

Suicide Later in Life

Challenges and Priorities for Prevention

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Suicide in later life is a major public health concern in the U.S., where more than 6,000 older adults take their own lives every year. Suicide prevention in this age group is made challenging by the high lethality of older adults' suicidal behavior; few survive their first attempt to harm themselves. Research has revealed that factors in each of five domains place older adults at increased risk for suicide—psychiatric illness, personality traits and coping styles, medical illness, life stressors and social disconnectedness, and functional impairment. Little research has examined the effectiveness of interventions to reduce the toll of suicide in older adulthood.

The study of strategies to decrease suicide deaths in later life should emphasize four areas. First is approaches to early detection of older people at risk through improved understanding of multi-dimensional determinants and their interactions. Second is research on the impact of general health promotion that optimizes well-being and independent functioning for older adults on suicide outcomes. Third concerns the study of approaches to the provision of mental health care that is evidence-based, accessible, affordable, acceptable, and integrated with other aspects of care. The fourth area of high priority for research is approaches to improvement of social connectedness and its impact on suicide in older adults.

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Introduction

Although rates of suicide among older adults, as in other groups, vary over time and place, they have historically been among the highest of any age group, particularly for older men both in the U.S.¹ (Figure 1) and worldwide. In 2011, the first wave of 75 million people born in the years 1946–1964 (the “baby boom” cohort) reached age 65 years. Demographers estimate that by 2030, more than 71 million Americans will be aged 65 years and older, or 20% of the population.² In some regions of the world, rates of late-life suicide have decreased in recent years; however, the expanding population of elders raises the possibility that the absolute number of older adults who will die by suicide in coming decades will rise. An aggressive and comprehensive strategy for preventing late-life suicide is indicated.

Developed as a resource for the National Action Alliance for Suicide Prevention's (Action Alliance) Research Prioritization Task Force (RPTF), this paper

addresses Aspirational Goal 11—to identify clear targets for intervention through better understanding of risk and protective factors. Its focus is on suicide prevention in later life. Emphasizing a public health perspective, the following sections provide an overview of current knowledge concerning factors that increase and mitigate risk for suicide in older people.

On that basis, the paper then outlines priorities for prevention research and programming at the individual, service system, and community levels. Ultimately, the most effective prevention approach to reducing late-life suicides will be one that incorporates evidence-based suicide preventive interventions of a variety of types across settings in which older adults live their lives.

Current Knowledge

Pre-Intervention Research

An extensive body of research conducted worldwide has examined factors associated with risk for suicide in older adults. As this literature is too large to review here, the reader is referred to recent publications for background.^{3,4} Figure 2 depicts a framework, adapted from Blumethal and Kupfer,⁵ which serves as a useful means with which to organize current knowledge about risk factors for late-life suicide into five domains or “axes.”

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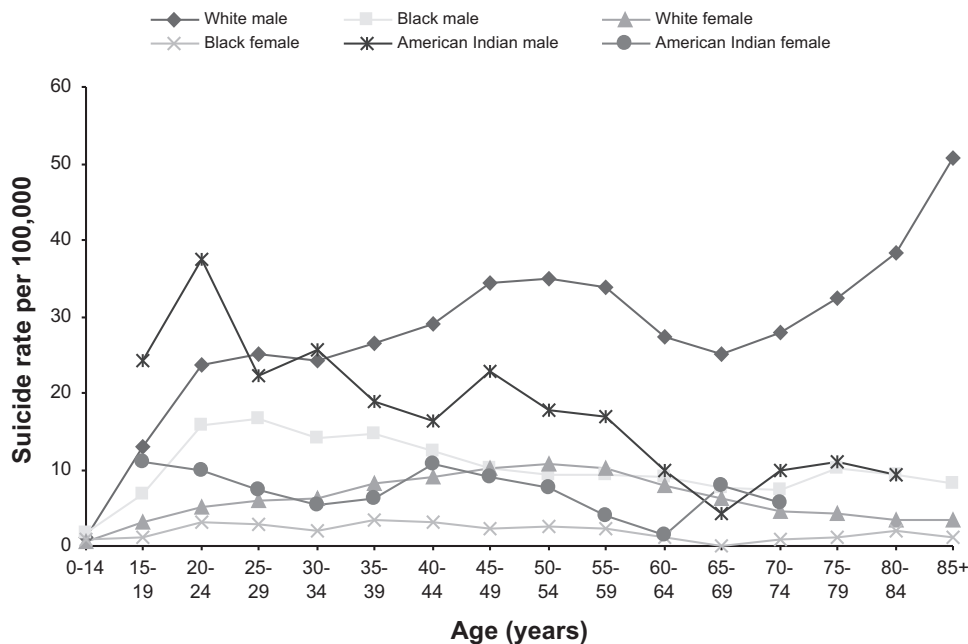


Figure 1. Rates of suicide by age, sex, and race, U.S., 2010
 From the CDC, Web-based Injury Statistics Query and Reporting System (WISQARS), cdc.gov/injury/wisqars/index.htm.

Axis 1: major psychiatric illness. Carefully conducted psychological autopsy studies indicate that major affective illness is the factor associated with the highest population-attributable risk for suicide in later life. Other Axis 1 conditions linked to older adult suicide in some (but not all) controlled studies include non-affective psychoses, anxiety disorders, and substance use disorders. The evidence for association with dementia is weak.

Axis 2: personality traits. Although personality disorder diagnosis has not been extensively examined, personality traits of neuroticism, rigid coping, and anxious and obsessive features have been repeatedly linked to late-life suicide as well.

Axis 3: physical illness. Physical conditions including malignancies and diseases of the cardiovascular,

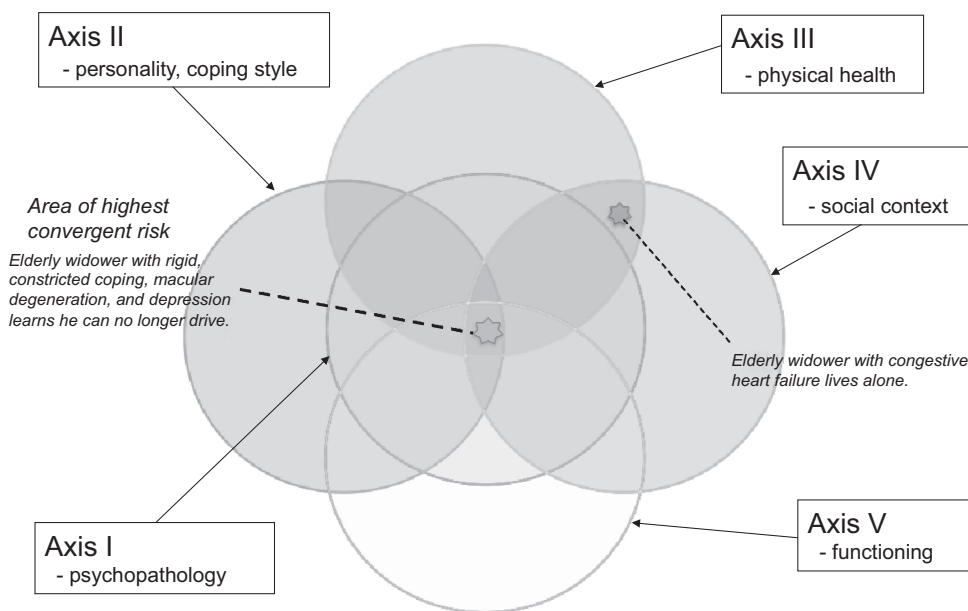


Figure 2. Axes of risk for suicide in older adults

Table 1. Driver diagram—research priorities for development and testing of late-life suicide preventive interventions

Primary outcome	Primary drivers	Secondary drivers		
		Individual	Service system	Community
Decrease suicide in older adults	1. Early detection of older adults with depression at risk for suicide owing to other more distal factors	<ol style="list-style-type: none"> 1. Identify cognitive vulnerabilities associated with impaired decision making 2. Identify family-, neighborhood-, and community-level risk and protective factors 3. Understand relative risk associated with combinations and sequences of risk factors 	<ol style="list-style-type: none"> 1. Systematic, multidimensional screening in PC 2. Risk stratification with multiple factors from all levels 	<ol style="list-style-type: none"> 1. Gatekeeper training
	2. General health promotion to minimize physical and mental morbidity and optimize functioning	<ol style="list-style-type: none"> 1. Empowerment of patients and families as partners in care 2. Provision of routine preventive care 3. Promotion of healthy behaviors 	<ol style="list-style-type: none"> 1. Use of in-home technologies (e.g., remote monitoring) to support patient/family engagement in care 2. Access to rehabilitation services 3. Aggressive pain control 4. Access to quality palliative and end-of-life care 	<ol style="list-style-type: none"> 1. Education about, and promotion of, healthy behaviors 2. Elder-friendly communities 3. Access to community-based long-term-care services and supports to optimize independent functioning
	3. Provide MH care that is evidence-based accessible affordable acceptable fully integrated with PC and community services and supports	<ol style="list-style-type: none"> 1. Education of patients, families, and providers about benefits of treatment of mental disorders 2. Tailor treatments to patient preferences 	<ol style="list-style-type: none"> 1. Collaborative, stepped care approaches to PC-based MH care 2. Use of evidence-based care transitions interventions—hospital to home, rehabilitation, residential care 3. Integration of PC, MH, and community-based aging services 	<ol style="list-style-type: none"> 1. Implementation of parity laws 2. Other payment system reforms to ensure affordable, high-quality MH care
	4. Increase social connectedness	<ol style="list-style-type: none"> 1. Psychosocial interventions to increase social networks and supports (e.g., IPT, PST) 2. Adaptation of interventions to address family-level dysfunction and adaptation to challenges of aging 	<ol style="list-style-type: none"> 1. Link aging services network agencies to healthcare delivery systems for coordination of care 	<ol style="list-style-type: none"> 1. Volunteer opportunities for older adults (RSVP) 2. Congregate living opportunities (NORCs) 3. Adaptation and dissemination of information and communication technologies to support social networking for homebound elders

IPT, interpersonal therapy; MH, mental health; NORC, naturally occurring retirement community; PC, primary care; PST, problem-solving therapy; RSVP, Retired & Senior Volunteer Program

pulmonary, gastrointestinal, and central nervous systems have been implicated. Chronic pain syndromes also are associated with increased risk of suicide.

Axis 4: social context. Stressors common to later life such as family discord, social isolation, and bereavement

distinguish older adults suicides from controls in numerous studies. All share the common themes of social and psychological disconnectedness.

Axis 5: functioning. The relationships between physical illness, mental disorders, social context, and impaired

functioning are complex. It is clear, however, that each may result in disability, and that disability is in turn associated with suicide in later life.

The fact that suicide is associated with risk factors on multiple axes implies that if we are able to reduce risk factors on any one, we may be able to alter an individual's trajectory toward death. Each of these factors alone, however, has insufficient predictive power to be useful in identifying a person at risk for suicide. Almost no studies to date have included sample sizes large enough to examine risk and protective factors in multivariate models, limiting our understanding of the role played by each. Although study of individual variables in each domain must go on, equally or more important will be studies adequately powered to test hypotheses about how combinations of factors within and across axes influence suicide risk. Research is needed to test interactions commonly found in older adults, such as those depicted in Figure 2.

Although numerous studies over the past decade have raised intriguing questions about the neurobiological basis of suicidal behavior,⁶ little work has focused specifically on older adults. Isolated findings using structural neuroimaging and cognitive testing require further study. Promising work by Dombrovski and colleagues⁷ has highlighted the potential importance of neurocognitive deficits, suggesting that older adults who attempt suicide overemphasize present reward/punishment contingencies to the exclusion of past experiences.

Aging-related neurobiological processes, possibly superimposed on innate (e.g., affect regulation deficits) or acquired (e.g., stress axis abnormalities due to early life trauma) vulnerabilities may contribute to the dramatic rise in rates of suicide with age for both men and women worldwide.⁸ Studies of the neural circuitry governing affect and aggression, and the changes that they are likely to undergo with aging, are particularly important to pursue.

In addition, research that combines functional neuroimaging with neurocognitive studies of decision-making processes is a promising avenue by which to elucidate who in later life is at risk for becoming suicidal in the face of stressors, and by what basic neurobiological mechanism.⁹ At this stage, however, these lines of research do not translate directly to the design or implementation of prevention strategies.

Preventive Intervention Research

Although evidence has accumulated about risk and protective factors, relatively little research has examined translation of that knowledge into preventive

interventions for which the specific target is late life suicidal ideation and behavior (review published elsewhere^{3,4}). Notable exceptions include tests of primary care-based, collaborative depression care management interventions in the U.S.,^{10,11} a community-based program to provide in-home support for isolated, frail elders in Italy,¹² and multilevel interventions in rural Japan that incorporated systematic depression screening and clinical referral with patient education and community-based services and supports.¹³ Although all these studies provide indications of effectiveness, each has methodologic limitations and additional research is needed.

The paucity of preventive interventions research in late-life suicide prevention is due to several barriers. One barrier to progress in developing effective approaches to detection of older people at increased risk for suicide is our inability to reliably measure, and make nuanced distinctions between, ideation that is indicative of suicide risk and thoughts of death that are a normal aspect of aging.¹⁴ Insufficient research has addressed this issue, yet it is important for several reasons. If research uses imprecise outcome measures (e.g., conflating normal and pathologic thoughts of death), results will be less likely to find meaningful solutions and be of limited relevance to the study of completed suicide. Furthermore, they may lead to diversion of precious prevention resources to interventions where none are warranted, with costs both for the older person and society.

Additionally, suicide has a low base rate and, unlike at younger ages when relatively higher rates of suicidal ideation and attempts make them potentially useful proxies for suicide in treatment and outcomes research, at older ages, rates of ideation and attempts are also very low. Studies estimate that there are as many as 200 attempts for each completed suicide in some adolescent and young adult samples, and a ratio of perhaps 20 attempts that come to medical attention for each suicide in the general population. In later life, however, there are as few as 2–4 attempts for each suicide death.⁴

The greater lethality of suicidal behavior in later life may be accounted for in part by the greater frailty of older adults who, therefore, may be more likely to die with any self-injurious act. Second, older adults in suicidal crises tend to be more isolated than younger people in our society, making them less subject to rescue or detection by others as being at risk. Importantly, older adults tend to use more immediately lethal means than younger people to take their own lives. In 2010 in the U.S., 46.7% of suicides among those under age 65 years were by firearm compared to 71.4% of older adults.¹

These observations have important implications for setting priorities for preventive interventions research. Because recognition of the suicidal state and prevention

of suicide death are more difficult in older adults, the most effective interventions are likely to be those that target individuals and groups with characteristics that place them at risk, but prior to the development of suicidal states (selective preventive intervention; e.g., social connections for those isolated by disability), or entire populations irrespective of any individual's or subgroup's risk status (universal preventive intervention; e.g., restriction of access to lethal means.)

When considered in this light, many interventions shown effective at reducing outcomes known to be “distal” risk factors for suicide (those factors that have remote or indirect causal influence on suicide, such as physical illness or social isolation) are likely to be important elements of the late-life suicide prevention armamentarium. However, they have not been tested with regard to impact on suicidal ideation or behavior per se. For example, optimal management of chronic pain or engagement of older adults in social networks may be potent selective suicide-preventive interventions, but data are lacking to test such hypotheses. Large-scale studies of interventions that address distal risk factors for suicide should be encouraged to include more “proximal” outcome measures (e.g., suicidal ideation, death ideation, hopelessness) as well, to demonstrate their relevance to comprehensive late-life suicide prevention (see Knox et al.¹⁵ for a discussion of application of the public health approach to suicide prevention).

Mental health settings are far less salient to suicide prevention in older adults than in younger and middle-aged populations.¹⁶ Rather, emphasis must be on other settings where older adults receive care who may develop suicidal states as a result of being depressed, medically ill or disabled, or socially disconnected. These venues include primary and specialty medical care, pharmacies, home health care, and aging services network agencies that provide community-based long-term services and supports. All serve potentially important roles in the detection of older adults at risk of suicide and implementation of preventive interventions.

A Framework for Preventive Interventions Research

Table 1 specifies a framework with which to establish priorities for research on preventive interventions. The proposed target interventions for study are based on the special considerations required for late-life suicide prevention, existing knowledge and promising early research findings on factors that place older adults at risk for suicide on each of the five axes, and lessons learned from intervention studies conducted to date that have targeted suicidal ideation and behavior in later life.

The framework takes the form of a driver diagram—a device used to conceptualize an issue, determine its system components, and thereby create a pathway to achieve a desired outcome. Driver diagrams are particularly useful in situations in which the desired outcome is relatively farther “downstream” from the point of intervention, and is difficult to measure, as for late-life suicide.

The “primary outcome” in our driver diagram is a reduction in suicide among older adults. “Primary drivers” represent the first-level objectives to be addressed in order to reach that outcome. Each primary driver is associated with a series of activities that must be undertaken to reach the objective; these activities are called “secondary drivers.” Because suicide prevention activities can take place at multiple levels of organization, we specify secondary drivers as occurring at the individual, service system, and community levels. The driver diagram for reduction in late-life suicide delineates four primary drivers, each of which is linked with five to ten secondary drivers according to the existing knowledge and knowledge gaps referenced above and reviewed in detail elsewhere.^{3,4} These drivers should be the subject of research.

Early Detection

The first primary driver of reduced suicide deaths in later life is early detection of individuals at risk and therefore is linked explicitly to the factors on all axes depicted in Figure 2. We emphasize detection of older adults with depression (Axis 1) because of the well-demonstrated and close association of mood disorders and late-life suicide. However, as not all older adults who die by suicide are clinically depressed, and because the predictive value of a depression diagnosis alone is low, additional research is needed on assessment of risk factors on each of the other four axes, and their interactions, in detecting who requires intervention.

Secondary drivers leading to early detection then can be conceptualized at the individual, service system, and community levels. At the individual level, priorities for research should be placed on studies of (1) cognitive vulnerabilities associated with impaired decision making; (2) family-, neighborhood-, and community-level risks and protective factors influencing detection of the individual; and (3) the relative risk associated with a combination or sequence of risk factors—the areas of overlap depicted in Figure 2.

At the service system level of improved early detection, secondary drivers for study include (1) systematic multi-dimensional screening in primary care and (2) applying risk stratification to inform design of service delivery,

suggesting the need for studies of how to make systems of care more effective in detecting and treating those at risk.

Finally, research needed at the community level should focus on the institution of gatekeeper training for all who may have access to older people in trouble and, thus, the opportunity to detect their risk and mobilize a helpful response.

General Health Promotion

The next primary driver of late-life suicide suggested by previous research is general health promotion to minimize mental (Axis 1 in Figure 2) and physical morbidity (Axis 3) and to optimize functioning (Axis 5). Consistent with observations described above about the lethal nature of suicidal states in older adults, the special emphasis here is on research into the primary prevention of illness and its progression once established. Although studies of detection and treatment of acute conditions that are more proximal to suicide are needed, research on more distal risk factors and their amelioration should be pursued as well.

At the individual level, secondary drivers for which study is needed include (1) provision of routine preventive care; (2) promotion of healthy behaviors in older people; and (3) empowerment of patients and families as partners in their own care, a central tenet of chronic disease management.¹⁷ At the service system level, secondary drivers recommended for study include (1) use of in-home technologies, including monitoring devices that provide real-time assessment of pertinent outcomes and technologies to reduce isolation and engage patients and their caregivers in their health care; (2) easy access to rehabilitation services; (3) pain control; and (4) palliative and end-of-life care.

At the community level, secondary drivers of general health promotion for study should include (1) community-wide education about the need for an active lifestyle and other adaptive health behaviors for older adults; (2) creation of elder-friendly communities through environmental and policy interventions to improve access of older people, for example, to exercise opportunities, optimal nutrition, and recreation; and (3) easy, affordable access to community-based long-term-care services and supports to optimize independent functioning.

Mental Health Care

Mental disorders are common in later life and closely associated with suicide (Axis 1), yet only a small proportion of older adults in need of mental health care receive adequate treatment. The third primary driver to reducing suicide in older people, therefore, is the provision of mental health care that is evidence-

based, accessible, affordable, acceptable to the older consumer, and well coordinated with other aspects of their care.

Thus, research needed on secondary drivers of improving care delivery at the individual level includes (1) education of patients and families about the need for, and benefits of, treatment for mental disorders and (2) ensuring that treatments are tailored to their preferences (patient- and family-centered care). At the service system level, secondary drivers for which research is needed include (1) use of integrated mental healthcare approaches in primary care settings according to established practice guidelines for collaborative mental healthcare management; (2) seamless transitions in care; and (3) integration of primary and mental health care with social services expertise in the multidisciplinary care team. At the community level, targets of study include (1) implementation of parity laws and (2) alignment of provider payment with quality, patient outcomes, and value.

Social Connectedness

A large body of risk factor research^{3,4} indicates that the fourth primary driver of late-life suicide is social disconnectedness (Axis 4). There is a compelling literature about the health effects of social connections and adverse consequences of social disconnections, including those among older people.^{3,18}

Therefore, secondary drivers of reduced late-life suicide that warrant study at the individual level are (1) interventions to enrich social networks and increase social supports, including through psychosocial treatments such as interpersonal and problem-solving therapies, and (2) other interventions to address family dysfunction and the individual's adaptation to age-related challenges.

At the service system level, it is particularly important that studies target linkage of aging service network agencies to healthcare delivery and other approaches to integration of biological, psychological, and social/environmental care. Secondary drivers for study at the community level might include (1) offering opportunities to volunteer one's time to others (a source of meaning in life for many older adults); (2) affordable congregate living options such as naturally occurring retirement communities; and (3) for homebound elders, the use of information and communication technologies to decrease social isolation.

Conclusions

Suicide in later life is complex and multidetermined. This complexity poses challenges to prevention but also indicates a wide range of possible avenues to intervene

that, in combination and over time, can be expected to reduce the rate of suicide in older adults.

There is no debate that additional studies of factors that place older adults at risk for suicide are indicated in order to refine our ability to target interventions to those most in need. Neither is there doubt about the importance of continuing to study interventions that target older people at imminent risk. However, the highly lethal nature of suicidal behavior in later life also indicates that study of more distal risk factors and approaches to their mitigation and prevention will be necessary if a substantial reduction in the number of older adults taking their own lives is to be achieved.

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