

Translating Brain Trauma: A Practical Approach to Suicide Prevention

Adam K Walsh^{1,2}, Aaron B Weingrad^{1,2}, Joshua C Morganstein¹, Brooke Heintz Morrissey^{1,2}, Carol S Fullerton¹, Julia M Petrini^{1,2}, Robert J Ursano¹

¹Center for the Study of Traumatic Stress, Department of Psychiatry, Uniformed Services University of the Health Sciences, Bethesda, MD
²Henry M Jackson Foundation for the Advancement of Military Medicine (HJF), Inc., Bethesda, MD, USA

Introduction

- Suicide is the tenth leading cause of death in the United States.¹ It was responsible for 47,500 deaths in 2019,¹ equating to one death every 11 minutes.²
- The CDC has classified suicide as a public health concern, suggesting that effective prevention should focus on individual, family, and community factors, involving both the public and private sectors.³
- Over the last decade there has been little to no theory development in the field of suicide prevention.^{4,5}
- None of the currently available theories conceptualize suicide and prevention strategies in the context of suicide as a complex traumatic event that encompass key environmental and agent vectors of suicide.
- Suicide prevention efforts primarily have focused on “why” someone attempts suicide rather than “how” someone attempts (i.e., the means used).^{6,7}
- The Haddon Matrix, developed by Dr. William Haddon Jr.,⁸ is a conceptual framework that can be used to identify public health targets of change in the context of primary, secondary, and tertiary prevention strategies.⁹
- Suicide is an event that develops over time and is influenced by multiple factors external to the individual and beyond the temporal occurrence of the attempt itself. Consequently, we chose to use the Haddon Matrix Conceptual Framework to address suicide using a trauma-informed public health approach.

Methods

A systematic literature search focused on factors, conditions, policies, theories, and prevention strategies for suicide was conducted. Also, an expert panel composed of scientists from the Center for the Study of Traumatic Stress (CSTS), Uniformed Services University School of Medicine was conducted. Further, newly conceived CSTS suicide prevention projects were analyzed for purpose and scope and were superimposed on a Haddon Matrix. Lastly, brainstorming sessions were conducted within the CSTS suicide prevention team to postulate what key factors would make the human environment more resistant to suicide.

Results

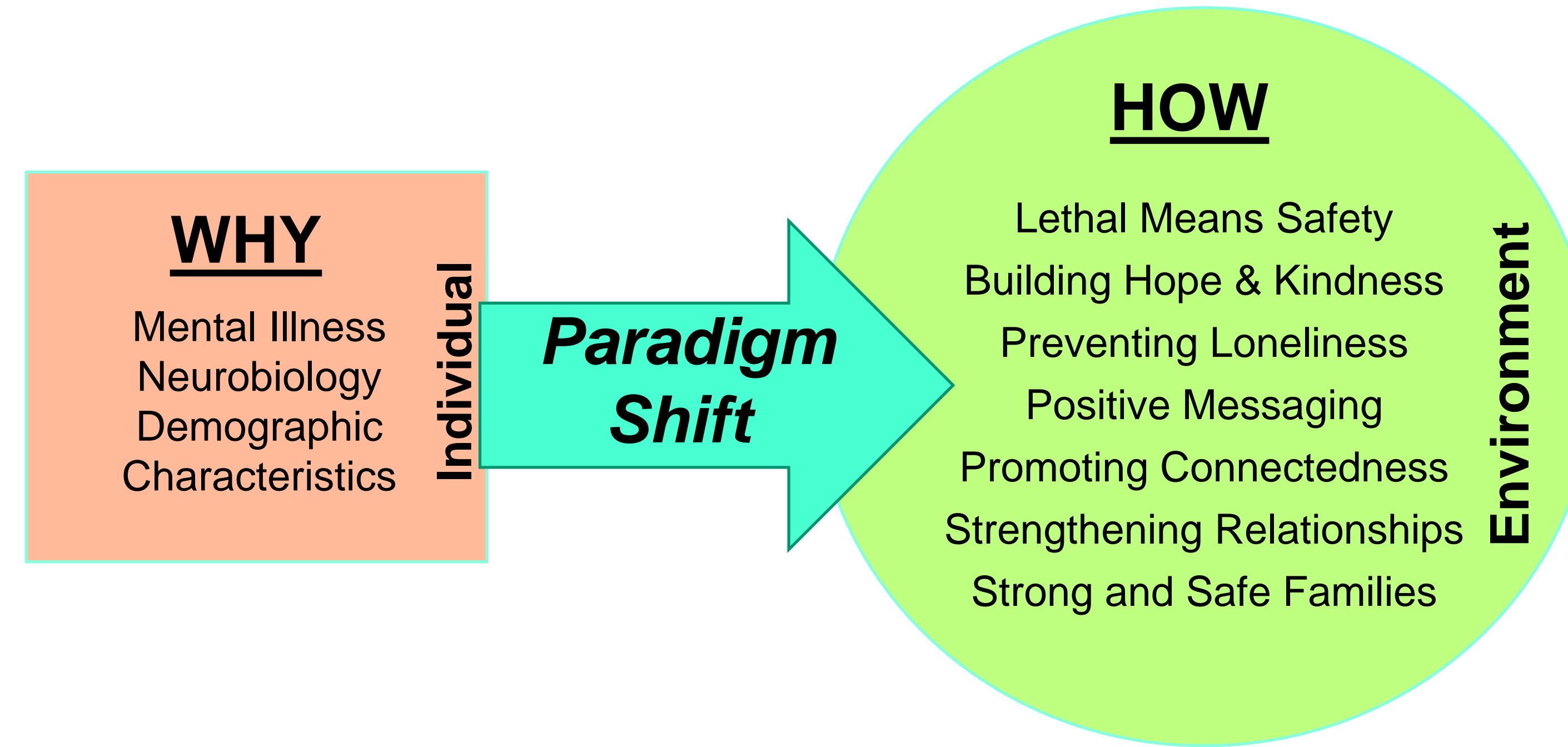


Figure 1: Transitioning from host to agent and environmental targets for action.

	Host	Agent	Physical Environment	Social Environment		Host	Agent	Physical Environment	Social Environment
Pre-Event	<ul style="list-style-type: none"> Mental Pathways: Mindfulness in the Military Application Sensory Realities in Battle: Video Scenarios Enhancing Effective Coping in Return: Suicide Risk: A Virtual App for Bereaved Family Members Finding the Words: A Video Series 		<ul style="list-style-type: none"> Conversations about safe storage 	<ul style="list-style-type: none"> Suicide Risk Determination and Response Protocol for Researchers Publicity Electronic Module (eModule) Production Targeting Family Health and Safety Profiles to Prevent Suicide Talk to an Expert Podcast 		<ul style="list-style-type: none"> Non-help-seeking Trait impulsivity Shame Mental illness Unemployed Feeling hopeless Occupational stress 	<ul style="list-style-type: none"> Comfort with lethal means of suicide Makes use of more lethal methods of suicide Habituation around methods of suicide (veterinarians around tranquilizers, soldiers around guns) 	<ul style="list-style-type: none"> Exposure to violence Access to lethal means Lack of structures to impede access to lethal means of suicide High alcohol availability Low minimum wage Lack of connection with community 	<ul style="list-style-type: none"> Lack of proper geographic distribution of mental health resources that affect access to resources Lack of social connectedness
Event						<ul style="list-style-type: none"> State impulsivity State aggression Alone Substance use Hopelessness Non-help-seeking No care provider Writing of suicide note 	<ul style="list-style-type: none"> Lethality of method Firearms most lethal, followed by jumping from extreme height, poisoning, asphyxiation, and medication overdose Use of method (self-inflicted gun-shot to head most lethal) 	<ul style="list-style-type: none"> Availability of suicide method Unfettered access to method of suicide No phone call for help No transportation to drive to help Lives alone 	<ul style="list-style-type: none"> No friend or family to call for help No scheduled activities Feeling like a burden to others Recent dissolution of an intimate partner relationship
Post-Event (death)				<ul style="list-style-type: none"> Tragedy Assistance Program for Survivors: Family Safety Guide to Post-Suicide Death The Military Survivor Family Safety Toolkit (MSTFSA) Penetration Project to Support Military Survivor Family Safety 		<ul style="list-style-type: none"> Autopsy on body to confirm cause of death is suicide Religious beliefs: life after death 	<ul style="list-style-type: none"> Forensic investigation of what method was used and circumstances surrounding the method used Assessments to see if any safety strategies were used 	<ul style="list-style-type: none"> Community and mental health resources to help family and friends cope with loss of loved one Community events that celebrate the life of the loved one who was lost and not events that glorify or stigmatize suicide death 	<ul style="list-style-type: none"> Ensure safe reporting of suicide death
Post-Event (survival)						<ul style="list-style-type: none"> Stabilization (hospitalization) CBT for suicide attempts Medical evaluation Safety plan Attempt survivors support groups Case management 	<ul style="list-style-type: none"> Remove all lethal means from home 	<ul style="list-style-type: none"> Build community that is accepting and supportive of suicide survivors and include survivor in community activities 	<ul style="list-style-type: none"> Educate family and friends about suicide survivor needs and available resources Promote positive messages about help-seeking

Figure 2: Haddon Matrix that identifies risk and protective factors that affect the likelihood of suicide attempt resulting in death (right), and ongoing CSTS projects that focus on suicide prevention using a public health approach (left).

Results (Cont.)

- A Haddon Matrix was created to conceptualize a public health approach to suicide. The matrix identifies risk and protective factors that affect the likelihood of suicide attempt resulting in death. The Matrix also identifies the ongoing projects at CSTS that focus on prevention of suicide from a public health perspective.
 - The rows correspond to the three temporal phases of an adverse public health event, specifically the pre-event, event, and post-event time points.
 - The host column represents the person or persons at risk of the event in focus.
 - The agent column refers to factors that contribute to the cause and severity of the event (i.e., inanimate object or person/organism).
 - Physical environment captures all attributes of the setting where the event takes place.
 - Social environment describes the cultural, social, political, and legal norms of the community.
- The development of the Haddon Matrix revealed to the authors that conventional approaches to suicide prevention that focus on the host factors and why people die by suicide have yielded poor to modest results. Constructing the Haddon Matrix guided the authors to key agent, physical, and social environment factors that provide actionable opportunities that may create a human ecosystem that is more resistant to suicide.

Discussion

- Importantly, the expert panel discussions and subsequent creation of the suicide prevention Haddon Matrices resulted in the conclusion that, like other public health problems, suicide prevention efforts need to shift more to how we better protect the human ecological environment against suicide.
- The public health approach to suicide allows for the creation and deployment of prevention strategies that address all levels of society.
- Public health professionals can use the Haddon Matrix Conceptual Framework to recognize key vulnerabilities that suggest possible intervention points in the community.

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