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# Systematic Review: Population and Community-based Interventions to Prevent Suicide

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**Prepared for:**

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Veterans Health Administration  
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**U.S. Department of Veterans Affairs**

Veterans Health Administration  
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## PREFACE

The VA Evidence Synthesis Program (ESP) was established in 2007 to provide timely and accurate syntheses of targeted health care topics of importance to clinicians, managers, and policymakers as they work to improve the health and health care of Veterans. These reports help:

- Develop clinical policies informed by evidence;
- Implement effective services to improve patient outcomes and to support VA clinical practice guidelines and performance measures; and
- Set the direction for future research to address gaps in clinical knowledge.

The program comprises three ESP Centers across the US and a Coordinating Center located in Portland, Oregon. Center Directors are VA clinicians and recognized leaders in the field of evidence synthesis with close ties to the AHRQ Evidence-based Practice Center Program and Cochrane Collaboration. The Coordinating Center was created to manage program operations, ensure methodological consistency and quality of products, and interface with stakeholders. To ensure responsiveness to the needs of decision-makers, the program is governed by a Steering Committee composed of health system leadership and researchers. The program solicits nominations for review topics several times a year via the [program website](#).

Comments on this evidence report are welcome and can be sent to Nicole Floyd, Deputy Director, ESP Coordinating Center at [Nicole.Floyd@va.gov](mailto:Nicole.Floyd@va.gov).

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## ACKNOWLEDGMENTS

This topic was developed in response to a nomination by the VA Health Services Research & Development (HSR&D) Office for an evidence review on community- and systems-level interventions and approaches for suicide prevention that could be adapted for use among US Veterans. The scope was further developed with input from the topic nominators (*ie*, Operational Partners), the ESP Coordinating Center, the review team, and the technical expert panel (TEP).

In designing the study questions and methodology at the outset of this report, the ESP consulted several technical and content experts. Broad expertise and perspectives were sought. Divergent and conflicting opinions are common and perceived as healthy scientific discourse that results in a thoughtful, relevant systematic review. Therefore, in the end, study questions, design, methodologic approaches, and/or conclusions do not necessarily represent the views of individual technical and content experts.

The authors gratefully acknowledge the following individuals for their contributions to this project:

### Operational Partners

Operational partners are system-level stakeholders who have requested the report to inform decision-making. They recommend Technical Expert Panel (TEP) participants; assure VA relevance; help develop and approve final project scope and timeframe for completion; provide feedback on draft report; and provide consultation on strategies for dissemination of the report to field and relevant groups.

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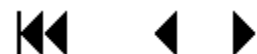
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### Technical Expert Panel (TEP)

To ensure robust, scientifically relevant work, the TEP guides topic refinement; provides input on key questions and eligibility criteria, advising on substantive issues or possibly overlooked areas of research; assures VA relevance; and provides feedback on work in progress. TEP members are listed below:

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### **Peer Reviewers**

The Coordinating Center sought input from external peer reviewers to review the draft report and provide feedback on the objectives, scope, methods used, perception of bias, and omitted evidence. Peer reviewers must disclose any relevant financial or non-financial conflicts of interest. Because of their unique clinical or content expertise, individuals with potential conflicts may be retained. The Coordinating Center and the ESP Center work to balance, manage, or mitigate any potential nonfinancial conflicts of interest identified.

## EXECUTIVE SUMMARY

### INTRODUCTION

Suicide is a national public health problem with 48,344 estimated United States (US) deaths in 2018, making it a top-10 leading cause of death.<sup>1</sup> Veterans are 1.5 times more likely to die by suicide than the general population, after adjusting for age and sex.<sup>2</sup> In 2018, Veterans represented 8% of the US adult population but accounted for 13.8% of suicide deaths.<sup>2</sup> Thus the Department of Veterans Affairs (VA) has made suicide prevention a top priority. Many VA initiatives focus on identifying and treating Veterans determined to be at elevated risk for suicidal behaviors. These initiatives include maintaining a Veterans Crisis line as well as preventions programs through the Veterans Health Administration (VHA), such as the Recovery Engagement and Coordination for Health – Veterans Enhanced Treatment (REACHVET) program, Caring Contacts to Veterans, yearly screenings for suicide risk, and hiring Suicide Prevention Coordinators at each Medical Center.<sup>3,4</sup> These VHA-specific initiatives may account for reduced suicide rates among Veterans who use VA health care compared with those who do not.<sup>5</sup> However, two-thirds of Veterans do not use the VA for health care. Community-based approaches to suicide prevention outside of VA health care settings may provide opportunities to reach Veterans. The *National Strategy for Suicide Prevention* released by the Office of the Surgeon General, the National Action Alliance for Suicide Prevention, VA's *National Suicide Prevention Strategy* and the President's Roadmap to Empower Veterans and End a National Tragedy of Suicide (PREVENTS) Executive Order all call for a public health approach to suicide prevention.<sup>6,7</sup> Population-based approaches targeting individuals across the spectrum of suicide risk may serve as adjunctive or complementary strategies to clinical interventions to help address this public health problem.

The purpose of this review was to examine the published literature on the effectiveness and harms of community-based or population-level strategies aimed at preventing suicide. We limited our review to studies conducted in non-health care settings and excluded studies that focused on pharmacologic treatments or psychotherapy. We addressed the following key questions: 1) What are the effects of population and community-based prevention interventions on suicide attempts and suicide deaths? 1a) What are the key/common components of the most effective interventions? 1b) What strategies have been used to deliver, sustain, and improve the quality of the most effective interventions? 1c) How do the effects vary by differences in community/setting and characteristics of individuals targeted? 2) What are the potential unintended consequences of population and community-based prevention interventions?

### METHODS

#### Data Sources and Searches

We searched MEDLINE, Embase, PsycINFO, Sociological Abstracts, and the Cochrane Database of Systematic Reviews from January 2010 to the end of November 2020 for references published in English-language. We used Medical Subject Headings (MeSH) and title/abstract terms indicative of suicide outcomes and community-based interventions. We reviewed reference lists of relevant systematic reviews.

## Study Selection

We included studies evaluating population and community-based interventions for suicide prevention in persons high-school age or older and reporting suicide attempts, suicide deaths, or possible unintended consequences, specifically suicide-related stigma or caregiver burden and switching means of suicide, when applicable. For interventions aimed at reducing access to lethal means, we included studies reporting on switching means or location of suicide as an unintended consequence. We included studies conducted in the general community, workplace, schools, military organizations, prisons, or suicide hotspots. We included randomized controlled trials (RCTs), observational studies with concurrent controls, or pre- post-intervention studies conducted in countries with a Very High Human Developmental Index. Studies were screened in DistillerSR (Evidence Partners Inc, Ottawa, Canada).

## Data Abstraction and Quality Assessment

We used the Cochrane Risk of Bias 1.0 instrument to assess the quality of RCTs.<sup>8</sup> Cluster RCTs were assessed with several additional domains. Observational studies were assessed for quality using a modified version of the Joanna Briggs Institute Critical Appraisal Tool for Quasi-Experimental Studies.<sup>9</sup> The overall risk of bias (ROB) of each RCT and observational study was classified as high, moderate, or low.

We abstracted information on study characteristics, participants, setting, intervention, control, and outcomes for eligible studies rated low or moderate ROB. Data from studies rated as high ROB were not further abstracted as they are unlikely to provide reliable information. We abstracted data on the following outcomes: suicide attempts, suicide deaths, caregiver burden, suicide-related stigma, switching suicide means, and cost. From the studies that found an intervention to be effective, we abstracted strategies to deliver, sustain, and improve the intervention. For this purpose, effectiveness was defined as reducing suicide deaths or attempts based on at least low certainty of evidence.

For each intervention and setting, we used the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) framework to rate the certainty of evidence (COE) as high, moderate, low, or very low for the outcomes of suicide deaths, suicide attempts, and suicide-related stigma.<sup>10</sup> For the studies that evaluated reducing access to lethal means, we rated the certainty for the outcome of switching suicide methods. We used a non-contextualized approach to make judgements about imprecision and reported if interventions led to a decrease (or increase) in suicides based on the point estimate. We did not derive thresholds or make judgments on magnitude of effect to determine clinical importance. When our overall COE across studies was deemed to be very low, we concluded that the effects were uncertain.

## Data Synthesis and Analysis

We used the Center for Disease Control and Prevention's (CDC) guidebook *Preventing Suicide: A Technical Package of Policy, Programs, and Practices* to group interventions into suicide prevention approaches modifications as outlined in Table 1 below.<sup>11</sup> Findings were narratively summarized across studies due to the heterogeneity in populations, interventions, settings, and outcomes. Data were analyzed in Comprehensive Meta-Analysis version 3 (Biostat).

## RESULTS

### Results of Literature Search

Our literature search yielded 4,499 citations after removing duplicates. We excluded 3,844 citations when reviewing titles and abstracts. From hand-searching, we added 37 articles, leaving 692 for full-text review. We excluded 623 articles for the following reasons: no eligible outcomes (N=271); ineligible intervention (N=180); ineligible study design (N=119); ineligible population (N=39); ineligible setting (N=11); and not published in English (N=3). Sixty-nine articles met eligibility criteria and 13 were rated as high ROB studies. Ultimately, we included 56 publications that described 47 unique studies.

### Summary of Results by Key Questions

*What are the effects of population and community-based prevention interventions on suicide attempts and suicide deaths? (KQ1) How do the effects vary by differences in community/setting and characteristics of individuals targeted? (KQ1c)*

#### *Housing stabilization programs*

Among Veterans, housing stabilization programs had unclear effects on suicide deaths and attempts. Our conclusions are based on observational study with concurrent control (rated as medium ROB) that evaluated the VHA Homeless Program, consisting of in-depth assessment for homeless services, emergency housing services, rapid rehousing and homelessness prevention, and permanent supportive housing, and transitional housing.<sup>12</sup> Overall COE was very low.

#### *Reducing access to lethal means*

Based on studies from Asia, restricting access to purchasing charcoal at retail stores may reduce suicides by self-immolation without any substitution effects (*ie*, increased suicides by other means). There was no data on suicide attempts. At bridges and railway stations, installing barriers may reduce suicide deaths and attempts at those locations. It is uncertain whether installing blue lights at railway platforms reduces suicide deaths and there was no data on attempts. Our conclusions are based on 11 observational studies (8 medium ROB, 3 low ROB) of reducing access to lethal means: 3 studies to reduce access to charcoal,<sup>13-15</sup> 7 studies of barrier installation at suicide hot spots,<sup>16-23</sup> and 1 study of blue light installation on a railway platform.<sup>24-26</sup> Overall COE was low to very low.

#### *Organizational policies and culture*

In police workplace settings, suicide prevention programs focused on organizational policies and culture may reduce suicide deaths. There was no data on suicide attempts. In construction workplace settings and military workplace settings (US Air Force and Israeli Defense Forces), the effects of organizational policies and workplace culture on suicide deaths are uncertain. There was no data on suicide attempts. Our conclusions are based on 4 observational studies (rated as medium ROB).<sup>27-30</sup> The intervention implemented in the police workplace setting in Montreal was referred to as “Together for Life” and in the construction workplace setting (Australia) was called “Mates in Construction.” The COE was low to very low.

*Social-emotional learning programs*

Social-emotional learning programs probably reduce suicide attempts in high school students over a follow up period of 3-12 months, but it is uncertain what effect they have on suicide deaths. Our conclusion is based on 2 RCTs (medium ROB) in high school settings that tested the following interventions: Youth Aware of Mental Health Programme (Europe) and Signs of Suicide (US).<sup>31,32</sup> The COE was moderate for suicide attempts and very low for suicide deaths. In addition, an RCT (medium ROB) evaluated the Contact+Connect program in construction workers in Australia.<sup>33</sup> However, the authors measured suicide attempts using a Likert Scale in response to the question “Have you tried to kill yourself in the past months?” (strongly agree to strongly disagree), and thus the data were not usable for our analysis.

*Gatekeeper training*

In high school students, the effect of gatekeeper training on suicide deaths is uncertain but gatekeeper training may reduce suicide attempts. In youths and young adults, the effect of the Garrett Lee Smith (GLS) program on suicide deaths (at 4 years) or suicide attempts (at 2 years) is uncertain. In an indigenous community, the effect of gatekeeper training on suicide deaths and attempts is uncertain. These conclusions were based on 1 RCT targeting high school adolescents (Europe), 1 RCT in an indigenous Canadian community which tested the Applied Suicide Intervention Skills Training (ASIST) program, and 1 observational study targeting youths and young adults evaluating the GLS program in the US.<sup>32,34-37</sup> Both RCTs were rated as medium ROB. The observational study was low ROB. The COE was low for suicide attempts and very low for suicide deaths in the study in high school students. The COE was very low for suicide deaths and attempts in both the study of indigenous Canadians and the GLS Program.

*Crisis intervention*

On non-pedestrian bridges, the effect of installing crisis phones (connecting individuals to suicide prevention specialists) on suicides is uncertain and there was no data on suicide attempts. This intervention was only informed by 1 pre-post observational study (US) with no concurrent control (medium ROB).<sup>38</sup> The COE was very low.

*Public awareness and education campaign*

The effect of a public awareness and education campaign on suicides is uncertain and there was no data on suicide attempts. Two observational studies (rated medium and low ROB) evaluated the effect of public awareness and education campaigns in Austria and Japan, respectively.<sup>39,40</sup> The interventions consisted of billboards with positive messages and crisis hotline numbers or pamphlets encouraging help-seeking behavior and telephone numbers for consultations. The COE was very low.

*Screening for at-risk individuals (in a non-health care setting)*

Community-based screening interventions for depression may reduce suicide deaths. There was no data on suicide attempts. In high school students, the effect of a suicide screening intervention is uncertain as no suicide deaths occurred during the 1-year study period. However, screening may reduce suicide attempts among high school students. In prisoners, the effect of a suicide screening intervention is uncertain and there was no data on suicide attempts. These conclusions are based on 4 studies (medium ROB) evaluating individuals at-risk for suicide in non-clinical



settings: 1 cluster RCT conducted in Europe targeted adolescent students,<sup>32</sup> 2 community-based observational studies conducted in Japan,<sup>41,42</sup> and 1 observational study of a German detention center with men.<sup>43</sup> The COE ranged from low to very low.

We found no studies that evaluated the following suicide prevention strategies listed in the CDC's technical package as stand-alone interventions: household financial security, community-based policies to reduce alcohol use, peer norm programs, community engagement activities, and parenting skills and family relationship approaches.<sup>11</sup> We note below the results from multi-strategy suicide prevention programs and their specific components.

### *Multi-strategy suicide prevention interventions*

Fifteen studies, organized by the country in which they were tested, evaluated multi-strategy suicide prevention interventions.<sup>44-60</sup>

In Europe, community-based, multi-strategy suicide prevention programs may reduce suicide deaths. The effect on suicide attempts is uncertain. Conclusions were based on 4 observational studies (3 medium ROB and 1 low ROB) evaluating the intervention referred to as the European Alliance Against Depression.<sup>45-48</sup> Components of the European Alliance Against Depression included cooperation with primary care physicians, public relations campaigns, community facilitators, support for high risk groups, and reducing access to lethal means. The COE was low for suicide deaths and very low for suicide attempts.

In Asia, the effect of community-based, multi-strategy suicide prevention programs on suicide deaths or suicide attempts is uncertain. This conclusion was based on based on 8 observational studies (5 medium ROB and 3 low ROB) conducted in Hong Kong, South Korea, Taiwan, or Japan.<sup>49-55,58,59</sup> Studies targeted both rural areas and highly populated areas and evaluated activities developed by national centers and programs for suicide prevention. The COE across these studies was very low.

In New Zealand, 1 cluster RCT (Multi-level Intervention for Suicide Prevention in New Zealand [MISP-NZ]) found that a multi-strategy prevention program may increase suicide deaths.<sup>44</sup> There was no data on suicide attempts. Intervention components included gatekeeper training for lay persons and professionals to recognize suicide risk factors, media reporting on suicide using best practices, distribution of print material and information on web-based resources, workshops on mental health topics, and community events. The overall COE was low.

In Australia, the effect of a locally targeted, community-based, multi-strategy suicide prevention program on suicides was uncertain. This was based on 1 observational study with concurrent control (rated medium ROB).<sup>60</sup> The intervention components included: community and professional education activities; crisis intervention, treatment and referral support; counseling and personal development initiatives; and health promotion initiatives. The COE was very low.

In Australia (at a suicide hotspot), the effect of a multi-strategy intervention on suicide deaths is uncertain and there was no data on suicide attempts. This was based on 1 pre-post study (medium ROB) evaluating a comprehensive intervention at Gap Park in Sydney,<sup>56,57</sup> a recognized location for suicides. The intervention components included building a 130 cm fence along the cliff tops, installing 2 crisis telephones, 2 signs to encourage help-seeking, cameras to

monitor the area, and changing the landscaping to increase the probability that suicidal persons would be seen prior to jumping. The COE was very low.

*What are the key/common components of the most effective interventions? (KQ1a)*

Most multi-strategy interventions failed to show a benefit or were found to have insufficient evidence. For multi-strategy interventions with evidence of effectiveness, we were unable to determine the key or common components because authors often provided limited information on the individual components or provided insufficient information to assess specific contributions of components.

*What strategies have been used to deliver, sustain, and improve the quality of the most effective interventions? (KQ1b)*

The following interventions had the strongest evidence of effectiveness in reducing suicide deaths: reducing access to lethal means, implementing programs that influence organizational policies and culture in police workplace settings, screening for depression in the community, and the multi-strategy intervention called the European Alliance Against Depression. Additionally, in high school settings, social-emotional learning programs, suicide screening, and gatekeeper training may be effective strategies for reducing suicide attempts. Across these studies, the strategies to delivering effective interventions included using peer support to deliver the intervention, providing in-person training, and distributing a procedure manual on how to implement the program. To sustain effective suicide prevention programs, a key strategy included engaging stakeholders to determine potential challenges to implementation and other factors (eg, costs, community acceptance, resource allocation, number of people that can be reached with the program). Strategies to improve the quality of the program were not evaluated.

*What are the potential unintended consequences of population and community-based prevention interventions? (KQ2)*

Possible unintended consequences included increased suicide, suicide-related stigma, caregiver burden, and switching suicide means, when applicable. Based on 3 medium ROB studies (2 RCTs in young adults and 1 observational study at an addiction center), social-emotional learning programs may reduce stigma towards suicide at 1 month in individuals targeted for these interventions.<sup>61-63</sup> For gatekeeper training, 1 RCT in social work students and 1 pre-post observational study in rural Australian communities found no differences on attitudes and stigma between those who received gatekeeper training versus control.<sup>64,65</sup> No studies reported on caregiver burden. In studies that evaluated switching suicide means, restricting access to charcoal may not result in switching to other means of suicide and is uncertain for installation of barriers at bridges or blue lights at railway stations. One RCT evaluating a community-based, multi-strategy suicide prevention program in New Zealand demonstrated an increase in suicides.<sup>44</sup>

## DISCUSSION

Using the CDC framework of community-based approaches to suicide prevention, we found that reducing access to lethal means, implementing programs that influence organizational policies and culture in police workplace settings, and screening for depression in the community may reduce suicide deaths. We found uncertain or no evidence for reducing suicide deaths for other interventions as standalone interventions, including public awareness and education campaigns,

crisis hotlines, and gatekeeper training. In high school students, social-emotional learning programs, gatekeeper training, and screening may reduce suicide attempts but had uncertain effects on suicide deaths. Additionally, we found inconsistent results for comprehensive, multi-strategy interventions. We found an increase in suicides after implementation of a multi-strategy intervention in New Zealand but found a decrease in suicides associated with the European Alliance Against Depression Program.

Our report builds on a 2009 VA-ESP report.<sup>66</sup> These authors focused on suicide prevention strategies among Veterans or military personnel and evaluated: educational awareness programs, screening for high-risk individuals, pharmacotherapy, psychotherapy, restriction of means, media reporting, and multi-component interventions (eg, the US Air Force). They summarized evidence from 1966-2008 and concluded that multi-component interventions in military personnel may reduce suicide risk. They also concluded that restriction of access to lethal means may reduce cause-specific suicides, although its effect on total suicides was less clear. The authors found insufficient data about community-based suicide prevention interventions and no studies assessing hotlines, outreach programs, peer counseling, treatment coordination programs, and new counseling programs.

Our inability to determine effective components of multi-strategy interventions limits the ability to adapt or implement them among Veterans or in other settings. It is unclear why interventions that combine multiple strategies into comprehensive programs showed inconsistent results. One possible explanation is that it is important to target specific populations or settings and use tailored interventions. For example, the “Together for Life” Program targeting the police workplace and the Signs of Suicide or Youth Awareness of Mental Health program targeting high school students were associated with reductions in suicide deaths or attempts.<sup>27,31,32</sup> Another possible explanation is that multi-strategy programs are arguably more complex and the fidelity of the individual strategies was not clear.

## Limitations and Future Research

An important limitation of the evidence is the methodological quality of the eligible studies. Drawing conclusions from these studies was challenging due to lack of adequate adjustment for temporal trends in suicide rates or differences between intervention and comparison communities in terms of socioeconomic characteristics and access to lethal means, both of which have been associated with suicide risk.<sup>67</sup> Additional limitations included the scarcity of evidence for some interventions, lack of detail on the specific elements of each intervention, and limited data on implementation, resource use, or cost. Additionally, we did not find studies that examined the applicability or adaptability of an intervention from 1 setting to another. Few studies examined implementation-related outcomes and thus it is not possible to determine if wider implementation of the included interventions would result in positive outcomes. Higher-quality studies using RCT trial designs may not be feasible for all community- or population-based intervention but could be conducted in organizational workplaces, schools, or other communities. In the absence of RCTs, observational studies with concurrent control groups and adequate adjustment for confounding would provide useful information. Because suicide is rare, having adequate follow-up and sample size is important. Evidence quality would be enhanced by using standardized descriptions of the interventions. More complete intervention descriptions would facilitate replication or evaluation of effective programs. For multi-strategy interventions, a clearer framework to justify and describe the components is needed, as well as an attempt to evaluate

individual components. More evidence is needed to see if the success of suicide interventions is population-specific and if specific combinations of interventions are more successful than others. Finally, studies examining interventions' acceptability, feasibility, effectiveness, and sustainability in US Veterans are needed, particularly those targeting suicide means relevant to Veterans, such as firearms, poisoning, and suffocation.

### **Applicability to Veterans**

Only 1 study targeted Veterans.<sup>12</sup> It provided unclear evidence regarding the effect of housing stabilization programs. Studies of interventions influencing organizational policies were conducted in the US Air Force and the Israeli Defense Forces,<sup>28,29</sup> but these may not be directly applicable to Veterans. In addition, while community-based programs to restrict the purchase of charcoal at retail stores may reduce self-immolation, this is not a common method of suicide in the US, where the top 3 suicide methods in 2018 were firearms, suffocation, and poisoning.<sup>68</sup> Utilizing peers with shared experiences may be an effective strategy to deliver a suicide prevention program for Veterans.

### **Conclusions**

Community-based interventions that may reduce suicide deaths include reducing access to lethal means, implementing organizational policies in workplace settings, and screening for depression. It is uncertain if housing stabilization programs, public awareness and education campaigns, crisis hotlines, and gatekeeper training prevent suicide. Evidence was inconsistent for community-based, multi-strategy interventions. The most promising multi-strategy intervention was the European Alliance Against Depression. In high school populations, social-emotional learning programs, gatekeeper training, and screening for at-risk may reduce suicide attempts; however, it is unclear if these interventions reduce suicides. Future studies using randomized designs or observational studies with concurrent controls and appropriate adjustment are needed. Studies are needed to determine which interventions and combinations would be most effective and feasible for US Veterans. Until then, community-based approaches to suicide prevention outside of VA health care settings may provide additional opportunities to prevent suicide among Veterans.

**Table 1. Overview of Study Outcomes by CDC Strategy and Approach\***

Primary CDC Strategy	Approach	Settings and Outcomes													
		Hot spots		General Community		Workplace		High School		Military or Veteran		Indigenous Community		Prison	
		SD	SA	SD	SA	SD	SA	SD	SA	SD	SA	SD	SA	SD	SA
Strengthen economic supports	<i>Household financial security</i>														
	<i>Housing stabilization</i>									<input type="checkbox"/>	<input type="checkbox"/>				
Strengthen access and delivery of suicide care	<i>Coverage of mental health conditions in health insurance policies</i>	Excluded from the current review. This strategy takes place within health care settings.													
	<i>Reduce provider shortages in underserved areas</i>														
	<i>Safer suicide care through systems change</i>														
Create protective environments	<i>Reduce access to lethal means</i>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="radio"/> <input type="radio"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="radio"/>											
	<i>Organizational policies and culture</i>					<input type="checkbox"/> <input type="radio"/>				<input type="radio"/> <input type="radio"/>					
	<i>Community-based policies to reduce alcohol use</i>														
Promote connectedness	<i>Peer norm programs</i>														

Primary CDC Strategy	Approach	Settings and Outcomes													
		Hot spots		General Community		Workplace		High School		Military or Veteran		Indigenous Community		Prison	
		SD	SA	SD	SA	SD	SA	SD	SA	SD	SA	SD	SA	SD	SA
	<i>Community engagement activities</i>														
Teach coping and problem-solving skills	<i>Social-emotional learning programs</i>						◇	◇	◇◇						
	<i>Parenting skills and family relationship approaches</i>														
Identify and support people at risk	<i>Gatekeeper training</i>			□	□			◇	◇			◇	◇		
	<i>Crisis intervention</i>	○													
	<i>Public awareness and education campaigns</i>			□	○										
	<i>Screening for at-risk (not in clinic setting)</i>			□□				◇	◇					□	
	<i>Treatment for people at risk of suicide</i>	Excluded from the current review. These approaches relate to clinical interventions.													
	<i>Treatment to prevent re-attempts</i>														
Lessen harms and prevent future risk	<i>Postvention</i>	Excluded from the current review. These approaches relate to interventions delivered after a suicide has occurred.													
	<i>Safe reporting and message about suicide</i>														

Primary CDC Strategy	Approach	Settings and Outcomes													
		Hot spots		General Community		Workplace		High School		Military or Veteran		Indigenous Community		Prison	
		SD	SA	SD	SA	SD	SA	SD	SA	SD	SA	SD	SA	SD	SA
Multiple Strategies	Varied	○		◇ □□□ □□□ □ ○○○ ○○○	<u>□□□</u>										

CDC=Centers for Disease Control and Prevention; SD=Suicide Deaths; SA=Suicide Attempts

- ◇=randomized controlled trial
- =observational study with concurrent control
- =observational study with pre-post study design and no concurrent control
- \_ =study reported both suicide deaths and suicide attempts

\*This framework was modified to remove the following CDC suicide prevention approaches: coverage of mental health conditions in health insurance policies, reduce provider shortages in underserved areas, safer suicide care through systems change, treatment of people at risk of suicide treatment to prevent re-attempts, postvention, and safe reporting and message about suicide. The following 2 interventions were added to the framework: public awareness and education campaigns and screening for at-risk (not in clinic setting).

