHA facilities.

ICD-9 codes:
1) concussion (850), cranial fracture—fracture of vault of skull (800), fracture of base of skull (801), and other and unqualified skull fractures (803)
2) cerebral laceration and contusion (851); subarachnoid, subdural, and extradural hemorrhage after injury (852); other and unspecified intracranial hemorrhage after injury (853); and intracranial injury of other and unspecified nature (854).
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<td>1831</td>
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<td>7</td>
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<td>VHA users with cerebral contusion/traumatic intracranial hemorrhage</td>
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<td>All</td>
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<td>78</td>
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<td>39467</td>
<td>100</td>
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<td>Substance abuse</td>
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<td>32.05</td>
<td>6703</td>
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<td>Bipolar I/II</td>
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<td>4.56</td>
<td>8</td>
<td>10.26</td>
<td>1794</td>
<td>4.55</td>
<td>.0256</td>
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<td>MDD</td>
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<td>17</td>
<td>21.79</td>
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<td>8.8</td>
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<td>Other depression, no MDD</td>
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<td>17</td>
<td>21.79</td>
<td>6125</td>
<td>15.52</td>
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<td>11</td>
<td>14.1</td>
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<td>3740</td>
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<td>6.41</td>
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Suicide Attempt

<table>
<thead>
<tr>
<th>Source</th>
<th>Design</th>
<th>Sample sex/age</th>
<th>TBI severity</th>
<th>SA source/time frame</th>
<th>Risk of bias (category of bias)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breshears et al., 2010</td>
<td>Retrospective cross-sectional</td>
<td>149M, SF</td>
<td>Mild 42</td>
<td>Medical record review, clinical determination of presence of SA, post-TBI</td>
<td>Rating: moderate risk of bias (Category 1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Age M (SD) - 30.30</td>
<td>Mod 44</td>
<td></td>
<td>Outcome assessors not blinded to exposure (DB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sev 68</td>
<td></td>
<td>Use of keyword searches instead of diagnostic codes to classify SA (DB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Limited to SA that occurred within 2 years post diagnostic evaluation (DB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rating: moderate risk of bias (Category 2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Those whose hospitalisations occurred prior to computerised records were not included (SB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Outcome assessors not blinded to exposure (DB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Validated measure of SI not used (DB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Data regarding SI limited to hospital discharge records (DB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Determined using the Taxonomy of Study Design Tool (Hartling et al., 2010).</td>
</tr>
</tbody>
</table>

| Gutierrez et al., 2008 | Retrospective case-series | 21M, MF           | Mild 1       | SA documented in psychiatric discharge summaries, post-TBI | Rating: moderate risk of bias (Category 1) |
|                       |                             | Age Mdn - 51 yrs (range 38-65 yrs) | Mod 11       |                      | Outcome assessors not blinded to exposure (DB) |
|                       |                             |                    | Sev 10       |                      | Validated measure of SI not used (DB) |

TBI: Traumatic Brain Injury; Mod, Moderate; Sev, Severe; M, Male; F, Female; H’x, History; IP, Inpatient; M, Mean; Mdn, Median; NA, Not Applicable; SD, Standard deviation; yrs, years.

2 studies – both retrospective
Suicide Ideation

2 studies – both retrospective
### Treatment

#### TABLE 6: Treatment Studies

| Source                          | Design | Sample, setting | Sex, age | Injury severity/time postinjury | Primary outcome, intervention | Measure of suicide ideation (SI) | Attrition, T'x | Outcome | Risk of Bias (category of bias)
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Simpson et al., 2011, Civilian, Australia</td>
<td>RCT</td>
<td>N = 17, Brain injury community rehabilitation service</td>
<td>16M, 1F</td>
<td>16M, 1F</td>
<td>16M, 1F</td>
<td>16M, 1F</td>
<td>16M, 1F</td>
<td>16M, 1F</td>
<td>16M, 1F</td>
</tr>
<tr>
<td>Rapoport et al., 2008, Civilian, Canada</td>
<td>Before-After Study</td>
<td>N = 65, Mild-moderate TBI clinic, tertiary trauma care centre</td>
<td>38M, 27F</td>
<td>38M, 27F</td>
<td>38M, 27F</td>
<td>38M, 27F</td>
<td>38M, 27F</td>
<td>38M, 27F</td>
<td>38M, 27F</td>
</tr>
<tr>
<td>Rees &amp; Bellon, 2007, Civilian, Australia</td>
<td>Before-After Study</td>
<td>N = 20, Brain injury community rehabilitation service, 20% of admitted clients over previous 10 yrs</td>
<td>10M, 1F</td>
<td>10M, 1F</td>
<td>10M, 1F</td>
<td>10M, 1F</td>
<td>10M, 1F</td>
<td>10M, 1F</td>
<td>10M, 1F</td>
</tr>
</tbody>
</table>

3 studies – 1 RCT and 2 Before and After Studies
PTSD and SI/SA

- **Ideation** - two meta-analyses (Krysinska and Lester 2010; Panagioti, Gooding and Terrier 2012) and one systematic review (Pompili et al. 2013) – increased risk

- **Attempt** - the association between PTSD with SAs remains significant after controlling for other psychiatric diagnoses (Krysinska and Lester 2010; Panagioti, Gooding and Tarrier 2009; Panagioti, Gooding and Tarrier 2012)
PTSD and Suicide

• Bullman and Kang (1994) found that, among male Vietnam Vets, **those with PTSD were significantly more likely to die by suicide** (relative risk = 3.97; 95% confidence interval = 2.20 - 7.03) than those without PTSD.

• Ilgen et al. (2010) - Veterans with a diagnosis of PTSD were **1.93 times more likely to die by suicide** (95% confidence interval for hazard ratios: 1.79 – 2.08), compared to Veterans without PTSD.
PTSD and Suicide

• Three recent studies with varying populations and methodological approaches did not find PTSD to be significantly associated with suicide (Desai, Dausey and Rosenheck 2005; LeardMann et al. 2013; Zivin, Kim and McCarthy 2007).
  - LeardMann and colleagues (2013) conducted a prospective cohort study with former and current military personnel using data from the Millennium Cohort Study. PTSD (i.e., a positive PTSD screen or self-reported lifetime diagnosis of PTSD) was not significantly associated with suicide in unadjusted or adjusted (i.e., age and sex) analyses.
TBI and PTSD: Suicide

- Traumatic Brain Injury (TBI) and Post Traumatic Stress Disorder (PTSD) as Risk Factors for Suicidal Thoughts and Behaviors
  - Sarra Nazem, PhD; Eryn Lonnquist, MD; Lindsey L. Monteith, PhD; & Lisa A. Brenner, PhD, ABPP

- **Suicide.** No studies were identified that examined the impact of co-occurring PTSD and TBI on suicide.
Any Post Concussive Symptom (n = 389)

Adjusted for age, gender, education, rank, and MOS

<table>
<thead>
<tr>
<th>Condition</th>
<th>Adjusted (PR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No mTBI &amp; no PTSD</td>
<td>1.00</td>
</tr>
<tr>
<td>Had PTSD but no mTBI</td>
<td>2.74</td>
</tr>
<tr>
<td>Had mTBI but no PTSD</td>
<td>4.03</td>
</tr>
<tr>
<td>Had mTBI &amp; PTSD</td>
<td>6.27</td>
</tr>
</tbody>
</table>

Total no. of soldiers (N = 1247)

Brenner et al., 2009
Assessment and Diagnosis of Mild Traumatic Brain Injury, Posttraumatic Stress Disorder, and Other Polytrauma Conditions: Burden of Adversity Hypothesis

Lisa A. Brenner
VA VISN 19 Mental Illness Research, Education, and Clinical Center (MIRECC); University of Colorado Denver, School of Medicine

Rodney D. Vanderploeg
James A. Haley VA Medical Center; University of South Florida; Defense and Veterans Brain Injury Center

Heidi Terrio
Evans Army Community Hospital; Defense and Veterans Brain Injury Center

Figure 3. Traumatic brain injury step-care treatment model. *Includes sleep hygiene, diet, exercise, and avoiding further traumatic brain injury.
Question 3: What Interventions Prevent Individuals From Engaging in Suicidal Behavior?

**Aspirational Goal 4:** Ensure that people who are thinking about suicide but have not yet attempted, receive interventions to prevent suicidal behavior.

Question 5: What Other Types of Preventive Interventions (Outside Health Care Settings) Reduce Suicide Risk?

**Aspirational Goal 11:** Prevent the emergence of suicidal behavior by developing and delivering the most effective prevention programs to build resilience and reduce risk in broad-based populations.
Universal
ALL MEMBERS of a given population regardless of risk

Selected
Sub-populations who may be AT ELEVATED RISK

Indicated
Members of a given population with SPECIFIC RISK CONDITIONS

Levels of Prevention
Use Your Smartphone to Visit the VISN 19 MIRECC Website

Requirements:
1. Smartphone with a camera
2. QR scanning software (available for free download just look at your phones marketplace)

www.mirecc.va.gov/visn19