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**The Garrett Lee Smith
Memorial Act: A Description
and Review of the Suicide
Prevention Initiative**

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suicide prevention, youth, evaluation, Garrett Lee Smith

Abstract

The Garrett Lee Smith (GLS) Memorial Act, continuously funded since 2004, has supported comprehensive, community-based youth suicide prevention efforts throughout the United States. Compared to matched communities, communities implementing GLS suicide prevention activities have lower population rates of suicide attempts and lower mortality among young people. Positive outcomes have been more pronounced with continuous years of implementation and in less densely populated communities. Cost analyses indicate that implementation of GLS suicide prevention activities more than pays for itself in reduced health care costs associated with fewer emergency department visits and hospitalizations. Although findings are encouraging, the heterogeneity of community suicide prevention programs and the lack of randomized trials preclude definitive determination of causal effects associated with GLS. The GLS initiative has never been brought fully to scale (e.g., simultaneously impacting all communities in the United States), so beneficial effects on nationwide suicide rates have not been realized.

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THE PUBLIC HEALTH PROBLEM OF SUICIDE AND SUICIDAL BEHAVIORS

Suicide has been a major public health problem in the United States for many years. Suicide is currently the second leading cause of death in the United States for youth aged 12–17 and the third leading cause of death for young adults aged 18–24 (CDC 2021). The number of suicide deaths nearly doubled for youth aged 12–17 and increased 42% for young adults aged 18–24 between 2007 and 2020 (CDC 2021). In particular, suicide deaths for 10- to 19-year-old females were higher in each of the 5 years from 2016 to 2020 than for any preceding year dating back to 1981 (CDC 2021). Suicide rates have been especially high in rural or mountainous areas, which often have higher rates of firearm use (Fontanella et al. 2015, Kim et al. 2011). Serious suicidal thoughts and suicide attempts are much more common among adolescents than suicide deaths: 8.9% of students in high school have reported in anonymous self-report surveys that they attempted suicide in the previous year, and 18.8% have reported that they seriously contemplated suicide (Ivey-Stephenson et al. 2020). On college campuses, despite decreases relative to prior years, 33% of students seeking mental health services in the 2020–2021 academic year experienced serious suicide ideation (10.9% in the last 2 weeks), and 9.4% attempted suicide (CCMH 2022). During the COVID pandemic, suicide-related admissions to emergency departments increased 31% among young people and 51% among girls in 2021 relative to the same period in 2019 (Yard et al. 2021).

BACKGROUND OF THE GARRETT LEE SMITH MEMORIAL ACT

In recognition of the public health problem of suicide and suicidal behavior, and in the aftermath of the tragic loss of his own son to suicide, Senator Gordon Smith proposed legislation that would help fund suicide prevention programs across the country. The Garrett Lee Smith Memorial Act (GLSMA) for suicide prevention was passed by Congress and funded in 2004. This initiative for the first time provided funding for community-based, comprehensive suicide prevention programs on a nationwide basis (Goldston et al. 2010). GLSMA-funded suicide prevention efforts have

encompassed a range of suicide prevention–related activities chosen by communities and grantees; the specific suicide prevention programs have not been dictated by funding requirements. As such, the GLSMA has funded a heterogeneous collection of programs rather than a single program. The Garrett Lee Smith (GLS) suicide prevention grants and a national resource center were authorized through the GLSMA in 2004 and reauthorized as part of the 21st Century Cures Act in 2016. The GLSMA has funded suicide prevention efforts in states and native communities, as well as college campuses, reaching both adolescents and young adults. Within states, many of the suicide prevention efforts have been focused on specific counties or communities.

GARRETT LEE SMITH MEMORIAL ACT GRANTEES

Broadly, GLS grants have been funded to develop and implement at the state, tribal, campus, and community levels early intervention and suicide prevention strategies across various systems (e.g., school, mental health, juvenile justice) or to support organizations involved in these efforts. These grants also have been awarded to institutions of higher education to support early intervention and suicide prevention efforts. The grants were funded not only to implement suicide prevention strategies but also to monitor the effectiveness of programs implemented. Collectively, these grants have addressed multiple objectives of the recently released *Surgeon General's Call to Action to Implement the National Strategy for Suicide Prevention* (HHS 2021). These objectives emphasize a broad-based public health response to suicide; increased awareness of the problem of suicide and suicide prevention activities; engagement of individuals with lived experience in suicide prevention efforts; development, implementation, and evaluation of interventions for preventing suicide; greater support for high-risk and underserved groups; dissemination of approaches that can reduce risk and increase safety for individuals at risk, such as lethal means counseling and safety planning; and improved access to needed mental health and substance-related services, particularly during transitions in care.

SCOPE OF THE GARRETT LEE SMITH MEMORIAL ACT-FUNDED PROGRAMS

The GLSMA-funded state/tribal and campus programs have been devoted to the prevention of youth and young adult suicide since 2004. Suicide prevention activities specified in funding announcements and used by GLS grantees have included education, training programs (including gatekeeper training), screening activities, continuity-of-care infrastructure enhancement for improved linkages to services, crisis hotlines, and community partnerships. Nonetheless, the mix and focus of activities (e.g., within specific communities or systems) that constitute these comprehensive approaches have differed across grantees to address identified needs and augment existing suicide prevention resources. Hence, the GLSMA does not fund grantees to implement a specific set of suicide prevention activities; rather, it allows for implementation of a heterogeneous mix of the suicide prevention activities that best meet the needs of the specific community or system.

From 2005 to 2019, the Substance Abuse and Mental Health Services Administration (SAMHSA) awarded 230 state and tribal grants to all 50 states, 2 US territories, and 63 tribes and 295 campus grants to 279 colleges and universities in 49 states, 2 US territories, and the District of Columbia (SAMHSA 2019). Subsequently in 2020 and 2021, with funding enhanced by American Rescue Plan dollars, SAMHSA awarded an additional 49 campus and 16 state/tribal grants. Since the first cohort of grantees funded in 2005, GLS Campus grant awards have been 3 years in duration with a core focus on the provision of comprehensive mental health support and suicide prevention on college campuses. Beginning in 2018, as a result of changes in the 21st Century Cures Act program reauthorization, the GLS Campus program revised its allowable activities, and

in addition to screening, workforce training, infrastructure development, and student awareness activities, grantees were allowed to use funds for service provision. To complement federal funding, campus grantees generally have been required to secure funding matches at the local level. Campuses receiving funding in 2022 (up to 22 grants) have had similar requirements and mandates as those funded in previous years (<https://www.samhsa.gov/sites/default/files/grants/pdf/fy-22-gls-state-tribal-nofo.pdf>).

The state/tribal grants also began (in 2005) as 3-year awards. Beginning in 2013, as a result of national evaluation findings that demonstrated an initial 1-year decrease in mortality that subsequently faded (Walrath et al. 2015), there was a shift to 5-year awards that allowed for broader investment in community-based partnerships, sustainable programs and processes, and incremental greater alignment with the revised National Strategy for Suicide Prevention (NSSP) (HHS 2012). Priorities and allowable activities have remained relatively consistent in the state/tribal programs and have included a focus on increasing the number of organizations that can identify and work with youths at risk of suicide; training gatekeepers across sectors; increasing the capacity of clinical service providers to assess, manage, and treat youths at risk of suicide; and improving the continuity of care and follow-up of youths identified to be at risk for suicide, including those who have been discharged from emergency departments and inpatient psychiatric units. In 2015, grant requirements were honed to better align with revised NSSP Goals 8 and 9 (HHS 2012) and included the integration of suicide prevention into health care services (i.e., the Zero Suicide model; SPRC 2015) and the promotion and implementation of effective clinical and professional practices for improved assessment and treatment of at-risk individuals. In 2019, the Zero Suicide grant program became an independently funded SAMHSA effort with the primary goal of implementing the Zero Suicide model throughout the health care systems and extending suicide prevention and intervention programs to adults aged 25 and older. The 2022 GLS state/tribal funding has maintained this emphasis and included a focus on lethal means restriction, the integration of those with lived experience (suicide and loss survivors), and an upstream focus on the social determinants of health and behavioral health disparities. Both GLS state/tribal and campus grantees are encouraged to reach populations most in need and to address racial, ethnic, sexual orientation, and military family/veteran behavioral health disparities with culturally appropriate prevention and intervention strategies. All grantees are required as a condition of funding to have a behavioral health disparities plan and an associated evaluation of that plan.

Between 2005 and 2019, outreach and awareness and gatekeeper-training activities were each implemented by 97% of GLS grantees and stood as the most common type of suicide prevention activities implemented by state/tribal and campus grantees. Between 2005 and 2019, over 66,000 GLS grant-sponsored events were delivered to more than 1.6 million individuals to educate and increase awareness of suicide and identify and refer youth at risk for suicide (SAMHSA 2019). In addition to training, approximately 70% of state/tribal grantees between 2005 and 2019 implemented screening for at-risk youth. During that time, approximately 83,000 youth were identified through GLSMA-funded screening or gatekeeper activities as being at risk for suicide. Available information on referrals and service receipt between 2005 and 2019 indicates that 88% of those referred to mental health services received that service within 3 months of the referral (SAMHSA 2019).

Historically, and at various points since the first grants were awarded in 2005, GLS grant recipients have had access to a variety of resources and worked with multiple GLS partners. The partners have included the Suicide Prevention Resource Center (SPRC) authorized under the GLSMA and funded by SAMHSA as a national suicide prevention resource center and source of support to SAMHSA GLS, NSSP, and Zero Suicide grantees; the GLS National Evaluation funded by SAMHSA between 2005 and 2019, and again in 2022, to design and implement a

process, outcome, and impact evaluation and to support evaluation participation capacity among GLS grantees; and the SAMHSA-sponsored technology transfer and training resources (Clinical Support System for Serious Mental Illness, Mental Health, Substance Abuse Prevention, Addiction Technology Transfer Centers) to develop and deliver training and technologies related to suicide prevention activities (<https://www.samhsa.gov/technology-transfer-centers-ttc-program>). In addition, grantees have been encouraged to connect with local crisis centers and the 988 Suicide and Crisis Lifeline to integrate crisis response and support services into their comprehensive programming (<https://988lifeline.org>).

While the type and amount of available support have varied since 2005, GLS partners have worked side by side with SAMHSA staff to support GLS grant recipients in their efforts to assess community needs, identify and implement culturally driven best practices and interventions, and build a local and national evidence base. With sustainability and data-driven decision making as priorities, grantees have been supported by GLS partners to select and deliver best practices and use data (monitoring, local and national evaluation data, and surveillance data) for continuous quality improvement and increased sustainability of program activities.

Local and national performance monitoring, data collection, and evaluation have been required as a condition of the GLS state/tribal and campus funding to drive improvement of suicide prevention programs and congressionally justify continuation and expansion of the program. Grantees have been required to submit locally tailored data collection and monitoring plans and to report on their efforts and outcomes. In earlier funded cohorts, SPRC provided local evaluation planning and reporting support while the GLS National Evaluation team provided support related to national data collection requirements and the management and reporting of that information at the local level. Additionally, while the specific SAMHSA systems and tools have been modified over the duration of the GLSMA, grantees have consistently been required to report systematic performance indicators for the purposes of program monitoring and congressional justification. As of 2022, both state/tribal and campus grantees were reporting on training and workforce development performance indicators; campus grantees were additionally reporting on partnerships and awareness, and state/tribal grantees were reporting on screenings, referrals, and access to care (<https://spars.samhsa.gov>).

GLS state/tribal and campus grantees have been required to evaluate local program implementation. Each funded grantee has been required to submit plans and processes for developing goals, measuring objectives, data collection, and monitoring. Regular reporting on local grantee activities and findings has generally happened through required grants management reporting to SAMHSA. Commensurate with the range in programming at the local level, evaluation efforts at the grantee level have also varied considerably. While all grantees have been required to track and submit performance monitoring information to SAMHSA on a quarterly basis, augmented site-specific evaluation has included the use of secondary data, surveys, and focus groups to understand local partnerships, specific intervention implementation and effectiveness, and short-term outcomes associated with the grant funding. Local evaluation efforts have generated culturally and contextually relevant findings that can be used to revise, redirect, and sustain prevention strategies (as indicated) at the community level. These efforts, by design, are rarely generalizable beyond the community(ies) of focus; however, some efforts as a function of their design and approach have resulted in more generalizable information.

The GLS National Evaluation (also referred to as the cross-site evaluation) was continuously funded between 2005 and 2019, experienced a hiatus between 2019 and 2022, and resumed in the fall of 2022. This independent national evaluation is a means through which the GLSMA initiative can be understood as a whole with a focus on the context within which programs are implemented, the process of implementation, and the overall outcomes and impacts associated with

implementation. Historically, data gathered about the prevention strategies implemented, their populations of focus, and their delivery timelines provided the necessary context and mediating variables essential to understanding the overall process and outcome of the GLS suicide prevention programming. Through a variety of instruments on gatekeeper-training delivery, trainee experience, youth screenings, community referral networks, continuity of care from identification through service receipt, postdischarge follow-up, zero suicide principles and practices, and knowledge and awareness, the GLS National Evaluation serves as a multisite repository of information used to understand GLSMA initiative outcomes and the lifesaving impacts associated with the grant program funding.

POSITION PAPERS REGARDING IMPLEMENTATION OF SUICIDE PREVENTION ACTIVITIES

As a complement to the evaluation of GLSMA-funded suicide prevention efforts, SAMHSA requested two position papers outlining strategies for careful implementation of programs. The first (Heilbron et al. 2013) was requested after concerns that well-intended case-finding approaches to suicide prevention (e.g., gatekeeper trainings, suicide risk screenings) were being implemented as part of GLSMA-funded efforts but not always with adequate planning or development of protocols for managing suicidal crises or linkage to care. This was an especial concern given that gatekeeper trainings and screenings have been used in the great majority of GLSMA-funded grants. Examples were provided of suicide prevention efforts that had to be abandoned when youth thought to be at risk were identified but there were not adequate resources for serving all the youth (Hallfors et al. 2006). Indeed, Wyman et al. (2008) suggested that the overall success of any suicide prevention program depends on adequate supports and the presence of linkages to needed care. It was recommended that before implementation of suicide prevention programming, plans and protocols should always be developed that address decision-making responsibilities, documentation, actionable procedures when individuals are found to be at immediate risk, and access to follow-up care.

In a similar manner, Heilbron et al. (2013) highlighted the increases in suicide prevention efforts, including screening, in emergency department settings and made several recommendations regarding best practices. Specifically, a review of best practices indicated that when youth are found to be at risk, there needs to be involvement of the family (when possible), procedures in place for linking young people and families to follow-up services, and education regarding means restriction. Of note, many of these recommendations are similar to recommended standards of care issued by the National Action Alliance for Suicide Prevention (Natl. Action Alliance Suicide Prev. 2018).

The second commissioned paper (Kuiper et al. 2019) highlighted the importance of continuous evaluation of suicide prevention initiatives. Although the majority of suicide prevention programs do not have unanticipated negative effects, some notable exceptions have been documented. For example, there have been instances in which subsets of youth became upset following programs aimed at providing education and highlighting awareness of suicide (Kalafat & Elias 1994). There also have been documented instances in which referrals of youth for mental health services following gatekeeper-training programs actually decreased until an adequate proportion of school personnel were trained in the program (Wyman et al. 2015). Hence, it was recommended that implementation of suicide prevention programs be accompanied by continued evaluation of efforts—of intended positive effects as well as unanticipated negative effects, at multiple levels—among the youth, among adults who might intervene with youth or help link them to treatment, and at the system level.

SITE-SPECIFIC AND SPECIAL PROJECT EVALUATIONS, AND PROCESS EVALUATION

As described above, local evaluation and national evaluation efforts have been ongoing since the inception of the GLS initiative. The former include campus and state/tribal grant-funded locally implemented investigations, state/tribal enhanced evaluations conducted at the site level for deeper inquiry into community-contextualized intervention processes and outcomes, and intervention-specific inquiries using data across sites to better understand aggregated processes and outcomes. Independent, federally funded national evaluation efforts, on the other hand, have gathered broad-based context and process information from all funded grantees to understand the suicide prevention mechanisms being implemented as part of the GLSMA-funded programs, the proximal and distal outcomes associated with such implementation, and ultimately the resultant impact on suicide.

Local efforts to monitor, document, and evaluate campus implementation of GLSMA-funded activities have resulted in the documentation of unique approaches to comprehensive suicide prevention programming on campuses and their outcomes. For example, a psychiatric nurse faculty member at a medium-sized state-supported university used GLS Campus program funds to initiate a comprehensive campus suicide prevention program that provided gatekeeper training and general education to over 2,500 students, faculty, and staff in its first few years (Cook 2011). An early monitoring and evaluation effort indicated no suicide deaths and a small (1%) increase in help-seeking behavior in the 3 years of grant funding. Additionally, a survey of a convenience sample of students indicated that 71% were exposed to suicide prevention activities, 84% were aware of a resource, and nearly 50% were aware of a crisis number (Cook 2011). A large midwestern university used GLS Campus funding to implement a comprehensive campus suicide prevention program modeled after the US Air Force Suicide Prevention Program (Van Deusen et al. 2015) and found through a survey of 819 students that exposure to suicide prevention messaging was associated with lower self-reported mental health help-seeking stigma and higher levels of perceived knowledge about suicide and suicide prevention. Additionally, participating in suicide prevention activities and having a close association with someone who had attempted suicide or died by suicide were associated with perceived and actual knowledge about suicide and suicide prevention (Van Deusen et al. 2015).

GLS state grantees have prioritized the early identification, referral, and service access of youth at risk for suicide. As a result, state-focused and cross-site evaluation efforts have concentrated on the behavioral outcomes of trained gatekeepers and the ultimate connection of identified youth to needed services. For example, Maine and Tennessee, funded in an early cohort of the GLS state/tribal grants, both implemented enhanced evaluation efforts of training programs (Keller et al. 2009). The Maine Youth Suicide Prevention Program implemented the Comprehensive Lifelines Program (adapted from Lifeline) in six school communities in addition to establishing collaboration with community and crisis agencies to help examine referral patterns (Wilkins et al. 2013). Results of the evaluation indicated that after implementation of the Comprehensive Lifelines Program, participating schools had increased capacity to identify students at risk for suicide and to make referrals for these youth (Wilkins et al. 2013). Tennessee Lives Count enhanced the QPR (Question-Persuade-Refer; Quinett 2012) curriculum to include attitude awareness, lethality assessment, and cultural adaptations. As part of that program, 400 training sessions with 14,000 gatekeepers from education, child welfare, health, and juvenile justice settings were implemented over an 18-month period (Keller et al. 2009). Analyses of 416 pretest, posttest, and 6-month follow-up surveys indicated an increase in perceived suicide prevention knowledge and self-efficacy to prevent youth suicide and a decrease in the perceived inevitability of youth suicide (Keller et al. 2009).

A collection of studies looked across a subset of funded GLS state/tribal grantees to assess the referral behavior of trained gatekeepers (Condrón et al. 2015, Rodi et al. 2012) and the effectiveness of gatekeeper training (Condrón et al. 2018, Godoy Garraza et al. 2021). Referral behavior findings from these multi-GLS grantee studies indicate that gatekeepers who trained for longer periods of time identified more youth at risk than those who underwent shorter training periods; the amount of time gatekeepers spent interacting with youth was positively correlated with the identification of youth at risk and gatekeepers' knowledge of whether the youth received the services to which they were referred (Condrón et al. 2015); the referral and service receipt of youth at risk for suicide were not found to be related to the demographic characteristics of youth (Rodi et al. 2012); and the majority of trained gatekeepers identified between one and five youth at risk in the 3 months following training, and nearly all youth identified at risk were referred for service (Condrón et al. 2015). In a comparison of the effectiveness of brief (QPR; Quinnett 2012) versus more in-depth (Applied Suicide Intervention Skills Training; see <https://livingworks.net/asist>) training using data collected from 81 state/tribal grantees between 2011 and 2016, it was found that a higher proportion of gatekeepers from in-depth trainings in school and community-based settings identified youth at risk, and a higher proportion of in-depth trainees from mental health settings referred at-risk youth for services when compared to brief training participants in the same setting (Condrón et al. 2018). Finally, a factorial randomized controlled design was used to assess the effectiveness of active learning strategies (receipt of booster training and the incorporation of role play) on gatekeeper behavior. The analysis of data gathered from 661 trainees across 70 training events implemented by eight GLS state/tribal grantees indicated no significant differences in identification and referral behavior associated with booster training alone or role play alone. However, among those assigned to role play during training, a higher proportion of those that also received booster training identified and referred youth at risk for suicide, notified the referral source about the youth, and escorted the youth to the resource (Godoy Garraza et al. 2021).

Many GLS tribal grantees and their partners have implemented culturally driven suicide prevention programming, and several have locally monitored the process and outcome of those efforts (SAMHSA 2019). For example, the Native American Rehabilitation Association of the Northwest developed culturally appropriate suicide prevention strategies by integrating an emphasis on protective factors. The implementation of these culturally aligned strategies aimed to increase community awareness of risk and improve the identification of at-risk youth. Data gathered through the Oregon Native Youth Survey indicated that protective factors (in the presence of risk factors) buffered at-risk youth against suicide attempts (Goldston et al. 2010, SAMHSA 2014). Beginning in 2001, the White Mountain Apache tribe created and implemented a community surveillance system to track suicide ideation, attempts, and deaths among tribe members. In 2006, the White Mountain Apache tribe received its first GLS tribal grant, which built upon their existing surveillance system and its ability to both triage and track youth to implement and evaluate a culturally driven and comprehensive approach to youth suicide prevention (Cwik et al. 2016). This triaging function of the system was used to ensure that appropriate levels of intervention and support were provided to those identified at risk. The surveillance portion of the system was used to evaluate the impact of the program by comparing suicide deaths during the 6 years of program implementation to the 5 years preceding program implementation. Overall, suicide deaths per 100,000 dropped by 38%, and suicides among youth aged 15–24 dropped 23% (Cwik et al. 2016).

CROSS-SITE EVALUATION

No randomized controlled trials have been conducted to evaluate the overall impact of the GLS comprehensive suicide prevention programs. Nonetheless, a number of large, carefully conducted

studies have compared matched communities with and without GLSMA-funded suicide prevention programs. In one study, Godoy Garraza and colleagues (2015) examined suicide attempts in counties that benefited from GLSMA funding for suicide prevention activities between 2006 and 2009 compared to matched counties that did not receive GLSMA funding. Propensity score matching was used to match intervention counties with comparison counties on a variety of background variables including the poverty rate, median income, racial/ethnic group composition, age-group composition, rurality, population, and historical suicide rates. In the final models, 466 counties with suicide prevention activities were matched with 1,161 comparison counties; the primary outcome variable was the suicide attempt rate for 16- to 23-year-old individuals, as described in the National Survey of Drug Use and Health. Because gatekeeper-training programs were ubiquitous in GLSMA-funded suicide prevention efforts despite the overall heterogeneity in suicide prevention initiatives across different communities, GLSMA-funded gatekeeper training was used as an indicator of GLSMA-funded prevention activity within a county or tribal community.

The impact on rates of suicide attempts was assessed for the years 2007–2010. Results indicated that there were 4.9 fewer suicide attempts per 1,000 youths at 1 year following GLSMA-funded programming. Given the total population of areas with implementation, this equated to approximately 79,379 averted suicide attempts through the year 2010. The reduction in suicide attempts persisted for 1 year following GLSMA-funded implementations but was not detectable beyond that. No significant differences were found between comparison and intervention counties in suicide attempts for adults older than age 23, an age group that was not targeted by GLSMA programming.

A complementary study examined the association between GLS programming and suicide mortality among 10- to 18-year-olds and 19- to 24-year-olds (Walrath et al. 2015). This study focused on GLS suicide prevention implementation in the years 2006–2009 with presumed impacts assessed in the years 2007–2010. The presence of GLSMA-funded gatekeeper training was used as a proxy for GLS suicide prevention activities. Paralleling the methods used to examine population-based rates of suicide attempts, propensity score matching was used to compare 479 intervention counties with 1,616 comparison counties, controlling for background and historical variables. Information about suicide and other deaths was extracted from the Compressed Mortality File of the National Vital Statistics System. The GLSMA-funded counties were found to have lower rates of suicide in the 1 year following GLS suicide prevention programs. Specifically, it was estimated that GLSMA-funded suicide prevention programs were associated with 1.3 fewer deaths per 100,000 youth per year following implementation. Collectively, this would have resulted in 427 saved lives through the year 2010. This difference between intervention and comparison counties was primarily apparent among the younger youth in the cohort aged 10–18. The effects of GLS implementation were not detectable two or more years after implementation. No differences were found in the nontargeted group of adults over the age of 24 or in the nontargeted outcome area of mortality for reasons other than suicide among young people.

In many communities, GLS suicide prevention activities were funded for multiple years, but it was not clear if multiple years of consecutive implementation or exposure led to greater or more sustained effects. Hence, a study was conducted to examine longer-term effects of GLS programming, particularly in relation to sustained suicide prevention efforts (Godoy Garraza et al. 2019). As with previous examinations, GLSMA-funded gatekeeper training in a county was used as a proxy for GLS implementation. Propensity score matching was used to examine differences between 525 intervention counties that had some exposure to GLS suicide prevention programs prior to 2010 and 969 comparison counties, which were matched on a variety of background and historical variables. The primary outcome of interest was suicide mortality.

In this study with longer-term follow-up, it was found that there was decreased suicide mortality (0.9/100,000) in counties exposed to GLS suicide prevention programs after 1 year. After 2 years of exposure, the decrease in suicide mortality increased to 1.1/100,000. There were additional increases in effects for the third and fourth years, but these were not found to be significantly different. Hence, it appeared that increased exposure to the GLS suicide prevention programs was associated with increased and longer-lasting decreases in suicide mortality. Of note, no differences were found between implementation and comparison counties for suicide mortality among adults aged 25 and above (this age group was not the target of GLS program efforts). In addition, no differences were found in rates of nonsuicide mortality following GLS suicide prevention programs.

The effects of GLS suicide prevention programs appear to be greater in rural and less densely populated areas. This is an especially important finding given observations and recommendations from a convened community of practice consisting of suicide prevention coordinators and GLS grantees from 26 organizations, which brought attention to issues related to suicide prevention in rural communities, such as the limited number of mental health providers, barriers to access of services, and stigma associated with help-seeking in those communities (Varia et al. 2014).

In the study of the impact of GLS programs on suicide attempts (Godoy Garraza et al. 2015), the differences in rates of suicide attempts were evaluated in five homogeneous classes of counties. The reduced population base rate of suicide attempts was found primarily among more rural counties. Similarly, in the study of suicide mortality, the reduced rates of suicides were tested in different subgroups of counties (Walrath et al. 2015). The strongest effects were found among the smaller, more rural groups of counties. In the study of longer-term effects of GLS programming, Godoy Garraza et al. (2019) examined differences between intervention and comparison counties separately in nonmetropolitan counties (more rural and smaller counties). In these counties with less population density, the differences were found primarily when there was at least 2 years of exposure to GLS (a reduction in the suicide death rate of 2.9/100,000).

As part of the evaluation of GLS, the cost and benefits of the program were examined (Godoy Garraza et al. 2018). Building on earlier findings regarding averted suicide attempts, estimates were made of the number of emergency department visits and hospitalizations that would have resulted from these attempts. This study used the same sample that was used in earlier analyses of suicide attempts, encompassing 46 GLS grantees across 38 states and 12 grantees for tribal communities from the years 2006–2009. Other national data sets were used to estimate the proportion of nonlethal suicide attempts that would result in hospitalization or an emergency department visit and the costs of these services. Based on these extrapolations and the 79,379 averted suicide attempts, it was estimated that GLS suicide prevention programs would have been associated with cost savings of \$187.8 million from averted emergency department visits and \$34.1 million from hospitalizations. These savings were compared to the cost of implementation of GLS programs and technical assistance (\$49.4 million) to determine that the benefit-to-cost ratio of the GLS suicide prevention programs was approximately \$4.50 in health care cost savings for each dollar invested in the program. These findings were subject to a wide number of sensitivity analyses to determine whether the findings were robust even if some of the underlying assumptions were incorrect. It was determined that the benefits of the program would outweigh the cost of implementation even if the cost of the hospitalization was as low as \$877 (rather than \$10,895) and the percentage of attempts requiring hospitalization was as low as 2% (rather than 25%).

SUSTAINABILITY AFTER FUNDING

Apsler et al. (2017) examined the degree to which suicide prevention activities that were funded with SAMHSA GLS grants continued following the end of that funding, and the factors that were

related to sustainability. Thirty-three sites completed a retrospective online survey about their suicide prevention activities prior to GLS funding, during GLS funding, and in the 1 year following GLS funding. Results from the study indicated that site-specific suicide prevention activities decreased only 6% from during GLS funding to after the funding. Specifically, two-thirds of the sites either increased their suicide prevention activities or decreased activities by 10% or less. Suicide prevention activities at other sites decreased between 11% and 30% in the year following the end of GLS funding. Follow-up interviews were conducted with 13 previously GLSMA-funded sites that had been able to continue suicide prevention activities to help identify factors related to sustainability, both during the funding period and following the end of funding. Efforts related to sustainability during GLS funding included (a) a focus on the goal of eventual sustainability, (b) continuing emphasis on relationships and partnerships integral to suicide prevention activities, (c) embedding mental health services and suicide prevention activities within other services, (d) pursuit of additional sources of funding, and (e) efforts to reduce costs associated with implementation. Factors associated with sustainability following the end of funding included (a) new or additional funding, (b) reconfiguration of the suicide prevention activities offered, and (c) maintenance of continuous leadership of suicide prevention efforts.

LIMITATIONS OF THE EVALUATIONS TO DATE OF THE GARRETT LEE SMITH SUICIDE PREVENTION PROGRAMS

The GLSMA-funded suicide prevention efforts have been heterogeneous in scope and not implemented in a randomized manner that would allow definite inferences of causality of effects of the program. The multiple studies with careful propensity matching score techniques notwithstanding, it is nonetheless possible that communities or counties where GLSMA-funded programs have been implemented differ in systematic, unmeasured ways from matched communities. As one concrete example, GLS funds for suicide prevention activities have been awarded on a competitive basis to states, tribal communities, and college campuses. It is possible that geographic areas receiving this competitive funding differed in systematic ways (e.g., readiness to implement suicide prevention programs, organizational support) from communities that did not receive funding or did not seek funding. Hence, findings regarding the impact of GLS programming may be conflated in unmeasured ways with characteristics of particular communities.

The community-driven approach to GLS suicide prevention activities increases ownership of suicide prevention activities and local determination of programs that are the best perceived fit with identified needs, which may be related to success of implementation and ultimate sustainability of these efforts. Nonetheless, this approach also may contribute to a scenario in which multiple communities, tribal partners, and college campuses are in essence charged with reinventing the wheel, as they determine which combination of suicide prevention activities will be best for their communities, with each new round of GLS funding. Because the GLSMA-funded suicide prevention activities have not been implemented systematically as an experiment or series of experiments, little definitive information is available regarding which programs are best suited for different communities and populations and in specific sets of circumstances. Moreover, it is difficult to determine which programs or combinations of programs are associated with the greatest effectiveness, particularly relative to the costs involved with the programs. Without this information, the evidence base remains limited regarding the specific facets of the GLS suicide prevention efforts that are driving positive outcomes.

Given the scope of the GLS suicide prevention programs, there are different facets of the program that deserve closer evaluation. For example, the overall impact of GLS suicide prevention programs on college campuses has not been studied, in part due to limitations of the type of

data collected from college grantees relative to their state/tribal counterparts. There has been one study that has focused on the sustainability of GLS programming following cessation of funding, but this study was primarily survey and focus group driven; no corresponding objective data regarding the continuation of suicide prevention efforts in the absence of GLS funding have been conducted to our knowledge. In another example, there has been increasing emphasis on implementing evidence-based suicide prevention measures in health settings, and Zero Suicide grants from SAMHSA and the National Institutes of Mental Health have facilitated these efforts in some regions. Nonetheless, the degree to which there is successful integration or synergistic efforts between different suicide prevention programs (e.g., between GLSMA-sponsored activities and complementary activities in health settings) has not been closely evaluated. Last, there has been less attention than needed to evaluating the impact of GLSMA-funded programs in diverse and underserved communities, many of which have implemented some of the most innovative suicide prevention activities drawing upon cultural practices and strengths.

SUMMARY OF FINDINGS, IMPLICATIONS, AND FUTURE DIRECTIONS

Given the continuing high rates of suicide and suicidal behavior among young people, it might be tempting to conclude that the GLS suicide prevention activities have not had any effects on rates of suicide or suicidal behaviors. However, suicide and suicidal behaviors are multidetermined, and there are other individual, contextual, and societal factors associated with increases in suicide and suicidal behaviors. Moreover, although a large initiative, the GLSMA-funded programs have never been brought to scale (i.e., reaching all communities), and the GLSMA-funded programs are far from universally disseminated in the United States. Even in states receiving funding, for example, suicide prevention programs are often used to address risk in specific communities, counties, or populations (e.g., school settings or foster care, tribal populations), while other systems with at-risk youth do not receive the same level of suicide prevention efforts. These and other factors preclude sweeping conclusions about the effects of the GLS suicide prevention efforts on reduction in national suicide rates.

However, as described above, there is strong national evidence indicating that implementation of the GLSMA-funded programs has been associated with lower rates of suicide deaths as well as nonlethal suicidal behavior and that the initiative in effect pays for itself. While creating some challenges to evaluation, the comprehensive nature of the GLSMA-funded suicide prevention activities is also a strength. The cross-site findings of the impact of the GLS comprehensive suicide prevention efforts dovetail with reports of positive impacts of other comprehensive suicide prevention efforts, such as those implemented in American Indian communities and by the US Air Force (Cwik et al. 2016, Knox et al. 2003). The findings regarding reduced suicide mortality and population-based suicide attempts from selected counties imply that even greater impact on national rates of suicide and suicidal behavior could be achieved through wider dissemination and penetration of the program into different communities. The analysis of the costs and benefits of the GLS program implies that an investment that would allow even greater dissemination of GLS suicide prevention programming throughout the United States would be more than offset by the savings to the health system (which, especially recently in the context of the COVID-19 pandemic, has been challenged severely by increasing needs for emergency care for youth experiencing suicidal crises).

The findings regarding sustained implementation of the GLS suicide prevention efforts imply that communities benefit the most when suicide prevention programs are continually and consistently implemented. Suicide prevention in different communities requires sustained efforts and funding to ensure continuation of the most beneficial impacts. This is particularly true in

rural communities that have disproportionate rates of suicide and suicidal behaviors, fewer mental health resources, and lower help-seeking, which appear to have benefited the most from GLS suicide prevention efforts.

The GLS memorial suicide prevention initiative continues to be a national resource—an important part of our national effort to increase awareness of suicide as a problem—and to implement efforts to reduce suicide and suicidal behaviors among young people. The national evaluation of the GLS state and tribal programs resumed in 2022. The proposed priorities for the next funding period include continuing and enhanced evaluation of the evidence of the impact of the GLSMA-funded programs. In particular, there will be an emphasis on further exploration of the impact of the programs among vulnerable groups in light of persistent disparities in suicidal behaviors and mental health service use. In addition, the cross-site evaluation will focus on identifying intervention components that drive positive outcomes or are most effective in different contexts. As part of evaluation efforts, there will be a deeper exploration of the experience of youth at risk and their resilience. Examinations of continuity of care will be extended to include a focus on treatment experience and on the continuity of care following discharge from emergency departments and hospitals. Last, given the ubiquity of gatekeeper-training programs in GLSMA-funded programs, the cross-site evaluation will include a focus on retention of knowledge from these trained gatekeepers. Data from these evaluations hopefully will continue to provide a foundation for continued support, refinement, and expansion of the GLSMA initiative, particularly in light of continuing high rates of suicide and suicidal behaviors.

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Errata

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