

# LETHAL MEANS & SUICIDE PREVENTION:

A Guide for Community & Industry Leaders

This document advances Goal 6 of the *National Strategy for Suicide Prevention (National Strategy)*: Promote efforts to reduce access to lethal means of suicide among individuals with identified suicide risk. To download a copy of the *National Strategy*, visit <https://theactionalliance.org/our-strategy>.

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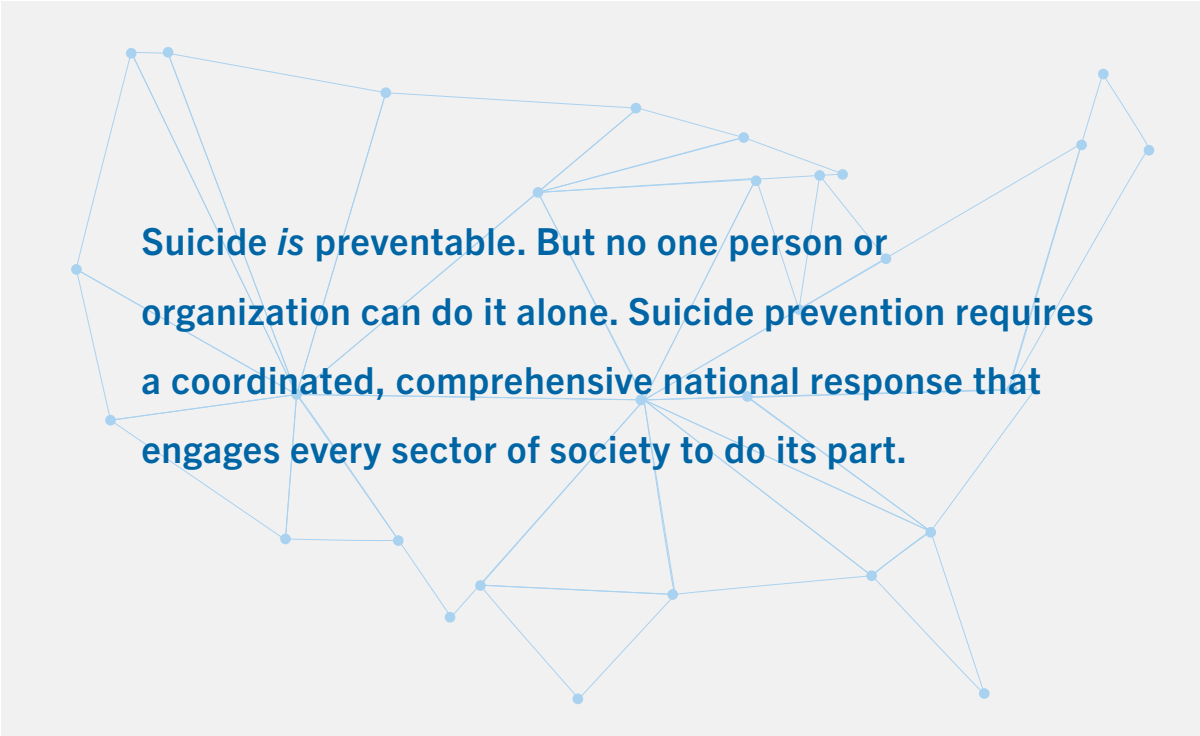
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# Background

Suicide is a significant and tragic national health issue that affects millions of Americans each year. In addition to the more than 48,000 people in the U.S. who died by suicide last year, more than a million attempted suicide and millions more had serious thoughts of suicide (Centers for Disease Control and Prevention [CDC], 2020; Substance Abuse and Mental Health Services Administration [SAMHSA], 2019).

A suicidal crisis may be relatively short in duration—minutes to hours—and the majority of people who attempt suicide and survive do not go on to die by suicide (Harvard Injury Control Research Center, n.d.). By putting time and distance between a lethal means—“the instrument or object used to carry out a self-destructive act . . .” (e.g., firearms, medicines, illegal drugs)—and individuals who may be at risk for suicide, suicide can be prevented, and lives can be saved (Barber & Miller, 2014; Mann et al., 2005; Pirkis et al., 2015; U.S. Department of Health and Human Services [HHS], Office of the Surgeon General, & National Action Alliance for Suicide Prevention [Action Alliance], 2012; Zalsman et al., 2016).

Suicide *is* preventable. But no one person or organization can do it alone. Suicide prevention requires a coordinated, comprehensive national response that engages every sector of society to do its part. The [National Action Alliance for Suicide Prevention](#) (Action Alliance) is the nation’s nonpartisan public-private partnership for suicide prevention. The Action Alliance works with more than 250 partners from the public and private sectors to advance the [National Strategy for Suicide Prevention](#) (*National Strategy*)—the nation’s road map for a coordinated, comprehensive approach to suicide prevention. The Action Alliance focuses on innovative solutions that move forward the goals of the *National Strategy* and have the greatest potential to transform communities, prevent suicide, and save lives.



**Suicide *is* preventable. But no one person or organization can do it alone. Suicide prevention requires a coordinated, comprehensive national response that engages every sector of society to do its part.**

## National Strategy Goal 6: Potential for Impact

Goal 6 of the *National Strategy* aims to “promote efforts to reduce access to lethal means of suicide among individuals with identified suicide risk” (HHS & Action Alliance, 2012):

- **Objective 6.1.** Encourage providers who interact with individuals at risk for suicide to routinely assess for access to lethal means.
- **Objective 6.2.** Partner with firearm dealers and gun owners to incorporate suicide awareness as a basic tenet of firearm safety and responsible firearm ownership.
- **Objective 6.3.** Develop and implement new safety technologies (e.g., bridge barriers, lockboxes) to reduce access to lethal means.

Recognizing this potential for impact, in 2017, the Action Alliance formed the first-ever national nonpartisan, cross-sector [stakeholder group](#) to identify innovative solutions to advance Goal 6. The Action Alliance Lethal Means Stakeholder Group does the following:

- **Serves as a national platform** for sharing and promoting creative, effective, and promising approaches for reducing access to lethal means among those who may be at risk for suicide
- **Identifies ways** to strengthen and invite cross-sector collaboration around this issue nationally and in communities
- **Offers a unified voice** that includes, reflects, and respects the unique perspectives of diverse partners around the table



**The Action Alliance formed the first-ever national nonpartisan, cross-sector stakeholder group to identify innovative solutions to advance Goal 6.**

## Purpose and Scope of This Paper

This paper describes the role and impact of reducing access to lethal means in preventing suicide. First, it presents an overview of suicide in the United States, including data for a broad range of lethal means. Then it highlights actions, for which there is cross-sector support, that governments, organizations, and industries are taking to advance Goal 6 of the *National Strategy*. The paper concludes by discussing key recommendations for a collective path forward.

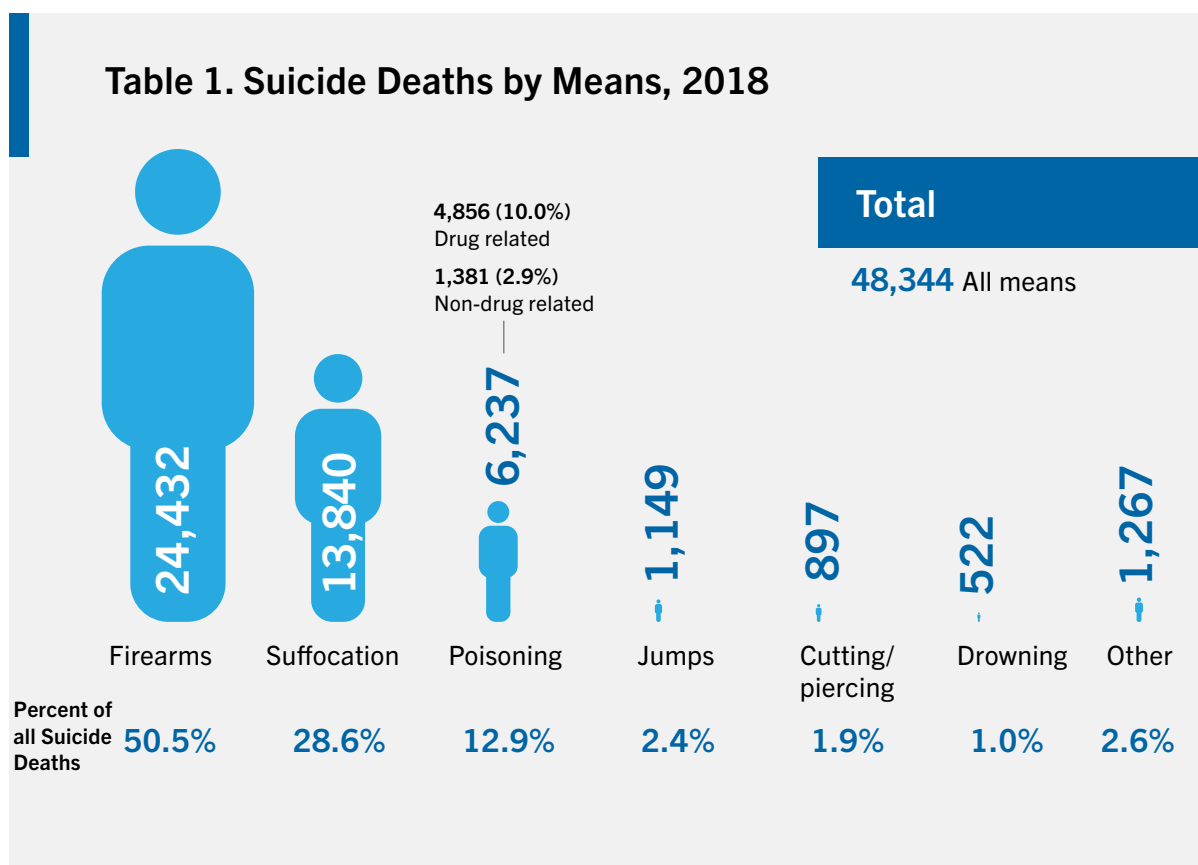
# Suicide: A Leading and Preventable Cause of Death

Suicide is a significant and tragic national health issue that affects millions of Americans each year. In 2018, 48,344 people died by suicide in the United States, making it the nation’s 10th leading cause of death and equating to about one suicide death every 11.1 minutes (CDC, 2020; CDC, 2017). In addition to those lives lost to suicide, 1.4 million adults attempted suicide, and 10.7 million adults had serious thoughts of suicide in 2017 (SAMHSA, 2019).

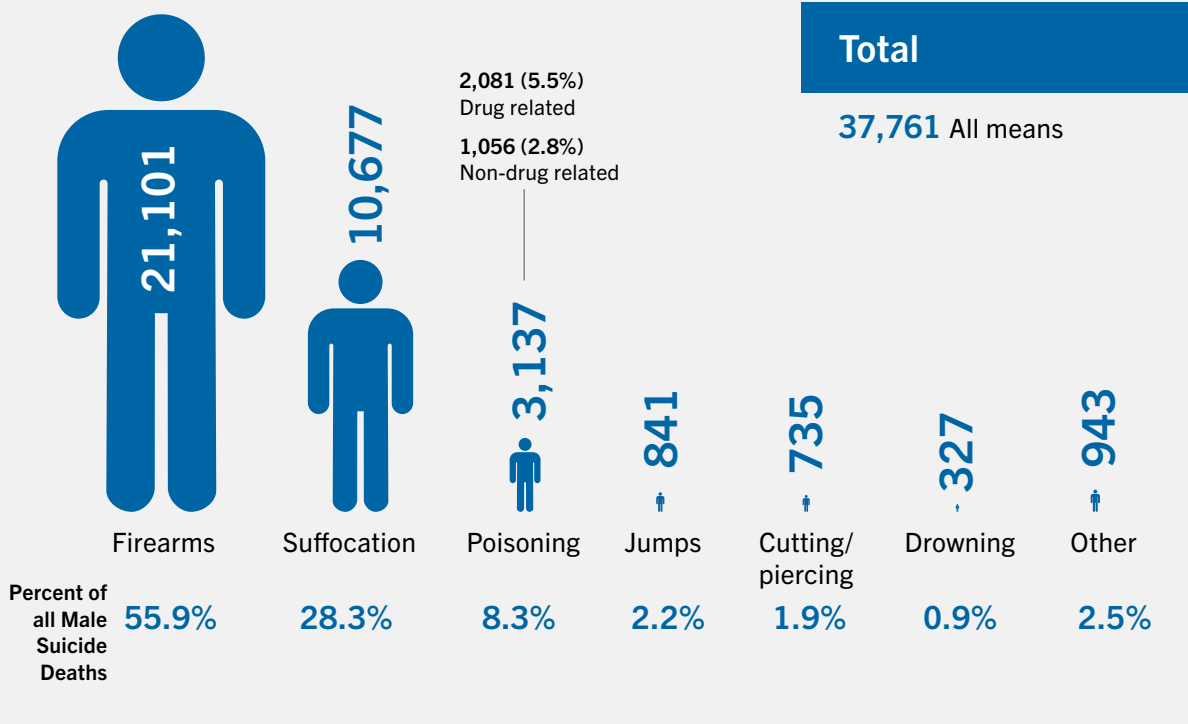
## Suicide by Means

While suicide may impact groups differently, all suicides have one thing in common—a lethal means was used. Individuals who die by suicide use a variety of means (see Tables 1–3; CDC, 2020). Suffocation includes suicides by hanging and ligatures (e.g., ropes, belts). Poisoning includes suicides that are drug-related (i.e., prescription and nonprescription medicine, illegal drugs) and non-drug-related (e.g., gas, chemicals).

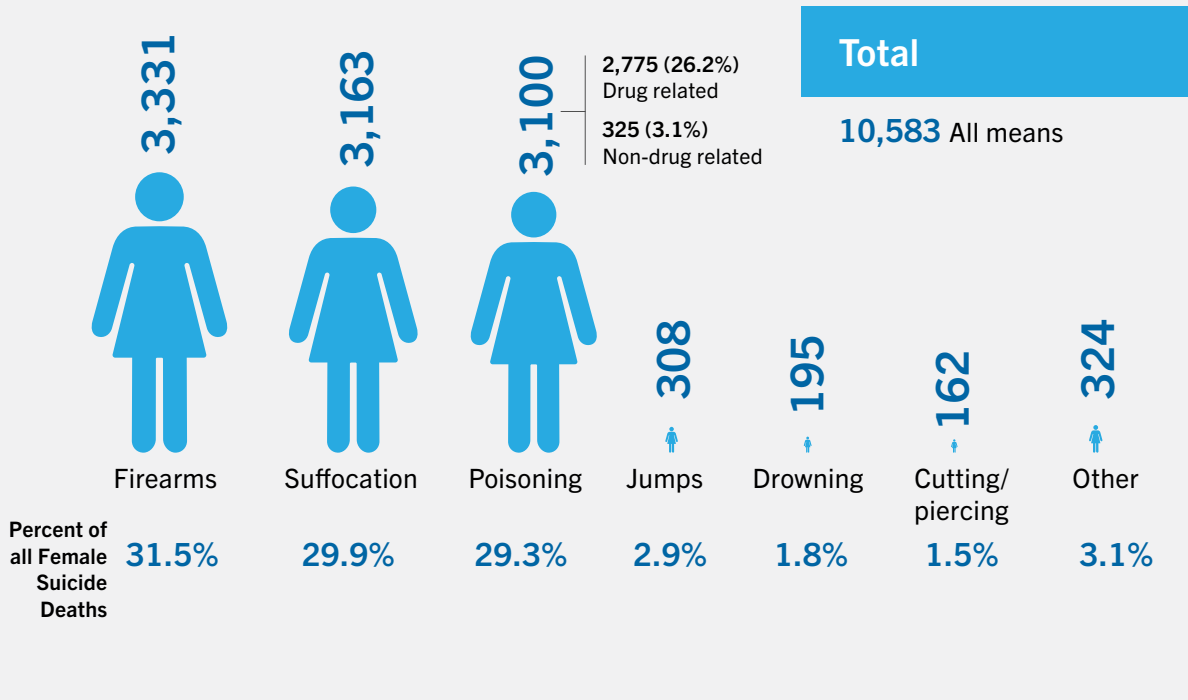
**Table 1. Suicide Deaths by Means, 2018**



**Table 2. Suicide Deaths by Means—Males, 2018**



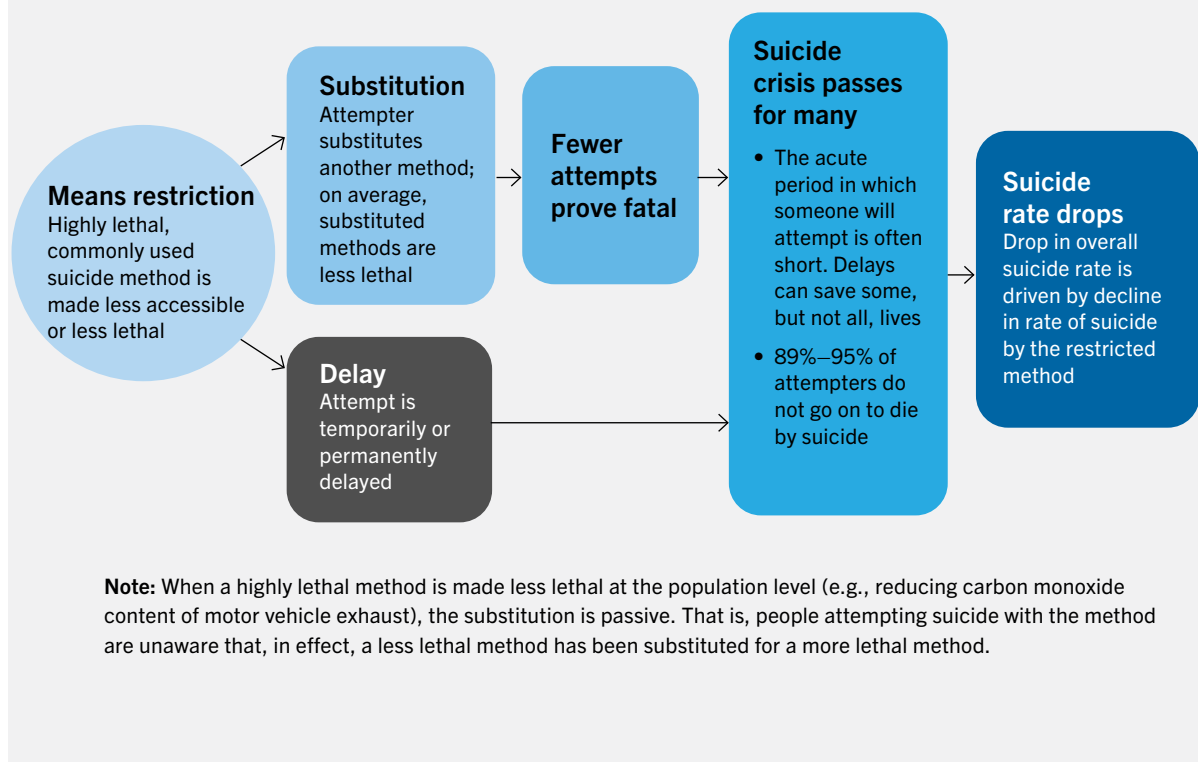
**Table 3. Suicide Deaths by Means—Females, 2018**



## Note about Means Substitution

There is relatively strong evidence at the population level that reducing access to, or the toxicity of, a commonly used and highly lethal means is associated with reductions in the overall suicide rate driven by a reduction in the restricted method (Gunnell et al., 2007; Kreitman, 1976; Lubin et al., 2010; Reisch, Steffen, Habenstein, & Tschacher, 2013; Sinyor et al., 2017). When people's access to a highly lethal means that they would use is blocked, it creates two pathways by which lives are saved (see Figure 1): they may attempt with a method less likely to prove fatal and thus live, or they may not attempt at all.

**Figure 1. Conceptual model describing how reducing access to a highly lethal and commonly used suicide method saves lives at the population level (from Barber & Miller, 2014).**



The evidence regarding the effectiveness of reducing access to a low-lethality suicide method, such as most over-the-counter medicines, is less clear. There is a possibility that a certain proportion of those restricted from a low-lethality method will substitute a more lethal method. The most important reductions in suicide rates have been obtained when a method that is both highly lethal and commonly used (e.g., pesticides, domestic gas) was made less deadly or less available (Swiss and Israeli policies regarding military-issued firearms access, p. 12).



# STRATEGIES TO REDUCE ACCESS TO LETHAL MEANS

Important strides have been made to reduce access to a broad range of lethal means among individuals who may be at risk for suicide. The following strategies highlight effective approaches that have been tested in the United States and other countries. Taken together, these approaches have the potential to reduce suicide and save lives.

# FIREARMS RESPONSIBILITY

Firearms responsibility includes safety technologies and interventions that promote safe storage, such as gun locks and safes; equipping firearm retailers and range owners with the skills to identify individuals who may be at risk for suicide; and asking friends or loved ones to temporarily hold on to firearms during a time of crisis.

## Partnering with Firearm Retailers and Shooting Range Owners

In recent years, people within the firearm industry, firearm instructors, and other firearm stakeholders have partnered with those in the field of suicide prevention to reduce access to firearms among those who may be at risk for suicide.

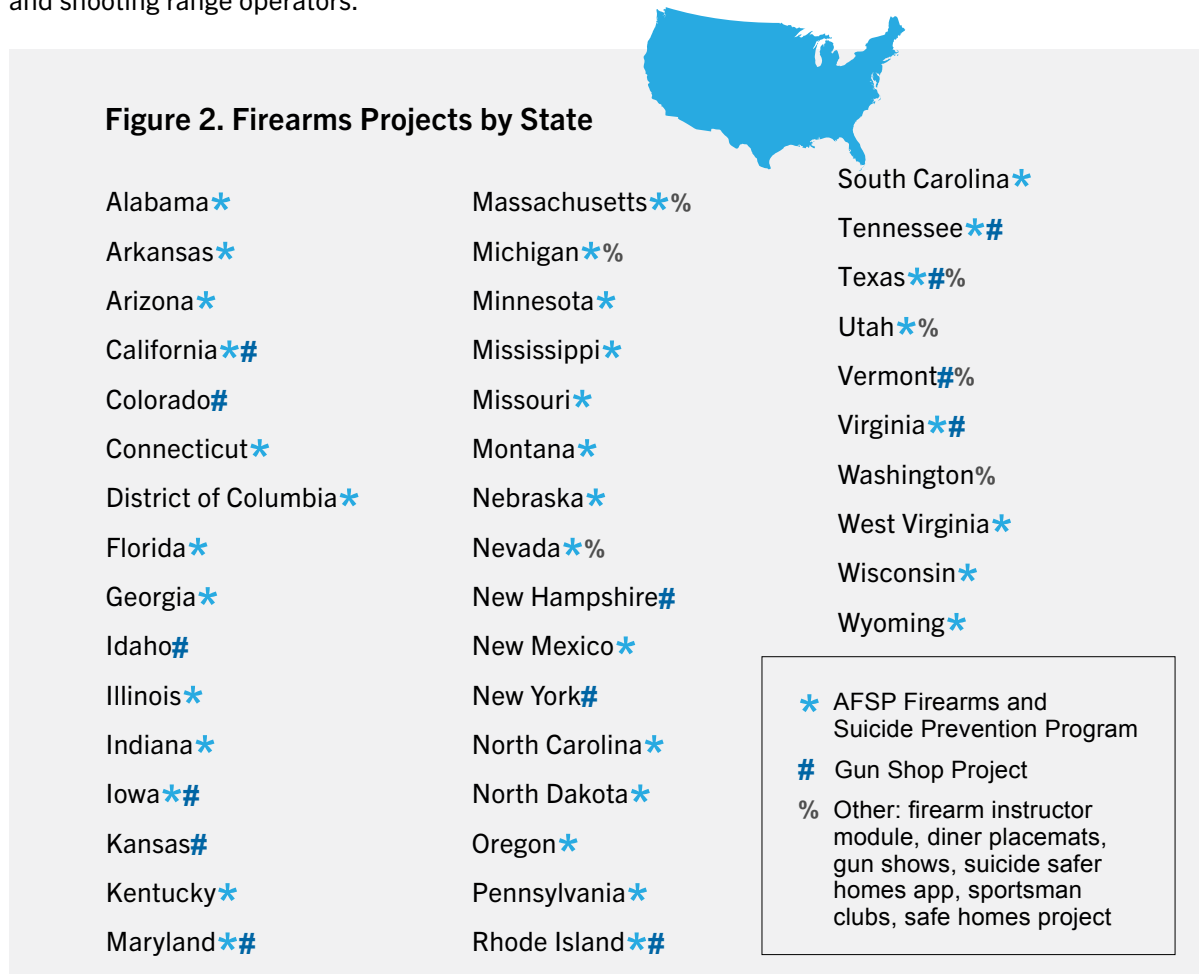
The Gun Shop Project is one example. The project aims to increase the capacity of firearm retailers to prevent suicide among customers and their friends and families (New Hampshire Firearms Safety Coalition, n.d.). The project originated in New Hampshire in 2009 as a collaboration between the New Hampshire Firearms Safety Coalition and the Means Matter campaign (Harvard Injury Control Research Center, n.d.), and it focused on educating firearm purchasers about suicide risk and associated safety precautions. Its specific objectives are to (1) help retailers avoid selling or renting firearms to new customers seeking a gun for suicide, and (2) educate existing customers in a trusted environment about the “11th Commandment of Firearm Safety” (i.e., be alert to signs of suicide risk among loved ones and help keep guns from them until they have recovered). The work has since expanded to include firearm instructors, writers for gun magazines, sportsman clubs, and other venues. A variety of training tools for instructors and retailers are available on the [Means Matter](#) gun owner pages.



**The Gun Shop Project aims to increase the capacity of firearm retailers to prevent suicide among customers and their friends and families.**

In 2016, the American Foundation for Suicide Prevention (AFSP) partnered with the National Shooting Sports Foundation (NSSF) to implement a program that educates firearm retailers, shooting range operators, and instructors about suicide prevention (American Foundation for Suicide Prevention, 2017). This program is planning to expand into all 50 states. AFSP launched this partnership to advance Project 2025—an AFSP initiative that aims to reduce the suicide rate by 20 percent by the year 2025 (a goal also endorsed by the Action Alliance in 2016), which includes firearm safety as one of its key strategies.

Figure 2 provides a listing of some of the firearm partnership projects currently underway that focus on increasing both responsible storage in the home and suicide prevention training for firearm retailers and shooting range operators.



## Responsible Firearms Storage

Responsible storage consists of keeping firearms locked, and preferably unloaded, and separating firearms and ammunition when not in use. Secure storage options for gun owners living with individuals who may be at risk for suicide include either storing household guns away from home (e.g., with a relative, at a gun shop, or at a storage facility) or locked at home in a secure gun safe, gun cabinet, or lockbox to which the at-risk person has no access (National Shooting Sports Foundation, 2017). For added security, portable storage devices can be secured to a wall, the floor, or both to prevent removal. In addition to locked storage, unloaded firearms can be secured with a gun-locking device that makes the firearm unusable. Firearms can also be disassembled, and the parts securely stored in separate locations.

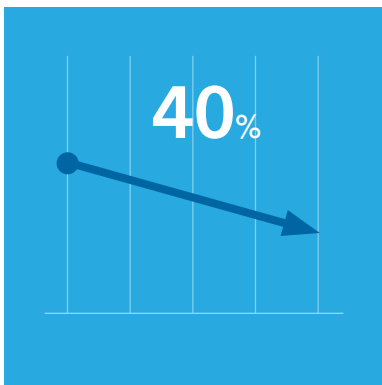
## Firearms and Veteran Suicide

According to one study, veterans are more likely than the general population to own firearms (44.95% vs. 20%, respectively; Cleveland, Azrael, Simonetti, & Miller, 2017). And the frequency of firearms use by veterans as a means of suicide remains high. Nearly 70 percent of veteran suicides involve a firearm versus 50 percent of suicides overall nationally (U.S. Department of Veterans Affairs, 2018).



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For veterans and other individuals who may be at risk for suicide, putting time and distance between them and a firearm has been proven to decrease the likelihood of suicide. In their study of Israeli Defense Force members, Lubin and colleagues (2010) observed a 40 percent decline in the overall suicide rate among soldiers after a policy took effect in 2006 that limited their access to their military-issued firearms during weekend leave. The drop was driven by a decline in weekend suicides by firearms. Reisch and colleagues (2013) observed a marked decline in the overall suicide rate in Switzerland after that country instituted army reforms in 2003 that cut the size of the army in half, and thus, reduced the number of service members with military-issued firearms. It is the policy of the U.S. Department of Defense and the U.S. Department of Veterans Affairs (VA) for health care clinicians to assess access to lethal means among patients who may be at risk for suicide and take steps to limit that access (Assessment and Management of Risk for Suicide Working Group, 2013). The VA prioritizes steps that are voluntary in nature, and clinicians are trained to work collaboratively with patients around solutions.



**Lubin and colleagues (2010) observed a 40 percent decline in the overall suicide rate among Israeli Defense Force soldiers after a policy took effect in 2006 that limited their access to their military-issued firearms during weekend leave.**

# ACCESS TO LIGATURES

Reducing access to ligatures (e.g., ropes, belts) and ligature points (e.g., beams, door knob, trees) is key to preventing suicide by suffocation. About 10 percent of suicides by hanging occur in the controlled environments of hospitals, prisons, and police custody. The remainder occur in the community (Gunnell, Bennewith, Hawton, Simkin, & Kapur, 2005), where ligatures and ligature points are all widely available. An evaluation of individuals in the United Kingdom who had survived a near-fatal suicide attempt by hanging indicated accessibility was a main factor that facilitated the attempt (Biddle et al., 2010).

Health systems, prisons, detention facilities, and jails can take action to prevent suicide by hanging. There are a number of safety technologies, including collapsible shower heads, light fixtures, door knobs, and specially designed bedding for hospitals and correctional facilities that is resistant to tearing.

The Joint Commission, an independent, nonprofit accreditor and certifier of U.S. hospitals, requires that hospitals (1) “conduct a risk assessment that identifies specific patient characteristics and environmental features that may increase or decrease the risk for suicide,” and (2) “provide for a location for the patient that is safe, monitored, and clear of items that the patient could use to harm himself or herself or others” (The Joint Commission, 2016). In 2017, The Joint Commission announced that “its surveyors will place special focus on suicide, self-harm, and ligature observations in psychiatric hospitals and units” and will identify potential risks for suicide by ligature in the environment” (The Joint Commission, 2017).



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# ACCESS TO POISONS

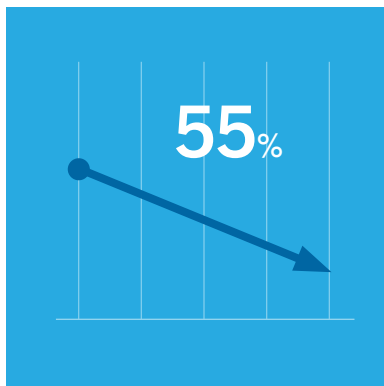
Poisons include prescription and nonprescription medicines that are used in a way other than directed as well as illegal drugs, chemicals, and gas. There are a number of different strategies that individuals, organizations, and communities can take to reduce access to poisons among those who may be at risk for suicide.

Key safety measures have been carried out in the United States and globally to make it harder for individuals in crisis to die by poisoning. For instance, in Denmark, reducing access to barbiturates and reducing the carbon monoxide content of car exhaust and household gas resulted in a 55 percent decrease in suicides between 1970 and 2000 (Nordentoft, Qin, Helweg-Larsen, & Juel, 2007).

## Nonprescription and Prescription Drug Packaging, Storage, Disposal, and Prescribing

Modifying medicine packaging and reducing pack sizes also may prevent suicide. In 1998, the United Kingdom enacted legislation to modify pack sizes and adopt blister packaging of analgesics including acetaminophen. This legislation resulted in a reduction in nonfatal acetaminophen overdoses, the number of tablets taken for overdoses, large overdoses, and salicylate self-poisoning (Hawton, 2002; Hawton et al., 2001).

In January 2018, the VA led the effort to promote opioid prescription safety for veterans, becoming the first hospital system to release opioid prescribing rates. The VA began [publicly posting information](#) on opioids dispensed from VA pharmacies along with its strategies for prescribing these pain medications appropriately and safely.



In Denmark, reducing access to barbiturates and to car and household gas with carbon monoxide resulted in a **55 percent decrease in suicides between 1970 and 2000.**

Safety measures available for individual storage and disposal of prescription and nonprescription drugs include drug lockboxes, drug buyback programs, and confidential drug return programs. The United States Drug Enforcement Agency (DEA) holds the National Prescription Drug Take Back Day, during which individuals can safely and conveniently dispose of prescription drugs at established collection sites. In addition, the DEA offers an online tool that locates DEA-authorized sites offering year-round collection. Many states also have similar online tools to identify local collection sites and resources, such as Washington state's [www.takebackyourmeds.org](http://www.takebackyourmeds.org). Other resources, such as [www.disposemy meds.org](http://www.disposemy meds.org), include a medication disposal locator that lists locations across the United States by zip code.

## Pesticide Access

Pesticides are a leading cause of suicide death worldwide (World Health Organization, 2006), and efforts to reduce access to pesticides have resulted in decreases in suicide. In Sri Lanka, restrictions on the import and sales of pesticides in 1995 and 1998 were associated with a 50 percent reduction of the suicide rate by 2005 (Chowdhury et al., 2018; Gunnell et al., 2007; Gunnell et al., 2017).

Although pesticides are a leading cause of suicide death globally, they do not play such a large role in the United States and other countries that have robust regulatory environments (World Health Organization, 2006; CDC, 2016). A comprehensive regulatory system combined with guidance and other information relating to the storage, transport, and distribution of pesticides increase the safeguards around the deliberate misuse of pesticides for self-harm. Pesticide manufacturers work in cooperation with the United States Environmental Protection Agency and foreign regulatory authorities to support the safe use of pesticides in accordance with their labels. They also support and promote improved labeling, packaging, and formulations to minimize the risk of misuse and poisoning.

Government programs and stewardship initiatives are also in place to prevent deliberate misuse of pesticides for self-harm and have led to beneficial effects in several countries. These initiatives provide information and training about the importance of securely locking away pesticides, effective disposal of pesticide waste products, and increased awareness about treatments for deliberate ingestion. The pesticide industry is committed to providing information and training materials on the responsible and safe use of pesticides for farmers, agricultural extension workers, retailers, customers, and other users. These efforts have resulted in a decrease in suicide deaths from the deliberate misuse of pesticides.

## Gas Exposure

Following the detoxification of domestic gas in the United States between 1950 and 1960, the suicide rate by domestic gas decreased (Lester, 1990). In the United Kingdom, suicide rates also decreased following the reduction of carbon monoxide in domestic gas (Kreitman, 1976).

The introduction of catalytic converters in vehicles has been associated with a decrease in suicide deaths from carbon monoxide poisoning (Amos, Appelby, & Kiernan, 2001; McClure, 2000; Thomsen & Gregersen, 2006). However, Strife and Paulozzi (2004) noted that catalytic converters do not completely remove carbon monoxide, particularly when a vehicle is started cold or running within a closed space, leaving suicide attempts by carbon monoxide in vehicle cabins still a high risk for death. They proposed a device that detects cabin levels of carbon monoxide, warns the driver, and automatically shuts down the engine in a stationary car if levels rise above a dangerous threshold. The device has been investigated in the United States (Galatsis & Wlodarski, 2006) and has been proposed to the United Nation's World Forum for Harmonization of Vehicle Regulations as a potential suicide prevention solution. Early models of the carbon monoxide shut-off device indicate that an estimated 600 suicide deaths could be prevented each year (National Action Alliance for Suicide Prevention, 2014).

# BRIDGE BARRIERS

Adding barriers (e.g., fencing, safety nets) to bridges can prevent suicide by making it harder for jumps to occur, while removing bridge barriers can lead to increases in suicide. In spring 2017, construction of a stainless steel safety net began on the Golden Gate Bridge, a location associated with at least 1,300 suicide deaths (Blaustein, M., & Fleming, A., 2009). Although it is too soon to know the impact of this construction on future suicide attempts, there are already a number of examples that highlight the effectiveness of bridge barriers in preventing suicide.

## **Bloor Street Viaduct, Toronto, Canada**

The city of Toronto erected a barrier at the Bloor Street Viaduct in 2003. In the 11 years prior to the barrier, there was an average of nine suicides per year at the site. In the 11 years following the barrier, the number of suicides dropped to almost zero (Sinyor et al., 2017).

## **Memorial Bridge, Augusta, Maine**

For the Memorial Bridge in Maine, the number of suicides decreased from 14 before the installation of an 11-foot barrier in 1983 to zero during the 22 years following the installation of the barrier (Pelletier, 2007).

## **Bridge Barriers in Australia and New Zealand**

Suicides decreased by 50 percent at the Gateway Bridge in Australia after barriers were installed in 1993 (Law, Svetlicic, & De Leo, 2014). At another Australian bridge, which was a suicide hot spot, suicides increased after safety barriers were removed in 1996 (Beautrais, 2001). A similar study in New Zealand found that suicides at a bridge increased five-fold after barriers were removed. But after the barriers were reinstalled, there were no reported suicides at the site (Beautrais, Gibb, Fergusson, Horwood, & Larkin, 2009).

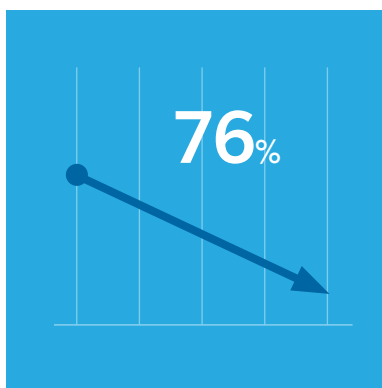


# RAILWAY BARRIERS

Suicide related to railways can be prevented with the installation of barriers blocking access to the tracks. The Federal Railroad Administration has identified two types of barriers: fencing that restricts access to the tracks and platform edge or screen doors. The agency stresses that while completely blocking off access to the tracks is not feasible, it may be feasible to focus efforts on reducing access to known locations where many suicides have occurred (i.e., suicide hot spots; Federal Railroad Administration, 2014).

One study found that installing physical barriers at railway stations in Japan resulted in a 76 percent decrease in suicides (Ueda, Sawada, & Matsubayashi, 2015). Chung and colleagues (2016) found that suicides at Seoul Metro subway stations in South Korea decreased by 89 percent after the installation of platform screen doors. Further, Law et al. (2009) found that suicides decreased by 59.9 percent following the installation of platform screen doors at rail stations in Hong Kong.

In the United States, there was an average of 284 suicide deaths per year from 2012 through 2016 on U.S. rails (Federal Railroad Administration, 2017). However, Berman and colleagues (2013) found that the majority of suicides on U.S. railways have occurred on freight rails rather than transit systems. Thus, the use of platform edge doors or screen doors in transit systems may not fully prevent all railway-based suicides. While they are not commonly used in the United States, these barriers are seen in some airport transit systems, and some communities are considering them. For instance, in 2017, the Southeastern Pennsylvania Transportation Authority (SEPTA), which already had posted signs for the National Suicide Prevention Lifeline, was asked “to consider platform barriers as part of City Hall Station’s ongoing renovation” to prevent accidents and suicide (Saksa, 2017).



One study found that installing physical barriers at railway stations in Japan resulted in a **76 percent decrease** in suicides (Ueda, Sawada, & Matsubayashi, 2015).

# HEALTH CARE STRATEGIES TO ADDRESS LETHAL MEANS

The majority of people who die by suicide had a health care visit in the weeks and months before their death (Ahmedani et al., 2014; Luoma, Martin, & Pearson, 2002). Thus, the health care system can play an enormous role in preventing suicide by creating safe environments, screening for suicide risk, assessing level of suicide risk, conducting safety planning and counseling on access to lethal means, and providing follow-up care and caring contacts (National Action Alliance for Suicide Prevention, 2018).

Creating a safe environment within health care facilities can include reducing access to ligatures and installing safety technologies, such as collapsible shower heads. Health care systems can also ensure that their providers counsel patients who may be at risk for suicide on access to lethal means, including how to make their home safer.

Training for health care providers on how to reduce access to lethal means among patients who may be at risk for suicide is now widely available. The Suicide Prevention Resource Center offers the free online course [Counseling on Access to Lethal Means](#) (CALM) for primary care and behavioral health care providers. CALM focuses on how to (1) identify people who could benefit from lethal means counseling, (2) ask about their access to lethal means, and (3) work with them and their families to reduce access (Suicide Prevention Resource Center, n.d.).

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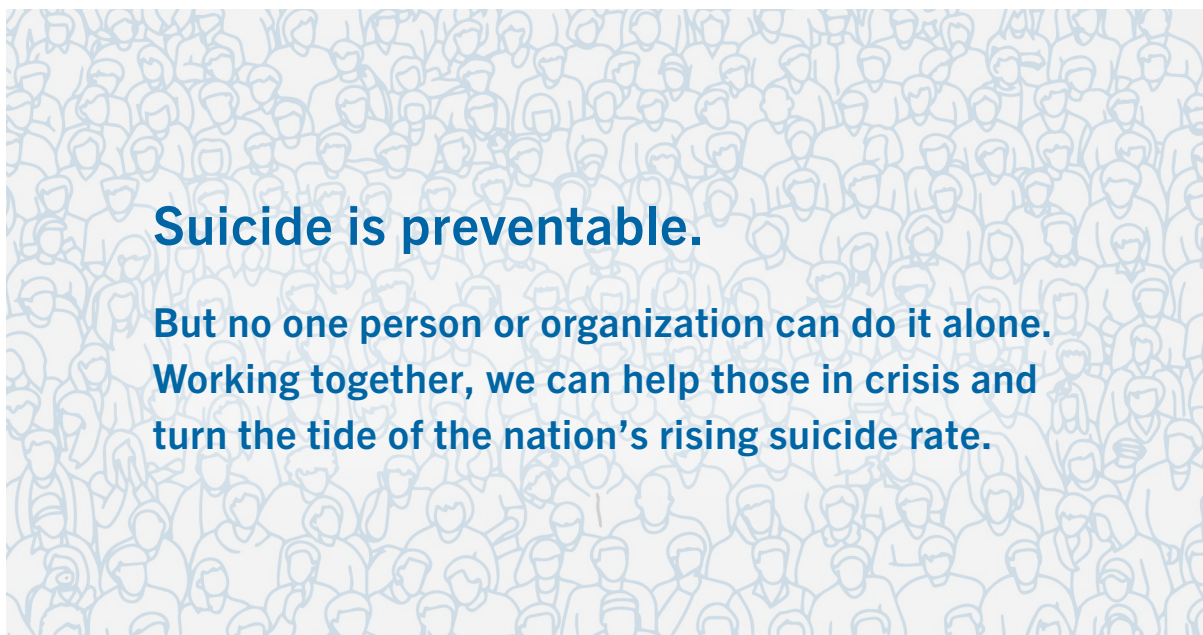


# Considerations for the Way Forward

Reducing access to lethal means is an effective way to prevent suicide and is critical for reducing the nation's rising suicide rate. This paper demonstrates that significant progress has already been made to save lives by putting time and distance between lethal means and individuals who may be in crisis. The Action Alliance recommends the following ways community and industry leaders can build on these successes and continue to advance Goal 6 of the *National Strategy*:

- 1 Launch or get involved in innovative cross-sector partnerships designed to advance Goal 6: promote efforts to reduce access to lethal means of suicide among individuals with identified suicide risk (HHS & Action Alliance, 2012).**
- 2 Support, promote, or invest in local, state, or national efforts that seek to advance Goal 6 through a multi-sector approach.**
- 3 Promote and expand access to widespread training for health care providers in clinical settings on ensuring counseling on access to lethal means is conducted.**
- 4 Encourage the inclusion of a wide range of perspectives in any effort to advance Goal 6 and the use of shared language that conveys the concept of reducing access to lethal means in terms that appeal to diverse audiences.**
- 5 Invest in the evaluation of efforts to advance Goal 6, in order to help build the evidence for what works in preventing suicide by reducing access to lethal means among those who may be at risk for suicide.**

Suicide is preventable. But no one person or organization can do it alone. Suicide prevention requires a coordinated, comprehensive national response that engages every sector of society, including leaders from suicide prevention, health and behavioral health care, business and industry, communities, public safety, and public policy. Continued progress will rely on cross-sector collaboration that brings together the best thinking and the best resources to advance goal 6 of the *National Strategy*. Working together, we can help those in crisis and turn the tide of the nation's rising suicide rate.



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