



The Colorado National Collaborative: A public health approach to suicide prevention

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ABSTRACT

Objective: Suicide rates in the United States have risen dramatically during the 21st century despite national, state and local level commitments to prevention, improvements in the development and delivery of evidence-informed prevention approaches, and advances in epidemiological capacity to identify areas for targeted intervention. Complex problems require comprehensive solutions. In Colorado, that solution is a comprehensive, integrated public health collaboration that aligns diverse community and programmatic efforts across the prevention continuum. The Colorado National Collaborative (CNC) is pursuing a real-world test of the public health approach to suicide prevention by helping community coalitions deliver a package of evidence-informed activities in geographically defined community systems.

Methods: The CNC began by identifying six diverse Colorado counties with high suicide rates or number of deaths. Working closely with community, state, and national partners, CNC identified existing community-level risk and protective factors, programs, and policies. This process provided insight on the overlay between existing efforts and identified burden centers and drivers.

Results: The CNC team identified six components for strategic implementation: (1) connectedness, (2) economic stability and supports, (3) education and awareness, (4) access to suicide safer care, (5) lethal means safety, and (6) postvention. Evaluation is being conducted through a collaborative, participatory, and empowerment approach that incorporates stakeholders as leaders in all aspects of the process.

Conclusion: The CNC includes data-driven identification of populations at risk of suicide, community identification of protective factors, and true collaboration between prevention experts at the national, state, and local level in implementing a comprehensive approach to prevention. Lessons learned are discussed.

1. Introduction

At the beginning of the 21st century, a time when the United States had experienced nearly a decade robust of economic growth, the suicide rate for the year 2000 hit a low point, with an age-adjusted rate of 10.4 per 100,000 persons—a total of 29,350 lives lost (Centers for Disease Control and Prevention, 2020a). National suicide rates had been dropping throughout the 1990s to levels not seen since the 1950s. Many clinicians, public health professionals, and community and political leaders thought that the nation was on the right track to see even greater improvements ahead. Moreover, the U.S. Surgeon General had recently issued a *Call to Action to Prevent Suicide* (U.S. Public Health Service, 1999), and the first *National Strategy for Suicide Prevention* was being

developed under the auspices of the U.S. Department of Health and Human Services.

Two decades later, suicide rates have risen dramatically. These rates started climbing before the Great Recession, even as the economy recovered following the horrific events of “9/11,” and this increase accelerated in the second decade of the new millennium. While there was a modest dip in suicides and related rates in 2019, from 1999 to 2019, age-adjusted rates increased by 32.4%, from 10.5 per 100,000 to 13.9 per 100,000, and 47,511 lives were lost to suicide in 2019 alone (Hedegaard et al., 2020; Kochanek et al., 2020). Since 1999, suicide rates have increased among both men and women, and in all age groups under the age of 75 years (Hedegaard et al., 2020). This increase is especially stunning given that, worldwide, suicide rates have been

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falling (Naghavi, 2019).

“Suicidality,” a broadly encompassing term, exists across a continuum of suicidal thoughts, gestures, communications, threats, plans, attempts, and deaths (Sveticic and De Leo, 2012; Silverman et al., 2007). For every person who dies by suicide, thousands more struggle with suicidal thoughts and behaviors. In 2019, 1.4 million U.S. adults reported that they had made a suicide attempt in the past, 3.5 million formed a suicide plan, and 12 million had serious thoughts of suicide (SAMHSA, 2020). While suicide prevention initiatives surely must respond with immediacy to individuals who are close to dying by suicide, they also must care for those populations that include greatly distressed or vulnerable persons who collectively carry many of the risk factors known to contribute to suicide. Moreover, prevention efforts never will have the fully desired impact unless they prevent individuals from ever becoming suicidal in the first place.

2. The need for a public health approach to suicide prevention

U.S. suicide prevention efforts have often reflected an individual-based, rather than a population-based, approach to prevention. As described by British epidemiologist Geoffrey Rose (1985), while an individual-based approach to prevention seeks to identify and target individuals at high risk for a disease, a public health approach or population-based strategy seeks to control the determinants of incidence in the population as a whole. Instead of asking, “Why does this patient have this disease?”, the public health approach asks, “Why is this population giving rise to this public health problem?”

Some clinically significant mental disorders—such as depression, bipolar disorder, anxiety disorders, and schizophrenia—have been found to be present in individuals who died by suicide (Arsenault-Lapierre et al., 2004; Cavanagh et al., 2003). As a result, suicide has often been viewed through a mental health lens, and prevention efforts have focused primarily on identifying symptomatic individuals at imminent risk of suicide, with the aim of referring them to psychiatric care (Caine, 2013). However, mental illness is only one among numerous factors that can influence suicide risk. Many persons with psychiatric disorders neither attempt nor die by suicide, and many individuals who die by suicide neither express suicidal ideas or plans nor show signs of mental disorders or serious intent (Caine et al., 2018).

Like other public health problems, such as obesity and heart disease, suicide is influenced by many factors across the four levels of the social ecological model: individual, relationship, community, and societal (Caine, 2020; Dahlberg and Krug, 2002). Data from CDC’s National Violent Death Reporting System (NVDRS) show that the circumstances associated with suicides include intimate partner conflict, physical health problems, or a recent or impending crisis, separate from mental illness and substance misuse (Ertl et al., 2019). Other relevant individual-level factors include a person’s genetic background, a family history of suicide, early life adversity, social isolation, and immediate access to lethal means, as well as broader contextual influences, such as economic turmoil and lack of access to needed medical and mental health care (Turecki et al., 2019).

The same is true regarding factors that may play a protective role by moderating or “buffering” the effect of these risk factors. Protective factors—such as one’s social connections and support, coping skills, and ready access to health care—also exist across all levels of the social ecological model (Steele et al., 2018). Risk and protective factors for suicide can vary across demographic groups (e.g., by age, sex, gender, race/ethnicity, and other characteristics) and subgroups, and may also change over time.

An approach to suicide prevention that focuses primarily on identifying and treating subgroups identified as being at high risk will fail to reach most people who struggle with suicidal thoughts or behaviors, and is unlikely to be effective in reducing state-level and national suicide rates. While it is essential to meet the needs of persons and populations that have suffered a history of neglect or oppression or to whom the

nation has special obligations—such as American Indian and Alaska Native (AI/AN) tribes and military veterans—these groups tend to contribute relatively fewer numbers to the overall death toll from suicide, when compared with broader populations (e.g., white men and women) that are larger in size.

Moreover, an approach that focuses primarily on higher-risk individuals and groups will fail to identify and address upstream factors that may influence the development of suicide risk. Suicide prevention must move upstream, reaching beyond the time of a suicidal crisis to times when suicidal thoughts or behaviors may not be evident but distress factors or risks may be apparent (Caine, 2020). This is similar to the public health approach to other health problems, such as heart disease or diabetes. Preventive strategies—such as increasing physical activity, improving diet, controlling blood pressure, and stopping smoking—are generally started decades before a cardiac event or diabetes diagnosis. By addressing risk and protective factors across the lifespan, the public health approach supports ongoing prevention well before a suicidal crisis occurs (David-Ferdon et al., 2016).

Public health approaches to care assuredly include persons in acute need. Our response to the coronavirus pandemic highlights the importance of identifying and treating individuals with COVID-19, and protecting groups that may be at an increased risk for infection or serious illness. But equally as critical are broader preventive measures—such as masking, handwashing, social distancing, and vaccine development—aimed at the general population. Similarly, a public health approach to the prevention of suicide must combine “universal” strategies that promote health and wellness among the entire population regardless of risk, “selective” strategies supporting groups or settings that could be at an increased risk, and “indicated” strategies designed to support those currently in crisis and at highest risk for suicide, especially those who have already exhibited suicidal thoughts or behaviors (Gordon Jr., 1983; Turecki et al., 2019).

Examples of successfully implemented initiatives from Denmark (Nordentoft, 2007; Nordentoft and Erlangsen, 2019) and Finland (Aaltonen et al., 2018; Partonen, 2016; Pirkola et al., 2009) underscore the essential quality of weaving together multiple strategies into a comprehensive programmatic effort designed to implement diverse activities while assuring integration and systemic change. In the United States, the U.S. Air Force operationalized its integrated suicide prevention programming into the Air Force Suicide Prevention Program (ASFPP). Launched in 1996 and fully implemented in 1997, ASFPP combined 11 overlapping components, such as leadership involvement, education and training, community preventive services, and trauma stress response (Knox et al., 2003). A study that compared data from before the ASFPP was launched with data from 1997 to 2008 found that program implementation was associated with a significant reduction in suicide rates (Knox et al., 2010). However, the Air Force is an organization with clearly defined cultural boundaries, expectations, and traditions—with a strongly reinforced command hierarchy, universal access to healthcare, housing support, and other programs to enhance personnel readiness, such as financial counseling and family advocacy. And even with all of these advantages, the Air Force could not stem a recent increase in death rates, which rose from 18.5 per 100,000 in 2018, to 25.1 per 100,000 in 2019 (U.S. Department of Defense, 2020).

In the early 2000’s, a multi-component program targeting depressive disorders in Nuremberg, Germany, was shown to significantly reduce suicide and attempted suicide rates by more than 20% (Hegerl et al., 2008). The program involved four different interventions: a public relations/education campaign, a training of community facilitators, a training of general practitioners in best practices in suicide safer care, and the establishment of a system of support for individuals at high risk of suicide and their families. These promising results prompted the implementation of a multi-faceted suicide prevention program by multiple European countries, called the European Alliance Against Depression (EAAD; Hegerl et al., 2008). Similarly, the Lifespan Suicide Prevention Model in New South Wales (Shand et al., 2020) is a multi-

component, multi-site comprehensive suicide prevention program built on activities with identified research support. Both models show promise, but more research is needed to support their efficacy, generalizability, and sustainability.

With 5.5 to 5.7 million residents, Denmark and Finland have populations similar in size to mid-sized U.S. states. While these countries are more heterogeneous than the U.S. Air Force, they are less diverse than many U.S. regions. Thus, it is not possible to simply replicate their efforts point-for-point to the different states, regions, cultures, and ethnic and racial groups found in the United States. Moreover, national suicide prevention initiatives must address the tension between addressing the needs of groups identified as having increased suicidal behaviors (e.g., veterans; American Indian and Alaska Native populations; sexual and gender minority youth), as well as groups that account for the greatest number of suicide deaths because they make up a large proportion of the population (e.g., white adults and older adults in urban and suburban settings).

With this context in mind, novel approaches to suicide prevention are needed at the state and regional levels in order to grapple with the challenges associated with populations that are not organized into hierarchies, preselected through recruiting and personnel screening, or offered universal access to health care. To date, there has been no sustained, far-reaching state level or regional suicide prevention program in the U.S. that has engaged diverse populations across the life span and combined community-driven initiatives with efforts implemented by health systems and other potential partners in a comprehensive and integrated way. The Colorado National Collaborative (CNC) was established to meet this need.

3. Methods

3.1. Why a Colorado National Collaborative (CNC)?

The genesis of the CNC reaches back to 2014, when the CDC-funded Injury Control Research Center for Suicide Prevention (ICRC-S) critically appraised the progress of its innovative “center-without-walls” approach (i.e., the center operated as a virtual workplace, with no dedicated physical site). A collaboration of the University of Rochester Medical Center and the Education Development Center (EDC), ICRC-S sought to transform the field of suicide prevention by drawing it fully into the domain of public health while linking it to complementary mental health approaches. The appraisal found that ICRC-S was meeting or exceeding all of its stated goals dealing with research, education of researchers and public health professionals, and outreach to diverse communities and states. However, this success was illusory in many respects, as the nation’s overall suicide had continued to rise since 2001, and the increase had accelerated in the years following the Great Recession. In response, ICRC-S began to contemplate the idea of a national-state-local collaborative that would develop, implement, and evaluate a comprehensive and integrated approach to suicide prevention at the state level. The initiative would seek to answer the research question: *To what extent does implementing a local-state-national collaborative—selecting a bundle of promising practices that responds to each county’s data on suicide burden and deploying these as an integrated, comprehensive approach to prevention—contribute to a 20% reduction in suicide at the state level by 2024?*

In discussions with CDC, ICRC-S identified the following as core principles that should guide development of the collaborative: (1) focus on the development of a broad-based, community centered approach to prevention (as opposed to one primarily developed for health systems); (2) build a program based on diverse, integrated efforts to more comprehensively address population-level risk and protective factors; and (3) rigorously evaluate outcomes. The ICRC-S also thought it essential to monitor the process of forming and promoting the success of the collaborative in order to glean lessons to share with other states and regions.

Given the wide cultural, economic, and social diversity that exists across the United States, the ICRC-S understood that no state could serve as a “one size fits all” model. To ensure that the initiative would yield lessons generalizable to various jurisdictions, the group identified specific criteria for selecting a state as the intervention site. These criteria included: (1) suicide rates among the top 10 nationally; (2) a sufficiently large number of suicides, such that an intentional, programmatically initiated reduction in deaths would be beyond typical year-to-year fluctuations; (3) stated recognition of suicide as a public health problem; (4) clearly evidenced leadership from the most senior levels of government (e.g., Governor, legislature) in identifying suicide prevention as a major health improvement priority; (5) an established state administrative organization/department with whom to work collaboratively; (6) agreement that the processes associated with developing and implementing a comprehensive, integrated suicide prevention program would be studied and rigorously evaluated; and (7) existing state data systems suitable to monitor program progress.

Based on the established criteria, Colorado was identified the best fit. In the years leading up to the CNC, suicide rates in the state were consistently higher than the national rates (Fig. 1). The data indicated that, in 2013, the state of Colorado had the 8th highest suicide rate in the nation: an age-adjusted suicide rate of 18.5 per 100,000, compared with a national rate of 12.6 per 100,000 (Centers for Disease Control and Prevention, 2020a). Other key variables included the presence of a strong infrastructure for suicide prevention program delivery, advanced data systems, data on morbidity and mortality resulting from suicidal behavior, political will to address suicide at the executive and legislative branches, and the existence of several suicide prevention initiatives, such as the Gun Shop Project, which engages gun sellers and local gun owning communities in supporting firearms safety (Colorado Department of Public Health and Environment, 2019). A 20% reduction in the rate of suicides at the state level, using 2019 as the base year, would mean approximately 262 lives saved in Colorado (CDC, 2020a).

As described elsewhere (see Caine et al., 2018), in 2015, leadership from ICRC-S and the state of Colorado identified a shared goal of reducing the suicide rate by 20% by 2024 and founded a formal structure, the CNC, to implement the collaborative research-practice framework. CNC developers recognized that building a community-centered approach to prevention that would promote diverse yet integrated program elements would require expertise and support on a national scale, combined with intense community involvement. ICRC-S brought to the initiative the expertise of federal agencies such as CDC, the National Institute of Mental Health, and the Substance Abuse and Mental Health Services Administration; and not-for-profit organizations, such as the American Foundation of Suicide Prevention, which provided essential interim funding to promote foundational development. The Colorado Department of Public Health and Environment (CDPHE) played a key role in assembling local partners from state and federal agencies and non-profits from cities and counties throughout Colorado. As CNC has grown, membership has continued to evolve, with any gaps in sector representation being identified and addressed.

3.2. Selecting the six counties

The next step was developing a comprehensive approach to prevention that would focus on all populations across the lifespan, with a special focus on groups identified as having high suicide-related risk factors and outcomes (e.g., ideation, attempts, deaths). Towards that end, the CNC set an early priority to create an interactive data tool that would afford state and local suicide prevention agencies the ability to explore trends, burden, and circumstances of suicide deaths in Colorado communities. This undertaking brought together experts in data visualization and suicide epidemiologists, who decided to use data from the Colorado Violent Death Reporting System (CoVDRS) to create an interactive suicide data dashboard.

The CoVDRS is an enhanced public health surveillance system that

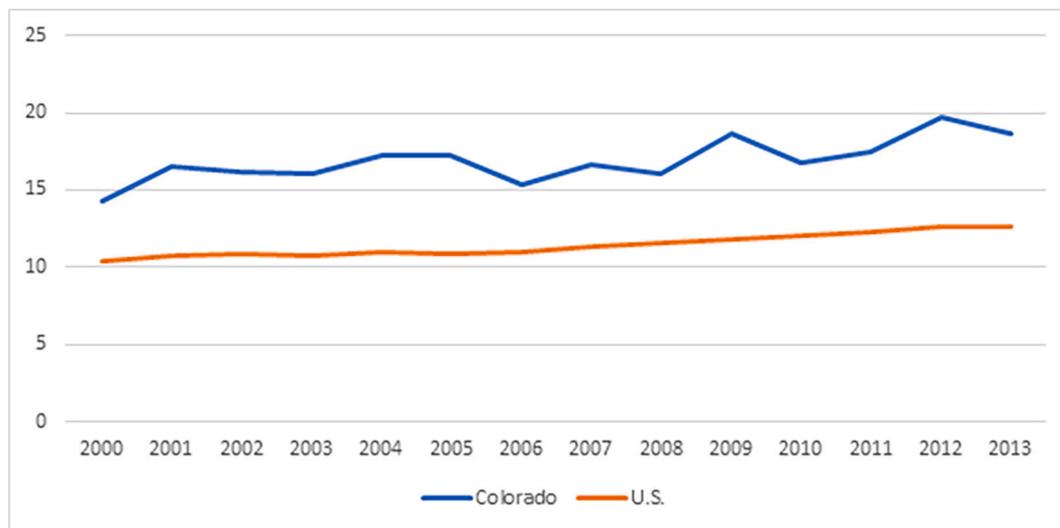


Fig. 1. Age-adjusted suicide rates, Colorado and National, 2000–2013.

Sources: Vital Statistics Program, Colorado Department of Public Health and Environment; CDC WONDER, Centers for Disease Control and Prevention.

obtains a complete census of all violent deaths occurring in Colorado, including demographic information and associated risk factor data and circumstantial information surrounding each death. The CoVDRS collects data from multiple sources, including death certificates, coroner/medical examiner reports, and law enforcement investigations. All 50 states participate in the broader NVDRS, which is maintained and funded by CDC.

Using the geocoded residence data from the CoVDRS, the CNC worked with Colorado's epidemiology team to use data visualization software to create a public facing dashboard profiling suicide data at the county, regional, and state level. The dashboard presents count data that allows users to identify the regions and populations where efforts could prevent the greatest number of deaths. With CNC guidance, Colorado's epidemiology team prioritized incorporating data elements that aligned with specific CNC priority areas, including older adults, youth, veterans of the armed forces, those in contact with the legal system (e.g., individuals with criminal legal problems, divorced persons), individuals who are unemployed, and those who work industries identified as having an increased suicide risk (e.g., construction) (Peterson et al., 2020).

Four unique dashboard views were produced: (1) an overview of suicide deaths, broken out by county of residence, selected demographics, and time; (2) tables of circumstances, method of injury and toxicology, broken out by county of residence, selected demographics, and time; (3) demographic statistics for suicides by specific circumstances or toxicological substances; and (4) industry and occupation information of suicide decedents with population specific circumstance information and broken out by county of residence, selected demographics, and time. Colorado's epidemiology teams applied best practices in data visualization (Meirelles, 2013) across all dashboard elements to maximize the user's ability to easily explore and understand these data, answer their own questions, and generate hypotheses related to prevention.

These geospatial and demographic analytics provide one lens for identifying regions with higher indicators of suicide-related risk factors or outcomes. When coupled with information about the prevention context within these regions—including existing capacity for suicide prevention, available community-based services, and cross-sector engagement readiness—a more complete picture emerges. To that end, the CNC also piloted an Environmental Inventory to begin to map existing government, health system, and community-based resources and activities related to the prevention of suicide. Surveys released to grant-funded and grassroots agencies explored existing prevention

efforts and social geography—an examination of who is engaged and who is excluded by existing prevention efforts. The geospatial overlay of existing prevention efforts and resources with NVDRS data offered a unique opportunity to map preventive interventions onto areas identified as having the greatest need. This allowed for a gap-determination process that informed the CNC's strategy to reduce burden.

A review of the suicide rates in Colorado counties from 2004 to 2015 showed that rates were highest in six counties: El Paso, Larimer, Pueblo, Mesa, La Plata, and Montezuma (Colorado Violent Death Reporting System, 2020). Suicide rates in these counties were higher than state-level and national suicide rates in that same time period (see Fig. 2). The six counties also represented a mix of both urban and rural counties within the state.

The CNC national partners visited the state several times to conduct county visits, assemble interested stakeholders, and present the pilot concept to determine degree of interest. All six counties expressed support and committed to working with the CNC to conduct the comprehensive initiative. Implementation was started in 2020 when the state of Colorado was awarded a CDC grant.

3.3. Identifying the six pillars of the CNC

The next step was to select a package of evidence-informed strategies for implementation across the six Colorado counties. To do so, we started with county- and state-level data, to help us understand populations at greatest risk. Similar to decision-making models used by Lifespan Model in New South Wales and the European Alliance Against Depression (Hegerl et al., 2008; Shand et al., 2020), we relied on existing evidence regarding the effectiveness of individual suicide prevention strategies, synthesized in CDC's technical package on suicide prevention (Stone et al., 2017), to select our strategies. As a result, we identified six strategy components, or pillars (Fig. 3): connectedness, economic stability and support, education and awareness, access to suicide safer care, lethal means safety, and postvention.

3.3.1. Increase connectedness

Research has consistently identified social isolation as a strong risk factor for suicide, and social connectedness as playing a protective role (Steele et al., 2018). The CNC defines connectedness “the degree to which an individual or group of individuals are socially close, interrelated, supportive, or share resources;” and notes that “social and structural connectedness can be formed within and between individuals, families, schools, neighborhoods, workplaces, faith communities,

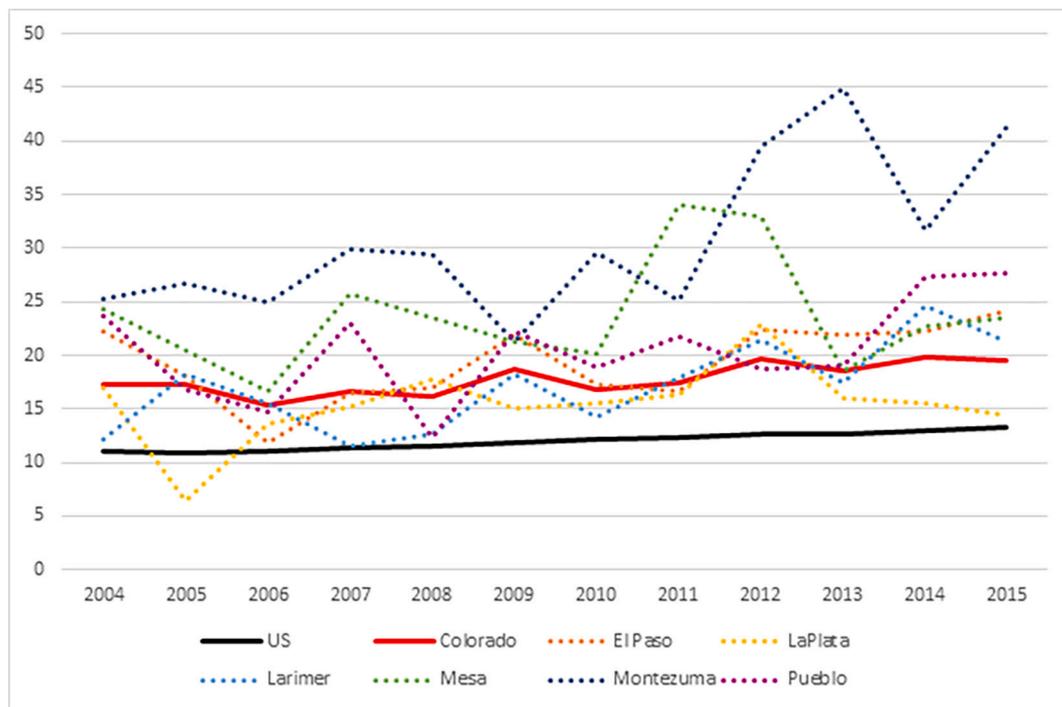


Fig. 2. Age-adjusted suicide rates, six counties, Colorado, and National, 2004–2015. Sources: Vital Statistics Program, Colorado Department of Public Health and Environment; CDC WONDER, Centers for Disease Control and Prevention.



Fig. 3. The six pillars, or strategy components, of the Colorado National Collaborative (CNC).

cultural groups and society”. Strategies related to connectedness include policies and programs that promote behavioral health, social and emotional learning, workplace policies that support inclusion, and other community engagement events and activities.

3.3.2. Increase economic stability and support

Financial problems have long been identified as a factor that can precipitate a suicidal crisis in a person at risk (Fowler et al., 2015). Research suggests that the fear of losing one’s job or being evicted, either now or in the near future, may also increase psychological distress that could contribute to suicide risk (Collins et al., 2020; Mateo-

Rodríguez et al., 2019). As CDC’s technical package notes, the available evidence suggests that strengthening economic supports may provide an important opportunity to buffer suicide risk. These supports may include economic benefits resulting from laws and policies; improvements in childcare and school options; adequate employment and living wages; and increased access to housing, transportation and education. Strategies in this category address financial stress, and include policies and practices for increasing food security; affordable housing; family-friendly employment; and access to affordable, quality childcare. Given the ravages of the COVID-19 pandemic, efforts to buttress economic stability will be especially important at the state and community

level, which inevitably will require federal funding.

3.3.3. Increase education and awareness

Education and awareness efforts seek to increase suicide prevention knowledge and skills among community members, health care providers, and other professionals, including the understanding that suicide is preventable. Key groups that can benefit from training include high-risk industries, such as construction, oil and gas, agriculture, and ranching; social service organizations; the legal and judicial community; faith organizations; and organizations serving veterans, youth, older adults, and sexual and gender minority populations. Activities include aligning with existing messaging and awareness campaigns, and partnering with local community organizations to develop policies and protocols to promote wellness and support intervention efforts.

3.3.4. Increase access to suicide safer care

This strategy component supports the adoption of practices that have been shown to be effective in improving quality of care and suicide-related outcomes among individuals at risk. As described in the Action Alliance report, *Recommended Standard Care for People with Suicide Risk: Making Health Care Suicide Safe*, examples include: screening and assessment for suicide risk, collaborative safety planning, treatment of suicidality, and the use of caring contacts ([National Action Alliance for Suicide Prevention, 2018](#)). These practices are part of the comprehensive Zero Suicide framework for providing effective suicide care in health systems, increasingly adopted in the U.S. and abroad, which is showing effectiveness in decreasing suicidal thoughts and behaviors among patients in care and in lowering hospitalizations and related costs ([Grumet et al., 2019](#)). Suicide safe practices are appropriate for diverse settings, including primary care, mental health centers, behavioral health and substance use disorder treatment agencies, hospitals, and emergency departments. A major challenge ahead involves fully integrating these efforts with emerging community-engaged programs.

3.3.5. Improve lethal means safety

Reducing access to lethal methods of suicide among individuals at risk is a prevention strategy backed by considerable evidence of effectiveness ([Platt and Niederkrotenthaler, 2020](#)). Common across all six participating counties is the commitment to data-driven strategies, including approaches that address the methods most frequently used in suicide deaths and attempts. Strategies related to improving lethal means safety include reinforcing the safe storage of firearms, lethal medications, and poisons through public messaging, as well as expanding the Colorado Gun Shop Project, and offering provider training on lethal means safety counseling.

3.3.6. Increase postvention services

The CNC defines postvention as “the response to and care for individuals and communities affected in the aftermath of a suicide attempt, crisis, or death” (Colorado Department of Public Health & Environment, n.d.). Postvention efforts focus on providing support for the bereaved and preventing potential negative effects of exposure to suicidal behaviors, such as contagion. Postvention components can include safe reporting and messaging about suicide by the media (e.g., the Recommendations for Reporting on Suicide available from www.reportingonsuicide.org) and by or within affected organizations, and caring follow up contacts after a suicide attempt or mental health crisis. Key strategies seek to ensure that communities are mobilized to support survivors of suicide loss, positive messaging is guided by individuals with direct lived experience of suicidal despair, and safe messaging resources are available to a variety of organizations.

3.4. Evaluating the CNC framework

The evaluation of the CNC framework will be complex. To create a model of comprehensive suicide prevention for the nation, not only will

the CNC need to explore the overall impact of its comprehensive approach, it must also be able to articulate the synergies and relative contributions of each of its six pillars on overall project outcomes. The CNC has already met with real-world barriers to controlled evaluation efforts, including pre-existing community differences, staggered implementation efforts, challenges in metric standardization, and funding limitations. Other challenges include emerging and continuing crises, such as the continuing coronavirus pandemic and seasonal wildfires that are increasing in intensity. Although Colorado has not yet seen a statistically significant change in suicide-related indicators across the age span during the COVID-19 crisis (fatality data is available through September 2020, and suicide-related emergency department visits available weekly) compared to previous years, it is difficult to predict the impact of COVID-19 on suicide rates. While the pandemic has left some individuals in a heightened state of isolation, others feel more connected to their families or communities as a result of changes to daily routines. It is important for suicide prevention to continue to mitigate the risk factors that could contribute to someone feeling suicidal and to bolster protective factors that reduce the likelihood of someone feeling suicidal or attempting to die by suicide. Crucial to a comprehensive suicide prevention approach is understanding how various crises, including the current pandemic, can impact both risk and protective factors. A comprehensive approach—one that strengthens economic supports, strengthens access and delivery of culturally appropriate and affirming suicide care, creates protective environments, and promotes connectedness—is hypothesized to support state residents regardless of whatever crises may occur.

The CNC opted for a collaborative, participatory, and empowerment (CP&E) approach to evaluation that fully and genuinely incorporates stakeholders as leaders in all aspects of the evaluation process, from evaluation design, to data collection and analysis, to the final dissemination of results. The CP&E approach was a natural fit with the collaborative nature of the CNC and its implementation efforts. CP&E evaluations often lead to better stakeholder engagement, which produces better-defined metrics, more appropriate recommendations, and improved uptake of findings ([Fetterman et al., 2010](#); [Guijt, 2014](#)).

The first step of the evaluation process was to form an evaluation subcommittee comprised of representatives from national, state, and community partners. The evaluation subcommittee meets bi-weekly to create and update an overall logic model to guide evaluation efforts, design an evaluation plan, and identify feasible, reliable metrics for charting progress. The evaluation subcommittee will also be tasked with analyzing results, developing a plan for continuous quality improvement, and disseminating findings to our stakeholders.

Using the CP&E approach, the evaluation subcommittee has created a dashboard, modeled after the CNC logic model, that illustrates individual county progress on activities under each of the six CNC pillars. Working together with the implementation team, the evaluation subcommittee has identified and operationally defined abstract constructs related to CNC project goals, such as “providing support,” “engaging youth serving organizations,” and “connecting with behavioral health organizations.” The evaluation subcommittee has identified feasible, low-cost metrics that can be entered quarterly into the project’s dashboard to record activities, including process measures related to level of effort and implementation fidelity. The dashboard also tracks progress on short-term, intermediate, and long-term goals. The dashboard is viewable by CNC leadership at the national, state, and county levels to allow for continuous quality improvement and sharing progress with stakeholders.

Prior evaluations of “what works” in community-based suicide prevention models have involved observational data ([While et al., 2012](#)) or investigator-driven, stepped wedge, cluster RCTs, such as the Lifespan Suicide Prevention Model in New South Wales ([Shand et al., 2020](#)). The current project will expand the field’s knowledge about how to effectively and efficiently engage stakeholders to improve the evaluation of a comprehensive state- and community-based model of suicide

prevention. Our CP&E approach to evaluation contributes to empowerment by giving communities a central voice in assessing impacts and directing decisions related to findings of the suicide prevention model, thereby extending suicidology science and practice regarding inclusion, diversity, and equity.

With support from CDC's new Comprehensive Suicide Prevention Program (CDC-RFA-CE20-2001), the CNC is well-poised to further implementation of its six pillars and continue the evaluation process in earnest. Over the next five years, the CNC will aim to demonstrate a 20% reduction in suicide statewide, by impacting the suicide death rate in the identified high-risk counties. Next steps include continuing to roll-out the selected prevention strategies, tracking progress and outcomes, and monitoring activity implementation. Evaluation efforts are bolstered by Colorado's work in opioid misuse prevention. The development of the dashboard, for example, is modeled after a similar dashboard being used to track opioid misuse prevention activities. Taken together, the dashboards provide important information on the intersection of injury-related conditions. The dashboard may inform the "deaths of despair" model, which articulates the mechanisms by which deaths due to drugs, alcohol, or suicide may be linked to a recent decrease in life expectancy among Americans (Auerbach and Miller, 2018).

4. Discussion

Communities and states in the United States face daunting challenges when considering how best to implement strategic efforts to prevent suicide, attempted suicide, and many of the deaths that arise from injury-related causes. To date, most suicide prevention efforts have relied heavily on identifying people who show signs of suicide risk during a clinical visit and connecting them to mental health care. This approach seeks to address the needs of individuals who have become suicidal, rather than changing life trajectories so that these persons do not develop suicidal thoughts or engage in suicidal actions. Although the approach addresses immediate and critical needs, it inadvertently turns attention away from factors that can increase the risk for suicide and other poor outcomes, whether in childhood or later in life. This approach is inherently reactive, rather than proactive and preventive.

In addition to serving those who currently are experiencing suicidal despair, which emphasizes downstream intervention efforts, suicide prevention must include upstream efforts that address contextual conditions that may lead to the development of life distress and demoralization—factors such as childhood adversities, family violence, community turmoil, social dislocation, and economic insecurity. Instead of labeling certain groups as "vulnerable," it is essential to address the fundamental contextual-structural problems that disadvantage individuals, families, and communities and block opportunities in education or access to health care, thereby setting the stage for personal vulnerabilities. At the same time, persons with many life advantages also die by suicide; understanding the factors leading to their premature deaths also requires attention. We need to better understand the social and interpersonal factors that help sustain persons facing adversities, thereby directing developmental trajectories towards life rather than death.

The CNC provides a real-world test of a comprehensive and integrated approach to suicide prevention that looks both upstream and downstream, and includes universal, selective, and indicated strategies for preventing suicide among individuals across the lifespan. The CNC framework recognizes that while identifying and supporting individuals at risk is important, suicide prevention cannot take place only in health care settings. Instead, CNC folds suicide prevention activities intended for at-risk individuals and groups into broader community-integrated efforts.

The CNC emphasizes place-based approaches that have the granularity and flavor of their communities. Rural Colorado and urban Colorado are not the same. Early on, the CNC team sought to identify

natural leaders in each of the selected counties, looking for ways to bring their voices and guidance to defining shared implementation strategies and assuring their cultural fit. The team sought guidance from all sectors—and from the state and national levels, as well—to forge an authentic engagement that brings the best of the suicide prevention field to bear.

The CNC framework has three abiding qualities. It is: (1) a well-considered public health initiative that combines activities that fall within six complementary prevention pillars and are tuned to the needs of specific communities; (2) a real-world test that seeks to reinforce broadly applicable protective factors that can change life contexts and trajectories; and (3) a framework of collaborative processes that bring together local, state, and national partners to accomplish tasks that none could do alone.

By focusing upstream on population-level risk factors that precede suicides, attempted suicides, and other adverse outcomes, we anticipate that the CNC's activities will lead to decreases in deaths from other adverse outcomes that share risk factors with suicide, such as substance abuse. The ability for suicide prevention initiatives to positively impact related outcomes was evident, for example, in the U.S. Air Force suicide prevention program, which was associated with decreases in homicide, family violence, and accidental death (Knox et al., 2003). Given that many of the CNC pillars seek to change life trajectories by promoting healthy behaviors far upstream, it will be essential to measure intermediate outcomes (e.g., improved opportunities for connectedness) in addition to examining longer-term outcomes (e.g., suicide attempts and deaths).

A tremendous challenge to implementing a comprehensive approach to suicide prevention at the state or county level is securing enough funding to support a broad, multi-component effort. The CNC recognized in its earliest days that extensive funding would be needed to create a more fully realized, comprehensive suicide prevention framework, and understood the likelihood that no single source of support would be available to cover all costs. The CNC has been able to achieve this goal by blending funding from federal agencies and private foundations. Federal funding mechanisms tend to create silos reflecting agency priorities (e.g., violence, mental health, substance abuse). The same practices often extend to states and counties, perpetuating programmatic inflexibility.

To create a comprehensive framework, CNC identified ways to creatively weave together traditional funding streams, thereby allowing them to "work smarter." Several federal grants, including funding from the CDC's Comprehensive Suicide Prevention Program (CDC-RFA-CE20-2001) and SAMHSA's Garrett Lee Smith Program (SM-19-006), non-profit foundation support, and in-kind support from collaborative partners, under the leadership of CDPHE Office of Suicide Prevention and CNC partners, led to the combination of funding streams that allowed this project to advance. To address upstream social determinants of health requires that initiatives move outside of silos. The CNC must ensure that incoming funding is well-connected to CNC efforts and that the CNC publicizes upstream initiatives through its partners.

5. Conclusions

Can we assure that the CNC will lead to lower suicide rates in Colorado? Of course not. However, by organizing a unique collaborative effort—bringing people with diverse voices and perspectives into the same room, frankly appraising what has been effective in the past and applying those lessons locally, and closely monitoring process, implementation, and outcomes—we have embarked on an *intentional effort* (Caine, 2020) to save lives and assess successes and failures through concerted collective action. If the United States hopes to learn from such intentional efforts aimed at preventing suicide, it will require more state and local versions of the CNC, catalyzed and funded nationally, together with energy and further funding from ardent state and local champions.

Credit authors statement

Jerry Reed: Conceptualization, Funding Acquisition, Project Administration, Supervision, Writing, Reviewing and Editing, Writing, Original Draft, Why Colorado? Kristen Quinlan: Conceptualization, Writing, Original Draft, Pillars, Evaluation, Writing, Reviewing and Editing, Magdala Labre: Final Draft Writing, Original Draft, Preparation, Synthesis, Public Health Approach, Writing, Reviewing and Editing, Sarah Brummett: Methods, Why Colorado?, Why CNC? Writing, Original Draft, Writing, Reviewing and Editing, Eric Caine: Conceptualization, Project Administration, Funding Acquisition, Methods, Public Health Approach, Conclusion, Writing, Review and Editing, Why CNC?

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Oregon Alliance to Prevent Suicide-Data and Evaluation Committee Workplan (2021-2022)

Goal	Strategies	Activities/ Topics	Timeline	Who's Responsible	Results	
					Outputs	Outcomes
Educate Alliance Data & Evaluation Committee Members on extant data sources, research and analysis relevant to suicide prevention	Coordinate topical presentations or discussions to occur during meeting times on relevant topics	ESSENCE	ESSENCE Presentation scheduled for 3.4.21	Roger Brubaker	ESSENCE Presentation occurred 3.4.21	Committee will discuss novel analyses of ESSENCE data at meeting on 4.1.21
		Crisis And Transition Services (CATS) & System of Care Dashboard AFTER PRIORITIZING CONVERSTATIONS AROUND PERFORMANCE METRICS	CATS is about the dramatically change due to 988 updates. FALL?			
		Crisis Text Line				

Oregon
Department of
Education/SWIS
data

Do folks
have
contacts?
John will
have
insights as
he
proceeds
with metrics
group.
SWIS data
collected by
UO. Unsure
of utility for
this
committee.
May have
relevance
for
exclusionar
y practices
and
reducing
them.
School
Wide
Information
System.

**Follow
back up on
this later.**

Identify novel data elements and analyses of existing data sources to support the evaluation of the YSIPP/ASIPP		Oregon Healthy Teens/Student Wellness Survey				
		Suicide Trends in Oregon compared to the US or other similar regions	Colorado dashboard introduced by Elissa			
	Define and advocate for the creation of novel data elements or analyses of extant data sources	Training – Count of people trained in Big 6 - including workforce demographics	Metric 1 Date of Action		Measurement Definition Created, Advocacy Letter Drafted Etc.	What happened as a result of the output/did something change in systems or surveillance?
		Gatekeeper training tracking and evaluation - are these trainings being used and how?				
		ESSENCE	Analyses 1 Date of Action			

		Adi's Act- Count of schools with complete plans				
		Suicide Prevention Coalition Study				
		Stigma – Statewide survey idea 2018 Survey 2020 Survey				
		Clinical Intervention Efficacy				
		Youth Suicide Death Reporting Forms				