

Traumatic Brain Injury (TBI) Research Priorities Update

CAPT Matt Breiding, PhD
TBI Team Lead
Division of Injury Prevention (DIP)

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Research Priorities Update

Goal: Assess NCIPC
TBI research efforts
and update the
Center's TBI
Research Priorities

2015 TBI Research Priorities

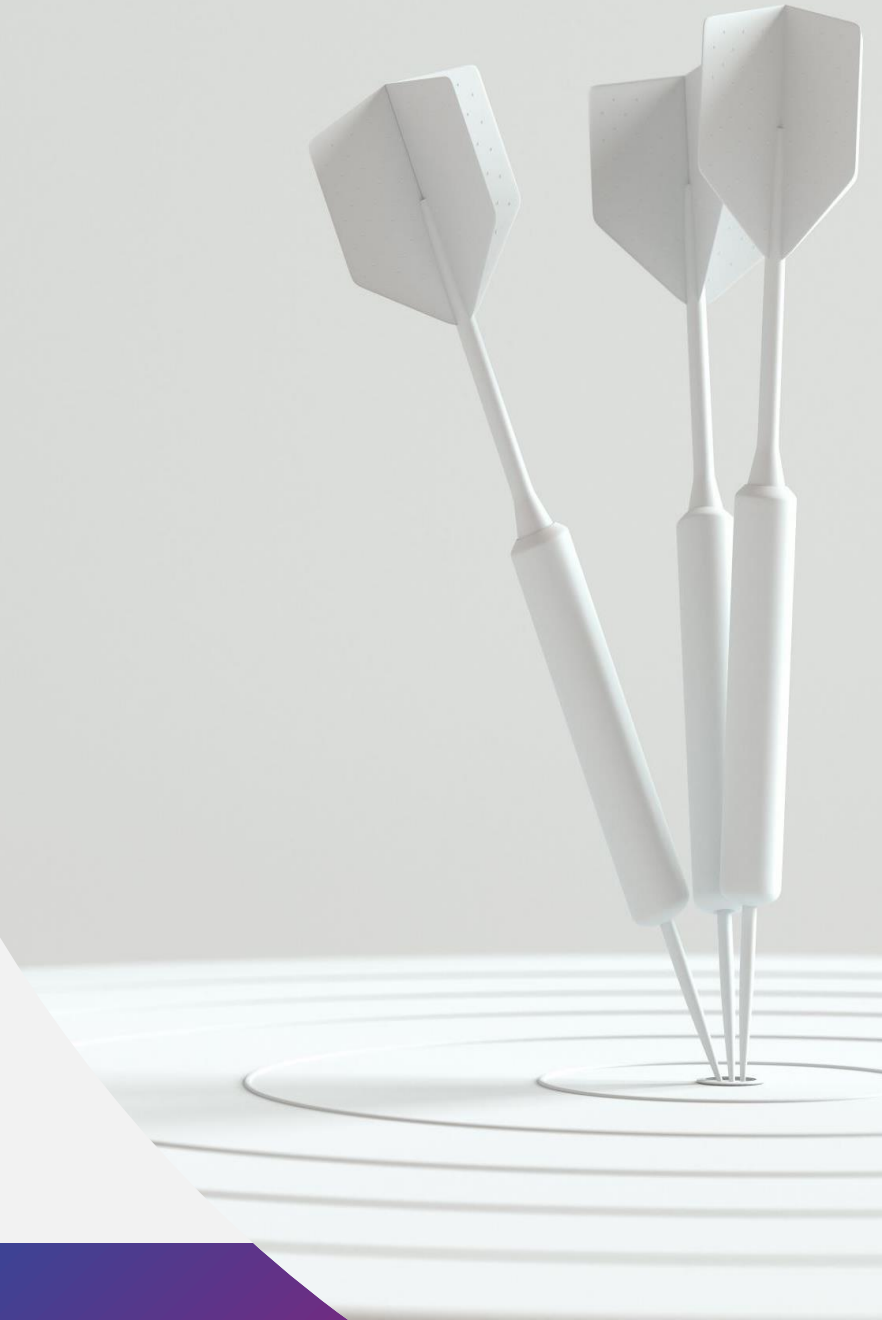
1. Evaluate the effectiveness of strategies for preventing all forms of TBI and enhance the recognition and management of mild TBI in clinical and community settings.
2. Identify effective strategies for the primary prevention of sports concussion.
3. Evaluate the effectiveness and economic efficiency of existing surveillance systems to capture TBI, especially mild TBI related to youth sports participation.
4. Quantify short- and long-term outcomes resulting from TBI and identify modifiable risk and protective factors predicting these outcomes.

Overall Process

- Set guiding principles and scope
- Establish workgroup and roles
- Gather and review materials
 - Inventory of NCIPC intramural and extramural TBI Research Landscape review
 - Conduct interviews with external and internal TBI Experts
 - Literature review of the TBI research field
- Synthesize findings
- Draft new priorities

Guiding Principles and Scope

- Research priorities
 - Research questions under each priority
- For next 3-5 years
- Intramural and extramural projects
- Need to demonstrate progress
- Review back to 2015

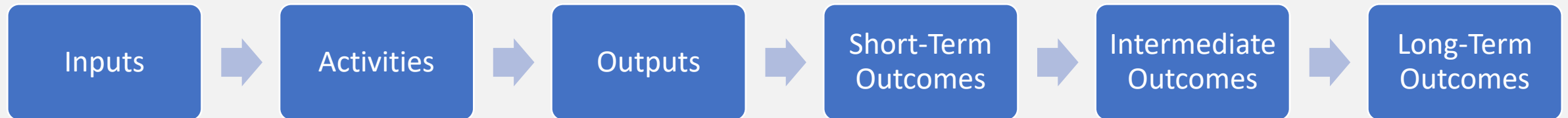


Workgroup and Roles

- Key Division of Injury Prevention (DIP) participants
 - Juliet Haarbauer-Krupa, Lindsey Womack, Jill Daugherty, Mick Ballesteros
- Workgroup
 - DIP subject matter experts:
 - Matt Breiding (TBI)
 - Gwen Bergen (Safety Promotion Team)
 - Gabrielle Miller (Data Analytics Branch)
 - Kelly Sarmiento (TBI Health Communication Specialist)
 - Bethany West (Transportation Safety Team)
 - Sally Thigpen (Program Implementation and Evaluation Branch)
 - Stephanie Miedema (Division of Violence Prevention)
 - Lara DePadilla (Division of Overdose Prevention)
 - Arlene Greenspan (NCIPC ADS)
- Contract support from Guidehouse

TBI Research Priorities Logic Model

Blueprint for the Process



Key Evaluation Questions



- How has TBI public health research evolved in the last 5 years?
- What progress has been made toward the 2015 priorities?
- What is CDC's role within the TBI public health research landscape?
- How do new and emerging TBI program priorities inform research priorities for TBI?
- What should the updated TBI research priorities be?

Gather and Review Materials: Inventory of NCIPC Projects – Extramural Inputs

Extramural

- NCIPC Office of Science
 - External Research Program Office files
 - Research Priorities Tracking System
- DIP's list of externally funded projects
- Injury Control Research Center projects

Gather and Review Materials: Inventory of NCIPC Projects – Intramural Inputs

Intramural

- Research Priorities Tracking System
- Agency internal review system
- Bibliographies from all divisions
- Concept development system
- Project list from the TBI Team

Gather and Review Materials: Landscape Review - Inputs

- Website reviews and targeted web searches
- Review of intramural and extramural TBI research publications:
 - Division of Unintentional Injury Prevention (DUIP) and DIP Bibliographies, 2015-2021
 - Injury Control Research Centers (ICRC) research projects
 - NCIPC Research Project Tracking System (RPTS), 2015-2020
 - CDC TBI webpage: Publications and Reports, 2015-2021
 - List of planned publications and ongoing research activities within DIP's TBI Team, 2021
- Discussions with internal and external subject matter experts
- Literature – research studies and review articles

NCIPC Research Inventory (2015-2021)

- 141 potential research activities identified
 - Excluded 71 publications
 - Included 70 publications
 - 53 intramural
 - 17 extramural

NCIPC Research Inventory (2015-2021) Continued

- Breakdown by 2015 TBI research priority:
 - Priority 1: **32 publications**
 - Evaluate the effectiveness of strategies for preventing all forms of TBI and enhance the recognition and management of mild TBI in clinical and community settings.
 - Priority 2: **28 publications**
 - Identify effective strategies for the primary prevention of sports concussion.
 - Priority 3: **6 publications**
 - Evaluate the effectiveness and economic efficiency of existing surveillance systems to capture TBI, especially mild TBI related to youth sports participation.
 - Priority 4: **14 publications**
 - Quantify short- and long-term outcomes resulting from TBI and identify modifiable risk and protective factors predicting these outcomes.

Stakeholder Interviews

Experts in TBI research from CDC and other external agencies and organizations

- What we want to know

- Understand how the TBI field has changed in the past five years
- Reflect on whether adequate progress has been made towards NCIPC's current research priorities
- Provide insight on which TBI research questions should be the focus of NCIPC research
- Describe potential gaps present in current NCIPC research agenda and field

Stakeholder Interviews – Federal Agencies

- Several federal agencies invest in TBI research initiatives:
 - Department of Defense (DoD)
 - Veterans Affairs (VA)
 - National Institute of Health (NIH)
 - Agency for Community Living (ACL) and its National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR)
 - Patient Centered Outcomes Research Institute (PCORI)

Stakeholder Interviews – Associations

- TBI research conducted or supported at non-profits:
 - Brain Trauma Foundation
 - Brain Injury Association of America (BIAA)
- Provide Advocacy for TBI Research:
 - National Association of State Health Injury Administrators (NASHIA)
 - United States Brain Injury Association (USBIA)

Stakeholder Interviews – CDC

- CDC's unique federal role
 - Prevention
 - Identification of risk and protective factors
 - Health disparities
 - Children who experience TBI across the lifespan

Stakeholder Interviews

Recommended Areas of Focus

- Identifying and evaluating effective strategies for primary prevention across all mechanisms of injury
- Enhancing and expanding diagnosis of TBI
- Improving the understanding of TBI as a chronic disease, including long-term outcomes and comorbidities
- Improving longitudinal surveillance and data harmonization
- Advancing implementation science for TBI guidelines and interventions

Literature Review

A targeted literature review related to TBI and public health was conducted

- 21 publications were reviewed:
 - 15 systematic literature review and research summary articles
 - 2 TBI-focused journal supplement prefaces
 - 2 commentaries
 - CDC's Report to Congress on the Management of TBI in Children
 - CDC's Guideline on the Diagnosis and Treatment of mTBI Among Children.
- This literature review highlighted a variety of populations disproportionately affected by TBI:
 - children and teens
 - older adults
 - athletes
 - individuals with mental health conditions
 - victims of intimate partner violence (IPV)
 - homeless and incarcerated populations
 - workers in high-risk occupations.

Literature Review – Key Findings

- Areas of TBI research where CDC is well positioned to advance the science:
 - Enhancing surveillance and data collection to understand the true burden of TBI
 - Identifying strategies to prevent and mitigate the physical, psychological, economic, and social impacts of TBI.
 - Rigorous evaluation of clinical guidelines is critical and will inform future revisions of recommendations and implementation materials

Literature Review – Key Findings Continued

More research needed related to:

- Risk and protective factors
- Strategies for disproportionately affected groups
- Implementation science

Proposed New Priorities

1. Improve methods to measure, collect, and analyze data to inform monitoring of TBI burden trends and evaluating prevention strategies.

- a) How can the methods to obtain national and state-level estimates of TBI incidence and prevalence, including underserved populations at disproportionate risk for TBI be improved?
- b) What is the validity and reliability of using self-reported TBI as a method for estimating TBI prevalence?
- c) How can the methods to estimate the economic burden of TBI, including long term costs, Quality Adjusted Life Years (QALYs), Disability Adjusted Life Years (DALYs)be improved?

Proposed New Priorities (2)

2. Develop and evaluate the effectiveness of strategies for primary prevention of TBI.

- a) Which strategies effectively prevent sport- and recreation-related TBIs?
- b) Which strategies effectively prevent TBIs in non-sports injury mechanisms (e.g., motor vehicle crashes, firearms, falls)?
- c) How can evidence-based prevention strategies be effectively adapted by groups disproportionately affected by TBI?
- d) What are the unique risk and protective factors (e.g., adverse childhood experiences, economic factors, access to care) for populations at higher risk for TBI such as people from racial and ethnic minority groups, people in lower socioeconomic statuses, LGBTQ+ persons, people experiencing homelessness, veterans and current servicemembers, and people in correctional or detention facilities?

Proposed New Priorities (3)

3. Improve the recognition and identification of concussion/TBI in healthcare and community settings.

- a) What are the most predictive strategies for screening and identifying TBI in the emergency department to support clinical care?
- b) What are the inequities in recognition and identification following TBI in populations at disproportionate risk, such as people from racial and ethnic minority groups, people in lower socioeconomic statuses, individuals with mental health conditions, victims of intimate partner violence, people experiencing homelessness, people in correctional or detention facilities? How can these inequities be reduced?
- c) How can recognition of TBIs be improved in multiple contexts such as clinicians evaluating patients with suspected TBI, athletes or coaches reporting symptoms, teachers observing symptoms at school, and parents observing changes in their child's behavior?
- d) To what extent are healthcare providers incorporating best available evidence regarding diagnosing TBI? What are the barriers to broader implementation?
- e) How can best practices related to TBI diagnosis be implemented more broadly?

Proposed New Priorities (4)

4. Identify modifiable risk and protective factors for negative post-TBI impacts and leverage these to improve short- and long-term outcomes.

- a) How do near-term diagnostic and management practices impact TBI-related outcomes?
- b) What practices related to injury education and the provision of discharge instructions at the time of diagnosis are effective in improving TBI management and preventing adverse effects?
- c) What are the long-term effects of TBI sustained during childhood) and how are they best managed (e.g., TBI as a chronic condition)? What are risk and protective factors contributing to long term effects?
- d) What strategies implemented in the days and weeks following a TBI can reduce the negative impacts of TBI among disproportionately affected populations?
- e) How can return to school strategies be improved to reduce short- and long-term outcomes after TBI diagnosis?

THANK YOU

Discussion

The findings and conclusions in this presentation are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.