

UNIVERSITY of WASHINGTON

**ADAI** Alcohol &  
Drug Abuse  
Institute

# INFO BRIEF

## Alcohol, Drugs, Mental Illness, and Gun Violence

February 2013

The prevention of gun violence is a topic of current interest and debate in the U.S. and in Washington state. Research suggests that substance abuse and mental illness may be contributing factors in some gun violence. This information brief specifically addresses the intersection of alcohol/drug use and mental health, and the use of firearms.

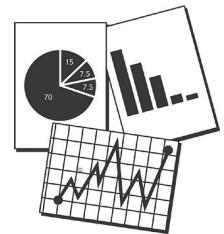
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### General Statistics

- Gun ownership, US compared to World:**

The United States ranks **number 1** in the world for both the **number** of privately owned firearms and also the **rate** per 100 population.

As of 2007, there were **270 million privately owned firearms** in the US (rate: 88 guns per 100 persons). (Karp A. [Small Arms Survey 2007: Guns and the City](#). Cambridge Univ. Press, 2007).



- Number of firearm-related injuries, homicides and suicides in the United States:**

**2010:** 31,672 injuries by firearm  
11,078 homicides by firearm (~68% of total homicides)  
19,392 suicides by firearm (~50.5%)  
606 accidental deaths by firearm

**2011** (preliminary): 32,163 injuries by firearm  
11,101 homicides by firearm (~70%)  
19,766 suicides by firearm (~51.6%)  
851 accidental deaths by firearm

From: Hoyert DL, Xu J. Deaths: Preliminary data for 2011. National Vital Statistics Reports (CDC) 2012;61 (6):52 p. <http://www.cdc.gov/nchs/products/nvsr.htm#vol61>

### Recommended Web Sites



**CDC's Injury and Violence Prevention and Control:** <http://www.cdc.gov/injury/>

Conducts and reports on research related to a variety of causes of violence and injury, including motor vehicle crashes, falls, homicides, illnesses, and more. The CDC's firearms-related injury research was defunded by Congress in 1996 (see Kellermann & Rivara, 2012 in [Public Health Policy & Law](#) section below) and only recently reestablished, however some firearms-related statistics are available via the agency's [National Violent Death Reporting System](#).

**GunPolicy.org:** <http://www.gunpolicy.org/>

An international organization hosted by the University of Sydney's School of Public Health that partners with groups all over the world to provide accessible statistical information on gun policy and violence. The United States section includes statistics drawn from a variety of sources broken into useful subcategories such as: gun numbers, death and injury, gun industry, gun trade, regulation, international controls, and more. <http://www.gunpolicy.org/firearms/region/united-states>

**Gun Violence in King County** (Public Health - Seattle & King County): <http://www.kingcounty.gov/healthservices/health/data/GunViolence.aspx>

Provides information on overall firearm deaths and injuries, economic costs of gun violence in King County, firearm homicides/suicides/injuries, firearm ownership in the county, and firearm policies in Washington state.

**Harvard School of Public Health's Injury Control Research Center:** <http://www.hsph.harvard.edu/hicrc/firearms-research/>

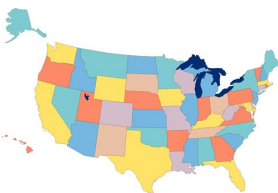
Excellent source of easy-to-read synopses of recent research on firearms-related violence and injury. Subtopics include homicide, suicide, accidents, children, women, gun ownership, gun storage, self-defense gun use, and more.

**Mayors Against Illegal Guns:** <http://www.mayorsagainstillegalsguns.org>

A coalition of mayors in the US determine to combat firearm-related violence through education and legislation. Established in 2006 by Mayor Bloomberg of New York and Mayor Menino of Boston, the coalition now has over 800 participating mayors from 44 states. Site includes information on state and local initiatives, federal legislation, and research on a variety of policy-related issues.

## US Federal and State Laws Related to Firearms and Alcohol/Drugs

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**Federal law** prohibits possession or receipt of a firearm or ammunition to any person who "is an unlawful user of or addicted to a controlled substance." Federally licensed firearms dealers are also prohibited from transfer of guns to persons "adjudicated as mental defectives or committed to any mental institution." (Federal Gun Control Act of 1968, codified at 18 U.S.C. § 92. See: *Quick Reference to Federal Firearms Laws*, US Dept. of Justice: <http://www.justice.gov/usao/ut/psn/documents/guncard.pdf>)

**Twenty-eight states and the District of Columbia** also prohibit drug abusers, persons convicted of drug-related misdemeanors, and/or persons under the influence of controlled substances from purchasing or possessing some or all firearms. Twenty states and DC specifically prohibit alcohol abusers, misdemeanants, and/or those under the influence of alcohol from purchasing/possessing firearms.

**Washington State**, on the other hand, only prohibits possession or purchase for those who have been convicted of class B felonies, rather than misdemeanors, for violations of the Controlled Substances Act. See: [RCW 9.41.040](#) and [RCW 9.41.010](#). In terms of mental illness, Washington State law prohibits sale/possession of firearms persons who have been involuntarily committed for mental illness treatment; the person's right to possess a firearm can be restored as provided in [RCW 8.41.047](#).

For an excellent overview of both Federal and State laws related to prohibited purchasers, see *Prohibited Purchasers Generally - Policy Summary from the Law Center to Prevent Gun Violence*: <http://smartgunlaws.org/prohibited-purchasers-generally-policy-summary/> (2012). See also the resources listed below in the [Public Health Policy & Law](#) section.

## Alcohol, Drugs, Mental Illness, and Violence

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Numerous studies have found that where there are more guns, there is more homicide (see Harvard Injury Control Research Center: <http://www.hsph.harvard.edu/hicrc/firearms-research/guns-and-death/>).

Alcohol abuse/dependence also appears to have a causal association with the perpetration of violent and impulsive crime, including assault, use of a weapon, theft, property damage, and fraud (Boden et al., 2013). Significant associations have additionally been found between substance use disorders and making threats against others with a firearm (Casiano, et al., 2008).

In addition, consumption of alcohol and drugs increases the risk one will become a *victim* of a violent crime. In a study that included medical examiner reports from King County, WA, alcohol and illicit drug use appeared to be

associated with an increased risk of violent death, including by firearms (Rivara et al., 2009). Among a studied population of homicide victims in Sao Paulo, alcohol consumption was positively correlated with homicide victimization, with firearms causing 78.6% of the deaths examined overall (Andreuccetti et al., 2009).

Illicit drugs were prominent among the victims of firearms-related homicides in a study in Australia, with the relative levels of psychostimulants (especially cocaine) in such cases twice as high as that seen in deaths due to other causes. In contrast, alcohol was most frequently seen amongst deaths due to blunt force injury (Darke & Duffoul, 2008).

Heavy drinkers in one study were found to be 2.67 times as likely to be shot in an assault compared to both light-drinkers and non-drinkers (light- and non-drinkers shared the same risk). That same study found that simply being in an area of high off-premise alcohol outlet availability ("off-premise" meaning take-out establishments such as liquor and convenience stores) doubled a person's risk of being shot in an assault. Heavy drinkers in high off-premise alcohol outlet availability areas were 9.34 times as likely to be shot in an assault. (Branas et al., 2009)

A nationwide Swedish study using outpatient and inpatient data found that people with mental illness who also have a substance use disorder are nine times more likely than the general population to be murdered. Overall, people with mental illness were almost five times as likely to be a murder victim, compared with those with no psychiatric diagnosis. (Crump et al, 2013)

## References

Andreuccetti G, de Carvalho HB, de Carvalho PJ, et al. Alcohol consumption in homicide victims in the city of Sao Paulo. *Addiction* 2009;104(12):1998-2006. doi: [10.1111/j.1360-0443.2009.02716.x](https://doi.org/10.1111/j.1360-0443.2009.02716.x).

Excessive consumption of alcohol is a serious public health issue and a major factor in triggering violent situations, which suggests a strong association between drinking and homicide victimization. In this study of homicide victims in Sao Paulo (the greatest urban area in S. America), firearms caused most of the deaths (78.6%) and alcohol consumption was greater among victims of homicide by sharp weapons.

Ashe M, Jernigan D, Kline R, Galaz R. Land use planning and the control of alcohol, tobacco, firearms, and fast food restaurants [Review]. *Am J Public Health* 2003;93(9):1401-1408. Free online: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447982/>  
This literature review examines how land use regulations can function as control tools for public health advocates, and includes a lengthy section on the connection between alcohol availability and violent crime. Does not specifically address firearms, but does examine assault and homicide, two violent crimes that frequently involve the use of guns.

Baskin-Sommers A, Sommers I. The co-occurrence of substance use and high-risk behaviors. *J Adolescent Health* 2006;38:609-611. doi: [10.1016/j.jadohealth.2005.07.010](https://doi.org/10.1016/j.jadohealth.2005.07.010)

The current study extends previous research by examining the co-occurrence of alcohol, marijuana, methamphetamine, and hallucinogen use with eight high-risk behaviors (carrying weapons, assault, partner violence, self-harm, multiple sexual partners, condom use, use of seatbelts, and speeding) in a sample of college students.

Boden JM, Fergusson DM, Horwood LJ. Alcohol misuse and criminal offending: Findings from a 30 year longitudinal study. *Drug Alcohol Depend* 2013;128(1-2):30-6. doi: [10.1016/j.drugalcdep.2012.07.014](https://doi.org/10.1016/j.drugalcdep.2012.07.014)

Examined associations between alcohol abuse/dependence (AAD) and several classifications of offending behavior (assault, use of a weapon, theft/burglary, property damage, fraud) in a New Zealand birth-to-age-30 cohort. In general, increasing rates of AAD symptoms were associated with increased risks of: assault, use of a weapon, theft/burglary, property damage, and fraud.

Branas CC, Elliott MR, Richmond TS, et al. Alcohol consumption, alcohol outlets, and the risk of being assaulted with a gun. *Alcohol Clin Exp Res* 2009;33(5):906-15. doi: [10.1111/j.1530-0277.2009.00912.x](https://doi.org/10.1111/j.1530-0277.2009.00912.x)

Gun assault risk to individuals near off-premise alcohol outlets is about the same as or slightly greater than the risk they incur from heavy drinking (heavy drinkers are over twice as likely to be shot in an assault than light drinkers). The combination of heavy drinking and being near off-premise outlets resulted in greater risk than either factor alone. By comparison, light drinking and being near on-premise alcohol outlets were not associated with increased risks for gun assault.

Casiano H, Belik SL, Cox BJ, et al. Mental disorder and threats made by noninstitutionalized people with weapons in the National Comorbidity Survey Replication. *J Nerv Ment Dis* 2008;196(6):437-45. doi: [10.1097/NMD.0b013e3181775a2a](https://doi.org/10.1097/NMD.0b013e3181775a2a)

This study found an association between mood, anxiety, impulse control, and substance use disorders and the rate of threatening others in the study population. A significant association was found between threats made against others with a gun and both substance use disorders and impulse control.

Crump C, Sundquist K, Winkleby MA, Sundquist J. Mental disorders and vulnerability to homicidal death: Swedish nationwide cohort study. *BMJ* 2013;346:f557. doi: [10.1136/bmj.f557](https://doi.org/10.1136/bmj.f557).

Large cohort study showed that people with mental disorders, including those with substance use disorders, personality disorders, depression, anxiety disorders, or schizophrenia, had greatly increased risks of homicidal death. Interventions to reduce violent death among this population should tackle victimization and homicidal death in addition to suicide and accidents, which share common risk factors.

Darke S, Duffou J. Toxicology and circumstances of death in homicide victims in New South Wales, Australia, 1996-2005. *J Forensic Sci* 2008;53(2):447-51. doi: [10.1111/j.1556-4029.2008.00679.x](https://doi.org/10.1111/j.1556-4029.2008.00679.x)

In this study of homicide victims in Australia, substances were detected in 62.6% of cases, and illicit drugs in 32.8%. Alcohol, cannabis, opioids, and psychostimulants were most commonly detected. Cases where death resulted from a physical altercation were more likely to have had alcohol and cannabis present. Illicit drugs were prominent amongst firearms deaths.

Price JH, Mrdjenovich AJ, Dake JA. Prevalence of state firearm mortality and mental health care resources. *J Community Health* 2009;34(5):383-91. doi: [10.1007/s10900-009-9163-7](https://doi.org/10.1007/s10900-009-9163-7)

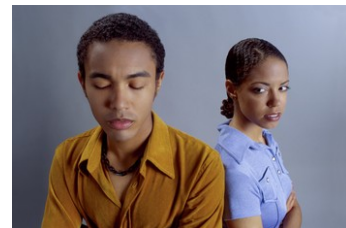
A disproportionate share of firearm suicides and homicides are committed by individuals who have a psychiatric diagnosis, many with a history of substance abuse. This study assessed whether increased access to mental health care or known demographic risk factors for firearm trauma predicted state variations in firearm-related deaths. The availability of mental health resources appears to have minimal association with rates of firearm-related deaths, however state levels of education achievement and expenditures do appear to reduce firearm mortality.

Rivara FP, Mueller BA, Somes G, et al. Alcohol and illicit drug abuse and the risk of violent death in the home. *JAMA* 1997;278(7):569-75. doi: [10.1001/jama.1997.03550070061039](https://doi.org/10.1001/jama.1997.03550070061039)

This examination of medical examiner data from homicide and suicide victims in 3 large urban areas in the US (including King County, WA), found an association between alcohol and illicit drug use and increased risk of violent death. The risk of homicide was also increased for non-substance-abusing individuals living in households in which other members abused alcohol or drugs.

## Domestic Violence

Firearms pose a particular threat to victims of domestic violence. Nationally, firearms were used to kill more than two-thirds of spouse and ex-spouse homicide victims between 1990 and 2005 (Bureau of Justice: <http://bjs.ojp.usdoj.gov/content/homicide/intimates.cfm>).



In nearly two-thirds of households that contained a firearm, one partner has used the firearm against the other, usually threatening to shoot or kill her; in 74.5% of those cases, alcohol or drugs had been used by the perpetrator just before the incident (Sorenson & Wiebe, 2004). Household use of illicit drugs, domestic violence, and readily available firearms place women at particularly high risk of homicide at the hands of a spouse or a close relative (Bailey et al., 1997), and in one study, perpetrator problem drinking was associated with an 8-fold increase in partner abuse and a 2-fold increase in femicide (Sharps et al., 2001).

Alcohol also plays a role in the victims of domestic violence, perhaps because the dynamics of intimate relationships are affected by the tendency of alcohol to increase aggressive behavior and decrease the ability of the victim to escape violent situations (Banks et al., 2008).

Though one study found no impact of increased alcohol taxes, a common metric of alcohol availability, on reducing intimate partner violence (Zeoli & Webster, 2010), another study found a strong connection between alcohol outlet density and increases in the risk of male-to-female partner violence, with an increase of 10 outlets per 10,000 persons increasing the risk of domestic violence against women by 34% (McKinney et al., 2009).

### References

Bailey JE, Kellermann AL, Somes GW, et al. Risk factors for violent death of women in the home. *Arch Intern Med* 1997;157(7):777-82. doi: [10.1001/archinte.1997.00440280101009](https://doi.org/10.1001/archinte.1997.00440280101009)

Among women, mental illness and living alone increase the risk of suicide in the home, and household use of illicit drugs and prior domestic violence increase the risk of homicide. Instead of conferring protection, keeping a gun in the home is associated with increased risk of both suicide and homicide of women. Household use of illicit drugs, domestic violence, and readily available firearms place women at particularly high risk of homicide at the hands of a spouse, an intimate acquaintance, or a close relative.

Banks L, Crandall C, Sklar D, Bauer M. A comparison of intimate partner homicide to intimate partner homicide-suicide: One hundred and twenty-four New Mexico cases. *Violence Against Women* 2008;14(9):1065-1078. doi: [10.1177/1077801208321983](https://doi.org/10.1177/1077801208321983)  
The authors compare cases of female intimate partner homicide-suicide to female intimate partner homicide alone to describe risk factors. Though data on blood-alcohol levels could only be retrieved from deceased victims, alcohol was clearly a factor in intimate partner homicide. Out of the 157 deceased individuals in the study, almost 38% had evidence of alcohol in the blood. The dynamics of intimate relationships are affected by the tendency of alcohol to increase aggressive behavior and to decrease the ability of the victim to escape violent situations.

Campbell JC, Webster D, Koziol-McLain J, et al. Risk factors for femicide in abusive relationships: Results from a multisite case control study. *Am J Public Health* 2003;93(7):1089-1097. Free online: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447915/>  
This paper doesn't address drugs or alcohol use specifically, but provides important information about the relationship between guns and domestic violence. Abused women are five times more likely to be killed by their abusers if the abuser owns a firearm.

McKinney CM, Caetano R, Harris TR, Ebama MS. Alcohol availability and intimate partner violence among US couples. *Alcohol Clin Exp Res* 2009;33(1):169-176. doi: 10.1111/j.1530-0277.2008.00825.x. Free online: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2692953/>

As alcohol outlet density increases, so does the risk of male-to-female partner violence (MFPV), including threats or use of either knives or guns. An increase of one alcohol outlet per 10,000 persons was associated with a 1.03-fold increased risk of MFPV, with an increase of 10 outlets per 10,000 persons associated with a 34% increased risk.

Sharps PW, Campbell J, Campbell D, et al. The role of alcohol use in intimate partner femicide. *Am J Addict* 2001;10:122-135. doi: [10.1080/105504901750227787](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1448464/)

This study examined alcohol use by victims and perpetrators as a risk factor for intimate partner violence and femicide. Perpetrator problem drinking was associated with an eight fold increase in partner abuse and a two-fold increased risk of femicide/attempted femicide.

Sorenson SB, Wiebe DJ. Weapons in the lives of battered women. *Am J Public Health* 2004;94:1412-1417. Free online: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1448464/>

A wide range of objects are used to injure and intimidate battered women, with over 1/3rd of women in this study reporting the use of vehicles or firearms against them. Having a firearm in the home appeared to be more common in homes where battering occurs than in households in the general population. In nearly 2/3rds of households that contained a firearm, one partner has used the firearm against the other, usually threatening to shoot or kill her; in 74.5% of those cases, substances had been used by the partner just before the incident.

Zeoli AM, Webster DW. Effects of domestic violence policies, alcohol taxes, and police staffing levels on intimate partner homicide in large US cities. *Inj Prev* 2010;16(2):90-5. Free online: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2913578/>

Reducing access to firearms for domestic violence restraining order (DVRO) defendants, increasing police staffing levels and allowing the warrantless arrest of DVRO violators may reduce the city-level risk of intimate partner homicide (IPH). There was no evidence that other policies to restrict firearm access to domestic violence offenders or alcohol taxes had a significant impact on IPH.

## Suicide & Self-Harm



In the United States, more people kill themselves with firearms than with all other methods combined. Across states, firearm availability and suicide appear to be associated. States with higher levels of household gun ownership also have higher rates of firearm suicide and overall suicide (Miller, Azrael & Hemenway, 2002), with variation in overall suicide rates relating to numerous factors, including alcohol consumption (Phillips, 2012).

However, gun owning households do not appear to have more (diagnosed) mental illness problems than non-gun owning households, including substance abuse issues. Differences in mental health do not appear to explain why gun owners and their families are at higher risk for completed suicide than non-gun owning families (Miller et al., 2009). Household handgun ownership itself, rather than a history of major depression or suicidal thoughts, appears to be positively correlated with suicide

(Hemenway & Miller, 2002).

Acute alcohol consumption, especially to excess, is statistically associated with a significantly higher risk of gun injury and suicide (Branas et al., 2011), however one study found that having an acute crisis was more strongly correlated with firearm use than a diagnosis of a mental illness problem, a history of suicide attempts, or alcohol problems (Kaplan et al., 2009).

Any degree of alcohol drinking was correlated with suicide by firearm in a U.S. nationwide study in 2004. Decedents who committed suicide by firearm were more than twice as likely to have consumed 1+ alcoholic drinks per occasion in the year prior to their deaths than those who had used other methods to take their own lives (59% v. 24%). They were also more likely than others to have stored a firearm in their residence (91% v. 35%) and less likely to have kept it safely locked or unloaded (62% v. 81%) (Shenassa et al., 2004). In a Slovenian study, males involved in suicides were much more likely to be intoxicated at the time of their deaths than women (87.1% of cases versus 12.9%) and alcohol levels were substantially higher with men as well (0.65:0.26 g/kg) (Bilban & Skibin, 2005).

## References

Bilban M, Skibin L. Presence of alcohol in suicide victims. *Forensic Sci Int* 2005;147 suppl:S9-12. doi: [10.1016/j.forsciint.2004.09.085](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1448464/)

Research has established a strong connection between acute intoxication, alcohol addiction and suicide. In this study of suicides in Ljubljana, Slovenia, 1995-1999, men were drunk in 87.1% of cases, women only in 12.9% and the given alcohol levels were substantially higher with men (0.65:0.26 g/kg). Alcohol was present in as many as 55.7% of suicides with intoxication and in 68.8% of all suicides committed by using firearms, while the highest alcohol levels were found in those who died from cutting their veins (2.01 g/kg).

Branas CC, Richmond TS, Ten Have TR, Wiebe DJ. Acute alcohol consumption, alcohol outlets, and gun suicide. *Subst Use Misuse* 2011;46(13):1592-603. doi: [10.3109/10826084.2011.604371](https://doi.org/10.3109/10826084.2011.604371)

Acute alcohol consumption, especially to excess, was statistically associated with a significantly higher risk of intentionally self-inflicted gun injury and gun suicide in the urban population studied. Alcohol outlet availability, on the other hand, did not appear to be a statistically significant risk factor (though on-premise alcohol outlet availability seemed associated with a lower risk of gun suicide compared to off-premise alcohol outlet availability).

Hemenway D, Miller M. Association of rates of household handgun ownership, lifetime major depression, and serious suicidal thoughts with rates of suicide across US census regions. *Inj Prev* 2002;8(4):313-6. Free online: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1756560/>

Cross-sectional studies in the US often find a significant positive association between levels of household firearm ownership and suicide rates. This study investigated whether the association could be explained by differences in levels of mental health, specifically major depression and suicidal thoughts. Results found that handgun ownership rates are positively correlated with suicide rates, but not with either lifetime prevalence of major depression or suicidal thoughts.

Kaplan MS, McFarland BH, Huguet N. Characteristics of adult male and female firearm suicide decedents: Findings from the National Violent Death Reporting System. *Inj Prev* 2009;15(5):322-7. doi: [10.1136/ip.2008.021162](https://doi.org/10.1136/ip.2008.021162)

These findings challenge the conventional view that those who are severely depressed and suicidal are prone to highly lethal methods, such as firearms. Rather, firearms users may be reacting to acute situations. For both males and females, having an acute crisis was more strongly correlated with firearm use than a diagnosis of a mental health problem, a history of suicide attempts, or alcohol problems.

Miller M, Barber C, Azrael D, et al. Recent psychopathology, suicidal thoughts and suicide attempts in households with and without firearms: Findings from the National Comorbidity Study Replication. *Inj Prev* 2009;15(3):183-7. doi: [10.1136/ip.2008.021352](https://doi.org/10.1136/ip.2008.021352)

People living in a home with firearms were no more or less likely than people in homes without firearms to have recent (past year) anxiety disorders, mood disorders, or substance dependence and/or abuse. Past year suicidal ideation and suicide planning were also not associated with living in households with firearms. The previously reported association between household firearm ownership and heightened risk of suicide is not explained by a higher risk of psychopathology among gun-owning families.

Miller M, Azrael D, Hemenway D. Household firearm ownership levels and suicide across U.S. regions and states, 1988-1997. *Am J Public Health* 2002;92(12):1988-1993. Free online: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1447364/>

In the US, more people kill themselves with firearms than with all other materials combined. This study examined the association between levels of household firearm ownership and rates of suicide, firearm suicide, and non-firearm suicide, and found that where firearm ownership levels are higher, a disproportionately large number of people die from suicide. (Substance abuse is not addressed.)

Phillips JA. Factors associated with temporal and spatial patterns in suicide rates across U.S. states, 1976-2000. *Demography* 2012 (in press). doi: [10.1007/s13524-012-0176-y](https://doi.org/10.1007/s13524-012-0176-y)

Across U.S. states, variation in overall suicide rates over the period was related to demographic (percentage male), economic (per capita income), social (percentage divorced), and cultural (alcohol consumption and gun ownership) factors.

Shen XH, McCabe J, Lovett H, et al. Characteristics of suicide from 1998-2001 in a metropolitan area. *Death Studies* 2006;30(9):859-871. doi: [10.1080/07481180600853074](https://doi.org/10.1080/07481180600853074)

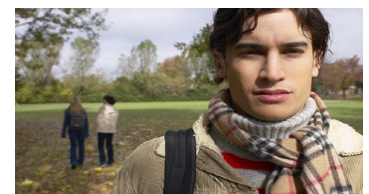
Coroner data was analyzed for the 468 suicides that occurred in Indianapolis, Indiana during 1998-2001. Almost one-half of the victims had a mental illness and 26% had a history of alcohol/substance abuse. The leading risk factors for suicide were age, impaired health, psychosocial stressors, and access to firearms.

Shenassa ED, Rogers ML, Spalding KL, Roberts MB. Safer storage of firearms at home and risk of suicide: A study of protective factors in a nationally representative sample. *J Epidemiol Community Health* 2004;58:841-848. Free online: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1763337/>

This study of the protective effect of storing firearms locked or unloaded (or both) on the risk of suicide by firearms among people with relatively low intention to die found that decedents who had stored their guns unlocked and/or loaded were more likely to use those guns to commit suicide than gun owners who stored their firearms more safely. The study also looked at prior year drinking in decedents and found that victims who had committed suicide with a gun were more than twice as likely to have imbibed alcohol in the year before their deaths than those using other methods (59% v. 24%).

## Adolescents

In 2010, 2,711 children and teens were killed by firearms in the U.S.: 1,790 by homicide, 749 by suicide, and 172 by accidental or undetermined causes (CDC. [Fatal Injury Reports](#) web query system). Children and teens in states with many guns have elevated rates of unintentional gun deaths, suicide, and homicide. In a 2002 study, one-quarter of US adolescents reported easy access to either alcohol or a gun in their home (10% reported easy access to both) (Swahn, Hammig & Ikeda, 2002).



In 2012, 3.1% of adolescents between the ages of 12 and 17 reported carrying a handgun in the previous year. Data analysis results indicated that in males, selling and using illicit drugs were robustly associated with an increased probability of handgun carrying (Vaughn et al., 2012). Binge drinking, marijuana use, sexual activity, prior injury by a gun, serious physical violence, and group violence also predicted access to guns (Loh et al., 2010); with alcohol use before the age of 13 increasing the rates of gun-related delinquency (carrying a weapon to school, e.g.) in teens (Peleg-Oren et al., 2009). For girls, alcohol consumption had only a minor impact as a predictor of weapon-perpetrated violence, and drug use none at all (Erickson et al., 2006).

With regard to the role of substances of abuse, use of substances other than alcohol (including cigarettes and marijuana) predicted violent behavior in young adults with the greatest consistency (Marcus & Jamison, 2013). Early onset of hard-drug use has a potentially causal effect on subsequent criminal gun use (Reid, 2001), with substance abuse in adolescents serving as a risk factor for violence in both adolescence and on into early adulthood (Marcus & Jamison, 2013). The density of alcohol outlets in an area also had a significantly positive effect on youth homicide for those aged 13-17 and 18-24 (including homicide using firearms) (Parker et al., 2011).

In terms of suicide, firearm ownership levels have been positively correlated with suicide rates among 15-24-year-olds (Birckmayer & Hemenway, 2001) and teen suicide victims who used firearms were 4.9 times more likely to have been drinking than were those who used other methods of suicide (Brent, Perper & Allman, 1987). Binge drinking in particular is a risk factor for adolescent suicide and self-harm (Swahn et al., 2012).

## References

- Birckmayer J, Hemenway D. Suicide and firearm prevalence: Are youth disproportionately affected? *Suicide and Life-Threatening Behavior* 2001;31(3):303-310. doi: [10.1521/suli.31.3.303.24243](https://doi.org/10.1521/suli.31.3.303.24243)  
Examines the association between suicide rates and household firearm ownership for four age groups in the nine census regions from 1979 to 1994. Results showed that firearm ownership levels are correlated with suicide rates among 15-24-year-olds and 65-84-year-olds, but not among 25-64-year-olds. The findings suggest that if the relationship is causal, a 10% fall in regional firearm ownership levels would lead to a 3.0% decrease in suicide rates.
- Birckmayer J, Hemenway D. Minimum-age drinking laws and youth suicide, 1970-1990. *Am J Public Health* 1999;89(9):1365-1368. Free online: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1508754/>  
Examines the association between the minimum legal drinking age (MLDA) and suicides among youths aged 18 to 20 yrs. Findings suggest that MLDA is associated not only with motor-vehicle death rate among youths but also with the rate of youth suicide. The authors estimate that lowering the drinking age from 21 to 18 yrs in all states could increase the number of suicides in the 18-20-yr-old population by approximately 125 youths each year.
- Brent DA, Perper JA, Allman CJ. Alcohol, firearms, and suicide among youth. Temporal trends in Allegheny County, Pennsylvania, 1960-1983. *JAMA* 1987;257(24):3369-72. doi: [10.1001/jama.1987.03390240075026](https://doi.org/10.1001/jama.1987.03390240075026)  
The death certificates and coroners' reports for all suicides, undetermined causes of death, and questionable accidents were obtained from the PA Dept. of Vital Statistics for 10- to 19-year-old residents of Allegheny County, PA, from 1960 to 1983. The proportion of suicide victims who had detectable blood alcohol levels rose 3.6-fold from 12.9% in 1968 to 1972 to 46.0% in 1978 to 1983. Suicide victims who used firearms were 4.9 times more likely to have been drinking than were those who used other methods of suicide. The availability of firearms and the increased use of alcohol among youth may have made a significant contribution to the increase in the suicide rate among the young.
- Erickson PG, Butters JE, Cousineau MM, et al. Girls and weapons: an international study of the perpetration of violence. *J Urban Health* 2006;83(5):788-801. Free online: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2438581/>  
The purpose of this study was to describe delinquent girls' weapons preferences where and how often they carried weapons. The major predictors of weapon perpetrated violent behaviours included ethnic origin, early onset of delinquent activities, participation in delinquent acts in the past 12 months, gang fighting and carrying a weapon as a result of violence. Site, age and heavy alcohol consumption had a minor impact, and drug use, drug selling, and neighborhood features, none.
- Loh K, Walton MA, Harrison SR, et al. Prevalence and correlates of handgun access among adolescents seeking care in an urban emergency department. *Accid Anal Prev* 2010;42(2):347-53. Free online: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2853359/>  
High rates of handgun access were evident among adolescents presenting in an inner city ED, including those seeking care for non-injury related reasons. Adolescents with access to handguns were more likely to report risk behaviors and past injury, providing clinicians with an opportunity for injury prevention initiatives. Binge drinking, marijuana use, sexual activity, prior injury by a gun, serious physical violence, and group violence also predicted access to guns.
- Marcus RF, Jamison EG. Substance use in adolescence and early adulthood: Which best predicts violence in early adulthood? *J Child Adolesc Subst Abuse* 2013;22(1):38-57. doi: [10.1080/1067828X.2012.729909](https://doi.org/10.1080/1067828X.2012.729909)  
Data from the National Longitudinal Study of Adolescent Health were used to test the contributions of alcohol, tobacco, marijuana, cocaine, LSD, PCP, and other illicit drugs to violence in early adulthood (including making threats with a gun or using a gun in a fight). Results found that contemporary substance use consistently predicted the violent behaviors examined, more so that a history of use in adolescence. Use of substances other than alcohol (including cigarettes and marijuana) predicted violent outcomes with the greatest consistency.

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Parker RN, Williams KR, McCaffree KJ, Acensio EK, Browne A, Strom KJ, Barrick K. Alcohol availability and youth homicide in the 91 largest US cities, 1984-2006. *Drug Alcohol Rev* 2011;30(5):505-14. doi: [10.1111/j.1465-3362.2011.00336.x](https://doi.org/10.1111/j.1465-3362.2011.00336.x)  
Results indicated that net of other variables, several of which had significant impacts on youth homicide and included firearm availability and narcotic drug activity, the density of alcohol outlets had a significant positive effect on youth homicide for those aged 13-17 and 18-24.

Peleg-Oren N, Saint-Jean G, Cardenas GA, et al. Drinking alcohol before age 13 and negative outcomes in late adolescence. *Alcohol Clin Exp Res* 2009;33(11):1966-72. doi: [10.1111/j.1530-0277.2009.01035.x](https://doi.org/10.1111/j.1530-0277.2009.01035.x)  
Results showed that after adjusting for gender, ethnicity/race, and grade, adolescents who initiated alcohol use before age 13 were more likely to report problems with school performance and display delinquent behaviors (carrying a gun, carrying a weapon to school, and recent marijuana use).

Reid LW. The drugs-guns relationship: Exploring dynamic and static models. *Contemp Drug Probl* 2001;28:651-677.  
Examines the effect of age of onset of minor criminal behavior and substance abuse on later hard-drug use and criminal gun use. This research found, contrary to a fair amount of previous research, that early onset of hard-drug use has a potentially causal effect on subsequent criminal gun use. For those who have used hard drugs and used a gun in a crime, drug use tends to precede gun use, though there is an overall lower prevalence of gun use than of hard-drug use in the given population of incarcerated youths.

Sheley JF. Drug activity and firearms possession and use by juveniles. *J Drug Issues* 1994;24(3):363-382.  
Results of an analysis of survey data collected from juveniles in maximum security reformatories. Findings offer no evidence of a progressive, linear relationship between level of drug use and gun possession and use. However, disregarding level of drug use, when nonusers were compared with users who did not sell drugs, significant differences in involvement in gun possession and use did appear. Also, when users who did not sell drugs were separated from users who did, the latter generally displayed higher involvement in gun possession and use.

Swahn MH, Ali B, Bossarte RM, et al. Self-harm and suicide attempts among high-risk, urban youth in the US: Shared and unique risk and protective factors. *Int J Environ Res Public Health* 2012;9(1):178-91. free online: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3315085/>  
This study examined the extent to which self-harm and suicidal behavior overlap in vulnerable youth in high-risk urban communities. Among this population, shared risk factors for co-occurring self-harm and suicide attempt include depression, binge drinking, weapon carrying, child maltreatment, and impulsivity.

Swahn MH, Hammig BJ, Ikeda RM. Prevalence of youth access to alcohol or a gun in the home. *Inj Prev* 2002;8(3):227-30. doi: [10.1136/ip.8.3.227](https://doi.org/10.1136/ip.8.3.227)  
One quarter of US adolescents reported easy access to either alcohol or a gun in their home (ten per cent of adolescents reported availability of both alcohol and a gun in their home). Given the risks associated with the misuse of alcohol and guns among adolescents, efforts to increase public awareness of the availability of alcohol and guns in the home are needed.

Vaughn MG, Perron BE, Abdon A, et al. Correlates of handgun carrying among adolescents in the United States. *J Interpers Viol* 2012;27(10):2003-2021. doi: [10.1177/0886260511432150](https://doi.org/10.1177/0886260511432150)  
Weapon-related violence, especially the use of handguns, among adolescents is a serious public health concern. Using data from the adolescent sample in the 2008 National Survey on Drug Use and Health (NSDUH), this study examines the behavioral, parental involvement, and prevention correlates of handgun carrying. Overall, 3.1% of adolescents reported carrying a handgun in the past year. Results indicated that in males, selling and using illicit drugs were robustly associated with an increased probability of handgun carrying.

Whiteside LK, Ranney ML, Chermack ST, et al. The overlap of youth violence among aggressive adolescents with past-year alcohol use – a latent class analysis: Aggression and victimization in peer and dating violence in an inner city emergency department sample. *J Stud Alcohol Drugs* 2013;74(1):125-35. PubMed: <http://www.ncbi.nlm.nih.gov/pubmed/23200158>  
This study aimed to identify overlap and violence types between peer and dating aggression and victimization. Results found that teens reporting multiple domains of violence and past-year alcohol use were more likely to be female, African American, report injury in a fight, carry a weapon, experience negative consequences from alcohol use, and have delinquent peers and family conflict. Also, those with high rates of violence across relationships have increased alcohol misuse and marijuana use. Violence-prevention efforts should consider addressing concomitant substance use.

## Public Health Policy and Law

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These articles provide addition information and dialogue on the impact of various policies/laws related to public health, mental illness, substance abuse, and firearms.

Carr BG, Porat G, Wiebe DJ, Branas CC. A review of legislation restricting the intersection of firearms and alcohol in the U.S. *Public Health Rep* 2010;125(5):674-679. Free online: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2925003/>  
Identifies 3 types of laws in 26 states that restrict firearm use by intoxicated people: sales or transfers are restricted in 6 states, carrying of concealed weapons is restricted in 4, and possession or use of a firearm while intoxicated is restricted in 20. Regulation of the carrying and use of firearms by acutely intoxicated individuals may represent a public health opportunity to reduce firearm-related injury.



Gostin LW, Record KL. Dangerous people or dangerous weapons: Access to firearms for persons with mental illness. JAMA 2011;305(20):2108-2109. doi:[10.1001/jama.2011.688](https://doi.org/10.1001/jama.2011.688)

In this commentary, the authors argue that categorically restricting access to firearms for persons with mental illness has proved difficult and ineffectual, reducing neither suicide rates nor homicide rates. The government should focus more on legislation related to safeguards, data collection, and background checks. "Regulating people and not firearms will always prove deficient."

Kellermann & Rivara FP. Silencing the science on gun research. JAMA 2012 (in press). Free online: <http://jama.jamanetwork.com/article.aspx?articleid=1487470>

Editorial that describes the 1996 effort in Congress to eliminate the National Center for Injury Prevention and Control at the CDC's funding on firearm injury research, and the extension of that ban to the National Institutes of Health in 2011 after an NIAAA-funded study was published examining the correlation between carrying a gun and risk of firearm assault.

Price M, Norris DM. Firearms laws: A primer for psychiatrists. Harv Rev Psychiatry 2010;18(6):326-35. doi:[10.3109/10673229.2010.527520](https://doi.org/10.3109/10673229.2010.527520)

Persons with mental illness or substance abuse have been perceived by the public to pose an increased risk of violence to themselves and others. As a result, federal and state laws have restricted the right of certain categories of persons with mental illness or substance abuse to possess, register, license, retain, or carry a firearm. Clinicians should be familiar with the specific firearm statutes of their own states, which describe the disqualifying mental health/substance abuse history and the role and responsibility of the psychiatrist in the process.

Schell TL. Can improved mental health care prevent gun crimes? The truth is, we don't know. RAND Blog, January 17, 2013. Free online: <http://www.rand.org/blog/2013/01/can-improved-mental-health-care-prevent-gun-crimes.html>

Many policymakers and commentators in the media have suggested that mental health care has a substantial role to play in reducing gun violence. Indeed, one of the prominent criticisms of the recently announced presidential plan to address gun violence is that it focuses efforts too much on guns and not enough of mental illness. Unfortunately, those suggesting that mental health treatment is the key to preventing gun crimes often mischaracterize the current state of the science in two ways.

Simpson JR. Bad risk? An overview of laws prohibiting possession of firearms by individuals with a history of treatment for mental illness. J Am Acad Psychiatry Law 2007;35(3):330-8. Pubmed abstract: <http://www.ncbi.nlm.nih.gov/pubmed/?term=17872555>

This article provides an overview of federal and state laws related to prohibition of individuals with a history of mental health treatment from purchasing, receiving, or possessing firearms and includes a discussion of implications of these laws for mental health clinicians and forensic practitioners.

Sterzer J. The good, the bad, and the ugly: A 50-state survey exploring federal and state firearms regulations related to mental health. J Legal Med 2012;33:171-199. doi: [10.1080/01947648.2012.657993](https://doi.org/10.1080/01947648.2012.657993)

This commentary outlines a brief history of the interpretation of the Second Amendment, then discusses the history of treatment of the mentally ill and how the changing attitudes of society toward the mentally ill have shaped gun-control regulations related to mental health.

Webster DW, Vernick JS. Keeping firearms from drug and alcohol abusers. Inj Prev 2009;15:425-427. Free online: <http://www.jhsph.edu/sebin/y/h/KeepingFirearmsfromDrugandAlcoholAbusers.pdf>

A large body of scientific evidence indicates that people who abuse alcohol or drugs are at increased risk of committing acts of violence and self-harm. Drug and alcohol abuse has been strongly linked with the perpetration of fatal and non-fatal domestic violence, youth violence, incarceration for violent crimes, and suicide and suicide attempts. Although there is some debate about whether these associations are causal or are due to other underlying determinants, there is little doubt that drug and alcohol abusers represent a high-risk group.

Webster DW, Vernick JS, Vittes K, et al. The Case for Gun Policy Reforms in America. Baltimore, MD: Johns Hopkins Center for Gun Policy and Research, October 2012.

Free online: [http://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-gun-policy-and-research/publications/WhitePaper102512\\_CGPR.pdf](http://www.jhsph.edu/research/centers-and-institutes/johns-hopkins-center-for-gun-policy-and-research/publications/WhitePaper102512_CGPR.pdf)

Provides an overview of many issues related to gun policy reform, including restriction of gun possession/purchase for alcoholics, problem drinkers, or other substance misusers.

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