Exhibit 1

RULES AGENDA: 06/16/21
ITEM: G.2

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: HONORABLE CITY COUNCIL

FROM: Mayor Liccardo
Vice Mayor Jones
Councilmember Carrasco
Councilmember Peralez
Councilmember Cohen

SUBJECT: **SEE BELOW**

DATE: June 16, 2021

APPROVED: Date: 06/10/21

SUBJECT: Reducing Gun Harm, and the Public Burdens of Gun Violence

RECOMMENDATION

1. **Reducing Gun Harm, and the Public Burdens of Gun Violence**: Direct the City Attorney to return to Council in September with an ordinance for Council approval that would require every gun owner residing in the City of San José—with exceptions delimited below—to obtain and maintain a City-issued document evincing (i) payment of an annual fee, and (ii) attestation of insurance coverage for unintentional firearm-related death, injury, or property damage.

    a. Compliance:
        1) The gun owner shall sign and complete the insurance attestation, describing her specific policy number and issuer, and sign it under penalty of perjury. Acceptable coverage may include any homeowner's or renter's policy providing a minimum coverage amount.
        2) The document (or signed waiver) shall be kept wherever guns are stored or transported with the owner (in-home gun safe, in car, etc.).
    b. Exemptions and waivers:
        1) A written, discretionary waiver of the fee requirement and the insurance coverage will be permitted for all low-income individuals who qualify under Cal. Govt. Code §68632. However, the owner must store and maintain the waiver document with the gun.

2) An exemption from these requirements will exist for sworn law enforcement.
3) An exemption from these requirements will exist for holders of a concealed carry weapon (CCW) permits, if the City Attorney deems it necessary to do so to avoid conflicts with state preemption over CCW regulation.

c. Penalties: Failure to comply shall constitute a civil violation subjecting the owner to the temporary or permanent seizure of the gun, and under specified circumstances, a fine. Subsequent failure to yield firearms upon the lawful demand of a law enforcement official under this ordinance would constitute a misdemeanor.
d. Legal issues:
   1) To minimize financial risk against the City, the City Manager is directed to retain fee revenue in a segregated account until the conclusion of active litigation seeking to overturn the ordinance.
   2) The City Attorney shall evaluate the legal feasibility of applying these requirements upon all persons possessing a firearm in the City of San Jose, whether they reside here or not.
   3) The City Attorney shall evaluate the constitutionality of permanent seizure of the firearm as a consequence of noncompliance.
e. Fee Calculation and Revenue:
   1) Pursuant to state law, fee revenue may only be utilized to fund city services provided specifically to respond to gun harm, including police officer response, fire/emergency medical response, and any City assistance to victims and their families.
   2) Return in September with the final report from the Pacific Institute for Research and Evaluation (PIRE) detailing the financial burden carried by City taxpayers for the use of firearms in the City, pursuant to Proposition 26. Calculate a fee substantially below each gun owner's pro-rata share of that cost, to ensure clear legal satisfaction of Proposition 26's dictates. As Proposition 26 allows, the fee should provide full cost recovery for the City's cost of processing the fee application.
   3) Should the County of Santa Clara indicate a willingness to participate in and enforce a fee mandate, fee revenue would be shared with the County to fund such services as emergency room treatment, victim assistance, jail, criminal prosecution, and mental health services within the constraints of Prop 26.
f. Ghost Guns: ensure that the definition of "firearm" under the ordinance includes unfinished frames and receivers commonly sold as do-it-yourself guns and/or assembled after downloading and 3D printing.

2. **Gun Violence Restraining Orders (GVRO):** Direct the City Manager to return to Council in the Fall to identify ways to increase access and use of GVRO's, including:

   a. Better inform residents in multiple languages about accessing GVROs, such as by:
      - requiring protocols in our gang prevention outreach by employees of PRNS and affiliated non-profits to clients and family members;
      - reviewing and revising SJPD protocols and training about proactively informing reporting parties of domestic violence about the availability of GVRO's (rather than doing so only upon their affirmative disclosure of the existence of a firearm in the home);

- publicly displaying information in our police lobbies, on our city website, and other prominent locations;
- Communicating to key HR/risk officers among employers and school districts; and
- participating in a convening of stakeholders by the District Attorney's Office to explore other options for enhancing public awareness.

b. Update training protocols for officers regarding recent changes in state law that enable police officers to complete DVRO's on behalf of residents afraid or otherwise constrained from doing so.

c. Return to Council during the time for identifying City-sponsored legislation, and add for Council consideration a bill that would strengthen the effectiveness of GVRO's, including (a) broadening authority to search the subject's residence to ensure compliance; (b) enhancing sanction for violating a GVRO from a misdemeanor to a wobbler/felony; (c) enabling District Attorneys' offices to submit GVRO's on behalf of concerned witnesses and victims.

3. **Assault Weapons Ban:** Direct the City Attorney to file an amicus curia or to join other cities and counties throughout the state in jointly filing to appeal the June 4, 2021, District Court decision in *Miller v. Bonta* that overturned California's three-decade ban on assault weapons.

4. **Ghost Guns:** Direct the City Attorney to craft a prohibition on the possession, assembly, and manufacturing of any untraceable gun lacking a serial number, in collaboration with partner organizations such as Brady United and Gifford Law Center, to cover gaps in California state prohibitions, most of which do not take effect until July 2022.

5. **Straw Purchasing and Suicide Prevention:** Direct the City Attorney to bring to Council this June the final ordinance of the measures upon which Council had already voted in 2019, to regulate gun sale transactions to counter "straw purchasing"—such as by videotaping transactions and training gun store staff—and to post suicide prevention information prominently at the point of sale. Gun store staff training should include vigilance for circumstances of the purchase of guns by domestic violence victims for their disqualified abusers.

6. **Ammunition Checks:** If pending federal litigation overturns the 2016 California mandate for background checks on all ammunition purchasers, return to Council to consider several options, including (a) assessing the legality of an SJPD-issued permit for ammunition purchases, and (b) evaluate whether to mandate fingerprinting on all ammunition purchases within the City of San José, modeled on the successful efforts of sixteen other cities.

7. **"Looking out for One Another":** Convene with County leaders to discuss how we can create a public campaign to encourage appropriate notification to mental health or law enforcement authorities of implied or explicit threats of violence, planning or preparatory steps to commit violence, or apparent fascination with prior acts of violence.

8. **Gun Buy-Back programs:** Direct the City Manager to return to Council to discuss how the City could more frequently host gun buy-backs and strengthen partnerships for buy-back programs with Santa Clara County and other public, private, and non-profit organizations.

9. **Leveraging Federal Information for Early Intervention**: Direct the City Manager to work with the Santa Clara County District Attorney to enhance communication between the San José Police Department and other local law enforcement with key Federal agencies—specifically the Special Agents in Charge (SAC) for local Federal Bureau of Investigations, Bureau of Alcohol, Tobacco, and Firearms, DEA, DHS, and U.S. Customs and Border Control—to improve protocols that will enable local law enforcement access to critical information about high-risk individuals in San José. Report back to Council the findings from such efforts.

Discussion

Let's begin by putting aside the obvious: none of these proposals will magically prevent all horrific mass shootings like those that took the lives of our community members on May 26, 2021, or July 28, 2019, or four other occasions in the past three years. A vaccine may control a single virus, but in a nation burdened with more than 300 million guns, no panacea exists to halt our nation's epidemic of mass shootings.

Yet beyond these mass shootings remain an even more horrific reality, the frequency of which has sadly desensitized us: daily gun violence. During the thirteen days that friends and family grieved the devastating loss of their nine loved ones at the VTA rail yard, San José has suffered eight more episodes of gun violence. Every year, too many San José families endure the devastating pain of dozens of gun killings and many more emergency room admissions for gunshot injuries.

We can take action to save lives. To do so, we must not focus our efforts on mass shootings, but rather on the more routine—and more deadly—gun harm that we see weekly in emergency rooms throughout our City. Firearm use leaves our nation with approximately 40,000 annual deaths, 71,000 annual non-fatal injuries, and too many grieving loved ones.

Since no city or state in the United States has yet implemented an insurance or fee mandate, these proposals will attract naysayers. In the current political climate, even modest harm-reduction approaches draw intense opposition. The gun lobby has beaten back similar proposals introduced in California, Massachusetts, New York, and Congress, where a bill currently exists. Yet, as we consider our nation's deadly daily toll of gun victims, future generations will reserve their criticism for those who chose to do nothing.

It has become axiomatic to say that America suffers from an "epidemic" of gun violence, and it's long past time for us to treat gun violence as a public health problem. A public health approach focuses our efforts on multiple and other varied interventions that can reduce risk factors and the ultimate harm of gun violence. As with other epidemics in which public health approaches have been applied, such as smoking and automobile-related deaths, we must use many different interventions, including market-based solutions, behavioral insights, regulation, and education. Implementation of these varied approaches has reduced per-mile auto fatalities by 80% in five

decades, saving an estimated 3.5 million lives. We must identify interventions, monitor results, and scale the impact of best practices for other cities and states. While the powerful gun lobby halts progress in Congress and state legislatures, cities have become laboratories of civic innovation, from which others can learn, adopt, and adapt.

Insurance and Fee Mandates

The insurance and fee mandates will accomplish several important goals:

- **Compensate the public for the cost of gun harm:** Direct costs of gun violence to California taxpayers for gunshot-related medical treatment, police response, ambulance transport, and the like exceeded $1.4 billion in 2018. While the Second Amendment protects the rights of citizens to own guns, it has never mandated that the public subsidize gun owners' exercise of that right.

- **Incentivize safer behavior:** Insurance-based mechanisms can encourage firearm owners to take safety classes, use gun safes, install trigger locks, or utilize chamber-load indicators. Insurers have long used risk-adjusted premiums to reward good driving and incentivize the use of airbags and other safety features, reducing per-mile auto fatalities by 80% in five decades. We need a similar approach to address gun accident risk, because 4.6 million children live in a household where a gun is kept unlocked and loaded, and 72% of gun injuries occur at home. Nearly 500 Americans also die from preventable, unintentional shootings every year—including many children.

- **Provide care to injured victims:** Injuries from unintentional shootings—which are generally insurable—comprise more than a third of all gun-related injuries. An insurance mandate will ensure proper medical care and rehabilitation for many of the 26,000 injured victims of unintentional shootings annually, including more than 7,000 children.

- **Take guns away from criminals:** This ordinance can provide a straightforward, constitutionally compliant mechanism for the temporary or permanent seizure of guns from individuals who have no intention of being law-abiding. Where an owner lacks the City-issued document, police could temporarily or permanently seize an identified gun immediately on-site, such as after responding to a domestic violence call, more immediately and effectively than a GVRO.

- **Fund critical public services:** Pursuant to Proposition 26, fees must support the provision of public services, such as medical treatment, emergency response, and police, in response to gun violence. Fines—for non-compliance—could compensate victims, and fund violence prevention, mental health care for trauma, or gun buy-backs.

- **Broaden impact:** With a successful effort, other cities could adopt similar ordinances, and—particularly with statewide adoption—enable greater impact, while engaging the insurance industry more broadly in incentivizing safer behavior.

To be sure, critics will assert that criminals won't pay a fee, and won't get insurance. That's precisely the point; they may not get driver's licenses either, nor update their registration, but the failure to do so provides a basis for a lawful seizure.

Ghost Guns

SJPD has reported a rapid rise in the possession and use of unserialized firearms seized from criminals, matching reports nationally. State law contains gaps, the most significant of which lies in its delayed application--another year away. San Francisco, San Mateo County, and other communities have taken action to ban the assembly, manufacture, and possession of these untraceable weapons, and non-profit partners have offered Constitutionally-compliant language for a proposed ordinance in San Jose. We should move forward quickly.

Gun Violence Restraining Orders

Many employers, family members, and educators become aware when a gun-owning individual poses a risk of harming themselves or others, but often feel helpless to do much about it. Identifying those high-risk individuals, and separating them from their guns—even temporarily—can make everyone safer. This appears particularly true within the home, where family members see the signs of mental distress most clearly; in one study, 54% of mass shootings involved domestic or family violence, and in 42% of those incidents, the shooter showed clear signs of intent to others. In another survey of survivors living in 67 California domestic violence shelters, 38% of respondents reported a gun in the household, of whom 2/3 reported that the abuser had used the gun to threaten or scare them.

Gun Violence Restraining Orders provide family members, neighbors, coworkers, and others who fear violent conduct by a gun owner a means to seek court-mandated seizure of those guns for 21 days, and with a permanent order, up to five years. While the rate of obtaining GVRO's has increased substantially in Santa Clara County in recent years—from four in 2017 to 122 in 2019, with much credit to the outreach of the Crime Strategies Unit at the District Attorney's Office and the combined work of the San José Police Department and City Attorney's Office—it remains an underutilized tool that can markedly reduce the risk of gun harm. Education is key—and not merely for community members, but also for police officers, employers, non-profit providers, schools, and many others.

From conversations with police officers and prosecutors, there appears to be a consensus that GVRO's could use more teeth, for example, by authorizing searches to verify full compliance, and enabling felony conviction for egregious violations. It also appears that the complexity of the multi-form GVRO application seems too daunting for many community members needing help, and requires that they provide information well beyond their likely knowledge, e.g., to describe all of the guns owned by the person, and whether there are "no less restrictive alternatives." Some recent changes in the law—for example, enabling police officers to submit GVRO's on behalf of potential victims—will help, but it's far from clear whether most SJPD officers even know of the new law, and how they can use this tool. The recommendations above include what we can accomplish as a City, but also suggested legislative reforms from local experts for making DVRO's more effective statewide.

Straw Purchasing and Suicide Prevention

Previously, Council approved direction to draft an ordinance requiring gun stores to conduct video and audio recording of all firearm and ammunition transactions, and training staff to detect straw purchases. We further required that all gun stores display County-approved suicide prevention materials at the point of sale. We understand that the ordinance appears near completion, and we urge its implementation this month.

While additional sensible restrictions on gun sales—particularly federal action that would meaningfully enforce eligibility restrictions, ban semiautomatic assault weapons with large ammunition clips, and the like—appear long overdue, their impact seems modest given the ubiquity of gun ownership and access. Gun sales amount to the shoreline to a much larger sea—the ocean of 300 million guns currently in circulation—we focus our attention on that larger source of risk.

Regulating Ammunition Purchases

Regulation of ammunition sales can reduce gun harm, but California's statewide ammunition database and background checks have come under scrutiny and legal challenge. If the Ninth Circuit invalidates the California law, we'll need to look for alternatives locally. The direction calls for staff to return to Council to discuss options, including a City-issued permit. Another promising alternative involves fingerprinting at the point of sale, which cities like Sacramento have used effectively to identify 156 persons illegally possessing guns, resulting in dozens of arrests and gun seizures in one year (2008) alone. Sixteen other communities in California have enacted similar ordinances.

Looking Out for Each Other

Among the best practices in cities globally are community-based efforts to reduce gun violence through vigilance—engaging community members to spot the signs of emotional and mental distress in coworkers, students, and family members that will result in preventative outreach by mental health and public safety officials. With new funding available from the State of California—and likely, federal dollars—the County will have opportunities to expand mental health services, and a collaboration with the City and the community could "crowd-source" early intervention. New York offers one example of an effective community outreach program, Cure Violence in the City of New York, utilizing community-based "outreach workers" and "violence interrupters" in neighborhoods most vulnerable to gun violence. In an area of East New York, Brooklyn, gun injuries fell 50 percent following the implementation of this program. Similarly, Berlin offers a compelling model focused on schools.

Collaboration of Partners

Our sincere thanks go to many partners who have helped to support this work—including Ron Conway and the Heising-Simons Foundation—and to the many partners who have helped to shape, inform, and provide feedback on these proposals, including the Santa Clara County Office of the District Attorney, The Gifford Law Center, local advocates with Moms Demand Action, the Office of the City Attorney, the San José Police Department, the Santa Clara County Public Health Department, the Santa Clara County Counsel's Office, Everytown for Gun Safety, Brady United, and attorneys at the offices of Keker Van Nest and Cotchett, Pitre who have graciously offered their guidance *pro bono.*

Conclusion

Plenty of criticism will emerge for these solutions. I encourage critics to come up with better ones—let's have a discussion of the best ideas, but above all, let's move forward. We don't have the luxury of remaining mired in discussing and posturing—our community demands action.

BROWN ACT: The signers of this memorandum have not had, and will not have, any private conversation with any other member of the City Council, or that member's staff, concerning any action discussed in the memorandum, and that each signer's staff members have not had, and have been instructed not to have, any such conversation with any other member of the City Council or that member's staff.

Exhibit 2

COUNCIL AGENDA: 1/25/22
FILE: 22-045
ITEM: 4.1

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: HONORABLE MAYOR AND CITY COUNCIL

FROM: Nora Frimann
City Attorney

SUBJECT: GUN HARM REDUCTION ORDINANCE

DATE: January 14, 2022

RECOMMENDATION

Consider approving an ordinance amending Title 10 of the San José Municipal Code to add Part 6 to Chapter 10.32 to reduce gun harm by: (a) requiring gun owners to obtain and maintain liability insurance; and (b) authorizing a fee to apply to gun harm reduction programs.

BACKGROUND

On June 29, 2021, the City Council directed the City Attorney to return to Council with an ordinance for Council consideration that would require every gun owner residing in the City of San José, with certain exceptions, to obtain and maintain a City-issued document evincing payment of an annual fee, and attestation of insurance coverage for unintentional firearm-related death, injury, or property damage.

Council directed that the ordinance include the following provisions:

- Compliance:
  - The gun owner shall sign and complete an insurance attestation, describing the specific policy number and issuer, and sign the attestation under penalty of perjury. Acceptable insurance coverage may include any homeowner's or renter's policy that provides for a minimum coverage amount.
  - The attestation document (or signed waiver) shall be kept wherever guns are stored or transported with the owner (in-home gun safe, in car, etc.).
- Exemptions and waivers:
  - A written, discretionary waiver of the fee requirement and the insurance coverage will be permitted for all low-income individuals who qualify under Cal. Govt. Code §68632. However, the owner must store and maintain the waiver document with the gun.
  - An exemption from these requirements for sworn law enforcement.
  - An exemption from these requirements for holders of a concealed carry weapon (CCW) permit.

- Penalties: Failure to comply shall constitute a civil violation subjecting the owner to the temporary or permanent seizure of the gun, and under specified circumstances, a fine.

ANALYSIS

The proposed ordinance includes provisions that are in accordance with the direction from Council. The proposed ordinance authorizes an annual gun harm reduction fee to be paid by gun owners to a designated nonprofit organization that will, in turn, use the fees collected to provide certain services, as specified in the ordinance, to residents of the City who own or possess a gun or to members of their household. The proposed ordinance also authorizes the City Manager to charge and collect any and all City cost recovery fees associated with fulfilling the policies of the ordinance relating to the reduction of gun harm, including any associated third-party costs.

The recitals within the draft ordinance contain the data and other information that supports the proposed ordinance.

The effective date of the proposed ordinance will be six months from the date of adoption. This is to allow for time for the City Manager's Office to potentially do outreach, develop regulations, and work through any other issues related to the implementation of the proposed ordinance.

CONCLUSION

If approved, the proposed ordinance will require, with certain exceptions, that San José residents who own firearms: (a) obtain and maintain liability insurance; (b) pay an annual gun harm reduction fee to a designated nonprofit organization that will use the fee proceeds to provide gun harm reduction services to residents of the City who own or possess a gun or to members of their household; and (c) pay any City cost recovery fees associated with program implementation, including any associated third-party costs.

CLIMATE SMART SAN JOSE

The recommendation in this memo has no effect on Climate Smart San José energy, water, or mobility goals.

COORDINATION

This memorandum has been coordinated with the City Manager's Office.

CEQA

Not a Project, File No. PP17-008, General Procedure & Policy Making resulting in no changes to the physical environment.

/s/
NORA FRIMANN
City Attorney

For questions please contact Nora Frimann, City Attorney, at (408) 535-1900.

Exhibit 3

COUNCIL AGENDA: 1/25/22

FILE: 22-045

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: HONORABLE CITY COUNCIL **FROM: MAYOR LICCARDO**

SUBJECT: GUN HARM REDUCTION ORDINANCE **DATE: JANUARY 19, 2022**

Approved  Date 1/19/22

DISCUSSION

A more substantive memorandum—with specific recommendations—will follow, but it is important for the entire City Council to have access to all of the data available to us in evaluating this proposed ordinance. When we initially proposed the imposition of a fee paid by gun owners in San Jose, it became apparent that under Proposition 26, it would be helpful to establish the legal baseline and ceiling for that fee, by identifying the cost burden to San Jose taxpayers of gun-inflicted injuries and death in San Jose. Doing so requires rigorous study of demographics and cost data from healthcare and other service providers, public agencies, and other sources.

Accordingly, we sought to identify a qualified consultant, and multiple references recommended the Pacific Institute on Research and Evaluation (PIRE), an independent, nonprofit organization, headed by health economist Dr. Ted Miller, Ph.D. Dr. Miller and his team–consisting of David Swedler, Ph.D and Bruce Lawrence, Ph.D, gathered data, conducted research, and prepared the attached document, reflecting their calculations. Dr. Miller summarized their preliminary findings in a June report, and the attached provides a fuller description of PIRE's assumptions, methods, and findings. Among those findings:

- On average, 206 people suffered death or serious injury from gunshots each year in the City of San José between 2012 and 2018.

- Conservatively, San José taxpayers annually spend approximately $39.7 million, or approximately $151 per firearm-owning household, to respond to gun violence with publicly-funded services such as emergency police and medical response, victim assistance, incident investigation, acute and long-term health care, and perpetrator adjudication and judicial sanctioning.

- When private financial costs to individuals and families are included in the calculation, San José residents incur an annual burden of $442 million per year.

This report was peer-reviewed by economist Dr. John J Donohue III, JD, PhD, a law professor at Stanford Law School, and epidemiologist Julie Parsonnet, MD, a health policy expert at Stanford University School of Medicine. My thanks for their commitment of time.

This work was funded by a grant from the Silicon Valley Community Foundation using philanthropic funds that originated from two donors. My deep gratitude to Director Holly Kreider and CEO Deanna Gomby at the Heising-Simons Foundation, and to SV Angel founder Ron Conway for their generous support. I also thank Gina Dalma and Nicole Taylor of the SVCF for their support of our efforts. None of these funders or supporters have reviewed the report, so it may or may not reflect their views.

PIRE

PACIFIC INSTITUTE FOR RESEARCH AND EVALUATION

Incidence and Cost of Firearm Injuries in San Jose, CA

January 19, 2022

Pacific Institute for Research and Evaluation
4061 Powder Mill Road, Suite 350
Beltsville, MD 20705-3113
www.pire.org

Prepared by:
Ted R Miller, PhD
David I Swedler, PhD
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The City of San José is considering legislation that would reduce the public cost of firearm injury. This report examines how many firearm injuries occur annually in the city and how much the city spends responding to them. It then analyzes the number of guns in the city and uses that information to calculate the city's annual firearm injury spending per gun. A report appendix provides the costs of firearm injuries in San José from the perspectives of society and of Federal, state, county, and city governments combined.

Gunfire Annually Kills or Injures More Than 200 People in San José

Annually, more than 200 people are killed or injured by gunfire in San José. Assaults and homicides are the most common. Almost 30% of those injured die. Suicide deaths by firearm also are frequent. Unintentional gunshot wounds tend to be less serious. Notably, those incidents virtually all involve a single bullet. Table 1 summarizes official statistics on the average annual number of firearm deaths and injuries in San José over the most recent 6 years of data. The table uses 6-year averages to protect confidentiality.

Table 1. Average Annual Number of People Killed or Injured by Gunfire in San José

	Deaths	Nonfatal Hospital Inpatient Admissions	Emergency Department Treated & Discharged Without Admission	Total
Assault/Homicide/Legal Intervention	28	32	29	89
Self-Inflicted/Suicide	28	3	*	31
Unintentional/Undetermined	2	25	59	86
Total	58	60	88	206

* Included with unintentional/undetermined to meet minimum count requirements that protect confidentiality.

Source: Tabulations of 2013-2019 Vital Statistics Multiple Cause of Death data and 2013-2018 California Hospital Discharge and Emergency Department Discharge Data censuses.

Many people are assaulted or robbed at gunpoint but not injured. Annually between 2017 and 2019, San José police responded to an average of 869 firearm robberies and assaults without physical injury.

Annually, San José Spends at Least $7,937,000 Responding to Shootings

The primary costs that the City of San José incurs in responding to a shooting are for fire department and police response including police investigation and participation in the criminal justice process. Table 2 summarizes those costs. The San José Fire Department delivered emergency medical services to 48 shooting victims in 2018, 57 in 2019, and 82 in 2020, with an average annual cost of $137,000. The fire department response volume for gunshot injuries in this calculation comes from the department's call database that includes a variable indicating if calls responded to a shooting. The $2,199 cost per call in 2020 is a performance measure reported in the 2021 department budget.

The annual police response costs totaled $7,800,000 annually. Of that amount, 72% involved homicides. The police cost estimates come from US average police response costs by crime from Hunt et al.[1] as refined by Miller et al.[2] The Hunt simulation model builds police costs per crime from the average police spending per capita in California in 2010 ($235.29 from Table A1). To adapt its estimates to San José, we therefore multiplied its mean costs by type of incident times the ratio of per capita costs in San José in 2020 versus the state in 2010. The San José per capita cost of $434.49 was computed as the average police cost per sworn officer hour of $144.34 according to the police budget office multiplied times 2080 hours per year times 1,151 sworn officers in 2020 times the ratio of 1.274 (sworn and nonsworn police labor payments) per sworn officer labor payment in the San José Police Department in 2016.[3] Hunt gave police costs for homicide, aggravated assault, motor vehicle crash, and a few other offenses. We did not vary police costs of an aggravated assault depending on whether the victim was injured, meaning our assault costs for cases with injury may be an underestimate. More likely than not, the police time required for a suicide or unintentional shooting death is comparable to the time required by an aggravated assault, whereas other nonfatal shootings involve modest costs comparable to a motor vehicle crash. Conservatively, we do not attribute any costs to robberies and assaults involving firearms but no injuries as these crimes might have happened even if the perpetrator lacked firearm access. The cost is even more conservative because it omits police costs of weapons violations and gun thefts. No data are available on the frequency of those crimes.

Table 2. Costs the City of San José Incurs Annually Responding to Firearm Injuries

	Unintentional/ Undetermined	Suicide Act	Homicide/ Assault	Total
Fire Department EMS	$69,403	$10,136	$57,531	$137,071
Police Fatal Injury Response	$29,224	$624,663	$5,680,080	$6,333,967
Police Nonfatal Injury Response	$135,072	$4,556	$1,329,692	$1,469,320
Total	$233,699	$639,355	$7,067,303	$7,940,358

50,000-55,000 Households in San José Own Guns

We estimate that between 50,000 and 55,000 households in San Jose own guns. This count was calculated using two approaches that have different limitations. Both approaches yielded counts for Santa Clara County in 2013-2015 (the most recent data available) that were used to calculate San José's share, then adjusted to account for firearms acquired in 2016-2020.

The first approach uses State of California background check data that show 363,725 guns were sold in Santa Clara County (SCC) between 2002 and 2015.[4] The County treats that count as the number of guns in SCC. The resulting count, however, has wide uncertainty because (a) people in SCC bought some of their guns before 2002, (b) some SCC residents purchased guns elsewhere and brought them to SCC, (c)

[1] Hunt PE, Saunders J, Kilmer B. Estimates of law enforcement costs by crime type for benefit-cost analyses. *Journal of Benefit-Cost Analysis, 10*(1), 95-123, 2019.
[2] Miller TR, Cohen M, Swedler D, Ali B, Hendrie D. Incidence and costs of personal and property crimes in the United States, 2017. *Journal of Benefit Cost Analysis. 12*(1), 24-54, 2021.
[3] Hyland S. Justice expenditure and employment extracts, 2016 – Preliminary. NCJ Number 254126, Bureau of Justice Statistics. 2019. https://bjs.ojp.gov/sites/g/files/xyckuh236/files/media/document/jeee16p.zip
[4] Santa Clara County Public Health. Guns in Santa Clara County. April 2018. The State requires that all gun sales in California go through its system.

some purchasers in SCC did not live in SCC and brought the guns they purchased elsewhere, (d) some SCC residents who purchased guns in SCC moved out of the County or stored their guns out of county, e.g., at a vacation home, (e) some people moved to SCC and brought guns with them, (f) some guns were sold in transactions outside SCC or were stolen and transported into or out of SCC, and (g) some guns were decommissioned (i.e., they became inoperative, were destroyed, or were otherwise removed from the stock of guns in San Jose). The count also excludes "ghost guns" that owners built themselves from parts they bought or printed on a 3-D printer.

The second approach uses 2013-14 Behavioral Risk Factor Surveillance System survey data that found 11% of households in Santa Clara County owned guns[5] (70,424 households when 11% is multiplied by the Census Bureau count of 640,215 households in SCC in 2015[6]). A national survey calculates that the average gun owner owns 4.8 guns, while Federal gun excise tax data adjusted for some guns being decommissioned arrived at an average of 5.16.[7] Multiplying the number of households with guns in SCC times the number of guns per household with guns yields a range of 338,034 to 363,545 guns in SCC in 2015.

These two approaches using different methods and data yield virtually identical counts when one uses the 5.16 average count of guns per household with guns. The similarity of results strengthens confidence in the accuracy of the calculated count.

The figures calculated above for Santa Clara County can be used to estimate the number of gun-owning households in San José . This calculation also can be approached in two ways. If we apply the 11% ownership rate to the 2014 household count of 325,114 for San José.[8] It yields a range of 164,856 to 177,298 guns in San José in 2014. Alternatively, we can build on published findings that the number of guns in a jurisdiction tracks the number of suicide deaths by firearm in the jurisdiction.[9,10] That alternative can be used with either the survey-based or sales-based SCC counts. It indicates that San José had 154,530 to 166,274 guns in 2015. Across the 5 calculated counts, the mean number of guns in San José in 2014-15 is 165,830, with a range from 154,530 to 177,298.

From 2015 to 2020, the number of guns in California rose by 55.3%. With that growth rate, people in San José owned 257,500 guns in 2020, with a range from 240,000 to 287,000. Dividing by the number of guns per household, 50,000 to 55,500 household owned guns.

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[5] Idem.

[6] https://www.census.gov/quickfacts/fact/table/santaclaracountycalifornia,sanjosecitycalifornia/INC110219? , accessed June 2021.

[7] Azrael D, Hepburn L, Hemenway D, Miller M. The stock and flow of US firearms: results from the 2015 National Firearms Survey. RSF: The Russell Sage Foundation Journal of the Social Sciences. 2017;3(5):38–57. The 5.16 average was computed by extending Table A1 in the article from 2013 to 2015, then multiplying the 4.8 average for 2015 from the survey by the 285-million-gun count from Table A1 divided by the 265 million survey count.

[8] https://www.sanjoseca.gov/home/showpublisheddocument/23765/636689378693570000 , accessed August 2021. A 2015 count is not readily available.

[9] Miller M, Barber C, White RA, Azrael D. Firearms and suicide in the United States: is risk independent of underlying suicidal behavior? Am J Epidemiol. 15;178(6):946-955, 2013.

[10]

San José Incurs an Annual Average Costs of $151 per Gun-owning Household Providing Services to Fatal and Nonfatal Firearm Injury Shooters and Victims

Dividing the total annual costs by the number of gun-owning household reveals that San José spends an average of $151 per gun-owning household providing injury-related services to firearm injury shooters and those they shoot. Given the range around the number of guns in the city, the cost per gun-owning household has an uncertainty range of $143 to $159. These figures incorporate a conservative estimate of total city expenditures on shooting response. The cost per gun averages $31, with a range from $28 to $33.

ACKNOWLEDGEMENT

For insightful peer reviews of our draft report that improved its clarity and quality, we thank economist John J Donohue III, JD, PhD, who is the C. Wendell and Edith M. Carlsmith Professor of Law at Stanford Law School, and Julie Parsonnet, MD, who is the George deForest Barnett Professor of Medicine and Professor of Health Research and Policy at Stanford University. Dr. Parsonnet also is the President and Chair of the Board of Directors of Scrubs Addressing the Firearm Epidemic (SAFE). We also thank The City of San José and The County of Santa Clara government personnel for promptly providing us with data we requested, as well as helpful guidance and insights. This work was funded by a grant from the Silicon Valley Community Foundation using funds that originated from Ron Conway and the Heising-Simons Foundation. The funders have not reviewed the report so it may not reflect their views.

APPENDIX: COSTS OF FIREARM INJURIES IN SAN JOSÉ TO SOCIETY AND GOVERNMENT

Annually Firearm Injuries in San José Cost $442 Million

We assessed the cost to society of gunfire in San José. Firearm deaths and injuries in San José annually impose losses valued at $442 million (Table 3). That's $432 per San José resident. Societal costs are comprehensive. The total includes costs paid by victims and their families, perpetrators, employers, insurers, and taxpayers. The value of pain, suffering, and lost quality of life accounts for the largest share of societal costs, with work losses of victims and perpetrators also large. Direct out-of-pocket costs total $35 million annually. These costs encompass medical and mental health care, police and emergency services, victim services, criminal justice, and employer spending because workers are absent temporarily or need to be replaced due to death or permanent disability.

Table 3. Annual Cost of Firearm Injury by Cost Category in San José, CA, 2013-2019

Cost Category	Annual Cost	% of Total
Direct	$35,068,500	8%
Lost Work	$78,275,000	18%
Quality of Life	$328,355,500	74%
Total	$441,699,000	100%

Source: Computations by Ted Miller, Pacific Institute for Research and Evaluation, 2021.

The societal costs here are tied to specific shootings. They exclude prevention costs and the impact on residents and businesses when gunfire harms neighborhoods.

Homicide and assault cause most (57%) of the firearm costs, followed by suicide acts (37%) and unintentional shootings (6%), per Table 4. The cost per shooting is highest for suicides, since so many of those incidents are fatal.

Table 4. Annual Incidence and Societal Cost of Firearm Injury by Intent in San José, CA, 2013-2019

	People Shot	Cost/Person Shot	Total Cost	Cost to Federal, State & Local Government
Homicide/Assault/ Legal Intervention	89	$2,851,000	$253,828,000	$34,180,000
Suicide	31	$5,238,000	$164,122,000	$4,298,000
Unintentional/Undetermined	86	$290,000	$24,749,000	$1,260,000
Total	206	$2,151,000	$441,699,000	$39,738,000

Source: Computations by Ted Miller, Pacific Institute for Research and Evaluation, 2021.

Governments across all levels pay almost $40 million annually due to firearm injuries in San José (Table 4). The taxpayer bill includes contributions to the costs of acute and long-term health care; public services including emergency response, victim assistance, incident investigation, and perpetrator adjudication and sanctioning; as well as tax revenue lost when someone is killed or unable to work.

The societal cost assessment used a peer-reviewed framework for costing gun violence that PIRE developed more than 20 years ago and periodically updates.[11] This framework consists of an economic analysis of direct out-of-pocket costs across the continuum of public services and employer responses associated with injury and death, as well as indirect cost data following an event. Direct costs include police, emergency response, hospital-related expenses, healthcare claims, family mental health services, court, criminal justice, and employer costs. Indirect costs include victim loss of wages and the estimated value of lost quality of life. For most of these cost elements, we use injury cost models and methods that we developed and have widely published to price injuries from all causes. That model is documented in considerable detail.[12] Other costs were adapted from our well-known crime cost model.[13] The indirect costs of fatalities were computed for each victim in San José, taking account of the victim's age and sex, then summed.

As explained above, we incorporated police and fire department EMS costs that are specific to San José. For other cost categories, the current estimates use national average costs per firearm incident by intent and severity adjusted to San José prices. We are working with Santa Clara County public health staff to

[11] Miller TR, Cohen MA**.** Costs of gunshot and cut/stab wounds in the United States, with some Canadian comparisons. *Accident Analysis and Prevention. 29*(3):329-341, 1997. Follman M, Lurie J, Lee J, West J. The True Cost of Gun Violence in America: The data the NRA doesn't want you to see. Mother Jones. 2015.

[12] Zonfrillo MR, Spicer RS, Lawrence BA, Miller TR. Incidence and costs of injuries to children and adults in the United States. *Injury Epidemiology. 5*(1), article 37, 2018. Miller TR, Pindus NM, Douglass JB, Rossman SB. Databook on nonfatal injury: Incidence, costs, and consequences. Washington, DC: The Urban Institute Press, 1993. Lawrence BA, Miller TR. Medical and work loss cost estimation methods for the WISQARS cost of injury module. Calverton, MD: PIRE, 2014. https://www.researchgate.net/publication/265162679_Medical_and_Work_Loss_Cost_Estimation_Methods_for_the_WISQARS_Cost_of_Injury_Module .

[13] Miller TR, Cohen MA, Wiersema B. Victim costs and consequences—A new look. Washington, DC: National Institute of Justice, 1996. Miller TR, Cohen M, Swedler D, Ali B, Hendrie D. Incidence and costs of personal and property crimes in the United States, 2017. *Journal of Benefit Cost Analysis. 12*(1), 24-54, 2021.

update the medical costs by applying our models to local hospital data, as well as to replace selected other direct costs with local data.

About PIRE and Dr. Miller

The Pacific Institute for Research and Evaluation (PIRE) is an independent, nonprofit organization merging scientific knowledge and proven practice to create solutions that improve the health, safety, and well-being of individuals, communities, and nations around the world. PIRE's mission is to promote, undertake, and evaluate activities, studies, and programs that improve individual and public health, welfare, and safety.

Founded in 1974, PIRE has a longstanding reputation for research integrity. Its work is funded with a balance of National Institutes of Health (NIH) grants, other federal grants and contracts, and foundation awards. PIRE has held a NIH/National Institute on Alcohol Abuse and Alcoholism Center Grant -- Berkeley's Prevention Research Center -- since 1980.

Ted R Miller, PhD, is a widely cited health economist who has more than 30 years of experience studying the costs of injury and violence. He has published more than 350 books and journal articles on the costs of societal ills and savings from prevention. Dr. Miller received the Excellence in Science and Distinguished Career Awards from the Injury Control and Emergency Health Services Section of the American Public Health Association and the Vision Award from the State and Territorial Injury Prevention Director's Association. He is a Principal Research Scientist at PIRE and an Adjunct Professor at the Curtin University School of Public Health.

Exhibit 4

COUNCIL AGENDA: 01/25/2022
FILE: 22-045
ITEM: 4.1

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: HONORABLE CITY COUNCIL

FROM: Mayor Liccardo,
Vice Mayor Jones,
Councilmember Cohen
Councilmember Carrasco

SUBJECT: SEE BELOW

DATE: 01/21/2022

Approved

Date 01/21/2022

DIRECTION:

1. Establish that the gun harm reduction fee in the initial year shall amount to $25 per gun-owning household—or an approximate amount close to $25 that assists with the rounding of the final fee—plus that amount strictly reflecting only the administrative cost incurred by:
    a. The Designated Non-profit Organization,
    b. The State of California for its use of the Department of Justice's Automated Firearm System and/or California Firearms Application Reporting System to communicate legal obligations and available services to gun-owning residents in San Jose, and
    c. The City, if any.

2. Determine that until or unless the Council determines otherwise,
    a. The City shall not be engaged in the collection of fees, the transmittal of information through the Department of Justice Database, nor the accounting nor distribution of the funds.
    b. After the initial implementation of the ordinance, the City's role will remain largely limited to setting the fee, engaging in contractual arrangements with the State of California and other entities necessary for the implementation of the ordinance, and enforcement.
    c. All administrative tasks shall be the responsibility of the Designated Nonprofit Organization, and all administrative costs shall be borne by that organization, and recovered by a portion of the fee revenue.

d. No fees shall be collected nor required of any gun owner until the City Attorney has determined that there is resolution of pending facial legal challenges to the ordinance for any claim which is not *res judicata,* that is, for any claim that is not precluded by a prior final judgment.

3. Approve the proposed ordinance, with modifications in the following sections:
   a. Expenditure of Gun Harm Reduction Fee, Section 10.32.220
      - Insert the following italicized language into A. to read, "All monies from the Gun Harm Reduction Fee shall be expended by the Designated Nonprofit Organization on providing services to residents of the City that own or possess a Firearm in the City or to members of their household, *or to those with whom they have a close familial or intimate relationship."*
      - Insert within the itemized list under A., "Addiction intervention and substance abuse treatment"
      - Revise provisions under C. to read: "*C. The Designated Nonprofit Organization shall spend every dollar generated from the Gun Harm Reduction Fee, minus administrative expenses, exclusively for programs and initiatives designed to (a) reduce the risk or likelihood of harm from the use of firearms in the City of San José, and (b) mitigate the risk of physical harm or financial, civil, or criminal liability that a San José firearm owner or her family will incur through her possession of firearms. Otherwise, t*he City shall not specifically direct how the monies from the Gun Harm Reduction Fee are expended*"*
   b. Exceptions, Section 10.32.225
      - Insert the following italicized language into B. to read, "Those persons who have a license to carry a concealed weapon issued pursuant to California Penal Code § 26150 or § 26155, *for as long as these statutes are legally enforceable."*
   c. Compliance, Section 10.32.230
      - Delete the following stricken language and insert the italicized language into A. to read, "Each person required to obtain and maintain insurance under Section 10.32.210 shall demonstrate compliance with the insurance requirement by completing and executing a City-designated attestation form. Each such person shall state both the name of the insurance company issuing the policy and the number of the insurance policy on the attestation form, sign the form under penalty of perjury and keep the attestation form with the Firearms where they are being stored or transported. ~~There is no requirement to submit the attestation form to the City. However, each~~ *Each* person shall complete and sign a new attestation form under penalty of perjury in the event any of the information on the form changes. *Each person shall present the form when lawfully requested to do so by a peace officer who knows or has reason to believe that a person possesses a firearm."*
   d. Purpose and Findings, 10.32.200
      Among the findings listed in B., add:

- "Based upon a November 2021 analysis by Dr. Ted Miller, Ph.D. and the Pacific for Institute Research and Evaluation (PIRE), on average, 206 people suffer death or serious injury from gunshots each year in the City of San José.
- Conservatively, San José taxpayers annually spend approximately $39.7 million, or approximately $151 per firearm-owning household, to respond to gun violence with such public services as emergency police and medical response, victim assistance, incident investigation, acute and long-term health care, and perpetrator adjudication and judicial sanctioning.
- Including private costs to individuals and families in the calculation, San José residents incur an annual financial burden of $442 million per year for gun deaths and injuries."

DISCUSSION:

When our current pandemic passes, an epidemic of gun violence will continue to take its grim toll throughout our nation. In response, we propose that the City of San Jose become the first city—or U.S. jurisdiction—to use liability insurance and a fee-supported non-profit organization to reduce gun violence and harm. We consider the merits for each of these two elements.

Insurance

Requiring every gun owner in my city to carry liability insurance will better compensate unintentional shooting victims and their families for medical and related expenses. More importantly, insurance can also incentivize safer gun ownership. Risk-adjusted premiums can—and in some cases, do—reduce the risk of gun harm, by encouraging firearm owners to take gun-safety courses, use gun safes, install child-safe trigger locks, or utilize chamber-load indicators. Unintentional shootings–often involving children–annually claim the lives of 500 Americans and injure another 26,000. We should apply the lessons of the insurance industry's impact on auto safety: reducing premiums on policyholders who drive more safely or buy cars with airbags or anti-lock brakes helped to reduce per-mile auto fatalities by 80% over the past five decades, saving 3.5 million lives. We need a similar approach to address unintentional firearm risk, because we live in a nation in which 4.6 million children live in a household where a gun is kept unlocked and loaded, and 72% of gun injuries occur at home, resulting in too many child victims. As in other contexts, an insurance requirement can help make our community safer.

Fees and Investment in Evidence-Based Prevention

Second, we propose the payment of a modest fee to support evidence-based community-led initiatives to reduce the harm of gun violence in our community, such as through domestic violence and suicide prevention efforts, gun-safety classes, mental health services, and addiction intervention.

Why should the funding nonprofit focus these services for occupants of gun-owning households? Because that's where the greatest risk is. Epidemiological studies show that even a properly stored firearm in the home doubles occupants' risk of becoming a victim of homicide and triples the likelihood of suicide. A more recent Stanford study concluded that male handgun owners may be eight times more likely to commit suicide by gun than other men, and gun-

owning women are 35 times more likely to do so than their gender peers. Prioritizing those investments for residents living with guns in the home will provide the most direct path for reducing gun harm.

Some gun owners will express the view that the 2nd Amendment renders any imposition of a gun-related fee unconstitutional. While the Second Amendment protects the rights of citizens to own guns, it doesn't require the public to subsidize gun ownership. Every day, our taxpaying residents bear the financial burden for police officers, ambulances, and trauma surgeons to respond to gun violence. These direct costs of gun violence to San Jose taxpayers--to say nothing of the human and financial toll to victims' families—exceeds $39 million annually, and $1.4 billion for all Californians. Using fees to fund initiatives to reduce gun violence reduces the financial burdens of gun use on all of us.

Moreover, courts have long upheld the imposition of taxes on the purchase of guns and ammunition ever since Congress imposed the federal gun tax in 1919. This history affirms the consistent position of courts to allow the imposition of modest fees on the exercise of constitutional rights, such as IRS filing fees on the formation of nonprofit advocacy organizations (1st Amendment), taxes on newspapers (1st Amendment), and court filing fees (7th Amendment), the cost of counsel for defendants of financial means (6th Amendment), or on filing to become a candidate for elected office (1st and 14th Amendments). The constitutional question is whether a modest fee substantially burdens the exercise of that right. Given that we provide an explicit exemption for those unable to pay, it imposes no such burden.

We are grateful for the many community leaders and experts—such as NextDoor Solutions to Domestic Violence CEO Esther Peralez-Dieckman, Health Trust CEO Michele Lew, Gardner Healthcare CEO Reymundo Espinoza, Stanford University Medical Center Epidemiologist Dr. Julie Parsonnet, National Rifle Association San Jose Chapter President Dave Truslow, Community Health Partnership CEO Dolores Alvarado and Deputy Director Cathryn Hyde, and Brady United Director Shikha Hamilton, and Moms Demand Action California Chapter representative Rachel Michelson, and SAFE Legislative Affairs Director Dr. Susie MacLean MD, who have stepped up to advise or participate in the creation of a nonprofit organization that will identify high-impact violence reduction programs for investment.

Compliance

The ordinance will impose fines and other administrative sanctions on violators. Of course, criminals won't obey insurance or fee mandates. Yet, given the legally frail status of concealed-carry regulations before the current U.S. Supreme Court, we will likely see many more guns out on the street—and in bars, nightclubs, and other contexts that will increase our peril. Law enforcement agencies face steep challenges keeping communities safe amid the ubiquitous presence of guns in America. Members of the California legislature are exploring bills to have law enforcement agencies seize guns as a sanction for violations of local gun regulations, with subsequent restoration of ownership as required by constitutional due process. Giving the police the ability to distinguish the scofflaws from law-abiding gun owners could provide a lawful basis for forfeiture of the gun in a context—where an officer responds to a bar brawl or domestic violence allegation—where even temporarily extracting a gun from a combustible situation could dramatically reduce the risk of deadly violence.

Thanks

Our gratitude goes to City Attorney Nora Frimann, Terra Chaffee, and the rest of her team for their extensive research and work in fashioning this ordinance, and to Christina Guimera and Paul Pereira in the Mayor's office for their mighty efforts to bring forward this initiative, and to convene partners to help.

In addition to those community leaders mentioned above, we also thank the many supporters, advocates, thought partners, and active partners of this initiative, including Rachel Michelson, Yvonne Murray, Maria Ines Ortega Barrera, and all of the volunteers and staff at Mom's Demand Action, Everytown, Brady United, and many of our Project Hope community leaders. We also thank local leaders who have stepped up to offer critical help, including District Attorney Jeff Rosen, Assemblymember Phil Ting and his lead expert on staff, Mark Chekal-Bain, Senator Josh Becker, California Attorney General Rob Bonta and his team, and Golden State Warriors Coach Steve Kerr.

We are deeply appreciative of the philanthropic support of the policy and research work necessary for the crafting of this initiative by the Heising-Simons Foundation—particularly Deanna Gomby and Holly Kreider—and by SV Angel CEO Ron Conway. We also appreciate the willingness of the Silicon Valley Community Foundation to serve as a fiscal agent for these funds.

Finally, we offer our very deep gratitude to the *pro bono* efforts of our legal team, led by Joe Cotchett and Tamarah Prevost of Cotchett, Pitre & McCarthy, LLP. We have had great support, advice, research, and legal assistance provided by Allison Anderman and Esther Sanchez-Gomez at the Giffords Law Center to Prevent Gun Violence; Tanya Schardt and Steve Lindley at Brady United; UC Berkeley School of Law Dean Erwin Chemerinsky; Stanford Law Professor and Economist John J. Donohue III; Michael Redding, John Marsh, and team at the California Attorney General's office, and Keker, Van Nest & Peters LLP.

The signers of this memorandum have not had, and will not have, any private conversation with any other member of the City Council, or that member's staff, concerning any action discussed in the memorandum, and that each signer's staff members have not had, and have been instructed not to have, any such conversation with any other member of the City Council or that member's staff.

Exhibit 5

COUNCIL AGENDA: 01/25/2022
FILE: 22-045
ITEM: 4.1

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: HONORABLE MAYOR AND CITY COUNCIL

FROM: Councilmember Dev Davis

SUBJECT: **SEE BELOW**

DATE: 01/21/2022

Approved

Date 01/21/2022

RECOMMENDATION:

1. Reject the recommendation made by the City Attorney in her January 14, 2022, memo requiring San Jose residents who own guns to carry liability insurance and pay fees to gun harm reduction programs.
2. Reinvigorate the Mayor's Gang Prevention Task Force to reconvene the multiple agencies and programs aimed at reducing gang violence and illegal gun use.
    a. Engage partners, such as the DA's office and the local judiciary, to ensure full enforcement of the firearm-related laws already in place.
    b. Work with state legislators and local law enforcement to eliminate ghost gun sales and arrest and prosecute those who are in possession of these weapons.
3. Educate residents about our local safe storage law and Gun Violence Restraining Orders and Emergency Protection Restraining Orders available to local law enforcement and concerned family and/or friends.
4. Direct staff to design a gun safety education program for residents and return to Council with a budget proposal.
5. Direct staff to establish an annual gun buyback program and return with a budget proposal for this cost.
6. Direct the City Manager's Office to work with the Police Department to identify and apply for all available federal and state grants to help offset costs related to gun safety education and gun buyback programs.

DISCUSSION:

Everyone agrees that guns are dangerous and sometimes lethal. At the same time, there are many valid reasons why some residents choose to legally own guns. Some feel it adds a degree of self-protection. Some enjoy the sport of target shooting, and others legally hunt game for food. It is tragic when someone uses a gun to commit suicide or decides to take the life of another human being. We need to responsibly address this multi-faceted reality in our community. Requiring insurance that may or may not be available to everyone and requiring a fee – of unknown amount

– given to a non-profit that may or may not be legally able to certify insurance coverage for a resident is not the way to reduce gun harm. It also adds an already overtaxed police department with yet another layer of bureaucracy and paperwork.

The Mayor and City Attorney are asking us to pass an ordinance where all the details and structure are to be "worked out later." Pardon the analogy - we are talking about guns - it's like shooting first and aiming later.

In the past, illegal gun use was addressed during multi-agency meetings of the Mayor's Gang Prevention Task Force. What has happened to that once very successful group? The last gang hotspot map on our city's website is from April 2015. The last workplan listed online is for 2015-2017. I recommend reinstating/reviving the Mayor's Gang Prevention Task Force to at least facilitate interagency connections and information sharing. A similar program in Oakland was shown in a quasi-experimental study to be effective in reducing total shootings and gang-involved shootings and is rated as an effective solution to crime by the US Department of Justice.[1]

We do have laws in place that address gun harm that are unevenly enforced. Let's work on using and enforcing those laws. Gun Violence Restraining Orders (GVRO) are law in California and expanding to many other states. It is a court order that temporarily removes a family member's access to guns if they are threatening to harm themselves or other people. A family member or a law enforcement officer can request the court to issue a GVRO. There is no cost to file an order. These orders can be in place immediately and be temporary or long term. We have not made this law known widely to our community. If we want to do something, give our agencies the tools and monetary resources they need to enact the laws we have already passed and inform our residents about their current options. Don't burden them with more legislation.

We should not be punishing legal gun owners because they are the easiest target to regulate. We should be pursuing prosecution and jail time for anyone in possession of ghost guns that circumvent regulation. According to SJPD Chief Anthony Mata, in his entire career, he has never seen so many ghost guns out on our streets. This past week, a carjacking suspect fired a ghost gun at responding officers. These ghost guns are homemade and illegal. They don't fall into the category of gun registration and they would not be searchable in the gun insurance registry.

We should listen to our public safety officers out on the streets who feel defeated when a suspect is released from custody sooner than the arresting officer has time to finish the initial arrest report. They call it catch and release. It's not funny. It's sad, and it's dangerous.

It is time we address this very real and serious issue with concrete solutions that do not burden lawful and responsible gun owners.

[1] National Institute of Justice Crime Solutions. Program Profile: Ceasefire (Oakland, Calif.). https://crimesolutions.ojp.gov/ratedprograms/700

Exhibit 6

COUNCIL AGENDA: 01/25/22
ITEM: 4.1

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: HONORABLE MAYOR AND CITY COUNCIL

FROM: Councilmember Raul Peralez

SUBJECT: GUN HARM REDUCTION ORDINANCE

DATE: January 21, 2022

Approved by: Date: 1/21/2022

RECOMMENDATION

Accept the memorandum authored by Mayor Liccardo, Vice Mayor Jones and Councilmembers Cohen and Carrasco and direct the City Manager and City Attorney to:

1. Prior to the second reading of the ordinance, report back with a status of the Community Violence Prevention & Response initiative[1] approved by the Rules & Open Government Committee (ROGC) on September 22, 2021 as well as next steps on any outstanding items.

2. Prior to the end of the fiscal year, schedule a joint study session with the County Board of Supervisors as directed by ROGC with a focus on gun violence prevention as it relates to mental health, Intimate Partner Violence (IPV) / Intimate Partner Homicide (IPH) and substance abuse with a diverse panel that includes but is not limited to mental health professionals, social service professionals and firearm experts.
    a. If the County BOS declines or does not respond, proceed with a Council Study Session and include experts from relevant County departments such as the Behavioral Health Services Department.

3. Provide a timeline and work plan on designating a non-profit before the ordinance takes effect to the Public Safety, Finance and Strategic Services (PSFSS) committee, and include responses to the following questions:
    a. Who will be delivering the services outlined in number 1-4 per section 10.32.220 in the draft Gun Harm Reduction Ordinance?
    b. Assuming providers are existing local organizations, do they have the bandwidth to effectively carry out these services?

[1] https://sanjose.legistar.com/View.ashx?M=F&ID=9819199&GUID=1C13D215-45C9-4AB0-A857-F15E0E5F4559

c. How will there be coordination with the County's Behavioral Health Services Department and other relevant county departments?
d. What metrics will be put in place to measure efficacy of the services and whether there is a correlation to reduced gun violence?
e. What is the contingency in the event that the designated non-profit is no longer financially viable?
f. What is the expected rate of registration by gun owners? Compared to other fee-required registration programs such as animal licensing.
g. Per section 10.32.240 of the draft ordinance, elaborate what the enforcement process will be.

4. Amend the ordinance requiring the designated non-profit to provide a bi-annual report to the appropriate committee with a possible cross reference to City Council.

DISCUSSION

Community Violence Prevention & Response

On September 22, 2021, the ROGC approved my proposed initiative titled *Community Violence Prevention and Response*, a three-pronged approach at examining and ultimately addressing the social and mental causation of gun violence in our community. We have an opportunity to break traditional silos and engage in a robust dialogue within our community on how to provide help to those before they cause harm to themselves or others. The Gun Harm Reduction ordinance creates a funding source for a designated non-profit to service delivery the following as outlined in the ordinance per section 10.32.220:

1. Suicide prevention services or programs;
2. Violence reduction or domestic violence services or programs;
3. Mental health services related to gun violence; or
4. Firearms safety education or training.

Specifically related to #1 and #3, it is critical that San José is working collaboratively with those responsible for delivering behavioral and mental health services, as well as maintaining a pulse on how we are managing the well being of our city staff and community members at large.

Actions Relating to Expenditures of Funds

I would like to first thank all current and future community advocates that will be involved in the daunting task of creating a designated non-profit chartered to expend the collected funds as envisioned by this ordinance. While I appreciate the intent, the proposed shift in direction to a fee collection and service delivery by a third party designated non-profit approach does prompt more questions than answers.

Non-profit management is comparable to running a business, and as such, if not properly structured for success, will result in its demise. We have seen in the past challenges of city-supported non-profits such as the Police Athletic League (PAL) and History San Jose in which the City had to dedicate resources for its survival. Ultimately, the "devil is in

the details" and prior to creating a new non-profit, something that the City has historically struggled with, we must do our due diligence and set ourselves up for success rather than failure.

Hence, the questions I have posed in the recommendations are not intended to prolong efforts towards reducing gun harm and violence, but rather ensure we will succeed in reducing it and save lives. As policymakers, we are expected to ask these tough questions so that we can assure our constituents and residents that their city resources are being effectively allocated.

CONCLUSION

Thank you to City Staff for the quick turnaround of a draft ordinance in effort to reduce gun harm and violence, a cause not only very personal to me but one that I have been consistently supportive of during my seven years in office. The data points articulated by Dr. Ted Miller and the Pacific Institute for Research and Evaluation (PIRE) are powerful. However, it is important as well that as we engage in this contentious debate that has penetrated every level of government in our country, we remember the individuals who are lost to gun violence are our sisters, brothers, daughters, sons, mothers, fathers, friends and neighbors – lives senselessly cut too short by a preventable epidemic that has touched our city one too many times.

Exhibit 7

COUNCIL AGENDA: 1/25/22
FILE: 22-045
ITEM: 4.1

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: HONORABLE MAYOR AND CITY COUNCIL

FROM: Nora Frimann
City Attorney

SUBJECT: GUN HARM REDUCTION ORDINANCE

DATE: January 21, 2022

SUPPLEMENTAL

REASON FOR SUPPLEMENTAL

The attached list provides the citations for the various research and data sources used in the recitals of the proposed ordinance that is being considered at the City Council's January 25, 2022 meeting. It may be useful in Council's deliberations on the matter.

/s/
NORA FRIMANN
City Attorney

STUDIES CITED IN GUN HARM REDUCTION ORDINANCE RECITALS

	Source
1.	The Educational Fund to Stop Gun Violence. "Public Health Approach to Gun Violence Prevention." https://efsgv.org/learn/learn-more-about-gun-violence/public-health-approach-to-gun-violence-prevention/ Data sourced from Centers for Disease Control and Prevention "Underlying Cause of Death" reports https://wonder.cdc.gov/ucd-icd10.html
2.	Data from the Centers for Disease Control and Prevention: https://wisqars.cdc.gov/data/explore-data/home
3.	Santa Clara County Public Health. "Firearms in Santa Clara County." https://publichealth.sccgov.org/sites/g/files/exjcpb916/files/firearms-facts-2018.pdf
4.	American Journal of Epidemiology. "Guns in the home and risk of a violent death in the jome: findings from a national study." https://pubmed.ncbi.nlm.nih.gov/15522849/
5.	Annals of Internal Medicine. "The Accessibility of Firearms and Risk for Suicide and Homicide Victimization Among Household Members." https://www.acpjournals.org/doi/10.7326/M13-1301
6.	The New England Journal of Medicine. "Handgun Ownership and Suicide in California." https://www.nejm.org/doi/full/10.1056/NEJMsa1916744
7.	American Academy of Pediatrics. "Guns in the Home." https://www.healthychildren.org/English/safety-prevention/at-home/Pages/Handguns-in-the-Home.aspx
8.	Everytown for Gun Safety and Moms Demand Action. "Innocents Lost: A year of unintentional child deaths, June 2014." https://momsdemandaction.org/new-analysis-one-year-unintentional-child-gun-deaths-u-s-finds-nearly-two-children-killed-every-week-60-percent-higher-federal-data-reflect/
9.	Social Science and Medicine. "State-level homicide victimization rates in the US in relation to survey measures of household firearm ownership, 2001-2003." https://pubmed.ncbi.nlm.nih.gov/17070975/
10.	Journal of Urban Health. "Firearm Storage in Gun-Owning Household with Children: Results of a 2015 National Survey." https://www.thetrace.org/wp-content/uploads/2018/05/Firearm-Storage-in-Households-with-Children_JUH.pdf
11.	The Educational Fund to Stop Gun Violence. "Unintentional Shootings." https://efsgv.org/learn/type-of-gun-violence/unintentional-shootings/

12.	Hartford Courant. “Sandy Hook Families Settle Lawsuits Against Lanza Estate for $1.5M.” https://www.courant.com/news/connecticut/hc-sandy-hook-lawsuit-settled-20150803-story.html Gilman & Bedigian, LLC. “Man who shot intruder in his home sued for wrongful death.” https://www.gilmanbedigian.com/man-who-shot-intruder-in-his-home-sued-for-wrongful-death/ CBS News. “Burglar sues Calif. Homeowner, 90, who returned fire.” https://www.cbsnews.com/news/burglar-sues-calif-homeowner-90-who-returned-fire/
13.	The Educational Fund to Stop Gun Violence. “Public Health Approach to Gun Violence Prevention.” https://efsgv.org/learn/learn-more-about-gun-violence/public-health-approach-to-gun-violence-prevention/
14.	The Actuary. “Firearm Risk: An Insurance Perspective.” https://theactuarymagazine.org/firearm-risk/

EFSGV | THE EDUCATIONAL FUND TO STOP GUN VIOLENCE

The Public Health Approach to Gun Violence Prevention

November 2020

Table of Contents

Introduction

Each day more than 100 Americans die by firearms and nearly 200 are shot and injured. These deaths are preventable. A comprehensive public health approach is needed to address the gun violence epidemic. Public health is the science of reducing and preventing injury, disease, and death and promoting the health and well-being of populations through the use of data, research, and effective policies and practices. A public health approach to prevent gun violence is a population level approach that addresses both firearm access and the factors that contribute to and protect from gun violence. This approach brings together institutions and experts across disciplines in a common effort to: 1) define and monitor the problem, 2) identify risk and protective factors, 3) develop and test prevention strategies, and 4) ensure widespread adoption of effective strategies.

We have used the public health approach to successfully eradicate diseases, reduce smoking-related deaths, and decrease car crashes. We can use this same approach to prevent gun violence in all its forms and strive towards a society where everyone can live free from gun violence.

What is Public Health?

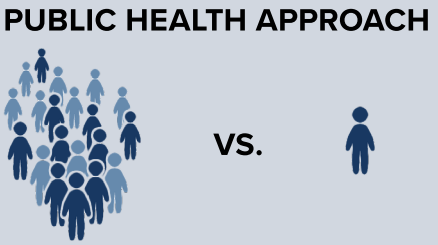
Public health is the science of reducing and preventing injury, disease, and death and promoting the health and well-being of populations through the use of data, research, and effective policies and practices. Public health works to address the underlying causes of a disease or injury before they occur, promote healthy behaviors, and control the spread of outbreaks.

Public health researchers and practitioners then work with communities and populations to implement and evaluate programs and policies that are based on research. Policymakers, researchers, and advocates have successfully used the public health approach in the United States to drastically decrease premature death rates, reduce injury, and improve the health and well-being of the population, including by eradicating diseases like polio, promoting widespread usage of vaccines, reducing smoking-related deaths, addressing environmental toxins, and decreasing motor vehicle crashes.

How Public Health differs from Healthcare

People often assume that public health is the same as healthcare. While both strive to improve health and well-being, they approach this goal differently. In healthcare, the focus is on improving the health of the individual. In contrast, public health focuses on improving the health of an entire population through large-scale interventions and prevention programs.

Public health works to address the many factors that determine the health and well-being of populations. These factors are often referred to as risk and protective factors. They are characteristics or behaviors in individuals, families, communities, and the larger society that increase or decrease the likelihood of premature death, injury, or poor health.



Why is Gun Violence a Public Health Epidemic?

Gun violence is a public health epidemic that affects the well-being and public safety of all Americans. In 2018, nearly 40,000 Americans were killed by gun violence, more than the number of Americans killed in car crashes.[2] An additional 71,000 Americans suffer nonfatal firearm injuries,[3] and millions of Americans face the trauma of losing a loved one or living in fear of being shot. The impacts of gun violence, both direct and indirect, inflict an enormous burden on American society. When a child is shot and killed, they lose decades of potential: the potential to grow up, have a family, contribute to society, and pursue their passions in life. When compared to other communicable and infectious diseases, gun violence often poses a larger burden on society in terms of potential years of life lost. In 2018, firearm deaths accounted for 919,185 years of potential life lost before the age of 65 – more than diabetes, stroke, and liver disease combined.[4]

Scope of Gun Violence

Americans are impacted by various forms of gun violence – including suicide, homicide, and unintentional deaths, as well as nonfatal gunshot injuries, threats, and exposure to gun violence in communities and society.

1. Firearm Suicide:

- Each year, nearly 23,000 Americans die by firearm suicide.[5]
- Half of all suicide deaths are by firearm.[6]
- Suicide attempts by firearm are almost always deadly — 9 out of 10 firearm suicide attempts result in death.[7]
- Access to a firearm in the home increases the odds of suicide more than three-fold.[8]

2. Firearm Homicide:

- Each year, more than 13,000 Americans die by firearm homicide.[9]
- Nearly three out of four homicides are committed with a firearm.[10]
- Access to firearms — such as the presence of a gun in the home — doubles the risk for homicide victimization.[11,12]
- The firearm homicide rate in the United States is 25.2 times higher than other industrialized countries.[13]

3. Domestic Violence:

- More than half of female intimate partner homicides are committed with a gun.[14]
- There are about 4.5 million women in America who have been threatened with a gun and nearly 1 million women who have been shot or shot at by an intimate partner.[15]
- A woman is five times more likely to be murdered when her abuser has access to a gun.[16]

4. Police-Involved Shootings:

- 1,000 Americans are shot and killed by police every year.[17]
- Black Americans are disproportionately impacted by police-involved shootings and are killed at more than twice the rate of White Americans.[18]

5. Unintentional Shootings:

- Each year, nearly 500 people die from unintentional firearm injuries — more than one person every single day.
- More than 100 children and youth die each year due to unintentional gun injuries.[20]
- Americans are four times more likely to die from an unintentional gun injury than people living in other high-income countries.[21]

6. Nonfatal Firearm Injuries:

- For every individual in the United States who dies by firearm, more than two individuals survive.[22]
- Each year, there are over 71,000 nonfatal gunshot injuries, costing hospitals an estimated $2.8 billion annually.[23]
- Each year, there are more than 7,100 emergency room visits for nonfatal gunshot wounds among children under the age of 18 and 36,000 visits among those ages 18-29.[24]

7. Exposure to Gun Violence:

- One-third of American adults say that their fear of mass shootings prevents them from going to certain places or events.[25]
- An estimated 15% of American adults state that they have witnessed a shooting and 15% of American adults also state that someone they care for has been killed with a gun.[26]
- An estimated 25% of American adults report being threatened or intimidated with a gun.[27]

What is the Public Health Approach?

The Centers for Disease Control and Prevention and World Health Organization outline a public health approach to violence prevention based on four steps: [28,29]

STEP 1 – DEFINE AND MONITOR THE PROBLEM

Researchers and policymakers need reliable data to understand the scope and complexity of gun violence. There are many different types of gun violence, and each type often requires different prevention strategies. Collecting and distributing reliable firearm data is essential to combating gun violence through a public health approach. Gun violence prevention researchers need reliable and timely data around the number of firearm fatalities and nonfatal injuries that occur in the United States each year. This data should include the demographics of the victim and shooter (if applicable), the location and time of the shooting, and the type of gun violence that occurred. Databases should classify the types of gun violence (suicides, intimate partner violence, mass shootings, interpersonal violence, police shootings, unintentional injuries) based on clearly defined and standardized definitions. This data should be made widely available and easily accessible to the general public free of charge.

STEP 2 – IDENTIFY RISK AND PROTECTIVE FACTORS

The public health approach focuses on prevention and addresses population level risk factors that lead to gun violence and protective factors that reduce gun violence. A thorough body of research has identified specific risk factors, both at the individual level and at the community and societal level, which increase the likelihood of engaging in gun violence. At an individual level, having access to guns is a risk factor for violence, increasing the likelihood that a dangerous situation will become fatal. Simply having a gun in one's home doubles the chance of dying by homicide and increases the likelihood of suicide death by over three-fold.[30] Other individual risk factors closely linked to gun violence include: a history of violent behavior, exposure to violence, and risky alcohol and drug use.[31] Community level factors also increase the likelihood of gun violence. Under-resourced neighborhoods with high concentrations of poverty, lack of economic opportunity, and social mobility are more likely to experience high rates of violence. These community level factors are often the result of deep structural inequities rooted in racism.[32,33] Policies and programs should mitigate risk factors and promote protective factors at the individual and community levels.

Applying the Public Health Approach to Prevent Firearm Suicide

The social ecological model is a public health framework that is used to show the interplay between risk and protective factors for health outcomes and to develop parallel policies and programs that address these factors. The model spans four levels: individual, relationship, community, and society.

Access to firearms is a significant risk factor for firearm suicide, and addressing firearm access is a critical component of any suicide prevention strategy. Prevent Firearm Suicide is a project of the Educational Fund to Stop Gun Violence that applies the social ecological model for firearm suicide prevention, by sharing the available programs and policies that reduce access to firearms from individuals when they are at an elevated risk for suicide. These interventions span the four levels of the model and include safer firearm storage (individual), lethal means safety counseling (relationship), gun shop projects (community), and extreme risk laws (society).

To learn more, visit **PreventFirearmSuicide.com**

STEP 3 – DEVELOP AND TEST PREVENTION STRATEGIES

Policymakers and practitioners must craft interventions that address the risk factors for gun violence. These interventions should be routinely tested to ensure they are effective and equitable; rigorous evaluations should be conducted on a routine basis. The foundation for effective gun violence prevention policy is a universal background check law, ensuring that each person who seeks to purchase or transfer a firearm undergoes a background check prior to purchase. Universal background checks should be supplemented by a firearm licensing system, which regulates and tracks the flow of firearms, to ensure that firearms do not make it into the hands of prohibited individuals. Building upon this, policymakers can create interventions that target behavioral risk-factors for gun violence (e.g. extreme risk laws) and they can push for policies that address community risk factors that lead to violence (e.g. investing in community based violence prevention programs). In addition to these gun violence prevention policies, there are a number of evidence-based strategies that can reduce gun violence within communities. For example, community based violence intervention programs work to de-escalate conflicts, interrupt cycles of retaliatory violence, and support those at elevated risk for violence.

STEP 4 – ENSURE WIDESPREAD ADOPTION OF EFFECTIVE STRATEGIES

While it is essential to pass strong laws, it is equally important to enforce and implement these laws and to scale up evidence-based programs. Strong gun violence prevention policies are only effective if they are properly implemented and enforced in an equitable manner. A key focus of the public health approach is ensuring that these strategies are not only effective but that they also promote equity. Historically disenfranchised groups should be involved in the implementation process to ensure that public health strategies do not have unintended consequences. For example, gun violence prevention policies should be consistently evaluated to ensure that they do not stigmatize individuals living with mental illness or perpetuate the discriminatory and racist practices embedded in the criminal justice system. The public health approach includes a focus on allocating funds for implementation and evaluation of these gun violence prevention strategies at the federal, state, and local levels. Funds should be allocated to train the proper stakeholders to ensure that new policies and programs are properly adopted and achieve measurable and equitable outcomes.

Health Impact Pyramid

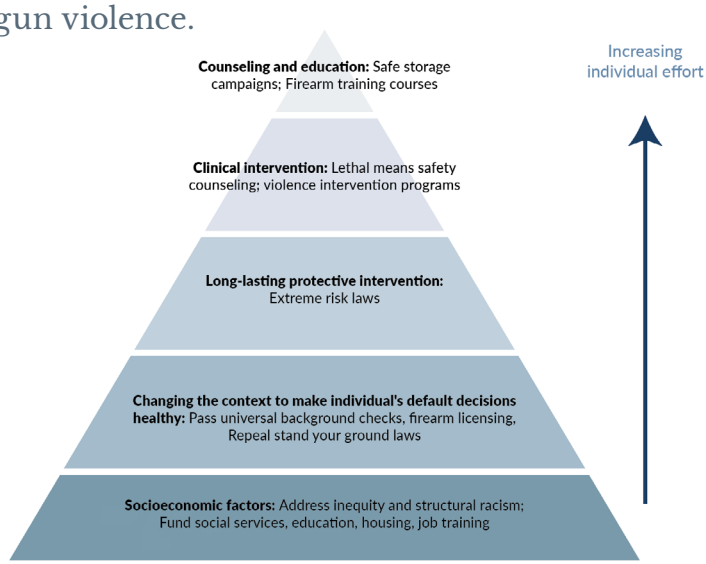
The goal of public health is to maximize the overall health and well-being of populations. Public health practitioners do this by developing a wide range of interventions. These interventions address risk and protective factors ranging from factors at the individual level to the societal level. The public health pyramid helps researchers conceptualize the many different levels of intervention needed to address a public health problem like gun violence.[34]

At the top of the pyramid are narrowly tailored interventions that work with individuals at risk for gun violence. These interventions, like lethal means safety counseling and violence intervention programs, can have a tremendous impact in reducing gun violence. Yet, they also require individual action. These programs provide the tools and support to change behavior, but the individuals themselves must be willing to take action and change behavior.

The middle of the pyramid includes interventions that require less individual action. They are often laws and policies that change the environments within communities to mitigate risk factors. One such policy is universal background checks and firearm licensing. Research shows that when individuals are required to undergo a background check and obtain a license to purchase a firearm, far fewer firearms are diverted into illegal markets and used to perpetrate violence.

At the bottom of the public health pyramid are the conditions within society that lead to poor health outcomes like gun violence. These factors are often referred to as the root causes or social determinants of health. Socioeconomic factors, such as racial disparities, inequality, poverty, inadequate housing and education, are all risk factors for interpersonal gun violence. Policies that address these root causes have enormous potential to reduce gun violence and improve health. These policies, while requiring a broad collective effort to achieve, require minimal individual effort to be effective at reducing gun violence.

The health impact pyramid helps researchers conceptualize the many different levels of intervention needed to address a public health problem like gun violence.

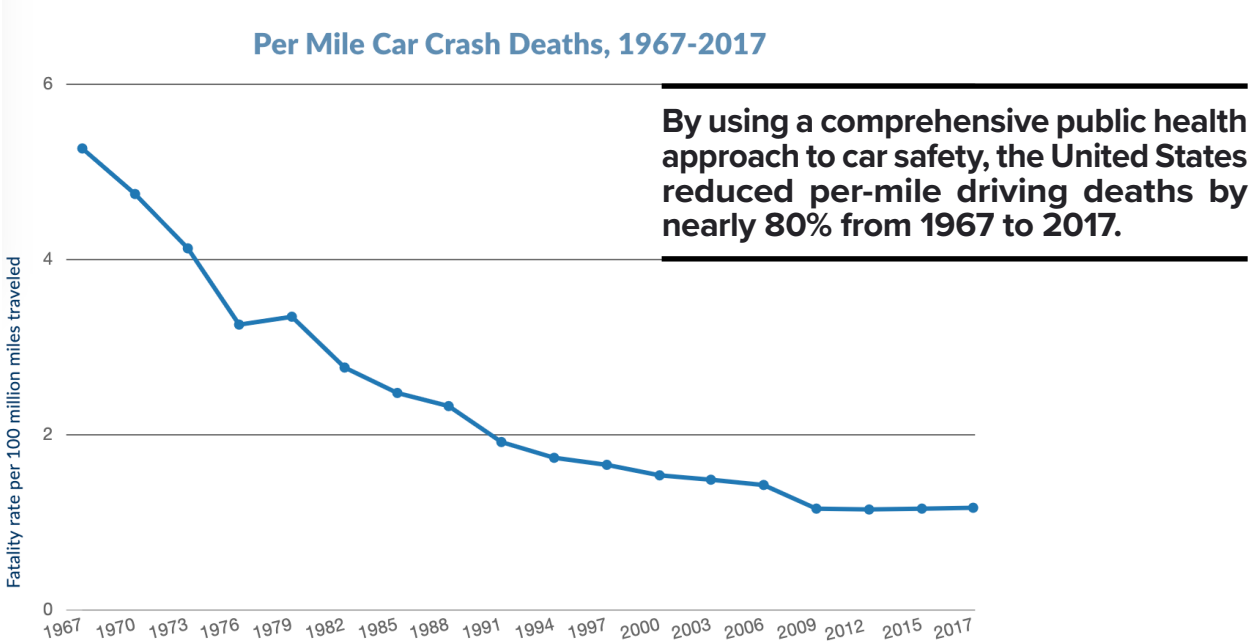


Source: Adapted from Frieden TR. (2010). A framework for public health action: the health impact pyramid. American Journal of Public Health.

How Do We Address Gun Violence Through the Public Health Approach?

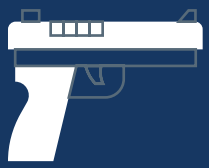
The public health approach is multifaceted and comprehensive and brings together institutions and experts across disciplines in a common effort to develop a variety of evidence-based interventions.[35] This comprehensive approach to tackling public health crises in America has been used over the last century to eradicate diseases like polio, reduce smoking deaths, and make cars safer. This public health approach has saved millions of lives. We can learn from public health successes – like car safety – and apply these lessons to preventing gun violence.

Applying the public health successes of car safety to prevent gun violence: One of the greatest American public health successes is our nation's work to make cars safer. By using a comprehensive public health approach to car safety, the United States reduced per-mile driving deaths by nearly 80% from 1967 to 2017.[36] This public health approach to car safety prevented more than 3.5 million deaths over these fifty years.[37] To reduce gun violence, we should apply this same time-tested public health approach.



Source: National Traffic Highway Safety Administration (NTHSA). Motor Vehicle Traffic Fatalities and Fatality Rates, 1899-2017.

Applying the Public Health Successes of Auto Safety to Gun Violence Prevention



	Preventing Car Crashes	Preventing Gun Deaths
ALLOCATE	Allocate funds to study the epidemic of motor vehicle crashes.	Allocate funds to the CDC and the NIH to research gun violence.
REGULATE	Federal agencies regulate car manufacturers and ensure car safety.	Allow federal agencies to regulate firearm manufacturers and ensure gun safety.
LICENSING	Drivers must submit an application and pass a test to obtain a driver's license.	Require firearm purchasers to submit an application, undergo a background check, and take safety education to obtain a license to own a firearm.
REGISTRATION	Car registration is required at each point of sale.	Pass firearm registration laws to ensure that firearms are registered at each point of sale.
PROHIBIT RISKY PEOPLE	Reckless and drunk driving laws ensure that risky individuals do not endanger others on the road.	Expand firearm prohibitions to include individuals who are at elevated risk for violence.
MANUFACTURING STANDARDS	Manufacturers are required to make safer cars by installing seat belts and airbags.	Require manufacturers to make fireams safer, including requiring that guns be outfitted with microstamping technology.
AGE REQUIREMENTS	Age requirements for obtaining a driver's license, including a graduated licensing system (driver's permit) for young drivers.	Enact stronger age requirements for owning or possessing all types of firearms.
LICENSING RENEWAL	Drivers are required to renew their license periodically.	Require gun owners to renew their license on a routine basis.
ONGOING MONITORING AND REGULATION	New models of cars are monitored and regulated, and recalls are issued for unsafe models.	Allow Consumer Product Safety Commission to regulate safety of firearms and ensure industry accountability.
LIABILITY	Manufacturers are held liable if they sell a dangerous vehicle.	Repeal the Protection of Lawful Commerce in Arms Act (PLCAA) to hold firearm manufacturers accountable for dangerous and reckless distribution of firearms.

Recommendations

Public health is the science of reducing and preventing injury, disease, and death and promoting the health and well-being of populations through the use of data, research, and effective policies and practices.

The public health approach has been successfully applied to tackle a wide variety of complex health problems at the population level. Gun violence is a public health epidemic that requires a public health solution. Based on the four steps of the public health approach to prevent gun violence, we recommend the following:

1. Better Data Collection

Federal, state, and local governments should collect more comprehensive gun violence data for fatal and nonfatal firearm injuries, shootings that may not involve physical injuries, and firearm-involved crimes where no shots were fired, including domestic violence-related threats. Federal, state, and local governments should make data publicly available where possible and particularly to researchers studying gun violence and its prevention.

2. Research Funding

Enhanced research funding is key for advancing knowledge and improving public health interventions and outcomes. Federal, state, and local governments, in addition to foundations and universities, should dedicate funding to research gun violence prevention.

3. Evidence-based policies and practices

Gun violence takes many forms and is a multifaceted problem that requires a multitude of data-driven solutions. Gun violence prevention policies and practices should be evidence-based.

4. Implementation and evaluation

Policies and practices should be continuously monitored and evaluated to ensure equitable implementation and ongoing effectiveness.

Resources

Research

- Allchin A, Chaplin V, & Horwitz J. (2019). Limiting access to lethal means: applying the social ecological model for firearm suicide prevention. Injury Prevention.
- Branas CC, Flescher A, Formica MK, Galea S, Hennig N, Liller KD ... & Ying J. (2017). Academic public health and the firearm crisis: an agenda for action. American Journal of Public Health.
- Decker MR, Wilcox HC, Holliday CN, & Webster DW. (2018). An integrated public health approach to interpersonal violence and suicide prevention and response. Public Health Reports.
- Cook PJ. Expanding the public health approach to gun violence prevention. (2018). Annals of Internal Medicine.
- Hemenway D & Miller M. (2013). Public health approach to the prevention of gun violence. New England Journal of Medicine.
- McGinty EE, Siddiqi S, Linden S, Horwitz J, & Frattaroli S. (2019). Improving the use of evidence in public health policy development, enactment and implementation: a multiple-case study. Health Education Research.
- Mozaffarian D, Hemenway D, & Ludwig DS. (2013). Curbing gun violence: lessons from public health successes. Journal of the American Medical Association.
- Maa J & Darzi A. (2018). Firearm injuries and violence prevention—The potential power of a Surgeon General's report. New England Journal of Medicine.
- Rajan S, Branas CC, Hargarten S, & Allegrante JP. (2018). Funding for gun violence research is key to the health and safety of the nation. American Journal of Public Health.
- Zeoli AM & Webster DW. (2019). Firearm policies that work. Journal of the American Medical Association.

Resources

- AFFIRM
- American Psychological Association: Gun Violence
- American Public Health Association: Gun Violence
- CDC Infographic: The Public Health Approach to Violence Prevention
- FACTS Consortium
- Harborview Injury Prevention & Research Center
- Johns Hopkins Center for Gun Policy and Research
- Reducing Gun Violence in America: Informing Policy with Evidence and Analysis
- Robert Wood Johnson Foundation: Gun Violence, a Public Health Epidemic
- Rutgers Center on Gun Violence Research
- Society for Advancement of Violence and Injury Research (SAVIR)
- Society for Public Health Education: Gun Violence Resolution
- University of California Firearms Violence Research Center (UCFC) and BulletPoints Project

About the Educational Fund to Stop Gun Violence

The Educational Fund to Stop Gun Violence (Ed Fund) seeks to make gun violence rare and abnormal. Founded in 1978, the Ed Fund is a nonprofit organization that makes communities safer by translating research into policy to prevent gun violence and engaging impacted communities in the policy making process. The Ed Fund is the gun violence prevention movement's premier research intermediary and founder of the Consortium for Risk-Based Firearm Policy, a group of researchers and experts who collaborate to develop innovative recommendations for policymakers. The Ed Fund's affiliate organization, the Coalition to Stop Gun Violence, has advocated for stronger gun laws since 1974. Together, they have paved the way for the gun violence prevention movement to advance research and support evidence-based gun violence prevention programs and policies.

Contributors

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Citations

[1] Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2018. Average based on years 2014-2018.

[2] Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2018.

[3] Gani F, Sakran JV, & Canner JK. (2017). Emergency department visits for firearm-related injuries in the United States, 2006–14. Appendix 13. Health Affairs.

[4] National Center for Injury Prevention and Control, CDC. WISQARS Years of Potential Life Lost (YPLL) Report, 1981 - 2018.

[5] National Center for Injury Prevention and Control, CDC. WISQARS Years of Potential Life Lost (YPLL) Report, 1981 - 2018.

[6] Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2018. Average based on years 2014-2018.

[7] Suicide attempts by firearm are almost always deadly — 9 out of 10 firearm suicide attempts result in death.

[8] Anglemyer A, Horvath T, & Rutherford G. (2014). The accessibility of firearms and risk for suicide and homicide victimization among household members: A systematic review and meta-analysis. Annals of Internal Medicine.

[9] Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2017. Average based on years 2014-2018.

[10] Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2017. Average based on years 2014-2018.

[11] Anglemyer A, Horvath T, & Rutherford G. (2014). The accessibility of firearms and risk for suicide and homicide victimization among household members: a systematic review and meta-analysis. Annals of Internal Medicine.

[12] Dahlberg LL, Ikeda RM, & Kresnow MJ. (2004). Guns in the home and risk of a violent death in the home: findings from a national study. American Journal of Epidemiology.

[13] Choron R, Spitzer S, & Sakran JV. (2019). Firearm violence in America: is there a solution? Advances in Surgery.

[14] Zeoli AM, Malinski R, & Turchan B. (2016). Risks and targeted interventions: Firearms in intimate partner violence. Epidemiologic Reviews.

[15] Sorenson SB, & Schut RA. (2018). Nonfatal gun use in intimate partner violence: A systematic review of the literature. Trauma, Violence, & Abuse.

[16] Campbell JC, Webster D, Koziol-McLain J, Block C, Campbell D, Curry MA... & Laughon K. (2003). Risk factors for femicide in abusive relationships: results from a multisite case control study. American Journal of Public Health.

[17] Fatal Force database. (2020). Washington Post.

[18] Fatal Force database. (2020). Washington Post.

[19] Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2018. Average based on years 2014-2018.

[20] Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2018. Average based on years 2014-2018.

[21] Solnick SJ & Hemenway D. (2019). Unintentional firearm deaths in the United States 2005–2015. Injury Epidemiology.

[22] Gani F, Sakran JV, & Canner JK. (2017). Emergency department visits for firearm-related injuries in the United States, 2006–14. Health Affairs. Appendix 13.

[24] Avraham JB, Frangos SG, & DiMaggio CJ. (2018). The epidemiology of firearm injuries managed in US emergency departments. Injury Epidemiology.

[25] One-third of US adults say fear of mass shootings prevents them from going to certain places or events. (2019). Press Release. American Psychological Association.

[26] SurveyUSA. Data collected from December 7-11, 2018. Questions 28, 29 Market Research Study.

[27] SurveyUSA. Data collected from December 7-11, 2018. Questions 35. Market Research Study.

[28] Centers for Disease Control and Prevention. The National Center for Injury Prevention and Control, Division of Violence Prevention. The Public Health Approach to Violence Prevention.

[29] World Health Organization. Violence Prevention Alliance. The Public Health Approach.

[30] Anglemyer A, Horvath T, & Rutherford G. (2014). The accessibility of firearms and risk for suicide and homicide victimization among household members: a systematic review and meta-analysis. Annals of Internal Medicine.

[31] Consortium for Risk Based Firearm Policy. (2013). Guns, public health, and mental illness: An evidence-based approach for state policy.

[32] Centers for Disease Control and Prevention. (2019). Risk and Protective Factors.

[33] Sampson RJ. (2012). Great American city: Chicago and the enduring neighborhood effect. University of Chicago Press.

[34] Frieden TR. (2010). A framework for public health action: the health impact pyramid. American Journal of Public Health.

[35] Hemenway D & Miller M. (2013). Public health approach to the prevention of gun violence. New England Journal of Medicine.

[36] Traffic Safety Facts: A Compilation of Motor Vehicle Crash Data. (2020). Annual Report Tables. National Highway Traffic Safety Administration.

[37] On 50th anniversary of Ralph Nader's 'Unsafe at Any Speed,' safety group reports auto safety regulation has saved 3.5 million lives. (2015). The Nation.

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Underlying Cause of Death, 1999-2020 Request

Deaths occurring through 2020

1. Organize table layout: Help

Group Results By Census Region
And By None
And By None
And By None
And By None

Notes:

• Group Results By "15 Leading Causes" to see the top 15 rankable causes selected from the corresponding 113 or 130 Cause List. More information.

Measures (**Default measures** always checked and included. Check box to include any others.)

☑ **Deaths** ☑ **Population** ☑ **Crude Rate**

For crude rates: ☐ **95% Confidence Interval** ☐ **Standard Error**

☐ **Age Adjusted Rate** ☐ **95% Confidence Interval** ☐ **Standard Error**

☐ **Percent of Total Deaths**

Title

Additional Rate Options *Click '+' for non-standard age adjusted rates and other options.* **Help**

2. Select location: Help

Click a button to choose locations by State, Census Region or HHS Region.
States ◉ **Census Regions** ○ **HHS Regions** ○

Browse or **search** to find items in the States Finder Tool, then **highlight** the items to use for this request.
(The *Currently selected* box displays all current request items.)

Finder Tool Help **Advanced Finder Options**

States

All (The United States)
+ 01 (Alabama)
+ 02 (Alaska)
+ 04 (Arizona)
+ 05 (Arkansas)
+ 06 (California)
+ 08 (Colorado)
+ 09 (Connecticut)
+ 10 (Delaware)
+ 11 (District of Columbia)

Currently selected:
All (The United States)

Browse the list by opening and closing items.
Use Ctrl+Click to multiple select, Shift+Click for a range.

2013 Urbanization

Pick between:
2013 Urbanization ◉
2006 Urbanization ○

All Categories
Large Central Metro
Large Fringe Metro
Medium Metro
Small Metro
Micropolitan (Nonmetro)
NonCore (Nonmetro)

3. Select demographics: Help

Hint: Use Ctrl + Click for multiple selections, or Shift + Click for a range.

Pick between:
Ten-Year Age Groups ◉
Five-Year Age Groups ○
Single-Year Ages ○
Infant Age Groups ○

Ten-Year Age Groups
All Ages
< 1 year
1-4 years
5-14 years
15-24 years
25-34 years
35-44 years
45-54 years
55-64 years
65-74 years
75-84 years
85+ years

Default rates per 100,000

Gender
All Genders
Female
Male

Hispanic Origin
All Origins
Hispanic or Latino
Not Hispanic or Latino
Not Stated

Race
All Races
American Indian or Alaska Native
Asian or Pacific Islander
Black or African American
White

4. Select year and month: Help

Browse or **search** to find items in the Year/Month Finder Tool, then **highlight** the items to use for this request.
(The *Currently selected* box displays all current request items.)

Finder Tool Help **Advanced Finder Options**

Year/Month

All (All Dates)
+ 1999 (1999)
+ 2000 (2000)
+ 2001 (2001)
+ 2002 (2002)
+ 2003 (2003)
+ 2004 (2004)
+ 2005 (2005)
+ 2006 (2006)
+ 2007 (2007)

Currently selected:
All (All Dates)

Browse the list by opening and closing items.
Use Ctrl+Click to multiple select, Shift+Click for a range.

5. Select weekday, autopsy and place of death: Help

Hint: Use Ctrl + Click for multiple selections, or Shift + Click for a range.

Weekday

All Weekdays
Sunday
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Unknown

Autopsy

All Values
No
Yes
Unknown

Place of Death

All Places
Medical Facility - Inpatient
Medical Facility - Outpatient or ER
Medical Facility - Dead on Arrival
Medical Facility - Status unknown
Decedent's home
Hospice facility
Nursing home/long term care
Other

6. Select cause of death: Help

Click a button to select ICD codes by Chapters or by Groups.

- (•) **ICD-10 Codes**
- ( ) **ICD-10 113 Cause List**
- ( ) **ICD-10 130 Cause List (Infants)**
- ( ) **Injury Intent and Mechanism**
- ( ) **Drug/Alcohol Induced Causes**

Browse or **search** to find items in the ICD-10 Codes Finder Tool, then **highlight** the items to use for this request.
(The *Currently selected* box displays all current request items.)

Finder Tool Help **Advanced Finder Options**

ICD-10 Codes

All (All Causes of Death)
+ A00-B99 (Certain infectious and parasitic diseases)
+ C00-D48 (Neoplasms)
+ D50-D89 (Diseases of the blood and blood-forming organs and certain disorders involving the i
+ E00-E88 (Endocrine, nutritional and metabolic diseases)
+ F01-F99 (Mental and behavioural disorders)
+ G00-G98 (Diseases of the nervous system)
+ H00-H57 (Diseases of the eye and adnexa)
+ H60-H93 (Diseases of the ear and mastoid process)
+ I00-I99 (Diseases of the circulatory system)

Currently selected:

All (All Causes of Death)

Browse the list by opening and closing items.
Use Ctrl+Click to multiple select, Shift+Click for a range.

7. Other options: Help

Export Results [ ] (Check box to download results to a file)
Show Totals [x]
Show Zero Values [ ]
Show Suppressed Values [ ]
Precision 1 **decimal places**
Data Access Timeout 10 **minutes**

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

WISQARS | EXPLORE FATAL INJURY DATA VISUALIZATION TOOL

FATAL DATA VISUALIZATION HOME | TRENDS | RESET FILTER | FILTER DATA

Year Range: 2005 - 2015 | All Fatal Injuries | Sex: Both Sexes | Age Range: 10 to 14 - 15 to 19 x | Race: All Races | Ethnicity: All Ethnicities | All Injury Types | Metro / Non-Metro Indicator: A

111,175	466,642,433	23.82	23.39	5,355,717
Number of Deaths	Population	Crude Rate	Age-Adjusted Rate	Years of Potential Life Lost

CAUSES OF INJURY-RELATED DEATH

For more information on a single cause of injury, select an element from the diagram to the right to filter the rest of the dashboard.

Hover over elements for details

Data source: NCHS Vital Statistics System for numbers of deaths. Bureau of Census for population estimates.

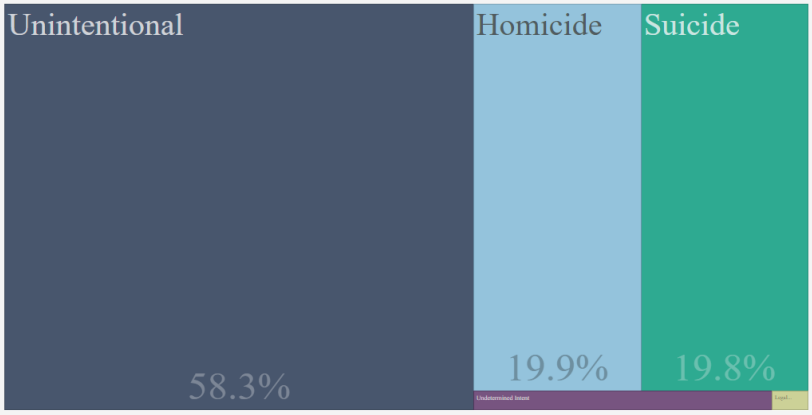
Users can filter data by clicking on chart or by selecting Filters from Filter Data button when using keyboard navigation.

DOWNLOAD DATA / IMAGE

Group By: Intent
View As: Graphic

SUBMIT

** indicates Unstable values, -- indicates Suppressed values, --* indicates Secondary Suppression



U.S. MAP OF INJURY - RELATED DEATHS (Color Shows level of Injury-Related Death)

Data source: NCHS Vital Statistics System for numbers of deaths. Bureau of Census for population estimates.

Users can filter data by clicking on a chart or by selecting Filters from the Filter Data button when using keyboard navigation.

Information on Census map regions and county boundary changes

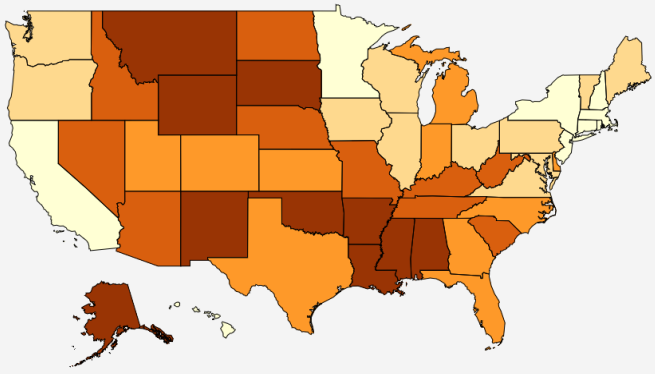
DOWNLOAD DATA / IMAGE

Show As: Age Adjusted Rate
View As: Graphic
Geospatial Smoothing: Actual — About smoothed rate calculations
Map Level Detail: State
Map Census Region/State:
Metro / Non-Metro Indicator: All
Color Scheme: Yellow-Orange-Brown (Seq)
Intervals (quantiles): 5

SUBMIT | RESET MAP VIEW

Legend
- 12.8 to 20.6
- 20.6 to 23.4
- 23.4 to 27.3
- 27.3 to 33.9
- 33.9 to 41.4
- Suppressed Value

** indicates Unstable values, -- indicates Suppressed values, --* indicates Secondary Suppression



DISTRIBUTION BY SEX

Data source: NCHS Vital Statistics System for numbers of deaths. Bureau of Census for population estimates.

Users can filter data by clicking on a chart or by selecting Filters from the Filter Data button when using keyboard navigation.

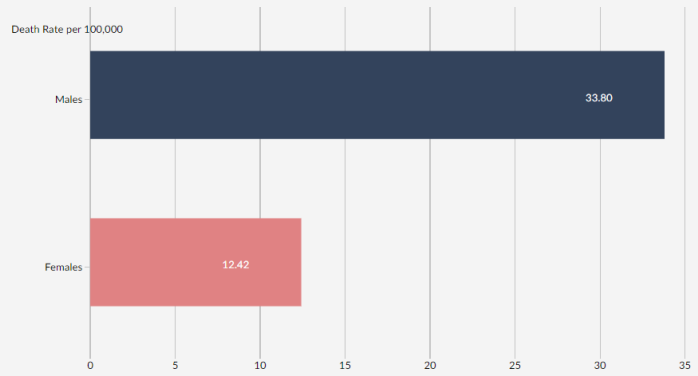
DOWNLOAD DATA / IMAGE

Show As: Age Adjusted Rate
View As: Graphic

SUBMIT

Legend:
- Females
- Males

** indicates Unstable values, -- indicates Suppressed values, --* indicates Secondary Suppression



DISTRIBUTION BY AGE

Data source: NCHS Vital Statistics System for numbers of deaths. Bureau of Census for population estimates.

Users can filter data by clicking on a chart or by selecting Filters from the Filter Data button when using keyboard navigation.

DOWNLOAD DATA / IMAGE

Show As: Age Adjusted Rate
View As: Graphic
Show Breakdown by Sex

SUBMIT

Legend:

navigation.

DOWNLOAD DATA / IMAGE

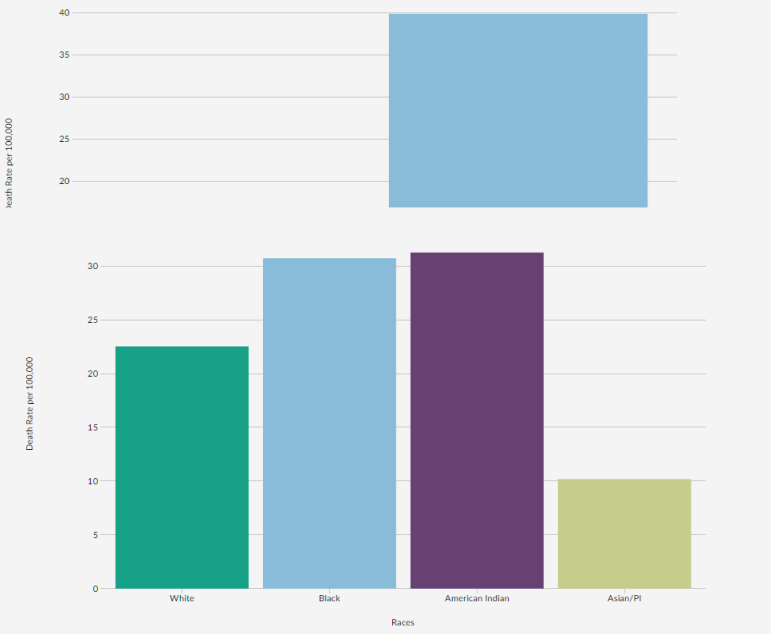
Show As: Age Adjusted Rate
View As: Graphic
Show Breakdown by Sex
Show Hispanic vs Non-Hispanic

SUBMIT

Legend:

- White
- Black
- American Indian
- Asian/PI

** indicates Unstable values, -- indicates Suppressed values, --* indicates Secondary Suppression



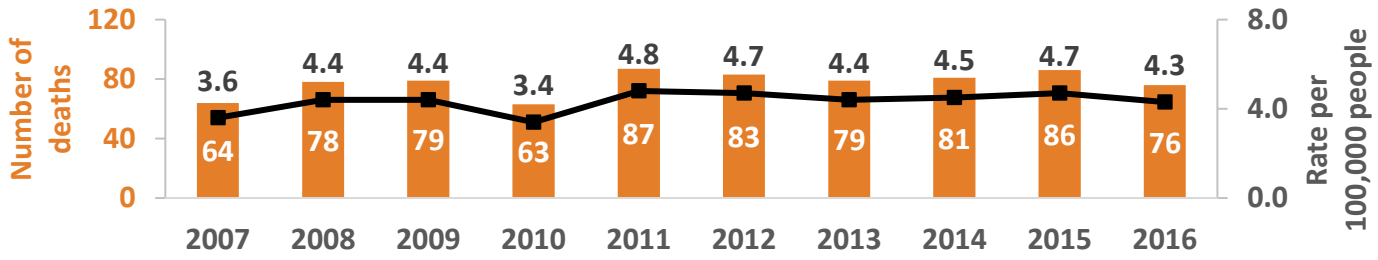
Firearms in Santa Clara County

Santa Clara County PUBLIC HEALTH

Key findings

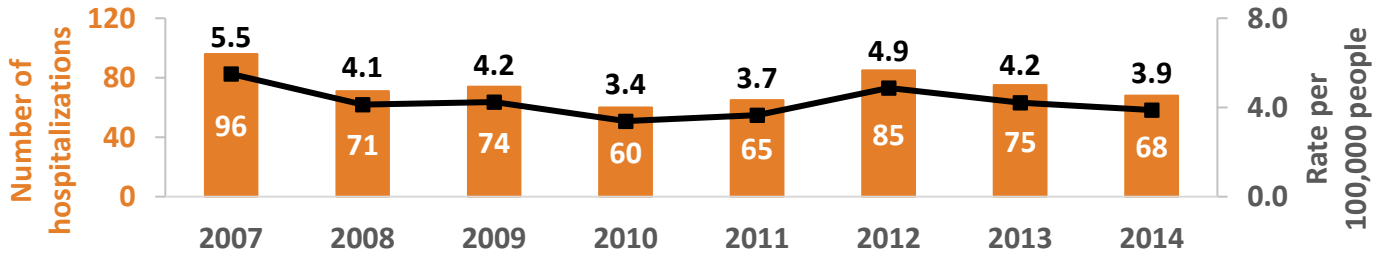
- In 2016, 11% of injury deaths were due to firearms injuries.
- The death rate from firearms injuries fluctuated from 2007 to 2016.
- The rate of hospitalizations for firearms injuries has decreased since 2007. The rate of emergency department (ED) visits for firearm injuries increased from 2007 to 2014.
- The rates of death, hospitalizations and emergency department visits for firearms are highest among males and African Americans.
- The rates of hospitalizations and emergency department visits are highest among adults ages 18 to 44. The rate of deaths is highest among adults ages 65 and older.
- One in 10 (11%) adult residents kept a firearm in and around the house in 2013-14. One in 10 (11%) middle and high school students saw someone carrying a gun, knife, or other weapon on school property in the past 12 months.
- Nearly a quarter (23%) of robbery crimes involved a firearm in 2016.

Number and age-adjusted rate of deaths from firearms injuries, 2007-2016



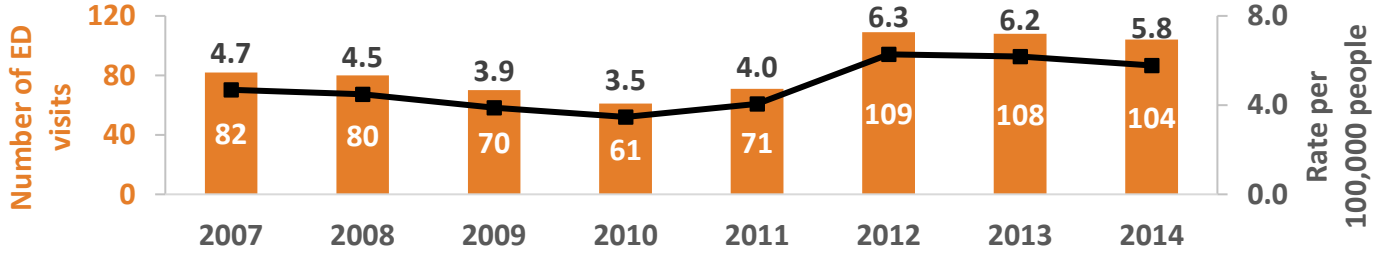
Source: Santa Clara County Public Health Department, 2007-2016 Death Statistical Master File[1]

Number and age-adjusted rate of hospitalizations for firearms injuries, 2007-2014



Source: Office of Statewide Health Planning and Development, 2007-2014 Patient Discharge Data[1]

Number and age-adjusted rate of emergency department (ED) visits for firearms injuries, 2007-2014



Source: Office of Statewide Health Planning and Development, 2007-2014 Emergency Department Data[1]

Note: In each graph above, the colored bars represent the number and the black line represents the age-adjusted rate per 100,000 people.

Firearms in Santa Clara County

Santa Clara County PUBLIC HEALTH

Number, percentage, and age-adjusted/age-specific rates of deaths from firearms injuries by demographic characteristics, 2012-2016

		Deaths		
		Average annual number of deaths±	% of deaths from firearms injuries*	Rate per 100,000 people+
Santa Clara County		81	N/A	4.5
Gender	Male	72	89	8.2
	Female	9	11	1.0
Age group	<18	3	4	0.7
	18-44	40	49	5.7
	45-64	25	30	5.5
	65+	13	17	6.8
Race/ethnicity	African American	4	5	8.6
	Asian/Pacific Islander	13	16	2.2
	Latino	21	26	4.3
	White	40	50	5.4

Source: Santa Clara County Public Health Department, 2012-2016 Death Statistical Master File[1]

Number, percentage, and age-adjusted/age-specific rates of hospitalizations and emergency department (ED) visits for firearms injuries by demographic characteristics, 2010-2014

		Hospitalizations			ED visits		
		Average annual number of visits±	% of hospitalizations for firearms injuries*	Rate per 100,000 people+	Average annual number of visits±	% of visits for firearms injuries*	Rate per 100,000 people+
Santa Clara County		71	N/A	4.0	91	N/A	5.1
Gender	Male	63	89	6.9	82	90	9.0
	Female	8	11	0.9	9	10	1.0
Age group	<18	9	12	3.1	11	12	1.5
	18-44	53	76	14.9	69	77	5.8
	45-64	8	11	3.2	9	10	1.3
	65+	--	--	--	--	--	--
Race/ethnicity	African American	8	12	17.1	9	10	19.6
	Asian/Pacific Islander	7	10	1.1	11	12	1.9
	Latino	42	60	7.5	53	59	9.4
	White	10	14	1.6	13	15	2.1

Source: Office of Statewide Health Planning and Development, 2010-2014 Emergency Department Data and Patient Discharge Data[1]

Note: ±Represents the average annual number of deaths, hospitalizations, or ED visits in each category over a 5-year period. If the average is reported, the sum of hospitalizations or ED visits for each 5-year period is >15 cases. *Represents the percentage of deaths, hospitalizations, or ED visits in each category, e.g., the percentage of deaths or visits for firearms injuries that were male or female. +Rates for age groups are reported as age-specific rates per 100,000 people. All other rates are age-adjusted rates per 100,000 people. Numbers and percentages may not sum to county totals or 100% because some categories are not presented (race/ethnicity), due to missing data, or due to rounding. N/A indicates fields where data are not applicable. (--) indicates not reportable due to small number of deaths, hospitalizations, or ED visits.

Firearms in Santa Clara County

Santa Clara County PUBLIC HEALTH

Number and percentage of deaths, hospitalizations, and emergency department (ED) visits for firearms injuries by intent of injury

Intent	Deaths 2007-2016		Hospitalizations 2010-2014		ED visits 2010-2014	
	Average annual number of deaths	% of deaths	Average annual number of visits	% of hospitalizations	Average annual number of visits	% of ED visits
Unintentional	<1	<1	12	16	28	31
Self-inflicted/suicide	46	59	4	6	--	--
Assault/homicide	28	36	52	73	45	50
Undetermined	1	2	--	--	7	7
Legal intervention	3	4	--	--	9	10

Source: Santa Clara County Public Health Department, 2007-2016 Death Statistical Master File; Office of Statewide Health Planning and Development, 2010-2014 Patient Discharge Data and 2010-2014 Emergency Department Data

Note: The number of firearms-related deaths and injuries is too small to report by intent of injury for individual years and groups. (--) indicates data are not reportable due to small number of hospitalizations or ED visits. Data presented for deaths, hospitalizations and ED visits are an annual average. If the average is reported, the sum of hospitalizations or ED visits for each 5-year period is > 15 cases.

Annual economic cost of firearms injuries

Costs	Deaths (N=76)	Hospitalizations (N=64)	ED visits (N=75)
Medical	$507,000	$1,479,000	$192,000
Work loss	$118,261,000	$5,892,000	$313,000
Combined	$118,768,000	$7,371,000	$505,000

Source: Santa Clara County Public Health Department, 2016 Death Statistical Master File; Office of Statewide Health Planning and Development, 2014 Emergency Department Data and 2014 Patient Discharge Data; Centers for Disease Control and Prevention, Web-based Injury Statistics Query and Reporting System, 2018

Note: For annual economic costs, data are for non-fatal hospitalizations and non-fatal treat and release ED visits only and so may not match numbers reported in other tables and graphs. Costs are indexed to 2015 U.S. prices for hospitalizations and ED visits and in 2015 California prices for deaths. Hospitalizations and ED visits exclude undetermined intent.

Self-reported firearm ownership among adults, 2013-14

		Any firearms now kept in or around home %	Any of the firearms are now loaded (among those with firearms) %
Santa Clara County		11	12
Gender	Male	13	16
	Female	9	7
Race/ ethnicity	African American	13*	10*
	Asian/Pacific Islander	2	3*
	Latino	5	6*
	White	22	13

Notes: * indicates estimate is statistically unstable due to a relative standard error of greater than 30% or less than 50 respondents in the denominator. These estimates should be viewed with caution and may not be appropriate to use for planning or policy purposes.
Source: Santa Clara County Public Health Department, 2013-14 Behavioral Risk Factor Survey

Firearms in Santa Clara County

Self-reported carrying of firearms among middle and high school students, 2015-16

		Carried a gun on school property in the past 12 months %	Saw someone carrying a gun, knife, or other weapon on school property in the past 12 months %
Santa Clara County		1	11
Gender	Male	2	12
	Female	1	9
Race/ ethnicity	African American	5	12
	Asian/Pacific Islander	1	8
	Latino	2	13
	White	1	9
Grade	7th	1	10
	9th	1	12
	11th	1	10

Source: California Healthy Kids Survey, 2015-16

Total offenses committed involving firearms among K-12 students, 2015-16

	Total offenses	Offenses resulting in an expulsion N (%)	Offenses resulting in a suspension N (%)	Offenses resulting in a disciplinary diversion N (%)
Santa Clara County	108	10 (9%)	93 (86%)	5 (5%)

Note: Counts include possession, sale, furnishing a firearm or knife and possession, sale, furnishing a firearm.
Source: California Department of Education. DataQuest. California Department of Education. https://dq.cde.ca.gov/dataquest/. Accessed 3/27/2018.

Crimes involving firearms, 2016

	Robbery crimes involving a firearm N (%)	Aggravated assault crimes involving a firearm N (%)
Santa Clara County	374 (23%)	498 (16%)

Source: California Department of Justice. Open Justice: Crime Statistics. California Department of Justice https://openjustice.doj.ca.gov/crime-statistics/. Accessed on 3/28/2018.

Domestic violence-related calls for assistance, 2016

	Total calls N	Total calls involving a weapon N (%)	Total calls involving a firearm (among those involving a weapon) N (%)
Santa Clara County	5,570	837 (15%)	28 (3%)

Source: California Department of Justice. Open Justice: Crime Statistics. California Department of Justice https://openjustice.doj.ca.gov/crime-statistics/. Accessed on 3/28/2018.

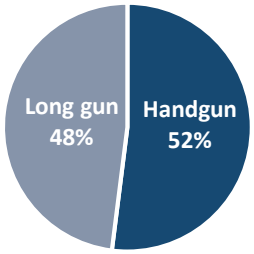
Firearms in Santa Clara County

Santa Clara County PUBLIC HEALTH

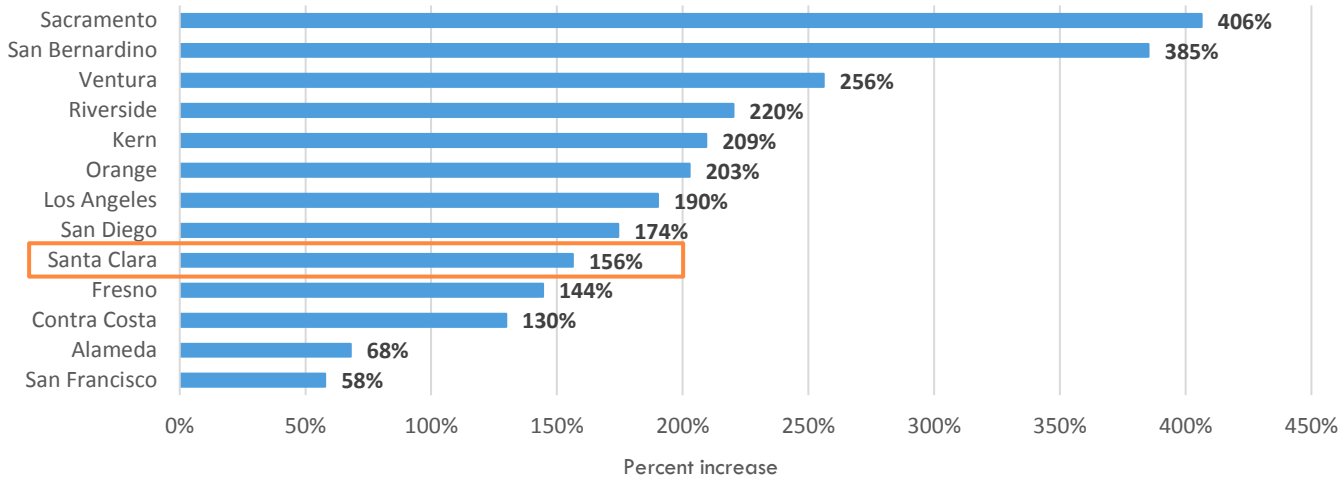
Gun sales in Santa Clara County from 2001-2015

- 363,725 guns sold
- Average of 24,000 guns sold per year
- Santa Clara County has the 15th lowest rate of average gun sales in California at 1,337 average guns sold per 100,000 people
- Gun sales rose by156% from 2001 to 2015

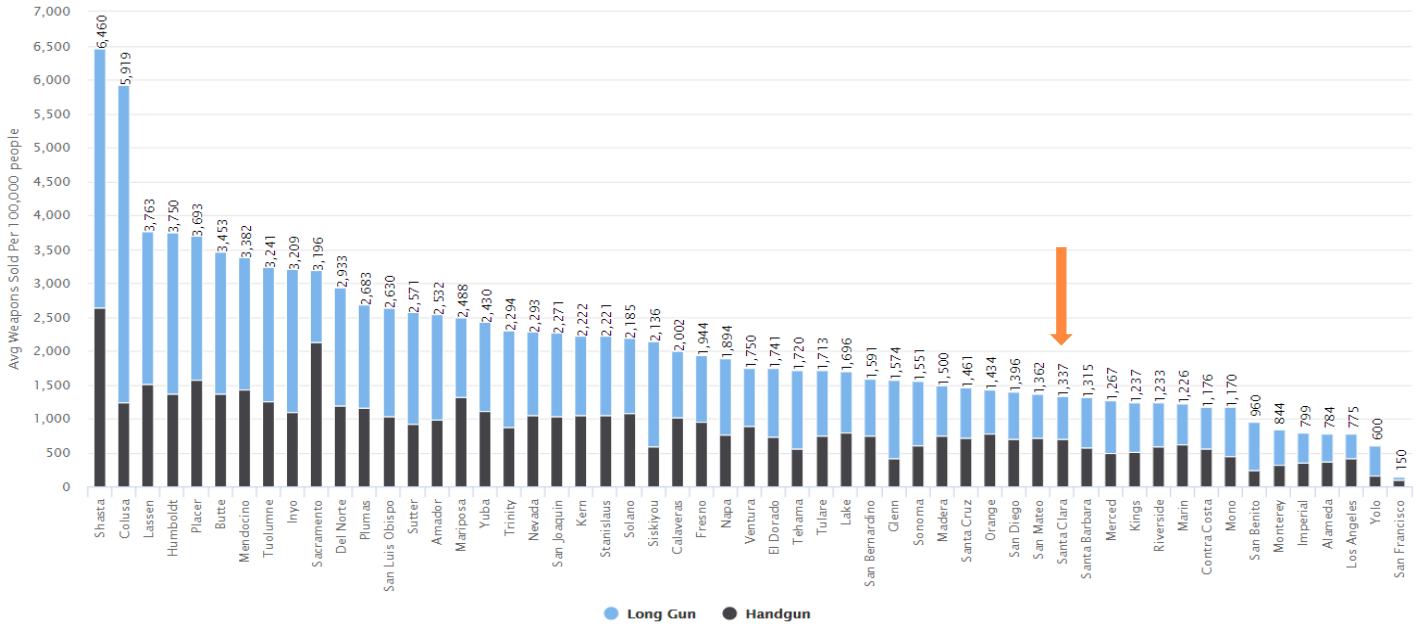
Total gun sales by type of gun sold in Santa Clara County, 2001-2015



Growth of gun sales from 2001 to 2015

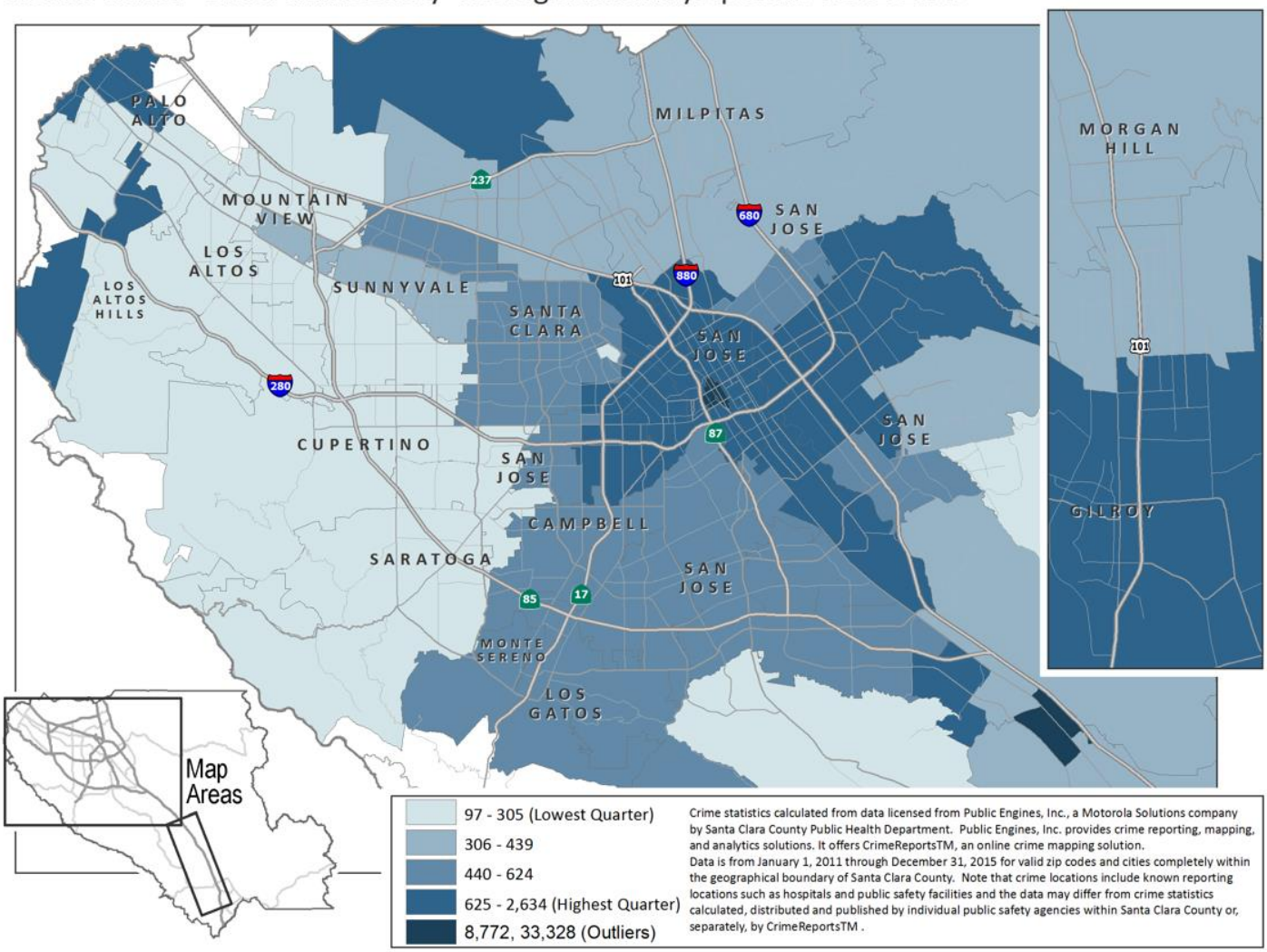


Average gun sales per 100,000 people by county from 2001 to 2015



Note: Figure for average guns sold per year was calculated by the Santa Clara County Public Health Department.
Source: California Department of Justice. Open Justice: Gun Sales in California. California Department of Justice https://openjustice.doj.ca.gov/firearms/overview#/avg-gun-sales-by-county-chart. Accessed on 3/28/2018.

Violent Crimes - Santa Clara County - Average Annual by Zip Code - 2011-2015



Crime statistics calculated from data licensed from Public Engines, Inc., a Motorola Solutions company by Santa Clara County Public Health Department. Public Engines, Inc. provides crime reporting, mapping, and analytics solutions. It offers CrimeReportsTM, an online crime mapping solution.
Data is from January 1, 2011 through December 31, 2015 for valid zip codes and cities completely within the geographical boundary of Santa Clara County. Note that crime locations include known reporting locations such as hospitals and public safety facilities and the data may differ from crime statistics calculated, distributed and published by individual public safety agencies within Santa Clara County or, separately, by CrimeReportsTM .

Technical notes

A firearms injury is defined as a penetrating force injury resulting from a bullet or other projectile shot from a powder-charged gun. This category includes gunshot wounds from powder-charged handguns, shotguns, and rifles.[2] This category does not include injury caused by a compressed air-powered paint gun or a nail gun, which falls in the "other specified" category. All intents are included in this category such as unintentional, self-inflicted/suicide, homicide/assault, undetermined, and legal intervention. Legal intervention is an injury or death that involves any law enforcement official, such as injury or death to law enforcement official, suspect, and/or bystander.

Injury data are presented as counts and rates:

- Counts represent the total number of events (e.g., deaths, hospitalizations) that occur in a defined period of time, such as one year.
- Rates consist of the count divided by the number of people in the population at risk (e.g., Latinos in Santa Clara County), multiplied by a standard number (e.g., 100,000). When comparing data over time or between different populations, rates are often used instead of counts to make it possible to compare outcomes between populations that differ in size.
- Rates are "age-adjusted" to account for differences in the age profiles in populations over time or between different populations, in this case using weights corresponding to the 2000 U.S. population.
- Age-specific rates are similar to overall rates. Age-specific rates represent the number of cases in a specific age group, divided by the number of people in Santa Clara County in that age group and multiplied by a standard number (e.g., 100,000) to enable comparison between age groups that differ in size.
- Trends are generally presented as single-year estimates over time. However, in some Quick Facts, a "moving average" is presented, which consists of combining data for overlapping three-year periods. Moving averages stabilize fluctuations that can be misleading when counts from a specific type of injury are low from year to year.

[1]Denominator is based on the following source: Data as of 05/26/2017; U.S. Census Bureau; 2010 Census, Tables PCT12, PCT12H, PCT12I, PCT12J, PCT12K, PCT12L, PCT12M; generated by Baath M.; using American FactFinder; Accessed June 20, 2017.[2]Centers for Disease Control and Prevention. Injury Center: 4.0 Definitions for WISQARS™ Nonfatal. http://www.cdc.gov/ncipc/wisqars/nonfatal/definitions.htm. Last modified 3/27/2007. Accessed 4/21/2014.

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ORIGINAL CONTRIBUTIONS

Guns in the Home and Risk of a Violent Death in the Home: Findings from a National Study

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Data from a US mortality follow-back survey were analyzed to determine whether having a firearm in the home increases the risk of a violent death in the home and whether risk varies by storage practice, type of gun, or number of guns in the home. Those persons with guns in the home were at greater risk than those without guns in the home of dying from a homicide in the home (adjusted odds ratio = 1.9, 95% confidence interval: 1.1, 3.4). They were also at greater risk of dying from a firearm homicide, but risk varied by age and whether the person was living with others at the time of death. The risk of dying from a suicide in the home was greater for males in homes with guns than for males without guns in the home (adjusted odds ratio = 10.4, 95% confidence interval: 5.8, 18.9). Persons with guns in the home were also more likely to have died from suicide committed with a firearm than from one committed by using a different method (adjusted odds ratio = 31.1, 95% confidence interval: 19.5, 49.6). Results show that regardless of storage practice, type of gun, or number of firearms in the home, having a gun in the home was associated with an increased risk of firearm homicide and firearm suicide in the home.

firearms; homicide; suicide; violence; wounds and injuries

Over 50,000 homicides and suicides occur each year in the United States (1), making them among the leading causes of death, particularly for young people. In 2001, homicide was the second leading cause of death and suicide the third for persons 15–24 years of age (2). Approximately 60 percent of all homicides and suicides in the United States are committed with a firearm (2).

Although an estimated 40 percent of adults in the United States report keeping a gun in the home for recreational or protective purposes (3), the risks and benefits of this practice are widely disputed in the literature (4, 5). Ecologic analyses have suggested a link between the prevalence of gun ownership and rates of homicide and suicide (6–8) and between regulations restricting access to firearms and rates of homicide and suicide (9–12). Although these studies are useful in demonstrating an association between access to firearms and rates of homicide and suicide at the aggregate level, it is not possible with this methodology to adequately assess whether access to a gun increases the risk of a violent death at the individual level.

Reprint requests to Dr. Linda L. Dahlberg, NCIPC, Division of Violence Prevention, Mailstop K-68, Centers for Disease Control and Prevention, 4770 Buford Highway, NE, Atlanta, GA 30341 (e-mail: ldahlberg@cdc.gov).

To address these limitations, previous researchers have used case-control study methodology to evaluate the relation between gun ownership and risk of a violent death in the home. For example, Kellermann et al. (13, 14) examined the relation between gun ownership and injury outcomes. After they controlled for a number of potentially confounding factors, the presence of a gun in the home was associated with a nearly fivefold risk of suicide (adjusted odds ratio = 4.8) (13) and an almost threefold risk of homicide (adjusted odds ratio = 2.7) (14). Other case-control studies have also found an increased risk of suicide for those with firearms in the home, with relative risks ranging from 2.1 to 4.4 (15–19).

Some studies have specifically examined the association between purchase of a handgun and risk of a violent death (20, 21). In a case-control study of members of a large health maintenance organization, Cummings et al. (20) found that a history of family handgun purchase was associated with an elevated risk of both homicide and suicide. Wintemute et al. (21) reported similar findings for suicide in a population-based cohort study of persons who had purchased a handgun in California. In both studies, the effects persisted for more than 5 years. However, studies conducted in other countries have failed to find a clear link between access to a firearm and risk of a suicide (22).

Many of the studies conducted to date have been based on small samples and were limited to specific population groups such as adolescents or older adults (15–19). Most of the studies have also been limited to a few counties, geographic areas, or states. We know of only two national case-control studies that have examined the relation between access to a firearm and a violent death (23, 24). One study focused on the perpetration of homicide as opposed to victimization and found a relatively weak association (adjusted odds ratio = 1.4) between gun ownership and homicide perpetration (23). The other study focused on victimization and found a strong association for suicide (adjusted odds ratio = 3.4) but a weak association for homicide (adjusted odds ratio = 1.4) (24). In both studies, cases and controls were drawn from different data sources, and neither study was able to control for many of the potential confounders of homicide or suicide.

To evaluate the relation between firearms in the home and violent deaths in the home, we analyzed data from a US mortality follow-back survey. The purpose of our study was twofold: 1) to determine whether having a firearm in the home increases the risk of a homicide or suicide in the home relative to other causes of death in the home, and 2) to determine whether having a firearm in the home increases the risk that a homicide or suicide in the home will be committed with a firearm or by using other means. To our knowledge, this is the first national study to specifically examine the relation between firearms and violent deaths in the home.

MATERIALS AND METHODS

Sample

Data for this study are from the 1993 National Mortality Followback Survey, which is based on a nationally representative 10 percent systematic sample of decedents aged 15 years or older in the United States (25). All 50 states with the exception of South Dakota, which was excluded because of a state law restricting the use of death certificates for research purposes, are represented in the National Mortality Followback Survey. The sample was drawn from death certificates received by the National Center for Health Statistics from state vital registration offices. To produce more reliable estimates, Blacks, persons less than 35 years of age or older than age 100 years, and persons who died from external causes of homicide, suicide, and unintentional injury were oversampled in this survey. The study protocol was reviewed and approved by the Centers for Disease Control and Prevention Institutional Review Board.

Data on each decedent in the National Mortality Followback Survey were obtained from death certificates and proxy-respondent interviews. All deaths were classified by using the *International Classification of Diseases*, Ninth Revision. The proxy interviews were conducted with next of kin or another person familiar with the decedent's life history approximately 6 months from the date of death. The decedent's next of kin, identified on the death certificate as having provided information, were initially contacted by letter and were asked to participate in the survey. In cases where no next-of-kin information was available from the death certificate, letters were sent to funeral directors requesting contact information for the next of kin. Over 90 percent of the proxy respondents were relatives, mostly immediate family members (spouse, parent, child, or sibling).

Interviews with the proxy respondents covered a wide range of topics including the decedent's access to health care, daily activities, life events, alcohol consumption and tobacco and drug use, and history of problem behaviors. The interviews also included a number of questions on firearms in the home of the decedent. The overall response rate for the proxy respondent survey was 83 percent.

We used the death certificates for information on the decedent's cause and manner of death and proxy-respondent interviews for all other demographic and behavioral information on the decedent. The study sample consisted of deaths that occurred in the home. Included were persons who subsequently died en route to or at a hospital. Deaths were classified by whether they were homicides ($n = 490$; *International Classification of Diseases*, Ninth Revision codes E960–E969), suicides ($n = 1{,}049$; *International Classification of Diseases*, Ninth Revision codes E950–E959), or the result of other causes ($n = 535$). Accidental poisonings or poisonings of undetermined intent, unintentional firearm injuries and firearm injuries of undetermined intent, and other deaths of undetermined cause were excluded from the study sample on the basis that they could be homicides or suicides. Deaths for which information on firearms in the home was missing were also excluded. By cause, these deaths were distributed similarly to those in the study sample. Overall, the study sample captured 89 percent of deaths for which the incident occurred in the home ($n = 2{,}074/2{,}338$).

Measures

Outcomes of interest. To determine whether having a firearm in the home increases the risk of a violent death in the home relative to other causes of death in the home, two outcome variables were created: 1) homicide versus other causes, and 2) suicide versus other causes. Violent deaths, whether from suicide or homicide, were excluded, respectively, from the "other causes of death" category. To determine whether having a firearm in the home increases the risk that a homicide or suicide will be committed with a firearm, we focused on homicides and suicides separately and created two additional outcome variables: 3) homicides committed with firearms versus homicides committed by using other methods, and 4) suicides committed with firearms versus suicides committed by using other methods.

Main exposure variable. The main exposure variable was the presence of a firearm in or around the home. Proxy respondents were asked, "At any time during the last year of life, were there any firearms kept in or around the home where the decedent stayed? Include those kept in a garage, outdoor storage area, truck, or car." Responses were coded as follows: yes—one or more firearms were kept in or around the home; no—no firearms were kept in or around the home.

Refined measures of exposure. Proxy respondents were also asked how many guns were kept in or around the home; whether the firearms were handguns, shotguns, rifles, or other types of guns; and how the firearms were stored. Three refined measures of exposure were created: 1) number of guns (coded as one gun, two or more guns), 2) type of gun (coded as handguns only, long guns only, handguns and long guns), and 3) storage practice (coded as ≥1 gun unlocked, all guns locked).

Characteristics of the decedent. A number of demographic and behavioral characteristics identified in the literature as being associated with either homicide or suicide were included in the analysis. Included were age, sex, race/ethnicity, education, marital status, residential status (i.e., whether the decedent lived alone or with others), region of death, alcohol consumption within 4 hours of death, use and frequency of using illicit drugs (cocaine, crack cocaine, heroin, hallucinogens, amphetamines, marijuana or hashish) in the past year of life, and whether the decedent expressed a wish to die during the last month of life.

The suicide model also included whether the decedent had thoughts of attempting suicide within the last month of life and symptoms of depression and anxiety in the last month of life. Evidence of depression and anxiety was based on the mean score of responses to three or more of the following nine items: seemed worried or apprehensive, seemed drowsy or sluggish, seemed unresponsive or withdrawn, seemed impatient or annoyed, said things such as "I'm no good" or "I'm worthless," cried for long periods of time for no apparent reason, slept more or less than usual, ate more or less than usual, and had trouble concentrating or making decisions. Mean scores ranged from 1 = never to 4 = often. The nine items are similar in wording and content to those used in existing scales of depression and anxiety but are not from a specific scale or index. Existing scales of depression and anxiety are designed for individual patient or respondent administration rather than proxy administration.

Analysis

We began with a bivariable analysis and calculated prevalence estimates for the characteristics of the decedent and the main exposure variable—presence of a firearm in or around the home. We then computed crude odds ratios and 95 percent confidence intervals to assess the association between each of the four outcome variables and the presence of a firearm in or around the home.

Next, we conducted a multivariable analysis by using logistic regression to examine the association between each of the four outcome variables and the main exposure variable, after adjusting for demographic and behavioral characteristics of the decedent. In modeling each outcome variable, we began with the main exposure variable, characteristics of the decedent (potential confounders), and all two-way interactions between the main exposure variable and characteristics of the decedent. Interactions were initially assessed simultaneously by using a likelihood ratio test and were then assessed individually in a backward stepwise fashion. The importance of interaction terms as well as main effects was assessed by using the Wald chi-square test statistic.

Finally, for models assessing whether the presence of a firearm in the home increases the risk that a homicide or suicide will be committed with a firearm, we performed a more refined analysis of exposure. We began with the final logistic regression model derived from the multivariable analysis and substituted our main exposure variable with the more refined measures of exposure (namely, type of gun, number of guns, and storage practice) to assess the association between certain firearm-related characteristics and each outcome.

All data were weighted to account for unequal selection probabilities and nonresponse and were poststratified to produce national estimates. Data were analyzed by using SUDAAN software (26) to account for the complex sampling design. p values of <0.05 were considered statistically significant.

RESULTS

The demographic characteristics of the decedents are presented in table 1. Homicide victims were mostly male, less than 35 years of age, and of racial or ethnic minority status. Suicide victims were predominately male, older, and non-Hispanic White. There was a slightly higher proportion of males among persons who died of other causes. These decedents were also mostly older than 45 years of age and non-Hispanic White. Although a large proportion of homicide victims had never married, most of the suicide victims and persons who died of other causes were married at the time of death or had been previously married. The majority of decedents, regardless of cause of death, were living with other people at the time of death. A large proportion of both homicide and suicide victims died in the southern region of the United States.

TABLE 1. Distribution of deaths in the home by cause and demographic characteristics, United States

	Homicide decedents		Suicide decedents		Other decedents	
	No.	Weighted %	No.	Weighted %	No.	Weighted %
Total	490		1,049		535	
Sex						
Male	363	62.6	741	80.7	283	55.8
Female	127	37.4	308	19.3	252	44.2
Age group (years)						
15–24	131	25.0	167	14.8	31	3.9
25–34	147	29.2	173	17.5	73	9.1
35–44	94	18.5	146	17.4	52	9.4
≥45	118	27.3	563	50.3	379	77.6
Race/ethnicity						
Non-Hispanic White	151	41.8	865	87.3	372	82.6
Non-Hispanic Other	269	46.8	99	7.2	123	13.6
Hispanic	60	11.4	52	5.5	30	3.9
Education						
Elementary <10 years	62	13.9	139	13.8	118	27.4
Some high school	152	30.3	205	20.7	99	12.8
High school graduate	163	37.3	371	37.8	164	33.5
>High school	87	18.5	285	27.7	117	26.3
Marital status						
Never married	252	45.5	292	28.9	120	16.1
Married	118	28.1	448	44.8	183	53.8
Widowed	36	9.0	156	12.2	158	19.6
Divorced/separated	80	17.4	144	14.2	72	10.5
Residential status						
Lived alone	106	20.7	290	27.7	176	24.5
Lived with others	373	79.3	738	72.3	352	75.5
Region of death						
Northeast	41	11.6	128	14.4	84	12.8
Midwest	100	19.3	258	23.7	134	27.1
South	244	49.8	398	39.8	205	30.6
West	105	19.4	265	22.1	112	29.5

Nearly three quarters of suicide victims lived in a home where one or more firearms were present, compared with 42 percent of homicide victims and one third of those who died of other causes (table 2). A firearm was used in 68 percent of both homicides and suicides. A larger proportion of homicide decedents than suicide decedents and those who died of other causes were drinking alcohol within 4 hours of death and used illicit drugs in the past year. A larger proportion of suicide decedents than homicide decedents and those who died of other causes expressed a wish to die, suicidal ideation, and symptoms of depression and anxiety in the last month of life.

Over three quarters (76.3 percent) of the homicide victims knew their assailant. Nearly one third (31.7 percent) of the homicides occurred during a family argument, 15.4 percent during a robbery, 4.1 percent during a drug deal, 0.2 percent during an abduction, and 44.1 percent for other unspecified reasons. In 4.5 percent of the homicides, multiple circumstances were reported.

Table 3 presents the crude and adjusted odds ratios for the presence of a firearm in the home and risk of a homicide or suicide relative to other causes of death in the home. There were no significant interaction effects in the model for homicide. After we adjusted for demographic and behavioral characteristics of the decedent, we found an increased risk of homicide for those with firearms in the home (adjusted odds ratio = 1.9, 95 percent confidence interval: 1.1, 3.4). Female sex, age less than 45 years, and being of a racial or ethnic

TABLE 2. Distribution of deaths in the home by cause, presence of a firearm in the home, method, and behavioral characteristics, United States

	Homicide decedents		Suicide decedents		Other decedents	
	No.	Weighted %	No.	Weighted %	No.	Weighted %
Total	490		1,049		535	
Firearm in the home	188	41.9	734	72.4	166	32.0
Method						
Firearm	339	68.1	687	67.8		
Other method	151	31.9	362	32.2		
Drank alcohol within 4 hours of death	117	35.8	234	31.0	98	30.2
Used illicit drugs in the past year	102	23.1	159	17.8	49	8.0
Expressed a wish to die in the past month	38	8.6	388	42.7	70	10.6
Suicidal ideation in the past month	14	3.3	330	36.3	15	2.1
Symptoms of depression and anxiety in the past month	23	4.5	265	27.6	33	5.7

minority group were also important predictors of homicide risk ($p < 0.01$).

There was a significant sex-by-gun-in-the-home interaction for suicide. Males with firearms in the home were at a significantly greater risk of suicide than males without guns in the home (adjusted odds ratio = 10.4, 95 percent confidence interval: 5.8, 18.9). Females with firearms in the home were also at an elevated risk of suicide compared with females without guns in the home, but the difference was only borderline significant (adjusted odds ratio = 2.3, 95 percent confidence interval: 1.0, 5.0). Other important predictors of suicide risk included young age (<35 years), suicidal ideation, and symptoms of depression and anxiety in the last month of life ($p < 0.01$). Living alone was borderline significant ($p = 0.05$).

To determine whether having a firearm in the home increases the risk that a homicide or suicide in the home will be firearm related, we focused on homicides and suicides separately and compared those committed with a firearm with those committed by using other means. These models were adjusted for demographic characteristics but not psychological and behavioral characteristics of the decedent because there were no significant differences between those who used a firearm and those who used some other means in terms of their psychological or behavioral characteristics. These models were also adjusted for significant interaction terms, where applicable. The results of this analysis are presented in table 4.

We found two significant, two-way interaction terms in the model assessing whether a homicide in the home will be committed with a firearm versus another method: a significant gun-in-the-home-by-residential-status interaction, and a significant gun-in-the-home-by-age interaction. Among those living alone at the time of death, there was no association between the presence of a firearm in the home and method of homicide. However, for persons living with others at the time of death, there was a significant association between the presence of a firearm in the home and risk of a firearm homicide among those aged 35 years or older (adjusted odds ratio = 16.4, 95 percent confidence interval: 5.9, 45.3). We found no significant interactions in the model for suicide. Those persons with guns in the home were at significantly greater risk than those without guns in the home

TABLE 3. Crude and adjusted odds ratios for the presence of a firearm in the home and risk of a violent death in the home, United States

Firearm in the home	Homicide vs. other causes		Suicide vs. other causes	
	OR†	95% CI†	OR	95% CI
Crude	1.5	0.8, 3.0	5.6*	2.9, 10.6
Adjusted‡	1.9**	1.1, 3.4		
Males			10.4*	5.8, 18.9
Females			2.3	1.0, 5.0

* $p < 0.01$, Wald chi-square test; ** $p = 0.02$, Wald chi-square test.
† OR, odds ratio; CI, confidence interval.
‡ Adjusted for sex, age group, race/ethnicity, education, marital status, residential status, region of death, alcohol consumption within 4 hours of death, illicit drug use, and an expressed wish to die. The model for suicide was also adjusted for depression/anxiety, suicidal ideation, and the interaction between the presence of a firearm in the home and sex. Because of the presence of a significant firearm-in-the-home-by-sex interaction term in the adjusted model, the association between suicide and a firearm in the home is shown separately for males and females. The reference group for males and females is, respectively, males and females without guns in the home.

TABLE 4. Crude and adjusted odds ratios for the presence of a firearm in the home and risk of a firearm homicide or firearm suicide in the home, United States

Firearm in the home	Firearm homicide†		Firearm suicide‡	
	OR§	95% CI§	OR	95% CI
Crude	3.5*	2.0, 6.1	27.9*	18.7, 41.4
Adjusted¶			31.1*	19.5, 49.6
Lived alone				
Aged 15–24 years	0.3	0.0, 2.1		
Aged 25–34 years	0.9	0.2, 4.6		
Aged ≥35 years	3.5	1.0, 12.8		
Lived with others				
Aged 15–24 years	1.2	0.3, 5.4		
Aged 25–34 years	4.0	0.9, 16.7		
Aged ≥35 years	16.4*	5.9, 45.3		

* $p < 0.01$, Wald chi-square test.
† Homicides committed with firearms vs. homicides committed by using other methods.
‡ Suicides committed with firearms vs. suicides committed by using other methods.
§ OR, odds ratio; CI, confidence interval.
¶ Adjusted for sex, age group, race/ethnicity, education, marital status, residential status, and region of death. The model for firearm homicide was also adjusted for the interaction between the presence of a firearm in the home and residential status, and between a firearm in the home and age. Because of the presence of two significant, two-way interactions in the model for firearm homicide, the association between a firearm in the home and firearm homicide is shown by residential status and age. The reference group for each category is those without a gun in the home.

TABLE 5. Adjusted odds ratios for the more refined measures of a firearm in the home and risk of a firearm homicide or firearm suicide in the home, United States

	Firearm homicide†		Firearm suicide‡	
	AOR§,¶	95% CI§	AOR¶	95% CI
Type of gun*				
Handguns only	2.8	0.9, 8.7	38.2	20.3, 71.9
Long guns only	6.0	2.1, 16.7	21.1	11.8, 37.6
Handguns and long guns	8.0	3.0, 21.4	36.2	19.9, 66.0
No gun	1.0		1.0	
No. of guns*				
≥2	6.3	2.3, 17.3	27.4	16.5, 45.7
1	3.0	1.1, 8.1	39.8	21.8, 72.6
None	1.0		1.0	
Storage practice*				
≥1 gun unlocked	3.1	1.3, 7.2	29.2	17.8, 48.1
All guns locked	7.7	2.0, 30.4	25.6	13.0, 50.4
No gun	1.0		1.0	

* $p < 0.01$, Wald chi-square test.
† Homicides committed with firearms vs. homicides committed by using other methods.
‡ Suicides committed with firearms vs. suicides committed by using other methods.
§ AOR, adjusted odds ratio; CI, confidence interval.
¶ Adjusted for sex, age group, race/ethnicity, education, marital status, residential status, and region of death.

TABLE 6. Comparison of the more refined measures of a firearm in the home and risk of a firearm homicide or firearm suicide in the home, United States

	Firearm homicide*		Firearm suicide†	
	AOR‡,§	95% CI‡	AOR§	95% CI
Type of gun				
Handguns only	0.3	0.1, 1.2	1.0	0.5, 2.0
Long guns only	0.7	0.2, 3.0	0.6	0.3, 1.0
Handguns and long guns	1.0		1.0	
Handguns only	0.5	0.1, 2.1	1.9	1.0, 3.7
Long guns only	1.0		1.0	
No. of guns				
≥2	2.1	0.6, 8.0	0.7	0.4, 1.2
1	1.0		1.0	
Storage practice				
≥1 gun unlocked	0.3	0.0, 2.9	1.2	0.7, 2.2
All guns locked	1.0		1.0	

* Homicides committed with firearms vs. homicides committed by using other methods.
† Suicides committed with firearms vs. suicides committed by using other methods.
‡ AOR, adjusted odds ratio; CI, confidence interval.
§ Adjusted for sex, age group, race/ethnicity, education, marital status, residential status, and region of death.

of dying from a firearm suicide versus one committed by using other means (adjusted odds ratio = 31.1, 95 percent confidence interval: 19.5, 49.6). No variables other than a firearm in the home were important predictors of firearm homicide. In addition to a gun in the home, male sex and living in the South were important predictors of firearm suicide ($p < 0.01$).

The results of the analysis that examined whether the type of gun or number of guns in the home or manner of storage increased the risk that a homicide or suicide would be committed with a firearm are presented in tables 5 and 6. Those persons with guns in the home, regardless of the type of gun, number of guns, or storage practice, were at significantly greater risk of dying from a firearm homicide and firearm suicide than those without guns in the home (table 5). There were no significant differences between those with only handguns in the home and those with only long guns or both handguns and long guns, those with two or more guns, and those having one gun in the household; and between those who stored one or more guns unlocked and those who stored all guns locked (table 6).

DISCUSSION

The findings of this study add to the body of research showing an association between guns in the home and risk of a violent death. Those persons with guns in the home were at significantly greater risk than those without guns in the home of dying from a suicide in the home relative to other causes of death. This finding was particularly the case for males, who in general have higher rates of completed suicide than females do. The findings showing an increased risk of homicide in homes with guns are also consistent with previous research (14, 20, 23, 24), although, when compared with suicide, are not as strong. Studies that have examined the risk of either violent victimization or perpetration at the individual level show relative risks between 1.4 and 2.7 (14, 20, 23, 24). Our findings are also in this range.

Our findings also suggest that the presence of a gun in the home increases the chance that a homicide or suicide in the home will be committed with a firearm rather than by using other means. Victims of suicide living in homes with guns were more than 30 times more likely to have died from a firearm-related suicide than from one committed with a different method. Guns are highly lethal, require little preparation, and may be chosen over less lethal methods to commit suicide, particularly when the suicide is impulsive. Suicidal persons may also be more likely to acquire a gun to commit suicide and, given the lethality of the weapon, are more likely to complete suicide, although the evidence on this point is mixed (20–22).

For victims of homicide, there was also a strong association between guns in the home and risk of dying from a firearm-related homicide, but this risk varied by age and whether the person was living with others at the time of death. These deaths may have been related to domestic violence or to other interpersonal disputes either involving them or someone else in the household. The majority of victims knew their assailant, suggesting that the assailant was either a family member or was acquainted with the victim or victim's family and less likely to be an unknown intruder.

Some of the research conducted to date has found a higher risk of a violent death in homes with handguns and unlocked and loaded guns (13, 17, 19). However, many studies have either not examined the risk associated with specific firearm-related characteristics (e.g., type of gun or storage practice) (14, 15, 18, 23, 24) or have found no significant differences (16). In our study, the risk of dying from a firearm-related homicide or suicide was greater in homes with guns, but this risk did not vary by specific firearm-related characteristics. Simply having a gun in the home increased the risk of a firearm homicide or firearm suicide in the home. Whether certain types of guns or storage practices confer greater or lesser risk, or reflect recall and reporting biases when studied, is unclear. Previous research suggests that proxy respondents and nonusers of firearms are not always knowledgeable about the number or types of guns in the household or the storage practice and may be inclined to give socially desirable responses (27–29).

A number of limitations should be considered when interpreting the findings from this study. First, our study was based on data from death certificates and proxy interviews. The accuracy and completeness of information from these types of data sources can vary. With death certificates, for instance, there is the possibility of misclassification regarding the cause or manner of death. In the case of proxy interviews, knowing the outcome might have introduced bias in assessing behavioral or psychological characteristics of the decedent prior to death. The nature, degree, or direction of recall bias among proxies reporting on violent deaths versus nonviolent deaths is not known, however. Second, the gun in the home may not have been the gun used in the death. This possibility seems less likely with suicide, but, with homicide, it is certainly plausible that someone brought a gun into the home.

Third, it is possible that the association between a gun in the home and risk of a violent death may be related to other factors that we were unable to control for in our analysis. For instance, with homicide, the association may be related to certain neighborhood characteristics or the decedent's previous involvement in other violent or illegal behaviors. Persons living in high-crime neighborhoods or involved in illegal behaviors may acquire a gun for protection. The risk comes not necessarily from the presence of the gun in the house but from these types of environmental factors and exposures.

Fourth, our analysis was restricted to violent deaths in the home. The dynamics of homicides or suicides occurring in other locations may be very different. However, the degree of bias with suicide is likely to be small given that over three quarters of all suicides (76.3 percent) in this nationally representative sample occurred in the home; of those that occurred outside the home, 52.7 percent were committed with a firearm. Finally, our study focused on fatal outcomes for a sample of decedents. We were unable to ascertain the risk of a nonfatal outcome and were also unable to weigh the risk of a violent death against any protective benefits of gun ownership.

Much of the debate in the literature has focused on the risks and benefits of gun ownership in terms of lives saved versus

lives harmed. Studies of defensive gun use suggest that millions of defensive gun use incidents occur each year by people to protect themselves or their property against assaults, theft, or break-ins (30, 31). However, guns are also involved in unintentional firearm shootings and domestic altercations in the home and are the primary method used in suicides in the United States (1, 32). The body of research to date, including the findings of this study, shows a strong association between guns in the home and risk of suicide. The findings for homicide, while showing an elevated risk, have consistently been more modest. They suggest a need for more research to better distinguish the risk and protective factors associated with guns in the home, including an examination of the risk posed by forces both internal and external to the home.

REFERENCES

1. Arias E, Anderson RN, Kung HC, et al. Deaths: final data for 2001. Natl Vital Stat Rep 2003;52:1–116.
2. Centers for Disease Control and Prevention. Web-based Injury Statistics Query and Reporting System (WISQARS). Atlanta, GA: National Center for Injury Prevention and Control, 2004. (Available at the following Internet website: http://www.cdc.gov/ncipc/wisqars/default.htm).
3. Maguire K, Pastore AL. Sourcebook of criminal justice statistics, 2000. Washington, DC: United States Department of Justice, Bureau of Justice Statistics, 2001 (Publication NCJ 190251).
4. Cummings P, Koepsell TD. Does owning a firearm increase or decrease the risk of death? JAMA 1998;280:471–3.
5. Kleck G. What are the risks and benefits of keeping a gun in the home? JAMA 1998;280:473–5.
6. Birckmayer J, Hemenway D. Suicide and firearm prevalence: are youth disproportionately affected? Suicide Life Threat Behav 2001;31:303–10.
7. Miller M, Azrael D, Hemenway D. Household firearm ownership and suicide rates in the United States. Epidemiology 2002;13:517–24.
8. Kaplan MS, Geling O. Firearm suicides and homicides in the United States: regional variations and patterns of gun ownership. Soc Sci Med 1998;46:1227–33.
9. Loftin C, McDowall D, Wiersema B, et al. Effects of restrictive licensing of handguns on homicide and suicide in the District of Columbia. N Engl J Med 1991;325:1615–20.
10. Sloan JH, Kellermann AL, Reay DT, et al. Handgun regulations, crime, assaults, and homicide: a tale of two cities. N Engl J Med 1988;319:1256–62.
11. Sloan JH, Rivara FP, Reay DT, et al. Firearm regulation and rates of suicide: a comparison of two metropolitan areas. N Engl J Med 1990;322:369–73.
12. Boor M, Bair JH. Suicide rates, handgun control laws, and sociodemographic variables. Psychol Rep 1990;66:923–30.
13. Kellermann AL, Rivara FP, Somes G, et al. Suicide in relation to gun ownership. N Engl J Med 1992;327:467–72.
14. Kellermann AL, Rivara FP, Rushforth NB, et al. Gun ownership as a risk factor for homicide in the home. N Engl J Med 1993;329:1084–91.
15. Brent DA, Perper JA, Goldstein CE, et al. Risk factors for adolescent suicide: a comparison of adolescent suicide victims with suicidal inpatients. Arch Gen Psychiatry 1988;45:581–8.
16. Brent DA, Perper JA, Allman CJ, et al. The presence and accessibility of firearms in the homes of adolescent suicides: a case-control study. JAMA 1991;266:2989–95.
17. Brent DA, Perper JA, Moritz G, et al. Firearms and adolescent suicide: a community case-control study. Am J Dis Child 1993;147:1066–71.
18. Shah S, Hoffman RE, Wake L, et al. Adolescent suicide and household access to firearms in Colorado: results of a case-control study. J Adolesc Health 2000;26:157–63.
19. Conwell Y, Duberstein PR, Connor K, et al. Access to firearms and risk for suicide in middle-aged and older adults. Am J Geriatr Psychiatry 2002;10:407–16.
20. Cummings P, Koepsell TD, Grossman DG, et al. The association between the purchase of a handgun and homicide or suicide. Am J Public Health 1997;87:974–8.
21. Wintemute GJ, Parham CA, Beaumont JJ, et al. Mortality among recent purchasers of handguns. N Engl J Med 1999;341:1583–9.
22. Beautrais AL, Joyce PR, Mulder RT. Access to firearms and the risk of suicide: a case-control study. Aust N Z J Psychiatry 1996;30:741–8.
23. Kleck G, Hogan M. National case-control study of homicide offending and gun ownership. Soc Probl 1999;46:275–93.
24. Wiebe DJ. Homicide and suicide risks associated with firearms in the home: a national case-control study. Ann Emerg Med 2003;41:771–82.
25. Centers for Disease Control and Prevention. 1993 National Mortality Followback Survey. Hyattsville, MD: National Center for Health Statistics. (Available at the following Internet website: http://www.cdc.gov/nchs/about/major/nmfs/nmfs.htm).
26. Shaw BV. SUDAAN software for the statistical analysis of correlated data, release 7.0. Research Triangle Park, NC: Research Triangle Institute, 1996.
27. Ludwig J, Cook PJ, Smith TW. The gender gap in reporting household gun ownership. Am J Public Health 1998;88:1715–18.
28. Nelson DE, Powell K, Johnson CJ, et al. Household firearm storage practices: do responses differ by whether or not individuals ever use firearms? Am J Prev Med 1999;16:298–302.
29. Azrael D, Miller M, Hemenway D. Are household firearms stored safely? It depends on whom you ask. Pediatrics 2000;106:E31.
30. Cook PJ, Ludwig J. Guns in America: national survey on private ownership and use of firearms. Washington DC: National Institute of Justice, United States Department of Justice, 1997. (Publication NCJ 165476).
31. Kleck G, Gertz M. Armed resistance to crime: the prevalence and nature of self-defense with a gun. J Crim Law Criminol 1995;86:143–86.
32. Gotsch KE, Annest JL, Mercy JA, et al. Surveillance for fatal and nonfatal firearm-related injuries—United States, 1993–1998. MMWR Morb Mortal Wkly Rep 2001;50(SS-2):1–34.

The Accessibility of Firearms and Risk for Suicide and Homicide Victimization Among Household Members

FREE

A Systematic Review and Meta-analysis

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Author, Article and Disclosure Information

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Abstract

This article has been corrected. The original version (PDF) is appended to this article as a Supplement.

Background:

Research suggests that access to firearms in the home increases the risk for violent death.

Purpose:

To understand current estimates of the association between firearm availability and suicide or homicide.

Data Sources:

PubMed, EMBASE, the Cochrane Central Register of Controlled Trials, and Web of Science were searched without limitations and a gray-literature search was performed on 23 August 2013.

Study Selection:

All study types that assessed firearm access and outcomes between participants with and without firearm access. There were no restrictions on age, sex, or country.

Data Extraction:

Two authors independently extracted data into a standardized, prepiloted data extraction form.

Data Synthesis:

Odds ratios (ORs) and 95% CIs were calculated, although published adjusted estimates were preferentially used. Summary effects were estimated using random- and fixed-effects models. Potential methodological reasons for differences in effects through subgroup analyses were explored. Data were pooled from 16 observational studies that assessed the odds of suicide or homicide, yielding pooled ORs of 3.24 (95% CI, 2.41 to 4.40) and 2.00 (CI, 1.56 to 3.02), respectively. When only studies that used interviews to determine firearm accessibility were considered, the pooled OR for suicide was 3.14 (CI, 2.29 to 4.43).

Limitations:

Firearm accessibility was determined by survey interviews in most studies; misclassification of accessibility may have occurred. Heterogeneous populations of varying risks were synthesized to estimate pooled odds of death.

Conclusion:

Access to firearms is associated with risk for completed suicide and being the victim of homicide.

Primary Funding Source:

None.

Firearms cause an estimated 31 000 deaths annually in the United States (1). Data from the 16-state National Violent Death Reporting System indicate that 51.8% of deaths from suicide in 2009 (n = 9949) were firearm-related; among homicide victims (n = 4057), 66.5% were firearm-related. Most suicides (76.4%) occurred in the victims' homes. Homicides also frequently occurred in the home, with 45.5% of male victims and 74.0% of female victims killed at home (2).

Firearm ownership is more prevalent in the United States than in any other country; approximately 35% to 39% of households have firearms (3, 4), and 22% of persons report owning firearms. The annual rate of suicide by firearms (6.3 suicides per 100 000 residents) is higher in the United States than in any other country with reported data, and the annual rate of firearm-related homicide in the United States (7.1 homicides per 100 000 residents) is the highest among high-income countries (4). Results from ecological studies suggest that state restrictions on firearm ownership are associated with decreases in firearm-related suicides and homicides (5).

Specific characteristics about storage and types of firearms seem to increase suicide risk. Firearms that are stored loaded or unlocked are more likely to be used than those that are unloaded or locked (6, 7), and adolescent suicide victims often use an unlocked firearm in the home (8). The apparent increased risk for suicide associated with firearms in the home is not unique to persons with a history of mental illness (7) and may be more of an indicator of the ease of impulsive suicide.

Impulsiveness may be a catalyst in using a firearm to commit suicide and may also play a role in firearm-related homicide. Researchers have estimated higher odds of homicide victimization among women than men (9, 10). Because most homicide victims know their perpetrators (9), this finding may indicate an impulsive reaction to domestic disputes.

To our knowledge, this is the first systematic review and meta-analysis to estimate the association between firearm accessibility and suicide or homicide victimization.

Methods

We used Cochrane Collaboration methods (11) throughout the review process.

Data Sources and Searches

We searched PubMed, EMBASE, the Cochrane Central Register of Controlled Trials, and Web of Science without date, geographic, or language limitations. We also examined bibliographies of included articles to identify additional references. In addition, we searched the gray literature for papers related to firearms and suicide or homicide. The Appendix and Appendix Table 1 (both available at www.annals.org) present details of our search strategy and screening process.

Appendix Table 1. Search Strategy

Core terms of PubMed search strategy, adapted as needed for use in other databases; initial search on 22 May 2013

(home*[tiab] OR house*[tiab] OR household*[tiab]) AND (Firearms[mh] OR Weapons[mh] OR Wounds, Gunshot[mh] OR firearm*[tiab] OR gun*[tiab] OR handgun*[tiab] OR rifle*[tiab] OR shotgun*[tiab])

individual database yields:

PubMed (n = 944)

EMBASE (n = 35)

Cochrane Central Register of Controlled Trials (n = 16)

Web of Science (n = 797)

Updated; additional search on 23 August 2013

(Accidents[mh] OR Homicide[mh] OR Suicide[mh] OR accident*[tiab] OR homicide*[tiab] OR suicide*[tiab]) AND (Firearms[mh] OR Weapons[mh] OR Wounds, Gunshot[mh] OR firearm*[tiab] OR gun*[tiab] OR handgun*[tiab] OR rifle*[tiab] OR shotgun*[tiab])

Terms of gray-literature search strategy

Gray literature search date: 25 August 2013

Publications, reports, and working papers from the following agencies and institutes:

1) Small Arms Survey publications (www.smallarmssurvey.org)
2) Violence Policy Center (www.vpc.org)
3) University of Colorado-Boulder Center for the Study and Prevention of Violence (www.colorado.edu/cspv)
4) Harvard Injury Control Research Center (www.hsph.harvard.edu/hicrc)
5) Firearm and Injury Center at Penn (www.uphs.upenn.edu/ficap)
6) University of California, Davis, Violence Prevention Research Program (www.ucdmc.ucdavis.edu/vprp)

Google searches of the following sites using these terms:

7) American Public Health Association (guns site:apha.org filetype:pdf)
8) American Psychological Association (guns site:apa.org filetype:pdf)
9) Centers for Disease Control and Prevention (guns site:cdc.gov filetype:pdf)
10) National Institute of Justice (guns site:nij.gov filetype:pdf)

Study Selection

Study Design

Study designs eligible for inclusion in our review were randomized, controlled trials; nonrandomized, controlled trials; pre- or postintervention evaluations; and observational studies (for example, cohort or case–control studies) if a comparator was available. Because we were concerned with the individual effects of firearm accessibility, we included only studies with individual-level data and excluded those with population-level data (for example, ecological studies).

Types of Participants

Participants were not restricted by age, sex, or country of residence.

Types of Exposures

Studies needed to assess whether firearms were available for all participants. In addition, included studies needed to assess outcomes between participants with and without access to firearms. Specifically, studies needed to compare firearm ownership or availability (that is, accessibility) with no firearm ownership or availability (that is, no accessibility) or provide adequate data to estimate the effect that firearms had on selected harms outcomes. Firearm accessibility could be defined as self- or proxy-reported or assumed from other types of exposure data (for example, firearm purchase records).

Types of Outcome Measures

The primary outcomes of interest were suicide or homicide victimization (that is, being a victim of homicide rather than a perpetrator).

Data Extraction and Quality Assessment

Two authors independently extracted relevant data into a standardized, prepiloted data extraction form.

Assessment of Risk of Bias

Two authors independently assessed the risk of bias for each study by using the Newcastle–Ottawa Scale (12, 13). We resolved disagreements by discussion or by involving the third author to adjudicate (Table 1 and Appendix Table 2).

Table 1. Summary of Critical Appraisal of Included Studies Using the Newcastle–Ottawa Scale for Assessing the Quality of Observational Studies*

Table 1. **Summary of Critical Appraisal of Included Studies Using the Newcastle–Ottawa Scale for Assessing the Quality of Observational Studies***

Study, Year (Reference)	Stars, *n*		
	Selection†	Comparability‡	Exposure§
Suicide outcomes			
Brent et al, 1988 (16)	3	1	1
Brent et al, 1991 (17)	3	2	1
Kellermann et al, 1992 (7)	4	2	1
Brent et al, 1993 (6)	4	2	2
Beautrais et al, 1996 (20)	4	2	2
Cummings et al, 1997 (22)	3	1	3
Shah et al, 2000 (8)	4	2	1
Conwell et al, 2002 (21)	4	2	1
Grassel et al, 2003 (24)	4	1	3
Kung et al, 2003 (18)	4	2	1
Wiebe, 2003 (10)	4	1	1
Mahon et al, 2005 (25)	4	1	3
Kung et al, 2005 (19)	4	2	1
Homicide victimization outcomes			
Kellermann et al, 1993 (9)	4	2	2
Cummings et al, 1997 (22)	3	1	3
Grassel et al, 2003 (24)	4	1	3
Wiebe, 2003 (10)	4	1	1
Branas et al, 2009 (48)	4	2	3

* Reference 23 not shown because the scale is different for cohort studies.
† Maximum 4 stars.
‡ Maximum 2 stars.
§ Maximum 3 stars.

Appendix Table 2. Detailed Risk of Bias Results Using the Newcastle–Ottawa Scale for Assessing Quality for Observational Studies

Appendix Table 2. **Detailed Risk of Bias Results Using the Newcastle–Ottawa Scale for Assessing Quality for Observational Studies**

Study, Year (Reference)	Selection Criteria				Comparability		Exposure			
	Adequate Case Definition With Independent Validation	Consecutive or Obviously Representative Series of Cases	Selection of Community Control Participants	Control Participants Defined by No History of Studied End Point	Comparability of Case Patients and Control Participants (Design/Analysis)		Ascertainment of Exposure		Same Ascertainment Method for Case Patients and Control Participants	Nonresponse Rate Same for Both Groups
					Controls for Mental Illness History	Controls for Age or Sex	Secure Record	Blinded Interviews		
Homicide victimization outcomes										
Wiebe, 2003 (10)	✓	✓	✓	✓		✓				✓
Grassel et al, 2003 (24)	✓	✓	✓	✓		✓	✓		✓	✓
Cummings et al, 1997 (22)	✓	✓		✓		✓	✓		✓	✓
Kellermann et al, 1993 (9)	✓	✓	✓	✓	✓	✓			✓	✓
Suicide outcomes										
Mahon et al, 2005 (25)	✓	✓	✓	✓		✓	✓		✓	✓
Brent et al, 1988 (16)	✓	✓		✓		✓			✓	
Brent et al, 1991 (17)	✓	✓		✓	✓	✓			✓	
Kellermann et al, 1992 (7)	✓	✓	✓	✓	✓	✓			✓	
Brent et al, 1993 (6)	✓	✓	✓	✓	✓	✓			✓	✓
Beautrais et al, 1996 (20)	✓	✓	✓	✓	✓	✓			✓	✓
Cummings et al, 1997 (22)	✓	✓		✓		✓	✓		✓	✓
Shah et al, 2000 (8)	✓	✓	✓	✓	✓	✓			✓	
Conwell et al, 2002 (21)	✓	✓	✓	✓	✓	✓			✓	
Grassel et al, 2003 (24)	✓	✓	✓	✓		✓	✓		✓	✓
Kung et al, 2005 (19)	✓	✓	✓	✓	✓	✓			✓	
Wiebe, 2003 (10)	✓	✓	✓	✓		✓				✓
Kung et al, 2003 (18)	✓	✓	✓	✓	✓	✓			✓	

Data Synthesis and Analysis

When necessary, we calculated the odds ratio (OR) and 95% CI for dichotomous outcomes, although published adjusted estimates were preferentially used if provided in the report. We pooled data across studies and estimated summary effect sizes by using fixed- and random-effects models. The choice of model was determined by the significance of the maximum likelihood estimate of the heterogeneity parameter (τ^2) (14).

If the estimate of τ^2 did not significantly differ from 0, the fixed-effects model was used (14). We present 2 estimates of heterogeneity—the I^2 statistic and the τ coefficient. Estimates of the former are interpreted as the percentage of variability in effect estimates due to heterogeneity rather than chance, whereas the latter can be interpreted as the clinical heterogeneity as determined by the estimated SD of underlying effects across studies. Unlike the I^2 statistic, the τ coefficient does not change with the number of patients included in the studies in a meta-analysis (15). We used R, version 3.0.0 (R Foundation for Statistical Computing, Vienna, Austria), for statistical analyses. The τ coefficient was measured on the log OR scale.

This review is registered in PROSPERO (CRD42013004469).

Results

Search Results

The database searches yielded 6902 references (Figure 1). We removed 2929 duplicates and an additional 2881 clearly irrelevant references. We then identified 2382 records through gray-literature searches. We closely

reviewed 3474 titles and abstracts. After this screening, we selected 70 articles for full-text review. We identified an additional 4 studies by cross-referencing bibliographies (16–19). Overall, 16 observational studies met our inclusion criteria. The Appendix shows the disposition of studies excluded after full-text review.

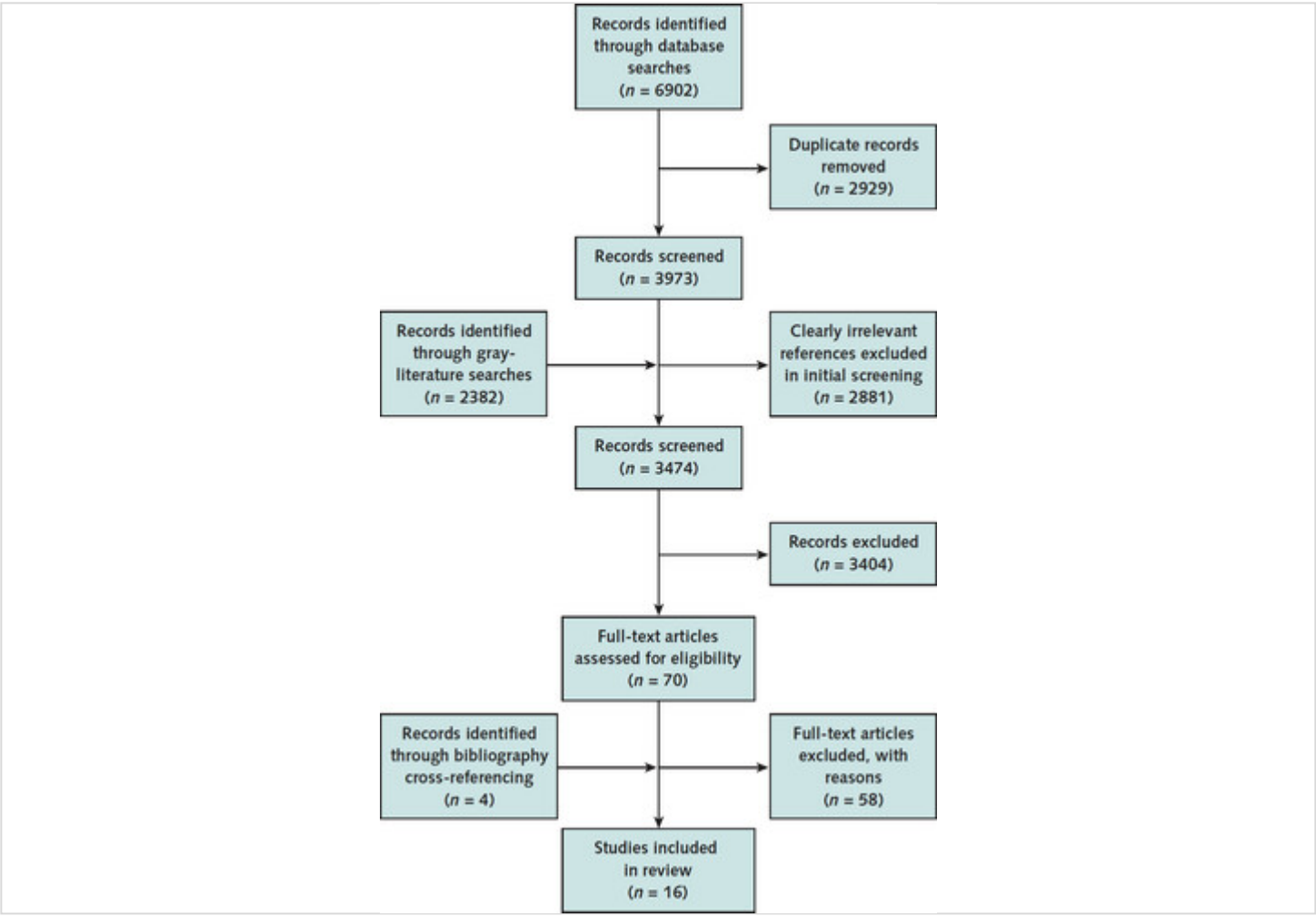

Figure 1. Summary of evidence search and selection.

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Fourteen of the included studies estimated the odds of suicide in the context of firearm accessibility (6–8, 10, 16–25), and 6 studies estimated the odds of homicide victimization in this context (9, 10, 22–24, 48). Four studies reported both outcomes (10, 22–24).

Study Characteristics

Demographic Characteristics

Persons who completed suicide (mean, 75% [range, 70% to 85%]) (6–8, 10, 16–21, 23) and homicide victims (mean, 79% [range, 63% to 92%]) (9, 10, 23, 48) were more commonly men. Most persons who completed suicide were white (range, 78% to 98%) (6, 8, 10, 16–19, 21, 23, 26), whereas most homicide victims were non-

Hispanic black or another race (range, 47% to 88%) (9, 10, 23, 48). Four (28.6%) of the 14 suicide studies were among adolescents only (6, 8, 16, 17), and 10 (71.4%) were among adults only (7, 10, 18–25). All studies of outcomes of homicide victimization were among adults only (9, 10, 22–24, 48).

Firearm Access

Among 11 U.S. case–control studies using survey data, proportions of firearm access ranged from 62.7% to 75.4% among case patients and from 26.4% to 50.8% among controls participants. One non-U.S. study (20) used survey data to estimate the proportion of case patients (23.9%) and control participants (18.5%) with firearm access, and another non-U.S. study (25) assumed firearm access from military duty and estimated the proportion of case patients (41%) and control participants (17%) with access. Among U.S.-based studies with reported data, the proportion of completed suicides using a firearm ranged from 47% to 73% (6, 7, 10, 16, 17, 21–24); 3 studies did not report adequate data (8, 18, 19).

One non–U.S.-based study of civilians reported that 13% of suicides were completed using a firearm (20), whereas another non-U.S. study of military personnel reported that 52% of suicides were completed using a firearm (25). The proportion of homicides using a firearm ranged from 50% to 76% (13, 15, 27–29).

Studies of Suicide

Eleven of 14 studies (78.6%) interviewed proxies to determine firearm accessibility among decedents or control participants (6–8, 10, 16–21, 23), whereas 3 studies (21.4%) used firearm purchase records or military duty to determine accessibility among decedents or control participants (22, 24, 25) (Table 2). Twelve studies (85.7%) defined suicide as self-inflicted, intentional death by any means (6, 7, 10, 16–23, 25), whereas 2 studies (14.3%) defined suicide as injury related only to firearms or firearm- or violence-related injury (8, 24). All suicides were reported consecutively or identified using death certificates. In case–control studies, various types of control participants were identified, such as inpatients who attempted suicide (14.3%) (16, 17), community or school control participants (42.9%) (6–8, 18, 20, 21), decedents from causes other than suicide (28.6%) (18, 19, 24, 25), participants in a national health survey (7.1%) (10), or living HMO-based control participants (7.1%) (22).

Table 2. Characteristics of Included Studies of Suicide and Homicide Victimization

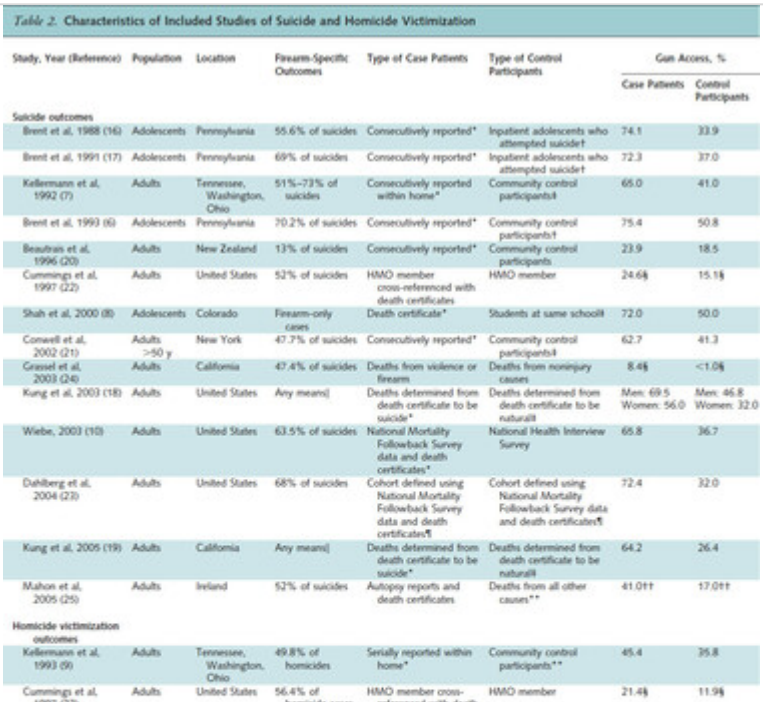
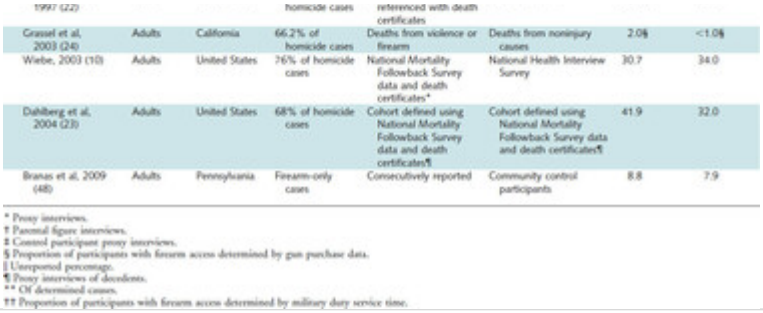


Table 2. **Characteristics of Included Studies of Suicide and Homicide Victimization**

Study, Year (Reference)	Population	Location	Firearm-Specific Outcomes	Type of Case Patients	Type of Control Participants	Gun Access, %	
						Case Patients	Control Participants
Suicide outcomes							
Brent et al, 1988 (16)	Adolescents	Pennsylvania	55.6% of suicides	Consecutively reported*	Inpatient adolescents who attempted suicide†	74.1	33.9
Brent et al, 1991 (17)	Adolescents	Pennsylvania	69% of suicides	Consecutively reported*	Inpatient adolescents who attempted suicide†	72.3	37.0
Kellermann et al, 1992 (7)	Adults	Tennessee, Washington, Ohio	51%–73% of suicides	Consecutively reported within home*	Community control participants‡	65.0	41.0
Brent et al, 1993 (6)	Adolescents	Pennsylvania	70.2% of suicides	Consecutively reported*	Community control participants†	75.4	50.8
Beautrais et al, 1996 (20)	Adults	New Zealand	13% of suicides	Consecutively reported*	Community control participants	23.9	18.5
Cummings et al, 1997 (22)	Adults	United States	52% of suicides	HMO member cross-referenced with death certificates	HMO member	24.6‖	15.1‖
Shah et al, 2000 (8)	Adolescents	Colorado	Firearm-only cases	Death certificate*	Students at same school‡	72.0	50.0
Conwell et al, 2002 (21)	Adults >50 y	New York	47.7% of suicides	Consecutively reported*	Community control participants‡	62.7	41.3
Grassel et al, 2003 (24)	Adults	California	47.4% of suicides	Deaths from violence or firearm	Deaths from noninjury causes	8.4‖	<1.0‖
Kung et al, 2003 (18)	Adults	United States	Any means‖	Deaths determined from death certificate to be suicide*	Deaths determined from death certificate to be natural‡	Men: 69.5 Women: 56.0	Men: 46.8 Women: 32.0
Wiebe, 2003 (10)	Adults	United States	63.5% of suicides	National Mortality Followback Survey data and death certificates*	National Health Interview Survey	65.8	36.7
Dahlberg et al, 2004 (23)	Adults	United States	68% of suicides	Cohort defined using National Mortality Followback Survey data and death certificates¶	Cohort defined using National Mortality Followback Survey data and death certificates¶	72.4	32.0
Kung et al, 2005 (19)	Adults	California	Any means‖	Deaths determined from death certificate to be suicide*	Deaths determined from death certificate to be natural‡	64.2	26.4
Mahon et al, 2005 (25)	Adults	Ireland	52% of suicides	Autopsy reports and death certificates	Deaths from all other causes**	41.0††	17.0††
Homicide victimization outcomes							
Kellermann et al, 1993 (9)	Adults	Tennessee, Washington, Ohio	49.8% of homicides	Serially reported within home*	Community control participants**	45.4	35.8
Cummings et al,	Adults	United States	56.4% of	HMO member cross-	HMO member	21.4‖	11.9‖



1997 (22)			homicide cases	referenced with death certificates			
Grassel et al, 2003 (24)	Adults	California	66.2% of homicide cases	Deaths from violence or firearm	Deaths from noninjury causes	2.0§	<1.0§
Wiebe, 2003 (10)	Adults	United States	76% of homicide cases	National Mortality Followback Survey data and death certificates*	National Health Interview Survey	30.7	34.0
Dahlberg et al, 2004 (23)	Adults	United States	68% of homicide cases	Cohort defined using National Mortality Followback Survey data and death certificates¶	Cohort defined using National Mortality Followback Survey data and death certificates¶	41.9	32.0
Branas et al, 2009 (48)	Adults	Pennsylvania	Firearm-only cases	Consecutively reported	Community control participants	8.8	7.9

* Proxy interviews.
† Parental figure interviews.
‡ Control participant proxy interviews.
§ Proportion of participants with firearm access determined by gun purchase data.
‖ Unreported percentage.
¶ Proxy interviews of decedents.
** Of determined causes.
†† Proportion of participants with firearm access determined by military duty service time.

Studies of Homicide Victimization

Three of 6 studies (50.0%) interviewed proxies to determine firearm accessibility in the home of decedents or control participants (Table 1) (9, 10, 23). Two studies (33.0%) used firearm purchase records to determine firearm accessibility of decedents or control participants (22, 24). In the 3 studies that used survey data, proportions of case patients with firearm access ranged from 30.7% to 45.4% and proportions of control participants ranged from 32.0% to 35.8%. Four studies (66.7%) defined homicide victimization as intentional death by any means, and 1 defined it as firearm- or violence-related injury (24). All homicides were reported consecutively or identified by using death certificates. In the 5 case–control studies with homicide outcomes, various types of control participants were identified, including community or school control participants (40.0%) (9, 48), nonhomicide decedents (40.0%) (10, 24), or living HMO-based control participants (20.0%) (22).

Control Participant Selection

Three case–control studies had potential selection bias resulting from how control participants were selected (16, 17, 22). Cummings and colleagues (22) used an HMO population as the source of their control participants, whereas 2 other studies used inpatient hospital control participants (16, 17). Using HMO or inpatient hospital control participants can violate principles in control selection—namely, that firearm accessibility for control participants may not be the same as that in the study base (30). This bias may occur when patients use the HMO system or hospital to seek care for suicidal planning with firearms as the means. Two studies (16, 17) are especially prone to the Berkson bias—that is, firearm access is related to inpatient hospitalization due to suicidal planning (31).

Comparability

Five studies of suicide had potential comparability bias resulting from a lack of adequate adjustment for major confounders (for example, history of mental illness) (10, 16, 22, 24, 25). Specifically, 1 study's authors describe significant differences between case patients and control participants with regard to some diagnoses of mental illness, although these are not adjusted for in the model with firearm accessibility (16). Four other studies did not report data on history of mental illness (10, 22, 24, 25). Similarly, 3 studies of homicide victimization had potential comparability bias resulting from a lack of adequate adjustment for major confounders (for example, arrest history of someone in the household) (10, 22, 24). In turn, it was not possible to discern whether domestic violence or arrest history differ between homicide case patients and control participants, which may have resulted in confounding.

Exposure

Eleven of 14 studies of suicide and 2 of 6 studies of homicide had potential exposure bias due to unblinded interviews of proxies of case patients and control participants or differential nonresponse rates between case patients and control participants (6–10, 16–21, 23). Specifically, these studies used surveys to collect data on firearm accessibility; proxies for case patients and control participants knew their case patient or control participant status, thereby potentially biasing recall of firearm accessibility. Finally, although 7 case–control studies reported equal nonresponse rates between case patients and control participants (6, 9, 10, 20, 22, 24, 25), 7 others did not report this (7, 8, 16–19, 21), potentially leading to differential misclassification of firearm exposure.

Meta-analysis of Effects of Guns in the Home

Suicide Outcomes

We pooled data from 14 identified observational studies that assessed the odds of suicide (6–8, 10, 16–25) and, using a random-effects model, calculated a pooled OR of 3.24 (95% CI, 2.41 to 4.40) with substantial heterogeneity ($I^2 = 89\%$; $\tau = 0.45$) (Figure 2). All but 1 study (20) found significantly higher odds of suicide among participants who had firearm access than among those who did not, with ORs ranging from 1.38 to 10.38.

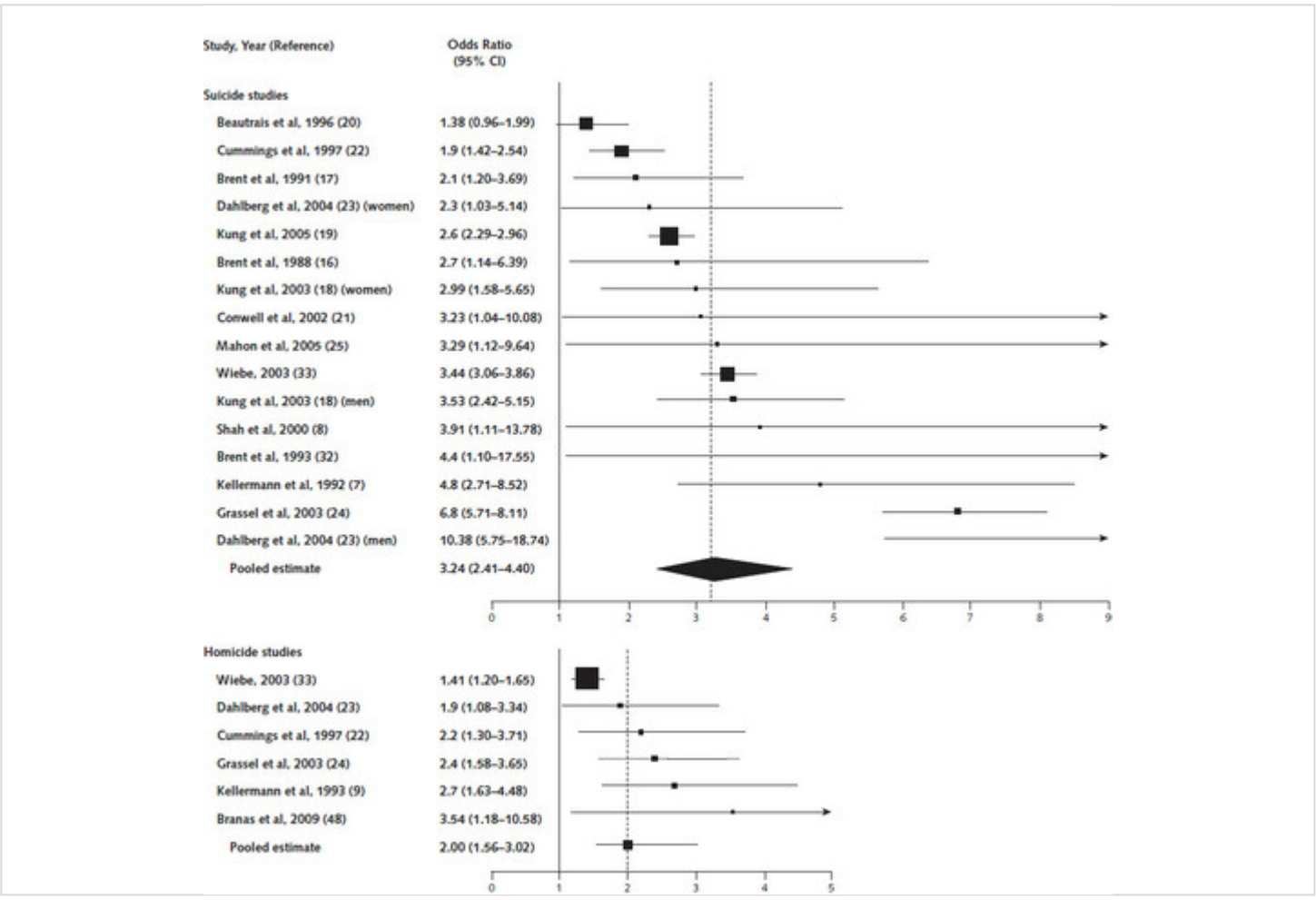


Figure 2. Odds of suicide and homicide in the context of firearm access.

Horizontal lines indicate 95% CIs, squares reflect point estimates, and the size of the squares is proportional to the study's weight. The diamonds reflect the pooled estimate across all studies, and the solid vertical lines reflect the null hypothesis.

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Homicide Outcomes

We also pooled data from 6 studies that assessed the odds of homicide (9, 10, 22–24, 48) and, using a random-effects model, estimated a pooled OR of 2.00 (CI, 1.56 to 3.02) with substantial heterogeneity ($I^2 = 63\%$; $\tau = 0.22$) (Figure 2). All studies found significantly higher odds of homicide victimization among participants who had access to a firearm than among those who did not, with ORs ranging from 1.41 to 3.54.

Subgroup Analyses

To determine the effect that differences between subgroups had on pooled estimates, we stratified results by sex, age (adolescent or adult), year of publication (before 1997 or 1997 to 2013), location of death (in home only or not in home only), and risk of bias (high or moderate to low) (Figure 3). Most tests for interaction between subgroups were not statistically significant, although women had significantly higher odds of homicide victimization than men ($P < 0.001$) and studies with moderate or low risk of bias yielded higher odds of homicide victimization than high-risk studies when firearm access was compared with no access ($P < 0.001$).

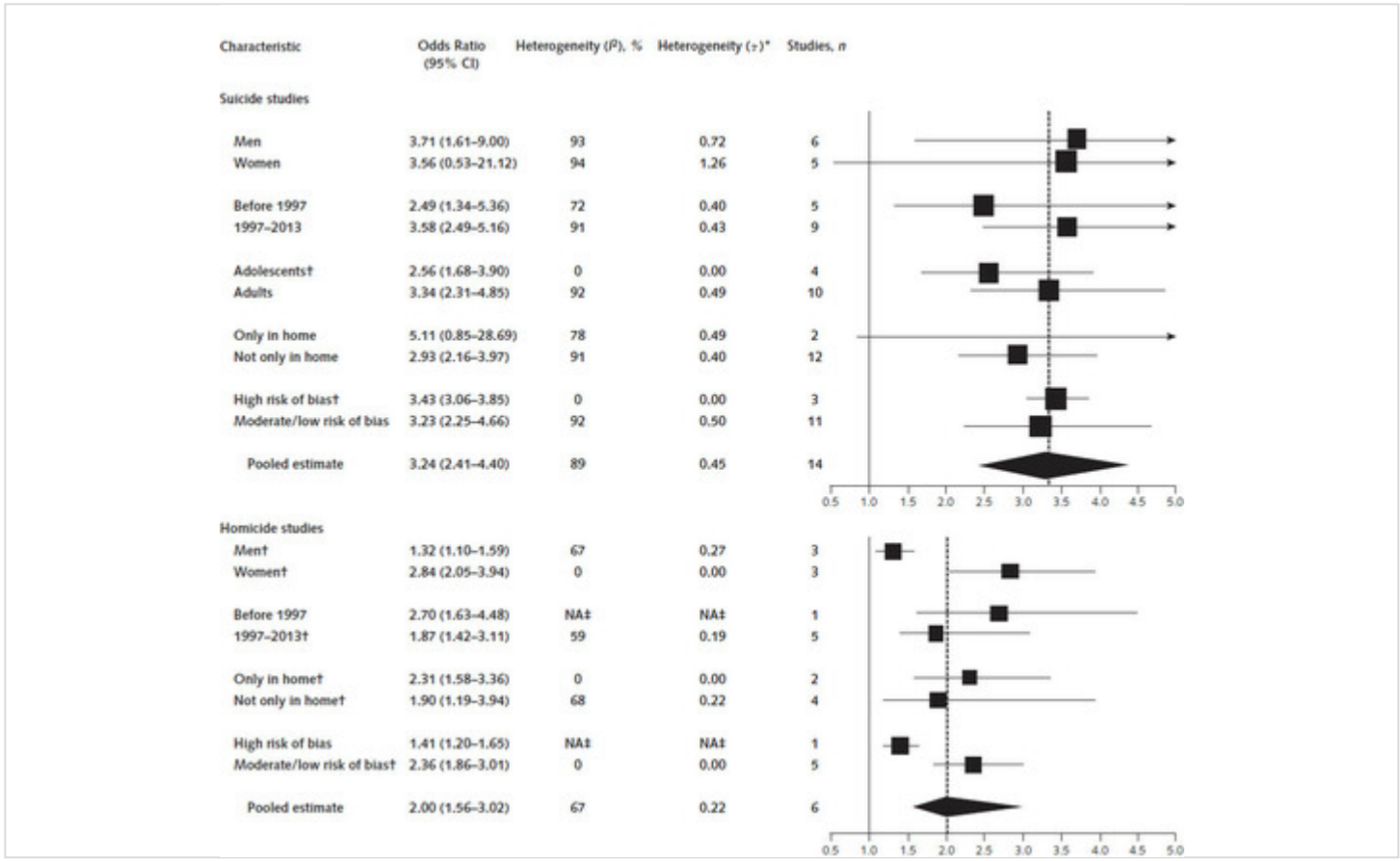

Figure 3. Meta-analyses estimating the odds of suicide and homicide between subgroups.

Horizontal lines indicate 95% CIs, squares reflect point estimates, the diamonds reflect the pooled estimate across all studies, and the solid vertical lines reflect the null hypothesis. The τ estimate was not reported in fixed-effects models. NA = not applicable.

* The τ estimate is on the log odds ratio scale.

† Fixed-effects models.

‡ No meta-analysis was performed.

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Discussion

We performed a systematic review and meta-analysis of all studies that compared the odds of suicide or homicide victimization between persons with and without reported firearm access. All but 1 of the 16 studies identified in this review reported significantly increased odds of death associated with firearm access. We found strong evidence for increased odds of suicide among persons with access to firearms compared with those without access (OR, 3.24 [CI, 2.41 to 4.40]) and moderate evidence for an attenuated increased odds of homicide victimization when persons with and without access to firearms were compared (OR, 2.00 [CI, 1.56 to 3.02]).

Although our study attempts to quantify a person's risk for suicide and homicide in the context of firearm access, many studies have used population-level data to describe the public health risk in terms of aggregate firearm ownership (34–48). Reported proportions of U.S. households and persons with access to firearms are the highest in the world (3, 4), whereas rates of firearm-related deaths are among the highest among high-income countries (4).

It has been suggested that higher rates of suicide and homicide in areas with the highest rates of gun availability may indicate impulsivity and ease of locating firearms (37, 49). In addition, although a public health approach to prevention that entails restriction of access to firearms may lead to violent death by other means, the increased rates of violent death (suicide and homicide) in states with the highest rates of firearm access were attributable more to firearm violence than to nonfirearm violence (37).

Sex-specific subgroup analyses suggest that men with access to firearms have statistically nonsignificant higher odds for committing suicide than women (ORs, 3.71 and 3.56, respectively). Moreover, the nonsignificant pooled OR of suicide among women when firearm access was compared suggests that evidence of an increased risk for suicide among women may not be very strong when all of the available literature is considered. Recent research that found that women are less likely to achieve suicide completion by firearm or hanging and are nearly 4 times more likely to use poison than men (OR, 3.65 [CI, 1.87 to 7.09]) (50) seems to support these findings.

Although men with access to firearms may have higher odds of committing suicide than women, women have higher odds of homicide victimization. The tests for interaction between sex subgroups in our meta-analysis were significant in fixed-effects models ($P < 0.001$). Although men account for more than three quarters of all suicides and homicides, women with firearm access have a higher risk for homicide victimization, a finding that previous studies support (9, 10). Of note, in our review, homicide was the result of victimization rather than perpetration. Furthermore, empirical evidence suggests that most homicide victims know their assailant (10, 24),

which suggests an interpersonal dispute within the household or other domestic violence and not an unknown intruder.

Our results suggest that the pooled OR of suicide is similar between adults and adolescents (ORs, 3.34 and 2.56, respectively; *P* value for interaction = 0.31). To determine the extent to which data from firearm purchases or military duty contribute to the effects seen among adults, we performed a sensitivity analysis that excluded studies with those data; the pooled OR for suicide among adults was slightly decreased (3% reduction; pooled OR, 3.25) in this analysis. We performed an additional sensitivity analysis that excluded the remaining non-U.S. study, and the pooled OR increased slightly (9% increase; pooled OR, 3.64). Tests for interactions among age subgroups remained nonsignificant ($P = 0.170$), although estimates for adults were more than 40% higher than those for adolescents. Accessibility may explain part of the difference in risk between adults and adolescents; adults typically purchase and store the firearms, and improper storage practices pose a serious risk because they have been previously associated with adolescent suicide (51).

The availability of firearms in the home may not be the catalyst for suicidal ideation, but firearms may be a preferred method of suicide among those who have suicidal thoughts. Betz and colleagues (52) found that adolescents with firearm access were no more likely to have suicidal thoughts or a suicide plan in the past 12 months than those without firearm access. However, among adolescents with a suicide plan, those with a firearm in the home were more than 7 times more likely to have a plan involving firearms than those without a firearm in the home (OR, 7.39 [CI, 2.04 to 26.84]) (52).

Since 1996, federal law has prohibited U.S. Department of Health and Human Services agencies from using funds for research that could be interpreted as promoting or advocating for gun control (53). Although we anticipated a lower absolute number of studies since 1996, we found that 63% of all studies ($n = 10$) were published from 1997 to 2013 compared with 37% published before 1997. Similarly, a recent study of publication rates of studies of firearm-related death among youths found an increase in publications (54). The investigators found that, although the rates of publication increased, the relative increase was lower than among publications of other leading causes of death among youths, and models exploring the effects of the federal law passed in 1996 did not suggest a temporal pattern in publication (54).

We also stratified our pooled results by risk of bias and found no significant difference between studies with high risk and those with moderate or low risk (ORs, 3.43 and 3.23, respectively). To the extent that we measured bias in the studies of suicide, we were not able to detect any influence of these biases in the pooled results. Among studies with only moderate or low risk of bias that evaluated the effect of firearm ownership on homicide, the pooled OR was 2.36 (CI, 1.81 to 3.01), which is 18% higher than the pooled OR that included all studies, suggesting that the higher bias in homicide studies may trend estimates toward the null.

Our review has limitations. First, our conclusions are only as good as the data and studies that we identified. To minimize this limitation, we searched extensively by using standardized search strategies from the Cochrane Collaboration to identify all relevant studies. Studies of death commonly have a case–control design, although the cohort study included in our meta-analysis found results similar to those of the case–control studies. In addition, although we limited our analysis to individual-level data, we acknowledge that several available ecological studies have also explored the link between firearms and violent death (5, 55). Among other concerns, we decided not to include population-level data because we were concerned about ecological bias; for example, gun ownership data on a population level may not reflect the persons who actually commit suicide, so no true link between gun ownership and harms outcomes can be made. Despite their limitations, individual-level data, such as those we included in this study, are ideal because confounding and explanatory reasons for the relationship among firearms and suicide and homicide can be better explored.

Second, misclassification of firearm exposure and cause of death is a potential risk in included studies. Although all studies of homicide were among adults, causes of firearm-related deaths are inconsistently reported as homicide or accidental, particularly among children (56). In fact, in some cases, accidental firearm-related deaths among children may be classified as homicide due to an unsecured firearm or as a result of a medical examiner's decision that any death resulting from 1 person shooting another, regardless of intent, is a homicide (56). Further, to determine firearm availability, proxies were interviewed in 79% of studies evaluating

suicide outcomes and 50% evaluating homicide outcomes. However, evidence suggests apparent differences between sexes in describing firearm ownership or firearm storage within the same household (57, 58). In fact, husbands are most often acknowledged by both men and women to be the person responsible for firearm storage and ownership (58), a sex gap that may introduce selection bias in proxy interviews.

Third, we synthesized heterogeneous populations of varying risks to estimate pooled ORs of death. We analyzed our pooled data by using fixed- and random-effects models but note that fixed-effects models only marginally changed pooled effects in the suicide outcomes and all models retained statistical significance. Specifically, when fixed-effects models were used instead of random-effects models, the pooled ORs changed from 3.24 to 3.32 for suicide and from 1.94 to 1.65 for homicide. Moreover, for the 11 U.S. studies that used survey data to classify firearm exposure, proportions of case patients with gun access were closely related, ranging from 62.7% to 75.4%. The reported proportions of control participants with gun access varied more, from 26.4% to 50.8%. Perhaps as a reflection of different firearm ownership culture or restrictions, the only non-U.S. study in a civilian population used survey data and estimated the proportions of suicide case patients and control participants with firearm access to be considerably lower than those in U.S. studies (23.9% and 18.5%, respectively) (20).

Fourth, we considered studies of suicide and homicide victimization by any means, and firearm-specific outcomes may differ. In addition to the other differences between U.S. and non-U.S. studies, 47% to 73% of suicide cases in the United States were firearm-specific compared with only 13% of cases in the study of non-U.S. civilians (20). When considering suicides by nonfirearm methods in the identified literature, researchers have generally found reduced odds of suicide completion by any means other than a firearm, comparing firearm accessibility (OR range, 0.68 to 0.90) (7, 10, 22, 24). Among homicide victimization studies, none reported a significant finding for homicides that are not firearm-specific, although the proportion of homicides in which firearms was used ranged from 50% to 100% (9, 10, 22–24, 48).

Fifth, in studies with homicide outcomes, whether the presence of a firearm among case patients is the result of environmental characteristics or living conditions is unclear. For example, some persons may purchase a firearm for protection because of neighborhood crime, which then translates the risk from the ownership of a firearm to the neighborhood. Also, in homicides, the case patients are by definition deceased and injuries due to firearms may be more lethal than other means; thus, assault by other means would be less likely to be captured (59).

Finally, other sources of bias are an ever-present threat. Among them, using firearm purchase data or military duty as a proxy for firearm access or ownership may not accurately represent ownership. The pooled OR for suicide in our random-effects meta-analyses with data from firearm purchase or military duty was only 3.2% higher than the pooled OR without these studies (3.24 and 3.14, respectively). In contrast, the pooled OR for homicide in the random-effects meta-analyses with firearm purchase data was 29.9% higher than the pooled OR (fixed-effects) without these studies (2.00 and 1.54, respectively), although this is probably partly an artifact of model specification. Finally, although publication bias is a concern, the Egger regression tests for asymmetry of the funnel plot (27) for suicide studies were not significant ($P = 0.88$). However, we identified too few studies of homicide to reasonably assess publication bias.

In summary, we found the association between firearm availability and homicide to be more modest than that between firearm availability and completed suicide. Future studies of firearm access and homicide risk should focus on the role that social factors and surrounding living conditions play in homicide victimization. Furthermore, the National Research Council has acknowledged the difficulty in establishing firearm ownership in studies because of privacy and questionable legality concerns (28). As such, it recommended that researchers receive adequate access to data to trace firearms (28). Future studies of the effect of firearms used in violent injuries may, as a result, have a lower risk for misclassification of firearm ownership and yield more methodologically robust results. Nonetheless, the evidence that we synthesize here helps to elucidate the risks of having a firearm in the home; restricting that access may effectively prevent injury (29).

Appendix: The Accessibility of Firearms and Risk for Suicide and Homicide Victimization Among Household Members

Search Strategy

One investigator reviewed the titles and abstracts identified in the initial search to assess potential relevance to the topic. After removing irrelevant titles, 2 investigators independently read the titles, abstracts, and descriptor terms of the remaining citations to identify eligible reports. We obtained full-text articles for all citations identified as potentially eligible, and 2 investigators independently determined the relevance of the articles according to our inclusion criteria.

When there was uncertainty about a study's eligibility, we obtained the full-text article. The 2 investigators independently applied the inclusion criteria, and any differences were resolved by discussion with the third investigator. We reviewed studies for relevance based on design, types of participants, and outcome measures.

Disposition of Excluded Studies After Full-Text Review

Of the full-text articles that we reviewed, 3 were excluded because the study populations were contained in previously published data included in this review (26, 32, 60), 16 were ecological studies comparing aggregate data between populations (34–47, 61, 62), 15 were only descriptive (2, 52, 63–76), 1 estimated only the victimization rates (nonfatal) of firearm owners (76), 3 were reviews (77–79), 7 did not evaluate our selected harms outcomes (80–86), 7 studied only unintentional firearm death (33, 87–92), 1 did not evaluate firearm access (93), and 4 were editorials (94–97). Overall, 16 observational studies met our inclusion criteria.

Comments

3 Comments

SIGN IN TO SUBMIT A COMMENT

Andrew Anglemeyer, PhDUniversity of California, San Francisco20 February 2014

Authors' Comment

In Dr Sklaroff's commentary, he refers to our systematic review and meta-analysis (1) as a "gun-control review" and suggests that the "preordained outcome" was due to "author-bias" (2). Clearly this is a contentious topic for many, but our scholarly endeavor was not clouded by any personal or political leaning. We are not "unabashedly campaigning to restrict the right to bear arms" (2), as Dr Sklaroff suggests--our review underscores the importance of firearm safety, particularly in high-risk situations (e.g., depressed family member or violent relationship).

Dr Sklaroff's suggestion that the exclusion of some studies and not others somehow creates "author bias" is incorrect. We correctly listed reference 26 (3) as an excluded study to avoid double counting

because its data were included in references 6 (4) and 16 (5), both of which were correctly included and correctly cited. References 32 (6) and 60 (7) were both excluded for similar reasons. All of the studies excluded because some or all of their data were previously published found higher odds of death among cases with firearm exposure. By excluding these data, we actually reduced the risk of artificially deflated variance in our pooled estimates (and subsequently the quality of evidence could have been stronger had we included them)--the opposite of "author-bias". In fact, had we incorrectly included these data, we would have obtained an estimate of suicide that was 5% greater with a margin of error 10% smaller than we obtained in our review. For the homicide outcome, we would have obtained an estimate 12% greater with a margin of error 9% smaller than we obtained in our review. Further, as we state in our response to the editorial (8), had we included population-level data, as opposed to only individual-level data, we would have likely found even stronger evidence. Lastly, the truncating of references in the print edition is a journal-specific issue, not an attempt to hide from the readership specific references. All 97 references are available in the online version of our review.

Respectfully,

Andrew Anglemyer, PhD
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San Francisco, California

References

1. Anglemyer A, Horvath T, and Rutherford G. The Accessibility of Firearms and Risk for Suicide and Homicide Victimization Among Household Members. A Systematic Review and Meta-Analysis. Ann Intern Med 2014; 160: 101-10.
2. Sklaroff Robert (February 4, 2013). “Potential Politicization of Gun Control Controversy”. In http://annals.org/article.aspx?articleid=1814426.
3. Brent DA, Baugher M, Bridge J, Chen T, Chiappetta L. Age- and sex- related risk factors for adolescent suicide. J Am Acad Child Adolesc Psychiatry. 1999;38:1497-505.
4. Brent DA, Perper JA, Moritz G, Baugher M, Schweers J, Roth C. Firearms and adolescent suicide. A community case-control study. Am J Dis Child. 1993; 147:1066-71.
5. Brent DA, Perper JA, Goldstein CE, Kolko DJ, Allan MJ, Allman CJ, et al. Risk factors for adolescent suicide. A comparison of adolescent suicide victims with suicidal inpatients. Arch Gen Psychiatry. 1988;45:581-8.
6. Brent DA, Perper J, Moritz G, Baugher M, Allman C. Suicide in adoles- cents with no apparent psychopathology. J Am Acad Child Adolesc Psychiatry. 1993;32:494-500.
7. Bailey JE, Kellermann AL, Somes GW, Banton JG, Rivara FP, Rushforth NP. Risk factors for violent death of women in the home. Arch Intern Med. 1997;157:777-82.
8. Anglemyer A (January 28, 2013). “Comment”. In http://annals.org/article.aspx?articleid=1814430.

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Potential Politicization of Gun Control Controversy

TO THE EDITOR:

Because Public Health research predictably guides generation of Public Policy, it is necessary to scrutinize the political science underlying the paired gun-control review (1) and editorial (2); challenges are detected to fundamental standards that may compromise an otherwise sound meta-analysis of available literature. The last sentences of each are revelatory, for the former finds “restricting [access to a firearm in the home] may effectively prevent injury” and the latter concludes “obtaining a firearm not only endangers those living in the home, but also imposes substantial costs on the community.” Notwithstanding unaddressed Second Amendment constraints, the authors of both unabashedly campaign to restrict the right to bear arms, thereby ignoring—for example—the human compulsion to manifest reasonable self-defense.

The intuitive deduction, that availability of a firearm will increase the risk that momentary depression will yield suicide, is consistent with modern lay culture—recalling the 1945 movie “Spellbound”—and medical scholarship—recalling an essay published last year in this journal (3). Yet, it is undermined by the editorialist, who has argued that the widespread ownership of firearms in private hands in the U.S. promotes the spread of the "disease" of gun violence (4). He invoked a generalized reference to his book when claiming “There is no association between gun ownership levels and suicide by means other than guns. These studies have controlled for…depression [and] suicidal ideation.” If true, this assertion would undermine efforts to include scrutiny of mental health data during any mandated background-checks; alas, it is untrue, for a profile has been generated of psychiatric patients at high risk for suicide (5).

This latter citation was among the articles cited in the review (#26), prompting confusion when noting it was among three articles cited in the online Appendix—which purports to show “the disposition of studies excluded after full-text review”—along with two others (#32 and #60) “because the study populations were contained in previously published data included in this review.” Noting there are 59 published references and 97 online references, merely counting the number of citations associated with a particular reason for exclusion yields the observation that there is an admixture of articles that were included and articles that were excluded (i.e., some were among the first #1-59 and at least one was among the latter #60-97). The authors should have provided a cross-walk “pairing” of how one set of data was subsuming another set of myriad peer-reviewed studies, precluding concern that any undue selectivity existed.

Therefore, author-bias—seeking the ability to generate the above preordained outcome—could have clouded how subsidiary observations were drawn regarding, for example, the allegation of enhanced risk of being killed by a household member. And, overall, adopting a purely academic approach could have yielded insights, for example, as to the type of mental health diagnoses that might predispose to criminal gun-use; indeed, this entire body of work could then have been compared/contrasted with

lethal violence committed via non-household, unregistered firearms, yielding far more useful insights as to what societal interventions might be optimal.

References

1. Andrew Anglemyer, Tara Horvath, George Rutherford; The Accessibility of Firearms and Risk for Suicide and Homicide Victimization Among Household Members - A Systematic Review and Meta-analysis. Ann. Intern. Med. 2014 Jan;160(2):101-110.
2. David Hemenway; Guns, Suicide, and Homicide: Individual-Level Versus Population-Level Studies. Ann. Intern. Med. 2014 Jan;160(2):134-135.
3. Carl E. Fisher, Jeffrey A. Lieberman; Getting the Facts Straight About Gun Violence and Mental Illness: Putting Compassion Before Fear. Ann. Intern. Med. 2013 Sep;159(6):423-424.
4. Wheeler, Timothy J. (September 2005). "Private Guns, Public Health". The Freeman. In http://en.wikipedia.org/wiki/Private_Guns,_Public_Health#cite_ref-free_1-0.
5. Brent DA, Perper JA, Moritz G, Baugher M, Schweers J, Roth C. Firearms and adolescent suicide. A community case-control study. Am J Dis Child. 1993; 147:1066-71.

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Firearm Screening and Individual Risk

The article by Anglemyer, et al., summarizes and affirms the association between elevated rates of homicide/suicide and the presence of firearms, but beyond estimating the role of impulsivity, more specific causalities of gun violent acts remain obscure. From other studies we recognize that certain populations are at greater risk: individuals with alcohol and other drug abuse (1), previous domestic violent conduct (2), etc.

Hemenway's editorial calling for individual-level studies of perpetrators would certainly move us towards a better understanding of firearm risk by those with access to guns. Indeed, firearm exposure is intrinsically relevant to the risk stratification of patients susceptible to perpetrating an act of self-directed or interpersonal violence. Patients' cognitions about firearms, as well as their behavior with them, have immediate clinical application. Firearm avoidance by patients presenting with suicidal ideation may indicate healthy insight by that individual regarding his/her impulsivity, and thus firearm avoidance may be evidence of good judgment. It is certainly plausible that such behavior may be perceived as protective. Conversely, whether and how a patient handles a firearm conveys essential information about the gravity of suicidal ideation: as in one recent case of mine, the patient unlocked and loaded only one of his two handguns – and subsequently consumed an excessive quantity of alcohol in order to impair further his impulse control.

Despite being the first medical professionals to assess acutely decompensated suicidal patients, the majority of emergency physicians do not screen for firearms (3). There are substantial barriers to firearm screening in clinical practice, as well as risks that might be encountered by physicians who attempt to use such information to reduce possible harm. Although firearm exposure may elevate the clinical estimation of risk for harm in certain presentations, physicians may not disclose such protected

health information unless a “serious and imminent” threat against an identifiable party is known (4). Additionally, outpatient management may be more problematic for patients whose firearm exposure cannot be managed.

We do need more research on individual-level perpetrators of gun violence, but what physicians also need right now are clear guidelines on how, when and to whom we should direct questions about firearm access. How should we interpret the information we receive? How and when is it appropriate to intervene? Without adequate legal support and professional guidelines, firearm screening will remain captive to the politics of gun control, and dangerous individuals will remain unrecognized, untreated and at high risk.

References:

1. Rivara F, Mueller B, Somes G, et al. Alcohol and illicit drug abuse and the risk of violent death in the home. JAMA. 1997;278:569-575.

2. Bailey J, Kellermann A, Somes G, et al. Risk factors for violent death of women in the home. Arch Intern Med. 1997;157:777-82

3. Betz M, Miller M, Barber C, et al. Lethal means restriction for suicide prevention: Beliefs and behaviors of emergency department providers. Depress Anxiety. 2013;30:1013-20.

4. HHS Regulations, Uses and Disclosures for Which an Authorization or Opportunity to Agree or Object is Not Required: Uses and Disclosures to Avert a Serious Threat to Health or Safety - § 164.512 (j)(i)(A).

The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

Handgun Ownership and Suicide in California

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ABSTRACT

BACKGROUND

Research has consistently identified firearm availability as a risk factor for suicide. However, existing studies are relatively small in scale, estimates vary widely, and no study appears to have tracked risks from commencement of firearm ownership.

METHODS

We identified handgun acquisitions and deaths in a cohort of 26.3 million male and female residents of California, 21 years old or older, who had not previously acquired handguns. Cohort members were followed for up to 12 years 2 months (from October 18, 2004, to December 31, 2016). We used survival analysis to estimate the relationship between handgun ownership and both all-cause mortality and suicide (by firearm and by other methods) among men and women. The analysis allowed the baseline hazard to vary according to neighborhood and was adjusted for age, race and ethnic group, and ownership of long guns (i.e., rifles or shotguns).

RESULTS

A total of 676,425 cohort members acquired one or more handguns, and 1,457,981 died; 17,894 died by suicide, of which 6691 were suicides by firearm. Rates of suicide by any method were higher among handgun owners, with an adjusted hazard ratio of 3.34 for all male owners as compared with male nonowners (95% confidence interval [CI], 3.13 to 3.56) and 7.16 for female owners as compared with female nonowners (95% CI, 6.22 to 8.24). These rates were driven by much higher rates of suicide by firearm among both male and female handgun owners, with a hazard ratio of 7.82 for men (95% CI, 7.26 to 8.43) and 35.15 for women (95% CI, 29.56 to 41.79). Handgun owners did not have higher rates of suicide by other methods or higher all-cause mortality. The risk of suicide by firearm among handgun owners peaked immediately after the first acquisition, but 52% of all suicides by firearm among handgun owners occurred more than 1 year after acquisition.

CONCLUSIONS

Handgun ownership is associated with a greatly elevated and enduring risk of suicide by firearm. (Funded by the Fund for a Safer Future and others.)

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Suicide attempts are often impulsive acts, driven by transient life crises.[1,2] Most attempts are not fatal, and most people who attempt suicide do not go on to die in a future suicide.[3,4] Whether a suicide attempt is fatal depends heavily on the lethality of the method used,[5-8] and firearms are extremely lethal.[6-8]

These facts focus attention on firearm access as a risk factor for suicide, especially in the United States, which has a higher prevalence of civilian-owned firearms than any other country[9] and one of the highest rates of suicide by firearm.[10] In 2018, 24,432 suicides by firearm occurred in the United States.[11] Handguns are used in approximately three quarters of suicides by firearm.[12-14]

Ecologic[15-17] and case–control[18-25] studies have consistently shown a positive association between firearm availability and suicide. Collectively, the evidence indicates that the risk of suicide is three times as high when there is firearm access as when there is not — an excess risk attributable to higher rates of suicide by firearm, not of suicide by other methods.[17,26-29] However, the evidence base has gaps and limitations. For example, the case–control studies are relatively small in scale and prone to mismeasurement of firearm availability and, with one apparent exception,[25] rely on data from the 1980s and 1990s.

We tracked firearm ownership and mortality over 12.2 years in a cohort of 26.3 million adult residents of California. Nearly 700,000 cohort members acquired their first handgun during the study period (October 18, 2004, through December 31, 2016). Our goal was to estimate the effect of handgun ownership on their risk of suicide.

METHODS

STUDY OVERSIGHT AND REPORTING

Our study was approved by the institutional review board at Stanford University, and the results are reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.[30] A checklist of the items recommended in the STROBE guidelines is provided in Table S21 in the Supplementary Appendix, available with the full text of this article at NEJM.org.

DATA

We formed the cohort by linking information on handgun transfers and all-cause mortality among adults in California to a series of historical extracts of the California Statewide Voter Registration Database (SVRD). The SVRD enumerates all registered voters in the state. The state must keep the SVRD up to date with new registrations and deregistrations (e.g., relocations and deaths). Thus, at the date of an extract, the SVRD consists of adults known to be alive and residing in California. We obtained 13 historical extracts of the SVRD spaced approximately 1 year apart and spanning our study period; the extracts included approximately 74% of residents of the state who were eligible to vote in California and 61% of all adult residents (Table S2).

Virtually all lawful transfers of firearms in California — including transfers between private parties, gifts, and loans — must be transacted through a licensed firearms dealer.[31] Dealers relay details of the transfers and transferees electronically to the California Department of Justice, where the information is archived in the Dealer Record of Sale (DROS) database. People who move to California with firearms are required to report or transfer their weapons within 60 days after arrival,[32] and these reports are also entered into the database. Although this regimen has governed handgun transfers for decades, transfers of long guns (rifles and shotguns) were not routinely archived until January 1, 2014.[33] We obtained records of the 9.1 million handgun and long-gun transfers archived in the DROS database over a 32-year period (from January 1, 1985, through December 31, 2016).

The California Death Statistical Master Files are the state's official mortality records. They contain detailed information on deaths of state residents, wherever the deaths occur. We obtained data on all deaths reported in the study period.

DATA CLEANING AND LINKAGE

Data-cleaning processes are described in Parts B and C in the Supplementary Appendix. We linked firearm acquisition and mortality records to the SVRD extracts at the individual level; the linkage methods are described elsewhere.[34]

KEY MEASURES

Causes of death were coded according to the *International Classification of Diseases, 10th Revision*, in which suicides are specified according to method (Sections X60–X84), including suicide by firearm (Sections X72–X74). DROS data indicated which cohort members acquired handguns and the dates of acquisition. The age and sex of cohort members were derived from the SVRD. Race and ethnic group and missing values for sex were imputed with use of validated methods[35,36] (see Sections XIII and XIV in the Supplementary Appendix). We geocoded residential addresses and then assigned them to census tracts — geographically contiguous areas designed to approximate small neighborhoods.[37]

Using DROS data, we constructed three additional variables. First, to identify cohort members who already owned a handgun, we linked data on handgun transfers in the 19.8 years leading up to the study period. Second, we created a time-varying variable that indicated the cumulative number of handguns owned (based on acquisitions and deacquisitions) and used it to identify "divestments" — transfers of the last known handgun a cohort member owned. Finally, we flagged cohort members who had acquired long guns with an indicator variable that switched on at the date of their first-known long-gun acquisition. (For additional details on all study variables, see Part B in the Supplementary Appendix.)

DATA-SET STRUCTURE AND OBSERVATION AND EXPOSURE TIME

The final analytic data set was at the person–period level. It excluded cohort members who had acquired one or more handguns before coming under observation during the study period and cohort members with missing census tracts or birth dates (Fig. S1). We also excluded observation time from registrants younger than 21 years of age, the minimum age for lawful handgun acquisition in California.[38]

Cohort members entered the cohort on the date of the SVRD extract in which each first appeared as a registrant at the age of 21 years or older. Observation time ended on the day before the next extract in which they did not appear,[39] at the time of death, or at the end of the study period, whichever came first. We defined exposure as beginning on the date of first handgun acquisition, although acquirers were not eligible to take possession of the weapon until 10 days later, owing to California's mandatory waiting period.[40] Exposure time continued until observation time ended, except among divesters, for whom it ended on the date of divestment, at which time their nonexposure time recommenced.

STATISTICAL ANALYSIS

We used Cox proportional-hazards models to calculate hazard ratios estimating the relationship between handgun ownership and mortality (all-cause mortality, suicide, suicide by firearm, and suicide by other methods). The predictor of interest was a binary variable distinguishing exposed person-time (periods of handgun ownership) from unexposed person-time (periods of nonownership). The models allowed the baseline hazard to vary according to census tract and was adjusted for age at baseline, sex, race and ethnic group, and long-gun ownership. We plotted survival curves using the Kaplan–Meier method and estimated adjusted survival curves using inverse probability weighting.[41]

We tested for unmeasured confounding in two ways. First, we conducted negative control outcome analyses.[42] In these analyses, we used the same modeling approach and exposure time used in our main analyses, but the outcomes were three causes of death (lung cancer, endocarditis, and alcoholic liver disease) that are more common among people who smoke, inject drugs, or have alcohol-use disorder, respectively — established risk factors for suicide[43-47] that could not be measured directly in our data. Thus, a finding of no association between handgun ownership and these three causes of death would suggest minimal bias from confounding by these unmeasured behaviors in our main analyses. Second, we conducted bias analyses to calculate how strong the associations would need to be between an unmeasured confounder and our exposure and outcome variables, respectively, to explain our main results. In these analyses, we used the E-value calculator developed by VanderWeele and colleagues.[48,49]

In addition, we probed the effect of having anchored the cohort to registered voters in California. Handgun acquirers in the cohort were

Table 1. Characteristics of the Study Sample According to Handgun-Ownership Status.*

Characteristic	Owners (N = 676,425)	Nonowners (N = 25,637,011)
Sex — no. (%)		
Male	528,111 (78.1)	11,324,350 (44.2)
Female	147,250 (21.8)	14,165,318 (55.3)
Missing	1,064 (0.2)	147,345 (0.6)
Age — yr†		
Mean (median)	41 (38)	43 (40)
Range	21–110	21–110
Race or ethnic group — no. (%)		
White	505,539 (74.7)	15,550,513 (60.7)
Hispanic	107,731 (15.9)	5,766,667 (22.5)
Asian	28,033 (4.1)	1,788,910 (7.0)
Black	30,490 (4.5)	2,239,863 (8.7)
Other	1,091 (0.2)	54,011 (0.2)
Missing	3,541 (0.5)	237,047 (0.9)
Residential location — no. (%)‡		
Urban	560,399 (82.8)	23,173,886 (90.4)
Suburban	78,285 (11.6)	1,716,930 (6.7)
Large rural town	21,727 (3.2)	443,986 (1.7)
Small rural town	16,012 (2.4)	302,048 (1.2)
Missing	2 (<0.01)	161 (<0.01)

* Handgun owners are defined as cohort members who acquired their first handgun on record (ever or since January 1, 1985) before coming under observation in the study period (October 18, 2004, through December 31, 2016). Nonowners are defined as cohort members for whom there was no recorded acquisition of a handgun between January 1, 1985, and the end of the study period. Percentages may not total 100 because of rounding.
† Values refer to cohort members' age on the first day they came under observation.
‡ Categories for residential locations are based on rural–urban commuting area (RUCA) codes (see Section III in the Supplementary Appendix). Values refer to cohort members' residential location on the day they entered the cohort. Missing values arise from census tracts that could not be mapped to RUCA codes from the 2010 Census.

weighted to represent all handgun acquirers in the state during the study period, not merely those who were registered voters, and nonacquirers were weighted to resemble all adult nonacquirers statewide. (For additional information about the generalizability and sensitivity analyses, see Sections VII and VIII in the Supplementary Appendix.)

Statistical analyses were performed with the use of R software, version 3.5.1 (R Foundation for Statistical Computing), and Stata software, version 14.1 (StataCorp). Confidence intervals for the hazard ratios were not adjusted for multiple comparisons. For additional details regarding the statistical analyses, see Section V in the Supplementary Appendix.

RESULTS

SAMPLE CHARACTERISTICS

The study sample comprised 26,313,436 people who were followed for an average of 6.9 years; 676,425 (2.6%) of them acquired one or more handguns during the study period. Handgun owners were younger than nonowners at baseline (mean age, 41 years vs. 43 years) and were more likely to be male (78.1% vs. 44.2%), white (74.7% vs. 60.7%), and residing outside an urban area (17.2% vs. 9.6%) (Table 1).

FREQUENCY AND RATE OF DEATH AND SUICIDE

A total of 1,457,981 cohort members died during the study period (Table 2); 17,894 died by suicide,

Table 2. Counts, Crude Rates, and Adjusted Hazard Ratios for All-Cause Mortality and Suicide among Cohort Members, According to Handgun Ownership Status.

Cause of Death	Owners		Nonowners		Adjusted Hazard Ratio (95% CI)‡
	Deaths*	Crude Rate†	Deaths*	Crude Rate†	
All causes	10,863	382.94	1,447,118	820.91	0.80 (0.79–0.82)
Male	9,343	409.60	697,731	910.11	0.81 (0.79–0.83)
Female	1,500	271.78	739,924	747.99	0.72 (0.68–0.76)
Suicide	1,354	47.73	16,540	9.38	3.67 (3.46–3.89)
Male	1,132	49.63	11,376	14.84	3.34 (3.13–3.56)
Female	219	39.68	5,107	5.16	7.16 (6.22–8.24)
Suicide by firearm	1,200	42.30	5,491	3.11	9.08 (8.48–9.73)
Male	1,003	43.97	4,575	5.97	7.82 (7.26–8.43)
Female	194	35.15	900	0.91	35.15 (29.56–41.79)
Suicide by other methods	154	5.43	11,049	6.27	0.68 (0.58–0.80)
Male	129	5.66	6,801	8.87	0.64 (0.55–0.76)
Female	25	4.53	4,207	4.25	1.01 (0.68–1.50)

* Death counts for handgun owners refer to deaths among cohort members during a period in which they owned one or more handguns. Death counts for nonowners refer to deaths among cohort members during a period in which they did not own a handgun. Sex-specific totals for all-cause mortality, suicide, and firearm suicide do not sum to the overall total because the overall total includes cohort members with missing values for sex.

† Rate denominators for handgun owners consist of the exposure time they contributed while owners. Rate denominators for nonowners consist of the sum of nonexposure time contributed by handgun owners in their nonownership periods and the nonexposure time contributed by nonowners throughout their observation period.

‡ Adjusted hazard ratios were estimated with the use of Cox proportional-hazards models in which baseline hazards were stratified according to census tract. The models were controlled for age at cohort entry, sex (overall models only), race and ethnic group, and ownership of rifles or shotguns. Complete estimates from the 12 models are shown in Tables S16–S19.

of which 6691 were suicides by firearm. Men accounted for 70% of the suicides and 83% of the suicides by firearm. A firearm was used in 89% of the suicides among handgun owners and 33% of those among nonowners.

Handgun owners had lower rates of all-cause mortality than nonowners but substantially higher rates of suicide (Table 2). The rate of suicide by any method among male handgun owners was three times as high as that among male nonowners (hazard ratio, 3.34; 95% confidence interval [CI], 3.13 to 3.56), and the corresponding rate among female handgun owners was seven times as high as that among female nonowners (hazard ratio, 7.16; 95% CI, 6.22 to 8.24). These elevated suicide rates among handgun owners were attributable to much higher rates of suicide by firearm. Men who owned handguns had a rate of suicide by firearm that was nearly eight times as high as that among male nonowners (hazard ratio, 7.82; 95% CI, 7.26 to 8.43) and a lower rate of suicide by other methods (hazard ratio, 0.64; 95% CI, 0.55 to 0.76). The rate of suicide by firearm among female handgun owners was 35 times as high as the rate among women who did not own handguns (hazard ratio, 35.15; 95% CI, 29.56 to 41.79) and the rate of suicide by other methods was similar in the two groups of women (hazard ratio, 1.01; 95% CI, 0.68 to 1.50). (Complete estimates from these models are available in Tables S16 through S19.)

TEMPORALITY OF THE RISK OF SUICIDE BY FIREARM

Handgun owners had higher rates of suicide by firearm than nonowners throughout the study period, but the magnitude of this difference changed over time (Fig. 1 and Fig. S6). One suicide by firearm occurred among owners during the 10-day waiting period, followed by 9 on the day owners became eligible to take possession of their weapons and 102 in the first week thereafter. From the first day of eligibility through the 30th day after purchase, the rate of suicide by firearm among owners was 471 per 100,000

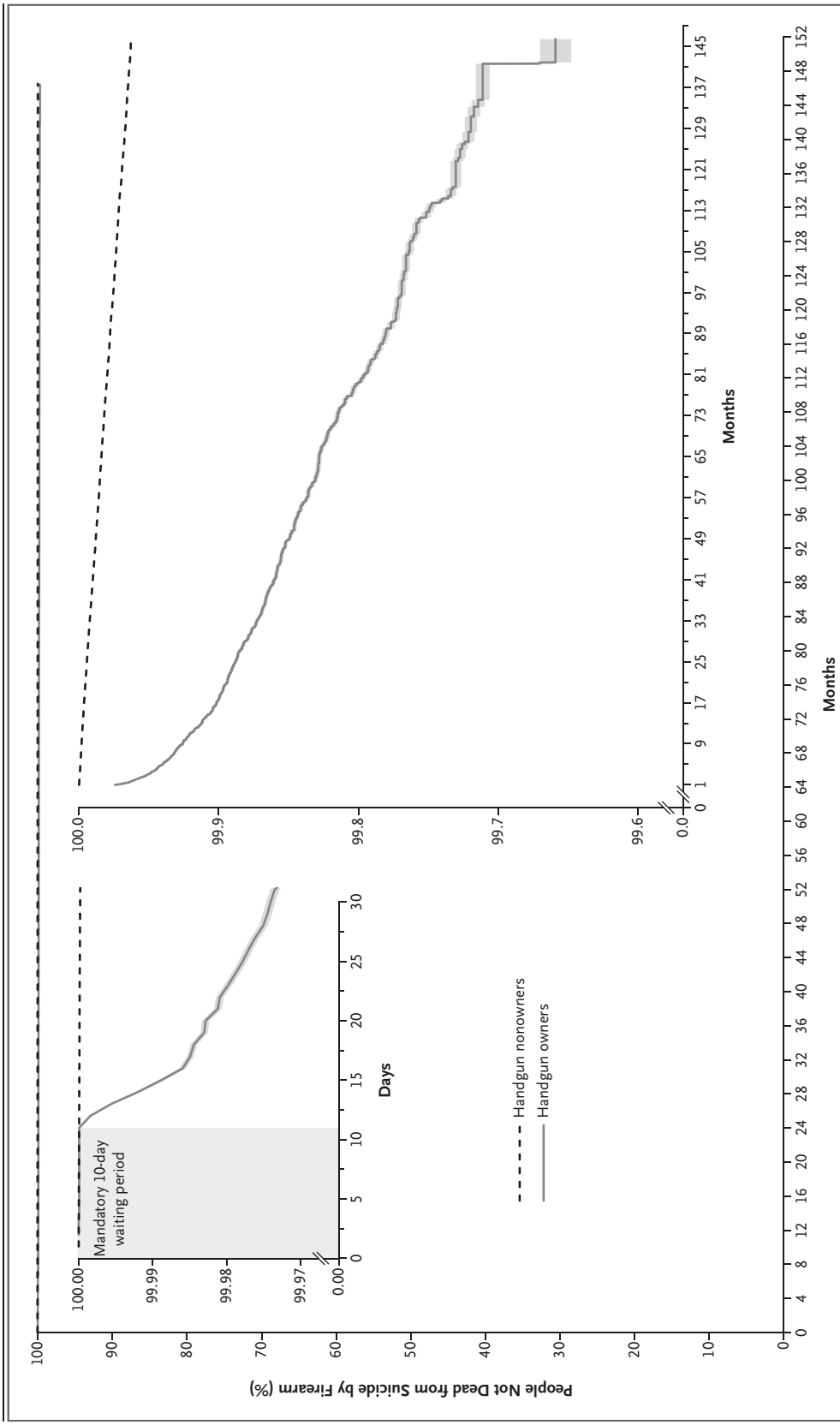

Figure 1. Adjusted Survival Curves for Suicide by Firearm among Handgun Owners and Nonowners.

The survival curves show the probability of not dying by suicide by firearm among handgun owners and nonowners over the 146-month study period and are adjusted for sex, age, and race and ethnic group. The shading around the curves indicates 95% confidence intervals, but these intervals are imperceptibly small for the curves for nonowners of handguns. Nonownership time is measured from the first day of observation, and ownership time is measured from the day of the first handgun acquisition. To address competing mortality risks, the survival curves do not censor cohort members who died of causes other than suicide by firearm (for details of this approach, see Section V in the Supplementary Appendix).

Table 3. Counts, Crude Rates, and Adjusted Hazard Ratios for Suicide by Firearm among Handgun Owners, According to Time Period after First Handgun Acquisition.*

Suicides by Firearm	Period Since First Handgun Acquisition						
	1–10 Days	11–30 Days	31–90 Days	91–365 Days	366 Days–3 Yr	4–6 Yr	7–12.2 Yr
Suicides — no./total no. (%)	1/1200 (0.08)	172/1200 (14.33)	154/1200 (12.83)	251/1200 (20.92)	309/1200 (25.75)	194/1200 (16.17)	119/1200 (9.92)
Crude rate per 100,000 person-years	5.41	470.80	147.30	60.71	45.87	18.55	14.28
Adjusted hazard ratio (95% CI)	4.59 (0.82–25.52)	100.10 (55.75–179.90)	16.62 (12.98–21.29)	12.40 (10.48–14.67)	5.35 (4.64–6.17)	1.58 (1.34–1.86)	2.61 (2.14–3.19)

* "Acquisition" refers to the time of the application to purchase. California requires a 10-day (240-hour) waiting period from the date and time of the application to purchase to the time at which the purchaser is permitted to take possession of the firearm.

person-years (hazard ratio, 100.10; 95% CI, 55.75 to 179.90), and these suicides accounted for 14% of all suicides by firearm among owners during the study period (Table 3). The rate of suicide by firearm among owners declined in subsequent periods but remained elevated over the long term, with 52% of all suicides by firearm among owners occurring after the first year of ownership.

SENSITIVITY AND GENERALIZABILITY ANALYSES

Handgun owners did not have higher rates of death from alcoholic liver disease than nonowners (hazard ratio, 0.83; 95% CI, 0.72 to 0.95), and owners 50 years of age or older did not have higher rates of death from lung cancer (hazard ratio, 0.86; 95% CI, 0.79 to 0.93); mortality from endocarditis was higher among owners than among nonowners, but the confidence interval included 1 (hazard ratio, 1.60; 95% CI, 0.93 to 2.76) (Table S20). The bias analyses showed that a putative confounder would need to be very large to nullify the positive association detected between ownership and suicide; for example, it would need to both increase the risk of suicide by a factor of six and be six times more common among handgun owners than nonowners (E values: overall, 6.80; men, 6.14; women, 13.80) (Table S5). Analyses weighted to make the cohort more closely resemble the total adult population of California (i.e., with inclusion of people who were not registered to vote) produced estimates of the association between handgun ownership and suicide risk that were very similar to those in our main results (Table S6).

DISCUSSION

In this study of firearm ownership and mortality in a cohort of 26.3 million adult residents of California, we found an elevated risk of suicide among a large sample of first-time handgun owners. This risk was driven by a much higher rate of suicide by firearm — not by higher rates of suicide by other methods. Handgun owners' risk of suicide by firearm peaked in the period immediately after their first handgun acquisition but remained relatively high 12 years later, and the long-term risk accounted for a majority of the excess suicides by firearm among owners.

Nearly all previous studies of the relationship between firearm access and suicide have detected positive associations. These studies have limitations. In ecologic analyses, grouping people reduces information and may mask important individual-level differences between exposure and outcome.[50] Risk estimates from case–control studies range widely, in part because many have analyzed only a few hundred suicides.[18-20,22,25] Psychological autopsy, the standard method for determining gun access in case–control studies,[18,20-22,24] is vulnerable to recall bias, with proxies of recent victims of gunshot injuries plausibly more likely to report access than proxies of controls.[51] Some case–control studies have used dead controls[22,24] or drawn controls from a population other than that of the cases[21,22,24,25]; both approaches are potential sources of bias. Finally, case–control studies are ill-suited to measuring temporal changes in risk.

Cohort studies are well suited to measuring

temporal changes, but the absence of centralized information on gun ownership has long impeded their conduct in the United States. In one previous cohort study involving recent purchases of handguns,[52] the rates of suicide by firearm among male and female handgun purchasers exceeded those in the general population, including gun owners (age-standardized mortality ratios of 3.23 and 15.50, respectively); the study did not adjust for other characteristics.

Our study is many times larger than previous ones and is unusual in estimating risks among first-time gun owners, accounting for divestment, and separately analyzing risks of suicide by firearm in both men and women. Our risk estimates are larger than those reported in some previous studies. However, direct comparisons are limited by the facts that case–control studies produce different measures of risk and that most define exposure as a gun in the home rather than personal ownership.

Although women accounted for only 16% of all suicides by firearm and had substantially lower suicide rates than men, the risk of suicide by firearm among female handgun owners (as compared with female nonowners) was substantially greater than that among male handgun owners (as compared with male nonowners). Women attempt suicide more frequently than men but have fewer completed suicides, largely because the means they tend to use (e.g., poisons) are less lethal than those men tend to use (e.g., guns or hanging).[5,7,8] Handgun ownership may impose a particularly high relative risk of suicide for women because of the pairing of their higher propensity to attempt with ready access to and familiarity with an extremely lethal method.

The lower risk of all-cause mortality detected among handgun owners should not be interpreted as a protective effect because it stems largely from owners' lower rates of death from common chronic diseases (e.g., cancer or heart disease) that do not have a clear relationship to handgun ownership. Two other explanations are more plausible. First, handgun acquisition involves participation in commerce. In California, this includes personal appearance at a dealer, which necessitates a degree of physical mobility and well-being. Second, handguns are expensive. People who can afford to buy them are wealthier,[53] and wealth is positively associated with health.

Unmeasured confounding is a threat to causal inference in observational studies.[54] Our bias analyses indicate that to substantially attenuate or erase the elevated rates of suicide by firearm we observed among handgun owners, any confounding difference between owners and nonowners would need to be as strong a predictor of suicide as well-established risk factors (e.g., major depressive disorders) and nearly an order of magnitude more common among handgun owners than nonowners, even after adjustment for the covariates accounted for in our analyses. What trait could reach that mark? One possibility is suicidal intent — owners who acquired handguns for the purpose of ending their life. Suicidal intent probably explains at least part of the spike in suicides by firearm soon after acquisition. However, intent is less plausible as an explanation for the elevated risk of suicide by firearm among owners over the longer term, when most occurred.

More generally, we were not able to adjust for mental illness; although it is a major risk factor for suicide, it is unlikely to be a strong confounder. Several national studies[55-57] have found that gun owners (or people with access to guns) and nonowners have similar rates of depression, suicidal ideation, and suicide attempts (for a review of these studies, see Section VI in the Supplementary Appendix). Moreover, our negative control outcome analyses did not detect consistent evidence of residual confounding from this source.

Our study has other limitations. First, we will have misclassified some handgun owners as unexposed because, for example, they acquired their handguns unlawfully or before our data on acquisition histories began. Such misclassification should bias toward the null any differences in the risk of death detected between owners and nonowners. Second, we only partially accounted for long-gun ownership, although the implications of this are mitigated by the fact that approximately three quarters of suicides by firearm involve handguns[12-14] and less than 20% of firearm owners in California own only long guns.[53] Finally, generalizability outside California is unknown. California has stricter gun laws than many other states, including universal background checks, a waiting period, and various prohibitions on firearm purchasing by people with severe mental illness.[58] Our results may underestimate the association between handgun

ownership and suicide in states without such safeguards.

Fifty-nine people were killed in the mass shooting in Las Vegas in 2017, the deadliest in U.S. history. Approximately the same number die each day in the United States from suicide by firearm. Many of these deaths are preventable. Our study bolsters and extends the message from previous research: ready access to firearms, particularly handguns, is a major risk factor for suicide. Health care providers and policymakers should be aware of this risk. This information is also important for current and prospective firearm owners seeking to weigh the risks and perceived benefits of ownership.

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REFERENCES

1. Kessler RC, Borges G, Walters EE. Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. Arch Gen Psychiatry 1999;56:617-26.
2. Rimkeviciene J, O'Gorman J, De Leo D. Impulsive suicide attempts: a systematic literature review of definitions, characteristics and risk factors. J Affect Disord 2015;171:93-104.
3. Owens D, Horrocks J, House A. Fatal and non-fatal repetition of self-harm: systematic review. Br J Psychiatry 2002;181:193-9.
4. Nordentoft M, Mortensen PB, Pedersen CB. Absolute risk of suicide after first hospital contact in mental disorder. Arch Gen Psychiatry 2011;68:1058-64.
5. Spicer RS, Miller TR. Suicide acts in 8 states: incidence and case fatality rates by demographics and method. Am J Public Health 2000;90:1885-91.
6. Shenassa ED, Catlin SN, Buka SL. Lethality of firearms relative to other suicide methods: a population based study. J Epidemiol Community Health 2003;57:120-4.
7. Miller M, Azrael D, Hemenway D. The epidemiology of case fatality rates for suicide in the northeast. Ann Emerg Med 2004;43:723-30.
8. Conner A, Azrael D, Miller M. Suicide case-fatality rates in the United States, 2007 to 2014: a nationwide population-based study. Ann Intern Med 2019 December 3 (Epub ahead of print).
9. Karp A. Estimating global civilian-held firearms numbers: briefing paper. Geneva: Small Arms Survey, 2018 (http://www.smallarmssurvey.org/weapons-and-markets/tools/global-firearms-holdings.html).
10. Global Burden of Disease 2016 Injury Collaborators. Global mortality from firearms, 1990-2016. JAMA 2018;320:792-814.
11. Centers for Disease Control and Prevention. Web-based Injury Statistics Query and Reporting System (WISQARS) (www.cdc.gov/injury/wisqars).
12. California Department of Public Health. EpiCenter: California injury data online (http://epicenter.cdph.ca.gov).
13. Centers for Disease Control and Prevention. National Violent Death Reporting System (NVDRS) (https://www.cdc.gov/injury/wisqars/nvdrs.html).
14. Hanlon TJ, Barber C, Azrael D, Miller M. Type of firearm used in suicides: findings from 13 states in the National Violent Death Reporting System. J Adolesc Health 2019;65:366-70.
15. Miller M, Hemenway D. The relationship between firearms and suicide: a review of the literature. Aggress Violent Behav 1999;4:59-75.
16. Miller M, Lippmann SJ, Azrael D, Hemenway D. Household firearm ownership and rates of suicide across the 50 United States. J Trauma 2007;62:1029-34.
17. Miller M, Barber C, White RA, Azrael D. Firearms and suicide in the United States: is risk independent of underlying suicidal behavior? Am J Epidemiol 2013;178:946-55.
18. Kellermann AL, Rivara FP, Somes G, et al. Suicide in the home in relation to gun ownership. N Engl J Med 1992;327:467-72.
19. Cummings P, Koepsell TD, Grossman DC, Savarino J, Thompson RS. The association between the purchase of a handgun and homicide or suicide. Am J Public Health 1997;87:974-8.
20. Conwell Y, Duberstein PR, Connor K, Eberly S, Cox C, Caine ED. Access to firearms and risk for suicide in middle-aged and older adults. Am J Geriatr Psychiatry 2002;10:407-16.
21. Wiebe DJ. Homicide and suicide risks associated with firearms in the home: a national case-control study. Ann Emerg Med 2003;41:771-82.
22. Kung HC, Pearson JL, Liu X. Risk factors for male and female suicide decedents ages 15-64 in the United States: results from the 1993 National Mortality Follow-back Survey. Soc Psychiatry Psychiatr Epidemiol 2003;38:419-26.
23. Grassel KM, Wintemute GJ, Wright MA, Romero MP. Association between handgun purchase and mortality from firearm injury. Inj Prev 2003;9:48-52.
24. Dahlberg LL, Ikeda RM, Kresnow MJ. Guns in the home and risk of a violent death in the home: findings from a national study. Am J Epidemiol 2004;160:929-36.
25. Dempsey CL, Benedek DM, Zuromski KL, et al. Association of firearm sue, accessibility, and storage practices with suicide risk among US army soldiers. JAMA Netw Open 2019;2(6):e195383.
26. Stroebe W. Firearm possession and violent death: a critical review. Aggress Violent Behav 2013;18:709-21.
27. Anglemyer A, Horvath T, Rutherford G. The accessibility of firearms and risk for suicide and homicide victimization among household members: a systematic review and meta-analysis. Ann Intern Med 2014;160:101-10.
28. Miller M, Swanson SA, Azrael D. Are we missing something pertinent? A bias analysis of unmeasured confounding in the firearm-suicide literature. Epidemiol Rev 2016;38:62-9.
29. The relationship between firearm availability and suicide. Santa Monica, CA: RAND, March 2, 2018 (https://www.rand.org/research/gun-policy/analysis/essays/firearm-availability-suicide.html).
30. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for report-

ing observational studies. Lancet 2007;370:1453-7.
31. California Penal Code §§26500, 27545.
32. California Penal Code §§17000, 27560.
33. California Penal Code §§11106, 26905.
34. Zhang Y, Holsinger EE, Prince L, et al. Assembly of the LongSHOT cohort: public record linkage on a grand scale. Inj Prev 2020;26:153-8.
35. Imai K, Khanna K. Improving ecological inference by predicting individual ethnicity from voter registration records. Polit Anal 2016;24:263-72.
36. Mullen L, Blevins C, Schmidt B. Package 'gender': predict gender from names using historical data. November 9, 2019 (https://cran.r-project.org/web/packages/gender/gender.pdf).
37. United States Census Bureau. Geographic areas reference manual. November 2004 (https://www.census.gov/programs-surveys/geography/guidance/geographic-areas-reference-manual.html).
38. California Penal Code §27505.
39. Lesko CR, Edwards JK, Cole SR, Moore RD, Lau B. When to censor? Am J Epidemiol 2018;187:623-32.
40. California Penal Code §§26815, 27540.
41. Cole SR, Hernán MA. Adjusted survival curves with inverse probability weights. Comput Methods Programs Biomed 2004;75:45-9.
42. Lipsitch M, Tchetgen Tchetgen E, Cohen T. Negative controls: a tool for detecting confounding and bias in observational studies. Epidemiology 2010;21:383-8.
43. Poorolajal J, Darvishi N. Smoking and suicide: a meta-analysis. PLoS One 2016;11(7):e0156348.
44. Wilcox HC, Conner KR, Caine ED. Association of alcohol and drug use disorders and completed suicide: an empirical review of cohort studies. Drug Alcohol Depend 2004;76:Suppl:S11-S19.
45. Murphy GE. Psychiatric aspects of suicidal behavior. In: Hawton K, van Heeringen K, eds. The international handbook of suicide and attempted suicide. Chichester, United Kingdom: John Wiley, 2000:135-46.
46. Norström T, Rossow I. Alcohol consumption as a risk factor for suicidal behaviour: a systematic review of associations at the individual and at the population level. Arch Suicide Res 2016;20:489-506.
47. Darvishi N, Farhadi M, Haghtalab T, Poorolajal J. Alcohol-related risk of suicidal ideation, suicide attempt, and completed suicide: a meta-analysis. PLoS One 2015;10(5):e0126870.
48. VanderWeele TJ, Ding P. Sensitivity analysis in observational research: introducing the E-value. Ann Intern Med 2017;167:268-74.
49. Mathur MB, Ding P, Riddell CA, VanderWeele TJ. Website and R package for computing E-values. Epidemiology 2018;29(5):e45-e47.
50. Wakefield J. Ecologic studies revisited. Annu Rev Public Health 2008;29:75-90.
51. Pirkis J, Nicholas A, Gunnell D. The case for case-control studies in the field of suicide prevention. Epidemiol Psychiatr Sci 2019;29:e62.
52. Wintemute GJ, Parham CA, Beaumont JJ, Wright M, Drake C. Mortality among recent purchasers of handguns. N Engl J Med 1999;341:1583-9.
53. Kravitz-Wirtz N, Pallin R, Miller M, Azrael D, Wintemute GJ. Firearm ownership and acquisition in California: findings from the 2018 California Safety and Well-being Survey. Inj Prev 2019 December 5 (Epub ahead of print).
54. Hernán MA, Robins JM. Causal inference. Boca Raton, FL: Chapman & Hall/CRC, 2020.
55. Sorenson SB, Vittes KA. Mental health and firearms in community-based surveys: implications for suicide prevention. Eval Rev 2008;32:239-56.
56. Ilgen MA, Zivin K, McCammon RJ, Valenstein M. Mental illness, previous suicidality, and access to guns in the United States. Psychiatr Serv 2008;59:198-200.
57. Miller M, Barber C, Azrael D, Hemenway D, Molnar BE. Recent psychopathology, suicidal thoughts and suicide attempts in households with and without firearms: findings from the National Comorbidity Study Replication. Inj Prev 2009;15:183-7.
58. Giffords Law Center to Prevent Gun Violence. Annual gun law scorecard (http://gunlawscorecard.org/).

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Guns in the Home

By: Judy Schaechter, MD, MBA, FAAP

Did you know that roughly a third of U.S. homes with children have guns? In fact, an estimated 4.6 million kids live with unlocked, loaded guns. That's a scary statistic when you think about the fact that even young toddlers are capable of finding unlocked guns in the home, and they are strong enough to pull the trigger.

As a parent, you may not realize what a serious risk a gun in the home is, especially for children. The reality is that having firearms in the home increases the risk of unintentional shootings, suicide, and homicide.

Unintentional Shootings

Unintentional shootings happen to children of all ages. In homes with guns, the likelihood of accidental death by shooting is four times higher.

In 2020, there were at least 369 unintended shootings by children in the United States. These shootings caused 142 deaths and 242 injuries. The COVID-19 pandemic hasn't helped either. From March to December 2020, unintended shooting deaths by kids went up more than 30% compared to the same time period in 2019.

Suicide

Kids and adolescents are at an increased risk for suicide when there is a gun in the home too. Suicide rates in this population are four times higher than for kids who live in homes without guns. In the past decade, 40% of the suicides committed by kids and teens involved guns. Nine out of 10 of these suicides were with guns that the victims accessed at their own homes or from a relative's home.

Homicide

The risk of homicide is three times higher when there are guns in the home. Not only that, but 58% of shooting deaths in children and teens are homicides.

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The most effective way to keep kids safe

The American Academy of Pediatrics (AAP) advises that the safest home for a child is one without guns. The most effective way to prevent unintentional gun injuries, suicide and homicide to children and adolescents, research shows, is the absence of guns from homes and communities.

What to do if you do keep a gun in your home

If you decide to keep guns in the home, be aware that many studies show that teaching kids about gun safety, or to not touch a firearm if they find one, is not enough. You can reduce the chances of children being injured, however, by following import ant safety rules:

- **Safe storage.** All guns in your home should be ***locked and unloaded, with ammunition locked separately*** (https://www.youtube.com/watch?v=J1bWyBZSPzU&feature=youtu.be). Make sure children and teens can't access the keys or combinations to lock boxes or gun safes. And remember not to keep loaded, unlocked guns in the car, or anywhere else on your property, either.
- **Safe use.** When using a gun for hunting or target practice, keep the safety catch in place until you are ready to fire it. Before setting the gun down, always unload it. As much as a child may want to take a turn shooting, this is not a good idea. No matter how much instruction you may give about how to safely shoot a gun, children are not capable or responsible enough to handle a potentially lethal weapon.

Keep kids safe in *other* homes

More than a third of all unintentional shootings of children take place in the homes of their friends, neighbors, or relatives. That's why it is also important to make sure your kids are safe when they spend time where other people live.

Here's how to help ensure your children and their playmates do not come across an unsecured gun while they play:

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(/English/news/Pages/Is-There-A-Gun-Where-Your-Child-Plays-Asking-Can-Save-Lives.aspx)

- **Add this question to your playdate checklist.** Even if you don't have guns in your own home, ask (/English/safety-prevention/at-play/Pages/Is-There-A-Gun-Where-Your-Child-Plays-Asking-Can-Save-Lives.aspx) about guns and safe storage at the other homes they visit. Just as you'd ask about pets, allergies, supervision and other safety issues before your child visits another home, add one more important question: "Is there an unlocked gun in your house?" If there is, reconsider allowing your child to play there or talk to them about keeping the guns unloaded and locked.
- **Talk to your children.** Remind your kids that if they ever come across a gun, they must stay away from it and tell you immediately.

Guns in the media

Make sure your children understand that gun violence they may see on TV, in movies, and in video games they play at home or friends' homes is not real. They need to be told—and probably reminded again and again—that in real life, children are killed and hurt badly by guns. Although the popular media (/English/news/Pages/Virtual-Violence-Impacts-Children-on-Multiple-Levels.aspx) often romanticize gun use, children need to learn that these weapons can be extremely dangerous.

More information

- Is There an Unlocked Gun Where Your Child Plays? (/English/safety-prevention/at-play/Pages/Is-There-A-Gun-Where-Your-Child-Plays-Asking-Can-Save-Lives.aspx)
- Where We Stand: Gun Safety (/English/safety-prevention/all-around/Pages/Where-We-Stand-Gun-Safety.aspx)
- 10 Things Parents Can Do to Prevent Suicide (/English/health-issues/conditions/emotional-problems/Pages/Ten-Things-Parents-Can-Do-to-Prevent-Suicide.aspx)
- Firearm-Related Injuries Affecting the Pediatric Population (http://pediatrics.aappublications.org/cgi/doi/10.1542/peds.2012-2481) (AAP Policy Statement)

About Dr. Schaechter:

Judy Schaechter, MD, MBA, FAAP, is a Professor of Public Health Sciences at the University of Miami Miller School of Medicine and past president of the national Injury Free Coalition for Kids. She is a past member of the American Academy of Pediatrics Council on Injury, Violence and Poison Prevention Executive Committee.

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MOMS DEMAND ACTION
FOR GUN SENSE IN AMERICA

NEWS & PRESS

New Analysis of One Year of Unintentional Child Gun Deaths in the U.S. Finds Nearly Two Children Killed Every Week, More Than 60 Percent Higher Than Federal Data Reflect

June 25, 2014

More than 70 Percent of These Tragedies Preventable By Responsible Gun Storage

New Poll Finds Strong Majorities – Including Gun Owners – Agree That Guns Should Be Locked and Unloaded, Support Criminal Charges When Children Access Negligently Stored Guns; www.Everytown.org/ChildAccess/

With kids out of school and playing at home over the coming summer months, Everytown for Gun Safety and Moms Demand Action for Gun Sense in America released a report today, "Innocents Lost: A Year of Unintentional Child Gun Deaths," a first-

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analysis that found at least 100 children were killed over a 12-month period. - almost two each week —is 61 percent higher than federal data reflect. Nearly two-thirds of these unintended shooting deaths (65 percent) took place in a

home or vehicle that belonged to the victim's family and more than two-thirds of the tragedies (70 percent) could have been avoided if gun owners stored their guns responsibly.

Everytown and Moms also released the findings of a new poll that found strong majorities of likely voters agree that kids and unsecured guns don't mix.

- 86 percent of Americans – and 77 percent of gun owners – agree that parents with guns in their homes should be required to keep them locked and unloaded.
- 73 percent of Americans – and 72 percent of gun owners – believe that doctors and teachers should be allowed to educate parents about responsible gun storage at home.
- 82 percent of Americans – and 81 percent of gun-owners – favor allowing law enforcement to charge adult gun owners with a crime when a minor gains access to a negligently stored gun and death or serious injury occur.

"This important study reveals the significant undercount of children who are unintentionally killed by guns – and that the majority of these tragedies could have been prevented by responsible firearm storage," said **Shannon Watts, founder of Moms Demand Action for Gun Sense in America, a part of Everytown for Gun Safety**. "When a child dies or is injured because a gun is left unsecured in a home, it's not an accident. Now that school's out for summer, more children will be playing at home throughout the next few months, making it even more important for gun owners to safely store their guns at home."

"Too often child gun deaths are reported as inevitable 'accidents', but our analysis found that more than two-thirds of these tragedies were entirely preventable – if only the firearm had been stored responsibly," said **John Feinblatt, president of Everytown for Gun Safety**. "Preventing doctors from talking to patients and parents about gun safety in the home – which the gun lobby has systematically tried to do in states across th ntry – puts our children's lives at risk. Sensible measures that will deter le gun storage respect the rights of lawful gun owners while also protecting m danger."

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Children's natural curiosity can turn an every day scenario into a deadly game of hide

Children's natural curiosity can turn an every day scenario into a deadly game of hide-and-seek — as highlighted in a recent video released by Everytown for Gun Safety. About a third of American children live in homes with firearms – and among them, 43 percent contain at least one unlocked firearm. In all, more than two million American children live in homes with unsecured guns, and 1.7 million live in homes with guns that

are both loaded and unlocked. The census of unintentional child gun deaths over the course of a year also found that:

- Toddlers age 2-4 have the highest risk of unintentionally shooting themselves.
- Children age 12-14 have the highest risk of being unintentionally shot by a peer.
- Boys were killed in unintentional shootings more than three times as often as girls. And boys were more than 10 times likely to be the shooter in an unintentional shooting as girls.
- The overwhelming majority of shootings occurred in a place likely thought of as safe – 84 percent of deaths occurred in the home or car of the victim's family, or in the home of a friend or relative.
- Handguns were used in 57 percent of the shootings, more than twice as many incidents as those involving long guns.
- In 58 percent of cases, the victim was killed by someone else, and in 36 percent the victim shot him or herself.
- Of the 66 shootings in which the firearm's legal owner was reported, 76 percent involved a gun that belonged to a parent or other family member.

"As this report so tragically illustrates, access to guns in the home puts our children at risk of serious injury or death. Young children are naturally curious – expecting them to follow safety rules as the only means to prevent gun injuries is a recipe for

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hat's why people who own guns have an absolute responsibility to store aded and locked out of reach of children," said Thomas K. McInerny, MD, FAAP, immediate past president of the American Academy of Pediatrics. "The AAP

urges local, state and federal lawmakers to enact the strongest possible laws to prevent firearm injuries and deaths."

"My nephew was killed with a gun that should never have been in a child's hands," said Ava Frisinger, whose nephew was killed in an unintentional gun death. "More than two million children live in homes with unsecured [JAS1] guns, and sadly we see almost twice a week how dangerous the consequences can be. We need to do more to keep kids away from unsecured firearms."

The report also reviews existing state laws and found that twenty-eight states and the District of Columbia have some laws on the books that, to varying degrees, allow law enforcement to bring criminal charges against gun owners if children access their guns. An interactive map that reviews state child access prevention laws is also available here.

Based on the findings of Everytown and Moms' analysis and existing scientific research, the report presents several ways to reduce the number of children killed in unintentional gun shootings – including enhancing responsible firearm storage by educating gun owners; deterring irresponsible storage practices with child access prevention laws; and fostering new technologies like smart guns. Everytown and Moms propose several specific recommendations to address the issue of unintentional child gun deaths:

- States should adopt stronger laws to prevent children from accessing unsecured guns, by authorizing criminal charges if an adult gun owner stores a gun negligently, a child gains access to the firearm, and some harm results.
- Congress should appropriate funds for research to improve public health data collection regarding unintended child gun deaths and to develop effective educational materials for promoting responsible gun storage.
- Congress should earmark funding for the Consumer Product Safety Commission to ate and set standards for emerging technologies that promote gun safety.

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ors should be allowed and encouraged to promote gun safety, and efforts to gag physicians should be opposed.

— Greater awareness of the issue should be promoted through a national public education campaign enlisting law enforcement, corporate, and non-profit partners.

Much like pool safety, there are simple, commonsense measures adults can take to save children's lives. In conjunction with the release of the report, Everytown and Moms also released today family-friendly tip sheets for safe firearm storage in the home. These tip sheets contain the simple steps responsible gun owners – and non-owners – can take to save children's lives.

If you're a member of the media, please send inquiries to media@momsdemandaction.org

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Soc Sci Med. 2007 Feb;64(3):656-64. doi: 10.1016/j.socscimed.2006.09.024. Epub 2006 Oct 27.

State-level homicide victimization rates in the US in relation to survey measures of household firearm ownership, 2001-2003

Matthew Miller [1], David Hemenway, Deborah Azrael

Affiliations

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Abstract

Two of every three American homicide victims are killed with firearms, yet little is known about the role played by household firearms in homicide victimization. The present study is the first to examine the cross sectional association between household firearm ownership and homicide victimization across the 50 US states, by age and gender, using nationally representative state-level survey-based estimates of household firearm ownership. Household firearm prevalence for each of the 50 states was obtained from the 2001 Behavioral Risk Factor Surveillance System. Homicide mortality data for each state were aggregated over the three-year study period, 2001-2003. Analyses controlled for state-level rates of aggravated assault, robbery, unemployment, urbanization, per capita alcohol consumption, and a resource deprivation index (a construct that includes median family income, the percentage of families living beneath the poverty line, the Gini index of family income inequality, the percentage of the population that is black and the percentage of families headed by a single female parent). Multivariate analyses found that states with higher rates of household firearm ownership had significantly higher homicide victimization rates of men, women and children. The association between firearm prevalence and homicide victimization in our study was driven by gun-related homicide victimization rates; non-gun-related victimization rates were not significantly associated with rates of firearm ownership. Although causal inference is not warranted on the basis of the present study alone, our findings suggest that the household may be an important source of firearms used to kill men, women and children in the United States.

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Firearm Storage in Gun-Owning Households with Children: Results of a 2015 National Survey

Deborah Azrael · Joanna Cohen · Carmel Salhi · Matthew Miller

Abstract Data from a nationally representative probability-based online survey sample of US adults conducted in 2015 ($n = 3949$, response rate 55%) were used to assess self-reported gun storage practices among gun owners with children. The presence of firearms and children in the home, along with other household and individual level characteristics, was ascertained from all respondents. Questions pertaining to household firearms (how guns are stored, number, type, etc.) were asked only of those respondents who reported that they personally owned a gun. We found that approximately one in three US households contains at least one firearm, regardless of whether children lived in the home (0.34 [0.29–0.39]) or not (0.35 [0.32–0.38]). Among gun-owning households with children, approximately two in ten gun owners store at least one gun in the least safe manner, i.e., loaded and unlocked (0.21 [0.17–0.26]); three in ten store all guns in the safest manner, i.e., unloaded and locked (0.29, [0.24–0.34]; and the remaining half (0.50 [0.45–0.55]) store firearms in some other way. Although firearm storage practices do not appear to vary across some demographic characteristics, including age, sex, and race, gun owners are more likely to store at least one gun loaded and unlocked if they are female (0.31 [0.23–0.41]) vs. male (0.17 [0.13–0.22]); own at least one handgun (0.27 [0.22–0.32] vs. no handguns (0.05 [0.02–0.15]); or own firearms for protection (0.29 [0.24–0.35]) vs. do not own for protection (0.03 [0.01–0.08]). Approximately 7% of US children (4.6 million) live in homes in which at least one firearm is stored loaded and unlocked, an estimate that is more than twice as high as estimates reported in 2002, the last time a nationally representative survey assessed this outcome. To the extent that the high prevalence of children exposed to unsafe storage that we observe reflects a secular change in public opinion towards the belief that having a gun in the home makes the home safer, rather than less safe, interventions that aim to make homes safer for children should address this misconception. Guidance alone, such as that offered by the American Academy of Pediatrics, has fallen short. Our findings underscore the need for more active and creative efforts to reduce children's exposure to unsafely stored firearms.

Keywords Firearms · Guns · Children · Storage · Suicide

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Introduction

In 2015, 1468 US children under the age of 18 died as the result of a gunshot wound and almost 7000 were non-fatally injured with a gun [1]. Of those children who died

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by firearm, 40% died either by suicide or as the result of an unintentional firearm injury, most often inflicted by themselves or another child [2]. In contrast to firearm deaths among adults, most firearm deaths of children, especially younger children, occur in their own homes [3]. For suicides and unintentional deaths, the gun used in the death almost always comes from the child's home [4].

A large body of evidence has shown that the presence of guns in a child's home substantially increases the risk of suicide and unintentional firearm death [5–18], though recent data suggest that few gun owners appreciate this risk [19]. Moreover, the risk of unintentional and self-inflicted firearm injury is lower in homes that store firearms unloaded (compared with loaded) and locked (compared with unlocked) [20]. In keeping with this evidence, guidelines intended to reduce firearm injury to children, first issued by the American Academy of Pediatrics (AAP) in 1992 [21], assert that whereas the safest home for a child is one without firearms, risk can be reduced substantially, although not eliminated, by storing all household firearms locked, unloaded, and separate from ammunition [20].

Only three nationally representative studies, and none since the early 2000s, have estimated the proportion of children living in homes where firearms are stored in the least safe manner (i.e., unlocked and loaded). Two of these studies used survey data from 1994 (the National Health Interview Survey and the Injury Control and Risk Survey) [22, 23]; the other used data from 2002 (the Behavioral Risk Factor Surveillance Survey) [24]. All three studies found that approximately 10% of gun-owning households with children contained at least one loaded and unlocked firearm.

Although household gun ownership rates in the USA have remained relatively stable over the past two decades [25], patterns of and reasons for gun ownership have shifted since the early 2000s, possibly affecting firearm storage practices. Over this period, millions of guns, the large majority of which are handguns, have been added to the US gun stock [26]. Handguns are more often owned for personal or household protection, compared to long guns [26], and are far more likely to be stored loaded and unlocked [27, 28]. Consistent with the shift in the gun stock, public opinion regarding the risks and benefits of having a firearm in the home also appear to have changed. According to polling conducted by Gallup, in 2000, approximately 35% of US adults believed that "a gun in the home makes it a safer place to be," whereas by 2014, 63% did [29].

The current study provides the first contemporary estimate in over 15 years of the number of US children who live in households with guns and, within these households, how firearms are stored.

Methods

Design and Sampling

Data for this analysis came from a nationally representative Web-based survey (The National Firearms Survey) designed by the investigators (D.A. and M.M.) to describe firearm ownership, storage, and use in the USA. The survey was conducted by the firm Growth for Knowledge (GfK) in April 2015. Respondents were drawn from GfK's KnowledgePanel, an online panel comprised of approximately 55,000 US adults sampled on an ongoing basis. Invitations to participate were sent by e-mail; one reminder e-mail was sent to non-responders 3 days later. All panel members, except those serving in the US Armed Forces at the time of the survey, were eligible to participate. To ensure reliable estimates, firearm owners and veterans were oversampled. Participants did not receive any specific incentive to complete the survey, although GfK has a point-based program through which participants accrue points for completing surveys and can redeem them later for cash, merchandise, or participation in sweepstakes. Additional details about the survey design and participants are available elsewhere [30].

Of the 7318 invited panel members who received the survey, 4165 began the survey and 3949 completed it (excluding 48 active-duty military personnel who began the survey but were ineligible to complete it). This yielded a survey completion proportion of 55% based on the formula recommended for calculating response proportions for Web panels [31]. Respondents were more likely than non-respondents to be younger, female, unmarried, less educated, and living in metropolitan areas. Respondents were about as likely as non-respondents to live in a firearm-owning house, but were more likely to personally own a firearm.

The study was approved by the Northeastern University Institutional Review Board.

Measures

Gun Ownership Status

The preamble to the survey read: "The next questions are about working firearms. Throughout this survey, we use the word *gun* to refer to any firearm, including pistols, revolvers, shotguns, and rifles, but not including air guns, bb guns, starter pistols, or paintball guns. By 'working guns', we mean guns that are in working order—that is capable of being fired." Immediately, following this preamble, respondents were asked "Do you or does anyone else you live with currently own any type of gun?" Those who responded affirmatively were asked a second question: "Do you personally own a gun?"

Only respondents who reported personally owning firearms were asked specific questions about household firearms, including the number and types of guns in the home, how guns were stored, and reasons for owning firearms. Specifically, respondents were asked: "Do you personally own any of the following types of guns? (handguns, long guns, other guns)," and then, for each firearm type owned by the respondent, "How many (handguns, long guns, other guns) do you own?" Thus, for each respondent, the total number of handguns, long guns, and "other" guns they owned could be tabulated.

Gun Storage

For each type of firearm (handgun, long gun, other), gun owners were asked to specify the number of guns they stored loaded and unlocked, loaded and locked, unloaded and unlocked, and unloaded and locked. Based on responses to these questions, for primary analyses, gun owners were sorted into one of three hierarchical, mutually exclusive, and collectively exhaustive categories: (1) those who stored at least one gun loaded and unlocked (the least safe storage method), (2) those who stored no guns loaded and unlocked but at least one gun loaded and locked, or unloaded and unlocked (the intermediate-risk category), and (3) those who stored all guns unloaded and locked (the safest storage method). The two types of storage in the intermediate-risk category were combined because the relative risk of a loaded and locked gun, compared with an unloaded and unlocked gun, was determined to be too context-specific to generalize about which is safer. Respondents ($n = 13$) who refused to answer any questions about how their guns were stored were excluded.

Demographic, Socio-Economic, and Firearm-Related Variables

Additional variables included in our analyses were age (18–29, 30–44, 45–59, ≥ 60), respondent gender, race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, other), education (< high school, high school degree, some college, ≥ Bachelor's degree), household income (< $25,000, $25,000–$59,999, $60,000–$99,999, ≥ $100,000), US region of residence (Northeast, Midwest, South, West), and rurality of residence (urban, suburban, rural). Whether or not the respondent had children living with them is reported as a mutually exclusive hierarchical variable: any child under 6 years old (yes/no), any child 6–12 years old but no child under 6 (yes/no), and any child 13–17, but no child under 13 (yes/no). Respondent political ideology was reported as liberal, moderate, or conservative. The type of guns owned by respondents was categorized as own at least one handgun vs. own no handguns. Respondents were asked for each type of gun they owned, to indicate their main reasons for ownership (protection against strangers, protection against people they knew, protection against animals, hunting, other sporting use, or for a collection). For this analysis, we include a binary variable: owns any type of firearm for protection against people vs. all other reasons.

Analysis

Analyses used survey weights provided by GfK that combined pre-sample and study-specific post-stratification weights accounting for oversampling and nonresponse, to produce nationally representative estimates with 95% confidence intervals, following the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines for reporting [32]. All bivariate and multivariate logistic regression analyses were conducted with Stata Version 14 (StataCorp LP, College Station, TX) using the SVY suite of commands.

We estimated the prevalence of children living in homes where guns are stored loaded and unlocked by multiplying the percentage of all households with children (obtained from 2015 Census data) by our survey-derived estimates of (a) the distribution of children in homes with vs. without firearms and (b) storage practices in homes with children and firearms.

Results

We find that approximately one in three US households contains at least one gun, whether the household includes children under the age of 18 (0.34 [0.29–0.39]) or not (0.35 [0.32–0.38]) (not shown). Among households with children, approximately two in ten store at least one gun loaded and unlocked (0.21, 95% CI 0.17–0.26), half store no guns loaded and unlocked, but have at least one gun either loaded and locked, or unloaded and unlocked (0.50, 95% CI 0.45–0.55), and three in ten store all guns unloaded and locked (0.29, 95% CI 0.24–0.34).

Gun storage practices do not vary significantly across most demographic characteristics of gun owners (Table 1), except gender: female gun owners in homes with children are more likely than are male gun owners in homes with children to store at least one gun loaded and unlocked (0.31 [0.23–0.41] vs. 0.17 [0.13–0.22]). Gun storage practices in homes with children also vary by US region, and the age of the youngest child in the household, although these results did not reach statistical significance. Those with older children only were more likely to store at least one gun loaded and unlocked than those with younger children (any child under 6, 0.17 [0.12–0.23]; no children under 6 and at least one child under 13, 0.22 [0.16–0.31]; no child under 13, 0.27 [0.19–0.37]). Households in which any gun is owned for protection are significantly more likely to contain a loaded and unlocked gun than are homes in which no guns are owned for protection (0.29 [0.24–0.35] vs. 0.03 [0.01–0.08]), as are households with at least one handgun, compared to those with no handguns (0.27 [0.22–0.32] vs. 0.05 [0.02–0.15].

A multiple logistic regression analysis (any gun loaded and unlocked vs. no gun loaded and unlocked) yielded consistent results. In a model adjusting for all of the respondent characteristics in Table 1, the adjusted odds for storing at least one household firearm loaded and unlocked was almost seven times higher for homes in which guns were owned for protection, compared with homes where guns were present but none were owned for protection (OR 6.94 [2.35–20.52]), more than four times higher in homes with handguns, compared to homes where all guns were long guns or other guns (OR 4.55 [1.44–14.39]), and almost twice as high for homes in which females owned firearms, compared to homes in which males owned firearms (OR 1.89 [1.04–3.43], Table 3 in Appendix).

Extrapolating from the reports of gun owners (i.e., that 21% of gun-owning households with children contain at least one gun that is both loaded and unlocked), we estimate that 7% of US households with children contain a loaded and unlocked gun (Table 2). Given that there were approximately 125 million US households in that year [33], 30% of which (37.5 million) included children under the age of 18, we estimate that about 13 million households with children (34%) contain at least one gun, and in approximately 2.7 million (21%) of these homes a gun is stored loaded and unlocked. Households with loaded and unlocked guns in our survey contained an average of 1.7 children, yielding an estimate of 4.6 million children (range 3.9–5.9 million) living in a household with a loaded and unlocked gun in 2015.

Discussion

Overall Firearm Storage Practices/Exposure

Consistent with prior national surveys, we find that approximately one-third of US households contain at least one gun, whether children live in the home or not [22, 26, 34]. Among gun-owning households, our finding that storage practices tend to be safer when children live in the home [23, 24, 27, 28, 34, 35], especially young children [22, 36], is also consistent with earlier work. By contrast, we find that nearly twice as many children live in homes where guns are stored loaded and unlocked, compared to the last nationally representative survey to assess this outcome (the 2002 BRFSS) [24]. For example, we find that approximately 21% of homes with children and guns store at least one gun loaded and unlocked, whereas the 2002 BRFSS estimates that approximately 8% of such homes had loaded and unlocked household firearms. Increases in the proportion of homes with children where firearms are stored loaded and unlocked, compounded by the growth of the US population of children since 2002, suggest that the number of children who live in homes with at least one loaded and unlocked firearm may have increased substantially over the past 15 years, from approximately 1.6 million to 4.6 million.

Three non-mutually exclusive reasons may contribute to the striking increase in the estimated number of children living in homes with guns stored unsafely: (1) growth in the US population; (2) a shift in the primary

Table 1 Firearm storage among US adult firearm owners with children under 18 in household

	No. (weighted %)	Unlocked/loaded	UU/LL	Locked/unloaded
	452 (100)	*0.21 [0.17–0.26]*	*0.50 [0.45–0.55]*	*0.29 [0.24–0.34]*
Age				
18–29	52 (17)	0.24 [0.14–0.38]	0.49 [0.35–0.63]	0.27 [0.16–0.42]
30–44	205 (51)	0.18 [0.13–0.25]	0.53 [0.46–0.61]	0.28 [0.22–0.36]
45–59	150 (26)	0.25 [0.18–0.33]	0.46 [0.37–0.55]	0.29 [0.22–0.38]
60+	45 (6)	0.24 [0.13–0.40]	0.44 [0.29–0.59]	0.32 [0.20–0.48]
Gender				
Male	329 (73)	0.17 [0.13–0.22]	0.54 [0.48–0.60]	0.29 [0.24–0.35]
Female*	123 (27)	0.31 [0.23–0.41]	0.40 [0.31–0.50]	0.28 [0.21–0.37]
Urbanicity				
Urban	62 (15)	0.19 [0.10–0.31]	0.53 [0.39–0.66]	0.29 [0.18–0.42]
Suburban	232 (51)	0.19 [0.14–0.25]	0.49 [0.42–0.57]	0.32 [0.25–0.39]
Rural	157 (34)	0.26 [0.19–0.35]	0.49 [0.41–0.58]	0.25 [0.18–0.33]
Race				
White	375 (78)	0.21 [0.17–0.26]	0.49 [0.44–0.55]	0.29 [0.25–0.34]
Black	20 (5)	0.22 [0.09–0.44]	0.52 [0.33–0.73]	0.26 [0.11–0.51]
Hispanic	31 (12)	0.18 [0.08–0.35]	0.52 [0.33–0.70]	0.30 [0.16–0.50]
Other	26 (4)	0.26 [0.08–0.59]	0.57 [0.31–0.80]	0.16 [0.07–0.34]
Region				
Northeast	54 (11)	0.14 [0.07–0.27]	0.54 [0.39–0.67]	0.33 [0.21–0.46]
Midwest	128 (26)	0.18 [0.11–0.26]	0.50 [0.41–0.60]	0.32 [0.24–0.41]
South	183 (42)	0.30 [0.23–0.38]	0.51 [0.43–0.59]	0.19 [0.14–0.26]
West	87 (21)	0.13 [0.07–0.23]	0.46 [0.34–0.58]	0.42 [0.30–0.54]
Education				
Less than high school	30 (8)	0.21 [0.09–0.40]	0.39 [0.22–0.59]	0.40 [0.23–0.61]
High school	94 (26)	0.22 [0.14–0.32]	0.56 [0.45–0.67]	0.22 [0.15–0.33]
Some college	156 (34)	0.25 [0.18–0.33]	0.46 [0.38–0.55]	0.29 [0.22–0.37]
Bachelor's degree or higher	172 (32)	0.17 [0.12–0.24]	0.52[0.44–0.60]	0.31 [0.24–0.39]
Income				
< 25,000	31 (6)	0.31 [0.15–0.52]	0.49 [0.30–0.69]	0.20 [0.09–0.37]
25,000–59,999	108 (24)	0.27 [0.18–0.37]	0.50 [0.39–0.60]	0.24 [0.16–0.33]
60,000–99,999	155 (37)	0.17 [0.12–0.25]	0.49 [0.41–0.58]	0.33 [0.26–0.42]
100,000+	158 (34)	0.20 [0.14–0.28]	0.51 [0.43–0.60]	0.29 [0.21–0.37]
Age of children in home (hierarchy)				
0 to 5	177 (42)	0.17 [0.12–0.23]	0.53 [0.45–0.61]	0.30 [0.24–0.38]
6 to 12	143 (32)	0.22 [0.16–0.31]	0.53 [0.44–0.62]	0.25 [0.18–0.34]
13 to 17	132 (26)	0.27 [0.19–0.37]	0.42 [0.32–0.51]	0.31 [0.23–0.41]
Political affiliation				
Liberal	59 (14)	0.15 [0.08–0.28]	0.54 [0.39–0.68]	0.31 [0.20–0.46]
Moderate	175 (41)	0.20 [0.15–0.28]	0.50 [0.42–0.59]	0.30 [0.23–0.38]
Conservative	212 (44)	0.24 [0.18–0.31]	0.48 [0.41–0.58]	0.28 [0.22–0.34]
Reason for ownership				
Any gun for protection***	307 (71)	0.29 [0.24–0.35]	0.51 [0.44–0.57]	0.20 [0.16–0.26]
No gun for protection	139 (29)	0.03 [0.01–0.08]	0.47 [0.38–0.57]	0.50 [0.40–0.59]
Type of guns owned				
Owns at least one handgun**	337 (75)	0.27 [0.22–0.32]	0.48 [0.42–0.54]	0.26 [0.21–0.31]
Owns no handguns	115 (25)	0.05 [0.02–0.15]	0.57 [0.47–0.67]	0.37 [0.28–0.48]

*p<0.05, **p<0.01, ***p<0.001

Table 2 Estimated number of US children exposed to firearms in the home

Storage*	% storage in gun-owning households with children**	% US households with children***	Mean number of children per household storage type	No. of US children < 18 exposed (millions)	
Loaded and unlocked	0.21	0.07	1.7	4.54	[3.7–5.6]
Loaded and locked or unloaded and unlocked	0.50	0.17	1.8	11.44	[10.3–12.6]
Unloaded and locked	0.29	0.10	1.8	6.64	[5.5–7.8]

*Hierarchical variable (1) at least one gun loaded and unlocked; (2) no guns loaded and unlocked, at least one gun loaded and locked OR unloaded and unlocked; (3) all guns unloaded and locked

**Per the National Firearms Survey, 34% of US households with children have one or more guns

***Per the US Census there were 124.59 million households in the US in 2015. Of these, 30% included children < 18 years old, yielding an estimated 37.4 million households with children

reasons people with and without children own guns, away from hunting and towards personal and home protection; and (3) methodological differences in the way that we assessed storage practices, compared to the approach taken in the BRFSS and other national studies. The first two reasons help explain a credible increase in exposure to unlocked, loaded firearms in general; the third suggests that some of the measured difference may be an artifact of systematic undercounting in prior reports due to the decision to elicit storage practice information from any household member, including non-gun-owning respondents, rather than as in our study, restricting questions to gun-owning respondents only.

Population Growth A portion, but not all, of the nearly threefold increase in the number of children exposed to unsafely stored firearms we observe may be accounted for by US population growth since 2002. According to US Census figures, the US population grew by approximately 4.6 million households 2002–2015, approximately one third of which were gun-owning households. Assuming our survey-derived estimate of 1.7–1.8 children per gun-owning household has roughly obtained over the past 15 years, we estimate that an additional 600,000 children are living in a household with a loaded and unlocked gun due to population growth alone.

Shifting Patterns of and Reasons for Gun Ownership Since the early 2000s, the composition of the US gun stock has shifted towards handguns (and away from long guns), and, consistent with the reasons people tend to own handguns, towards personal or household protection, and away from hunting or sporting uses alone [26]. Both these trends would be expected to lead to shifts in storage practices towards less safe storage, and in particular, towards household guns being stored loaded and unlocked [27, 28]. Consistent with the observed shift in the gun stock, public opinion regarding the risks and benefits of having a firearm in the home also appear to have changed: according to polling conducted by Gallup, for example, whereas in 2002, approximately 35% of US adults believed that "a gun in the home makes it a safer place to be," by 2014, 63% did [29]. Because the 2002 BRFSS does not ascertain the types of guns people own, or reasons for gun ownership, quantitative assessment of the extent to which this secular shift contributes to the observed increase in children living in homes with guns is not possible.

Survey Effects It is also possible that reports of household firearm storage from the BRFSS may have yielded underestimates of unsafe storage practices because of the well-established discrepancy between gun stock and gun storage estimates based on reports of subgroups more likely to personally own firearms, but no more likely to live in homes with guns (e.g., estimates based on reports by married men, compared with estimates based on reports of married women). This discrepancy is commonly referred to as the "reporting gap." Historically, the reporting gap is substantial. For example, prior work has found that married men, compared with married women, are far more likely to report that there is *any* gun in their household and, conditional on reporting any gun, that there are *more* guns in their household [37]. Moreover,

among people in two adult households with children, proxy reporters (i.e., non-gun-owning respondents who report living in homes with firearms) are more likely to report that guns are stored securely, compared with reports by gun owners themselves [38]. As a result of the reporting gap, most major recent surveys that have sought to estimate the stock of guns in the USA, or other characteristics of gun ownership (types and number of guns, etc.), have based their estimates on data provided by those who personally own guns only. Discrepancies due to the "reporting gap" might be compounded, to an indeterminate extent, because of reporting differences related to survey administration modes (e.g., random digit dial telephone survey vs. in-person vs. online), or to secular changes in proxy respondents' knowledge about, and willingness to report, how firearms are actually stored in their homes. Although we know of no studies to date that have examined these issues quantitatively, it seems plausible that the shift towards owning household guns for protection may have increased the likelihood that non-gun-owning women in households with firearms are more knowledgeable about the presence of guns and how they are stored.

Factors Associated with Unsafe Firearm Storage

Our finding that female gun owners in households with children, compared with male gun owners in homes with children, are more likely to store at least one gun loaded and unlocked has not, as far as we can tell, been previously reported. Given the actuarial risk that loaded and unlocked firearms (as well as firearms in general) pose to children, additional research on this issue is warranted.

Our finding that storing at least one gun loaded and unlocked is more common in the South, and among those who own handguns and firearms for protection are consistent with work on firearm storage in general (i.e., in all households, or in sub-populations such as veterans) [27, 28, 35, 39, 40]; however, we are not aware of any prior work that presents data on firearm storage in households *with children* with respect to any of these characteristics.

As with findings from all self-report surveys, our study's results should be interpreted in light of potential inaccuracies due to social desirability, recall, and other biases [41]. And while the magnitude of bias may vary for these possible sources of distortion, the direction of bias would likely be to underestimate, not overestimate, the prevalence of unsafe storage. In this regard, it is worth noting that online panel surveys, such as used here, have been shown to reduce social desirability bias and yield more accurate estimates of respondent characteristics than telephone surveys [42, 43]. In addition, prior research has validated survey responses to firearm questions on random-digit dial surveys, with false denials of gun ownership limited to approximately 10% [44, 45]. Another advantage of online panels is high completion rates for those who begin the survey [31]. Among gun owners in households with children, for example, only 2.8% ($n = 13$) declined to answer our questions about firearm storage. Finally, our survey completion rate (54.6%) is higher than rates for typical nonprobability, opt-in, online surveys (2–16%) [43], higher than those of previous national injury surveys that included questions about firearm ownership [46], and similar to those from other surveys conducted by GfK. Nevertheless, panel members who chose not to participate in our survey may have differed in important ways compared with panel members who chose to participate.

Despite these limitations, our study suggests that more than 1 in 15 US children (7%) live in a household in which at least one firearm is stored loaded and unlocked, and that the number of children who are exposed to unsafely stored guns appears to have grown substantially over the past 15 years. To the extent that the high prevalence of children exposed to unsafe storage that we observe reflects a secular change in public opinion towards the belief that having a gun in the home makes the home safer, rather than less safe, interventions that aim to make homes safer for children should address this misconception. Guidance alone, such as that offered by the American Academy of Pediatrics, has fallen short. Our findings underscore the need for more active and creative efforts to reduce children's exposure to unsafely stored firearms.

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Appendix 1

Table 3 Characteristics of gun owners with children who store firearms loaded and unlocked

	Any firearm loaded and unlocked (OR)	95% CI
Age		
18–29	Reference	
30–44	0.65	0.24–1.75
45–59	1.04	0.37–2.91
60+	0.97	0.26–3.68
Gender		
Male	Reference	
Female*	1.89	1.04–3.43
Urbanicity		
Urban	Reference	
Suburban	0.73	0.29–1.84
Rural	1.23	0.49–3.06
Race		
White	Reference	
Black	0.99	0.32–3.05
Hispanic	1.03	0.37–2.85
Other	1.09	0.29–4.20
Region		
Northeast	Reference	
Midwest	1.37	0.45–4.12
South	2.22	0.79–6.22
West	1.01	0.30–3.37
Education		
Less than high school	Reference	
High school	1.65	0.51–5.34
Some college	1.85	0.59–5.77
Bachelor's degree or higher	1.68	0.49–5.74
Income		
< 25,000	Reference	
25,000–59,999	0.94	0.30–2.97
60,000–99,999	0.41	0.13–1.30
100,000+	0.72	0.21–2.39
Age of children in home (hierarchy)		
0 to 5	Reference	
6 to 12	1.57	0.76–3.25
13 to 17	1.52	0.66–3.46
Political affiliation		
Liberal	Reference	
Moderate	1.90	0.73–4.94
Conservative	2.04	0.77–5.40
Reason for ownership		
Any gun for protection*	6.94	2.35–20.52
No gun for protection	Reference	
Type of guns owned		
At least one handgun*	4.55	1.44–14.39
No handguns	Reference	

References

1. Centers for Disease Control and Prevention, National Centers for Injury Prevention and Control. *Web-based Injury Statistics Query and Reporting System (WISQARS)* [online]. (2005) {cited 2018 Mar 15}. Available from: www.cdc.gov/injury/wisqars.
2. Hemenway D, Solnick SJ. Children and unintentional firearm death. *Inj Epidemiol*. 2015;2(1):26. https://doi.org/10.1186/s40621-015-0057-0.
3. Miller M, Azrael D, Hemenway D. Firearms and violent death in the United States. In: Webster DW, Vernick J, editors. *Reducing Gun Violence in America: informing Policy with Evidence and Analysis*. Baltimore, MD: John Hopkins University Press.
4. Grossman DC, Reay DT, Baker SA. Self-inflicted and unintentional firearm injuries among children and adolescents: the source of the firearm. *Arch Pediatr Adolesc Med*. 1999;153(8):875–8. https://doi.org/10.1001/archpedi.153.8.875.
5. Miller M, Hemenway D. The relationship between firearms and suicide: a review of the literature. *Aggress Violent Behav*. 1999;4(1):59–75. https://doi.org/10.1016/S1359-1789(97)00057-8.
6. Brent DA. Firearms and suicide. *Ann N Y Acad Sci*. 2001;932:225–40. https://doi.org/10.1111/j.1749-6632.2001.tb05808.x.
7. Anglemyer A, Horvath T, Rutherford G. The accessibility of firearms and risk for suicide and homicide victimization among household members: a systematic review and meta-analysis. *Ann Intern Med*. 2014;160(2):101-110. https://doi.org/10.7326/M13-1301.
8. Kellermann AL, Rivara FP, Somes G, Reay DT, Francisco J, Banton JG, et al. Suicide in the home in relation to gun ownership. *N Engl J Med*. 1992;327(7):467–72. https://doi.org/10.1056/NEJM199208133270705.
9. Brent DA, Perper J, Moritz G, Baugher M, Allman C. Suicide in adolescents with no apparent psychopathology. *J Am Acad Child Adolesc Psychiatry*. 1993;32(3):494–500. https://doi.org/10.1097/00004583-199305000-00002.
10. Brent DA, Perper JA, Allman CJ, Moritz GM, Wartella ME, Zelenak JP. The presence and accessibility of firearms in the homes of adolescent suicides. A case-control study. *JAMA*. 1991;266(21):2989–95. https://doi.org/10.1001/jama.1991.03470210057032.
11. Brent DA, Perper JA, Moritz G, Baugher M, Schweers J, Roth C. Firearms and adolescent suicide. A community case-control study. *Am J Dis Child*. 1993;147(10):1066–71. https://doi.org/10.1001/archpedi.1993.02160340052013.
12. Conwell Y, Duberstein PR, Connor K, Eberly S, Cox C, Caine ED. Access to firearms and risk for suicide in middle-aged and older adults. *Am J Geriatr Psychiatry*. 2002;10(4):407–16. https://doi.org/10.1097/00019442-200207000-00007.
13. Bailey JE, Kellermann AL, Somes GW, Banton JG, Rivara FP, Rushforth NP. Risk factors for violent death of women in the home. *Arch Intern Med*. 1997;157(7):777–82. https://doi.org/10.1001/archinte.157.7.777.
14. Wiebe DJ. Homicide and suicide risks associated with firearms in the home: a national case-control study. *Ann Emerg Med*. 2003;41(6):771–82. https://doi.org/10.1067/mem.2003.187.
15. Wintemute GJ, Parham CA, Beaumont JJ, Wright M, Drake C. Mortality among recent purchasers of handguns. *N Engl J Med*. 1999;341(21):1583–9. https://doi.org/10.1056/NEJM199911183412106.
16. Dahlberg LL, Ikeda RM, Kresnow M-J. Guns in the home and risk of a violent death in the home: findings from a national study. *Am J Epidemiol*. 2004;160(10):929–36. https://doi.org/10.1093/aje/kwh309.
17. Miller M, Azrael D, Hemenway D. Firearm availability and unintentional firearm deaths, suicide, and homicide among 5–14 year olds. *J Trauma*. 2002;52(2):265–7. https://doi.org/10.1097/00005373-200202000-00011.
18. Miller M, Azrael D, Hemenway D, Vriniotis M. Firearm storage practices and rates of unintentional firearm deaths in the United States. *Accid Anal Prev*. 2005;37(4):661–7. https://doi.org/10.1016/j.aap.2005.02.003.
19. Conner A, Azrael D, Miller M. Public opinion about the relationship between firearm availability and suicide: results from a national survey. *Ann Intern Med*. 2018;168(2):153–5. https://doi.org/10.7326/M17-2348.
20. Grossman DC, Mueller BA, Riedy C, Dowd MD, Villaveces A, Prodzinski J, et al. Gun storage practices and risk of youth suicide and unintentional firearm injuries. *JAMA*. 2005;293(6):707–14. https://doi.org/10.1001/jama.293.6.707.
21. Dowd MD, Sege R, Council on Injury, Violence, and Poison Prevention Executive Committee; American Academy of Pediatrics. Firearm-related injuries affecting the pediatric population. *Pediatrics*. 2012;130(5):e1416–23. https://doi.org/10.1542/peds.2012-2481.
22. Schuster MA, Franke TM, Bastian AM, Sor S, Halfon N. Firearm storage patterns in US homes with children. *Am J Public Health*. 2000;90(4):588–94. https://doi.org/10.2105/AJPH.90.4.588.
23. Stennies G, Ikeda R, Leadbetter S, Houston B, Sacks J. Firearm storage practices and children in the home, United States, 1994. *Arch Pediatr Adolesc Med*. 1999;153(6):586–90. https://doi.org/10.1001/archpedi.153.6.586.
24. Okoro CA, Nelson DE, Mercy JA, Balluz LS, Crosby AE, Mokdad AH. Prevalence of household firearms and firearm-storage practices in the 50 states and the District of Columbia: findings from the Behavioral Risk Factor Surveillance System, 2002. *Pediatrics*. 2005;116(3):e370–6. https://doi.org/10.1542/peds.2005-0300.
25. Smith TW, Son J. *Trends in gun ownership, 1972–2014*. Chicago, IL; 2015. http://www.norc.org/PDFs/GSS Reports/GSS_TrendsinGunOwnership_US_1972–2014.pdf. Accessed 2 March 2018
26. Azrael D, Hepburn L, Hemenway D, Miller M. The stock and flow of US firearms: results from the 2015 National Firearms Survey. *RSF Russell Sage Found J Soc Sci*. 2017;3(5):38–57. https://doi.org/10.7758/rsf.2017.3.5.02.
27. Weil DS, Hemenway D. Loaded guns in the home. Analysis of a national random survey of gun owners. *JAMA*. 1992;267(22):3033–7. https://doi.org/10.1001/jama.267.22.3033.
28. Crifasi CK, Doucette ML, McGinty EE, Webster DW, Barry CL. Storage practices of US gun owners in 2016. *Am J*

Public Health. 2018;108(4):532–7. https://doi.org/10.2105/AJPH.2017.304262.

29. McCarthy J. More than six in 10 Americans say guns make homes safer. *Gallup*. http://news.gallup.com/poll/179213/six-americans-say-guns-homes-safer.aspx. Published 2014. Accessed March 15, 2018.
30. Miller M, Hepburn L, Azrael D. Firearm acquisition without background checks: results of a national survey. *Ann Intern Med*. 2017;166(4):233–9. https://doi.org/10.7326/M16-1590.
31. Callegaro M, Disogra C. Computing response metrics for online panels. *Public Opin Q*. 2008;72(5):1008–32. https://doi.org/10.1093/poq/nfn065.
32. von Elm E, Altman D, Egger M, Pocock S, Gotzche P, Vandenbroucke J, et al. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *Ann Intern Med*. 2007;147:573–7. https://doi.org/10.7326/0003-4819-147-8-200710160-00010.
33. US Census. https://www.census.gov/data.html. Accessed March 15, 2018.
34. Johnson RM, Coyne-Beasley T, Runyan CW. Firearm ownership and storage practices, US households, 1992–2002. A systematic review. *Am J Prev Med*. 2004;27(2):173–82. https://doi.org/10.1016/j.amepre.2004.04.015.
35. Hemenway D, Solnick SJ, Azrael DR. Firearm training and storage. JAMA. 1995;273(1):46–50. https://doi.org/10.1001/jama.1995.03520250062035.
36. Johnson RM, Miller M, Vriniotis M, Azrael D, Hemenway D. Are household firearms stored less safely in homes with adolescents?: analysis of a national random sample of parents. *Arch Pediatr Adolesc Med*. 2006;160(8):788–92. https://doi.org/10.1001/archpedi.160.8.788.
37. Ludwig J, Cook PJ, Smith TW. The gender gap in reporting household gun ownership. *Am J Public Health*. 1998;88(11):1715–8. https://doi.org/10.2105/AJPH.88.11.1715.
38. Azrael D, Miller M, Hemenway D. Are household firearms stored safely? It depends on whom you ask. *Pediatrics*. 2000;106(3):E31. https://doi.org/10.1542/peds.106.3.e31.
39. Powell KE, Jacklin BC, Nelson DE, Bland S. State estimates of household exposure to firearms, loaded firearms, and handguns, 1991 through 1995. *Am J Public Health*. 1998;88(6):969–72. https://doi.org/10.2105/AJPH.88.6.969.
40. Simonetti J, Azrael D, Rowhani-Rahbar A, Miller M. Firearm storage practices and risk perceptions among a nationally representative of US Veterans with and without self harm risk factors. SLTB. 2018. https://doi.org/10.1111/sltb.12463https://doi.org/10.1111/sltb.12463
41. Marsden P, Wright J. In: 2nd, editor. *Handbook of survey research*. Bingley, UK: Emerald Group Publishing; 2010.
42. Kreuter F, Presser S, Tourangeau R. Social desirability bias in CATI, IVR, and Web Surveys: the effects of mode and question sensitivity. *Public Opin Q*. 2008;72(5):847–65. https://doi.org/10.1093/poq/nfn063.
43. Chang L, Krosnick J. National surveys via RDD telephone interviewing versus the internet: comparing sample representativeness and response quality. *Public Opin Q*. 2009;73(4):641–78. https://doi.org/10.1093/poq/nfp075.
44. Kellermann AL, Rivara FP, Banton J, Reay D, Fligner CL. Validating survey responses to questions about gun ownership among owners of registered handguns. *Am J Epidemiol*. 1990;131(6):1080–4. https://doi.org/10.1093/oxfordjournals.aje.a115600.
45. Rafferty AP, Thrush JC, Smith PK, McGee HB. Validity of a household gun question in a telephone survey. *Public Health Rep*. 1995;110(3):282–8.
46. Betz ME, Barber C, Miller M. Suicidal behavior and firearm access: results from the second injury control and risk survey. *Suicide Life Threat Behav*. 2011;41(4):384–91. https://doi.org/10.1111/j.1943-278X.2011.00036.x.

Unintentional Shootings

“Unintentional” is the description used in public health for an injury or death that was not caused purposely (in contrast with suicide and homicide, in which there is an intent to cause harm). Unintentional shootings can be self-inflicted or inflicted by someone else and can happen to Americans of all ages. Unintentional injuries and deaths are often called “accidents,” which can imply that nothing could be done to stop them from happening; we do not use “accident” terminology because gun violence is preventable. We must reduce unintentional gun deaths and injuries by, among other things, educating people about the risk that guns pose in the home, avoiding alcohol and gun use, training on proper firearm use, and advocating for safer storage.

Quick Facts about Unintentional Shootings

Each year, nearly 500 people die from unintentional firearm injuries — more than one person every single day.

Unintentional firearm injuries account for 37% of nonfatal firearm injuries but less than 2% of all gun deaths.

Americans are four times more likely to die from an unintentional gun injury than people living in other high-income countries.

Unsafely stored firearms increase the risk of unintentional firearm deaths.

EFSGV | THE EDUCATIONAL FUND TO STOP GUN VIOLENCE

Citations: CDC WONDER Database; Gani, Sakran, & Canner (2017); Solnick & Hemenway (2019); Weibe (2003); Miller, Azrael, & Hemenway (2001); Miller, Azrael, & Hemenway (2005).

UNINTENTIONAL SHOOTINGS, NOT ACCIDENTS

The public health approach is centered on the idea of prevention. As the Society for Public Health Education puts it, “Injuries are not accidents — they are not random incidents. Injuries have identified risk and protective factors making them preventable.”[1]

Unintentional deaths and injuries are often called accidents, which can imply that nothing could be done to stop them from happening. For this reason, we do not use “accident” terminology because gun violence is preventable.

This framework applies to other injuries like car crashes, falls, and drownings. Words matter!

BACKGROUND

In 2019, 486 Americans died from unintentional firearm injuries — about 1.2% of total gun deaths.[2]

Unintentional is the description used in public health for an injury or death that was not caused purposely (in contrast with suicide and homicide, in which there is an intent to cause harm). Unintentional shootings can be self-inflicted or inflicted by someone else. About half of all unintentional gun deaths are caused by another person pulling the trigger.[3] Each year, nearly 500 people die from unintentional firearm injuries — more than one person every single day.[4]

Much like other forms of gun violence, unintentional gun deaths are more likely to occur in the United States than in other high-income countries. Americans are four times more likely to die from an unintentional gun injury than those in comparable countries.[5]

THE CDC PLAYS A VITAL ROLE IN PROVIDING PUBLIC HEALTH DATA TO RESEARCHERS

Researchers need robust and reliable data on unintentional gun injuries and fatalities to study and develop solutions to address the epidemic of gun violence in the United States. The Centers for Disease Control and Prevention (CDC) is the federal agency responsible for protecting the health of Americans by ensuring that data is properly collected to develop solutions to our nation’s public health crises, including gun violence. The CDC’s National Violent Death Reporting System (NVDRS) plays an instrumental role to gun violence prevention advocates and researchers. The NVDRS uses death

certificates, police reports, and hospital records to report information about the victim, the cause of death, and the circumstances surrounding their death.[6] The CDC makes this data publicly available and easily accessible through their Web-based Injury Statistics Query and Reporting System (WISQARS).

MISCLASSIFICATION OF UNINTENTIONAL GUN INJURIES AND DEATHS

Although the CDC releases data on firearm injuries and deaths in the U.S., the data, especially related to firearm injuries, is not reliable. As a result of a lack of a robust and reliable data source, there are often misclassifications for firearm injuries and deaths. Due to these misclassifications and underreporting of gun injuries and deaths, we do not know the true burden of unintentional firearm injuries and deaths in the U.S.

According to a 2017 study, over half (50.2%) of all nonfatal gun injuries are assaults and over one-third (36.7%) are unintentional injuries. However, the unintentional category may be overreported because those with gun injuries may not admit that they were assaulted to either avoid law enforcement scrutiny or out of fear of retaliation.[7]

Data problems exist for fatal injuries, too. A 2011 study found that “As much as 38% of true cases of unintentional firearm deaths were missed, as were 42% of cases reported as false-positives.”[8] The study authors write, “In answer to the question, ‘Are there too many or too few unintentional firearm deaths in official mortality data?’ the best answer is, ‘Both.’ Many true accidents are missed, while many suicides and homicides are mistakenly reported as accidents.”

There is a critical need for accurate data on the burden of gun violence in the United States.

CIRCUMSTANCES IN WHICH UNINTENTIONAL SHOOTINGS CAN HAPPEN

One study found that, across all ages, the most common circumstances in which an unintentional gun death occurs are:[9]

- Playing with a gun (28.3%),
- Believing that the gun was not loaded (17.2%), and
- Hunting (13.8%).

This study also found that nearly a quarter of those who died from an unintentional firearm injury — and nearly half of all 20-29-year-olds who died from unintentional shootings — had consumed alcohol.[10]

GUN OWNERSHIP AND UNINTENTIONAL FIREARM DEATHS

Studies show that higher rates of household gun ownership and availability of guns are associated with higher rates of unintentional firearm deaths.[11,12,13] There is an association between unsafely stored firearms and unintentional gun deaths — one study found that states with higher rates of unsafely stored guns have higher rates of unintentional gun deaths.[14]

Children ages 5-14 were more likely to die from unintentional gun injuries if they lived in states where guns are more prevalent.[15,16] This trend holds for adults, too. A 2013 survey found that in New York, 10.3% of the adult population owns guns while 48.9% of Alabama's adult population owns guns.[17] Alabama's unintentional firearm death rate is 48 times that of New York.[18]

PREVENTING UNINTENTIONAL SHOOTINGS

SAFER STORAGE OF FIREARMS

Evidence shows that parents of adolescents — the most at-risk group in terms of unintentional firearm deaths — were more likely than parents of younger children to keep guns in the home stored unsafely (unlocked, loaded, or both).[19]

If a person chooses to store their firearm in the home, it is important to always practice safe firearm storage. For at-home firearm storage, it is widely recommended to store firearms locked and unloaded, store and lock ammunition separately from firearms, and ensure the key or lock combination is inaccessible to children or others who may be at risk for injury.

Safely storing and reducing access to firearms for the gun owner and other individuals, especially children, in the home is an unintentional injury prevention strategy supported by researchers, healthcare professionals, and gun owners alike. While there is no safer storage law at the federal level, various safer storage laws exist at the state level.[20]

Healthcare providers can also play a role in preventing unintentional firearm injuries by improving their patients' safer storage practices through lethal means safety counseling. Studies show that healthcare providers influencing patients' gun storage practices can substantially lower the risk of firearm-related injury.[21] For example, researchers found that for every five gun-owning parents whose child's pediatrician gave them lethal means safety counseling and free cable locks, two parents reported using

the cable locks six months later.[22] In addition to parents, lethal means safety counseling should be given to individuals who have risk factors for unintentional firearm injury, including people with risky alcohol or substance use and individuals with dementia or conditions impairing cognition and judgment.

To learn more, visit our page on lethal means safety counseling (https://efsgv.org/learn/policies/lethal-means-safety-counseling/).

ALCOHOL AND UNINTENTIONAL SHOOTINGS

Guns should never be handled after consuming alcohol and other substances. Alcohol use is a risk factor for all forms of gun violence, including unintentional injuries and deaths.[23] Alcohol can impair judgment and lead to violent behavior. Adding firearms to this already dangerous situation can be deadly.

Indeed, evidence shows that alcohol use is common in unintentional firearm deaths. A 2019 study found that nearly a quarter of those who died from an unintentional firearm injury — and nearly half of all 20-29-year-olds who died from unintentional shootings — had consumed alcohol.[24] For the oldest age group in the study (adults aged 60 or older), alcohol was involved in 11.3% of unintentional gun deaths.

DEMENTIA AND UNINTENTIONAL SHOOTINGS

Older adults living with dementia or conditions impairing cognition and judgment may be at an increased risk of firearm injury and death.[25] One-third of adults 65 and older own guns, and another 12% live in a household with a gun.[26] It is estimated that 60% of people living with dementia live in a household with a gun.[27]

People living with dementia who have a firearm in the home may pose a risk to themselves and others. Dementia may make a person unable to safely handle a firearm, and also may result in misperceptions of actual threats.[28] Further, dementia, and other diseases, could impair logical thinking and emotional control.[29]

Just as family members may consult with older relatives' physicians about concerns about their ability to drive or live alone, family members may also express concerns about their relatives' ability to use a firearm.[30] The Alzheimer's Association recommends removing firearms from the home of someone living with dementia to prevent unintentional shootings, recognizing that storing or locking up a firearm may not be enough.[31] Extreme risk laws may be an appropriate mechanism for removing firearms from an individual living with dementia. This tool has the potential to prevent all forms of gun violence, including unintentional shootings.

To learn more, visit our page on extreme risk laws. (https://efsgv.org/learn/policies/extreme-risk-laws/)

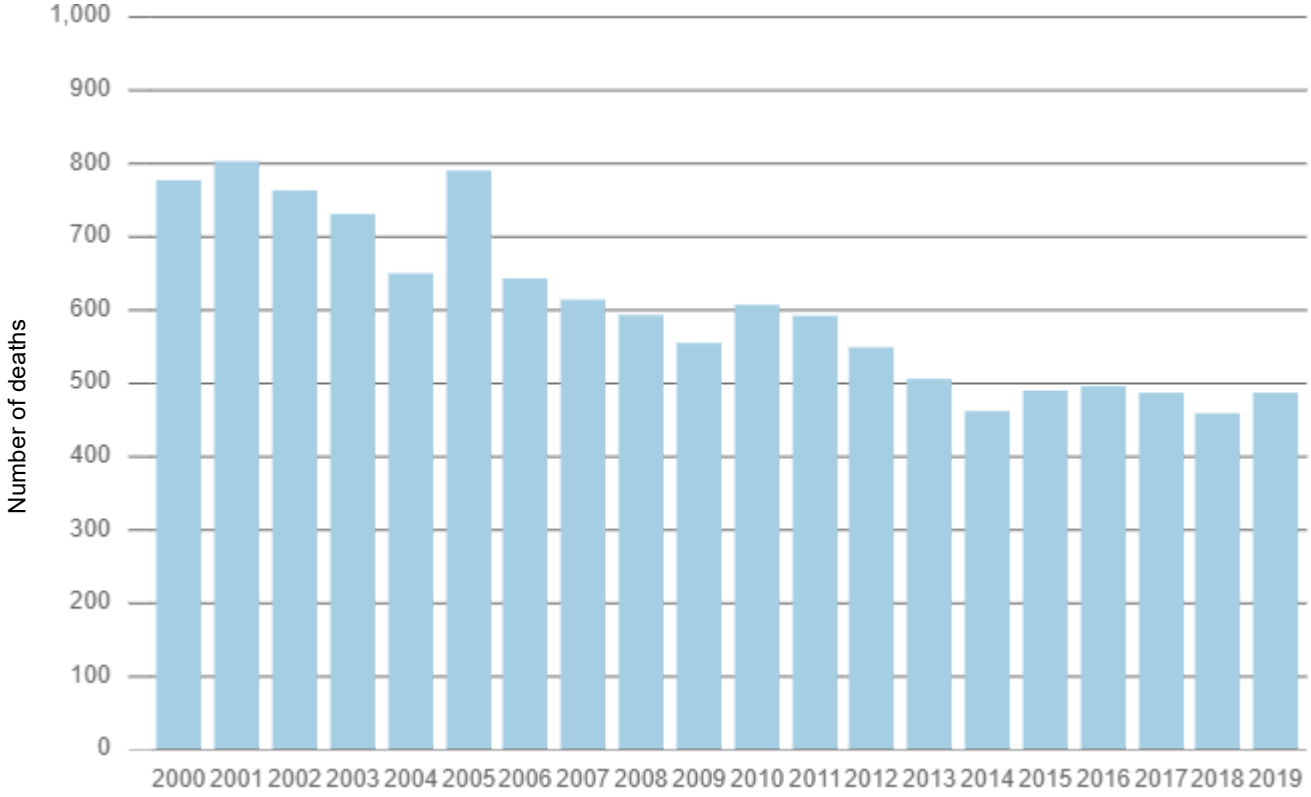
UNINTENTIONAL GUN INJURIES IN THE UNITED STATES

Annually, more than 27,000 individuals are admitted to the emergency department for unintentional firearm injuries. The vast majority of these individuals, more than 26,000, do not succumb to their injuries and die. In fact, unintentional firearm injuries account for 37% of all nonfatal firearm injuries but less than 2% of all gun deaths.[32] The lethality of unintentional firearm injuries is far less than any other type of gun violence. According to Nationwide Emergency Department Sample (NEDS) and CDC data, two out of every 100 unintentional firearm injuries are fatal.[33] However, as previously mentioned, some nonfatal injuries classified as unintentional may actually be the result of an assault. Regardless, the vast majority of unintentional firearms injuries are not fatal.

UNINTENTIONAL FIREARM DEATHS IN THE UNITED STATES

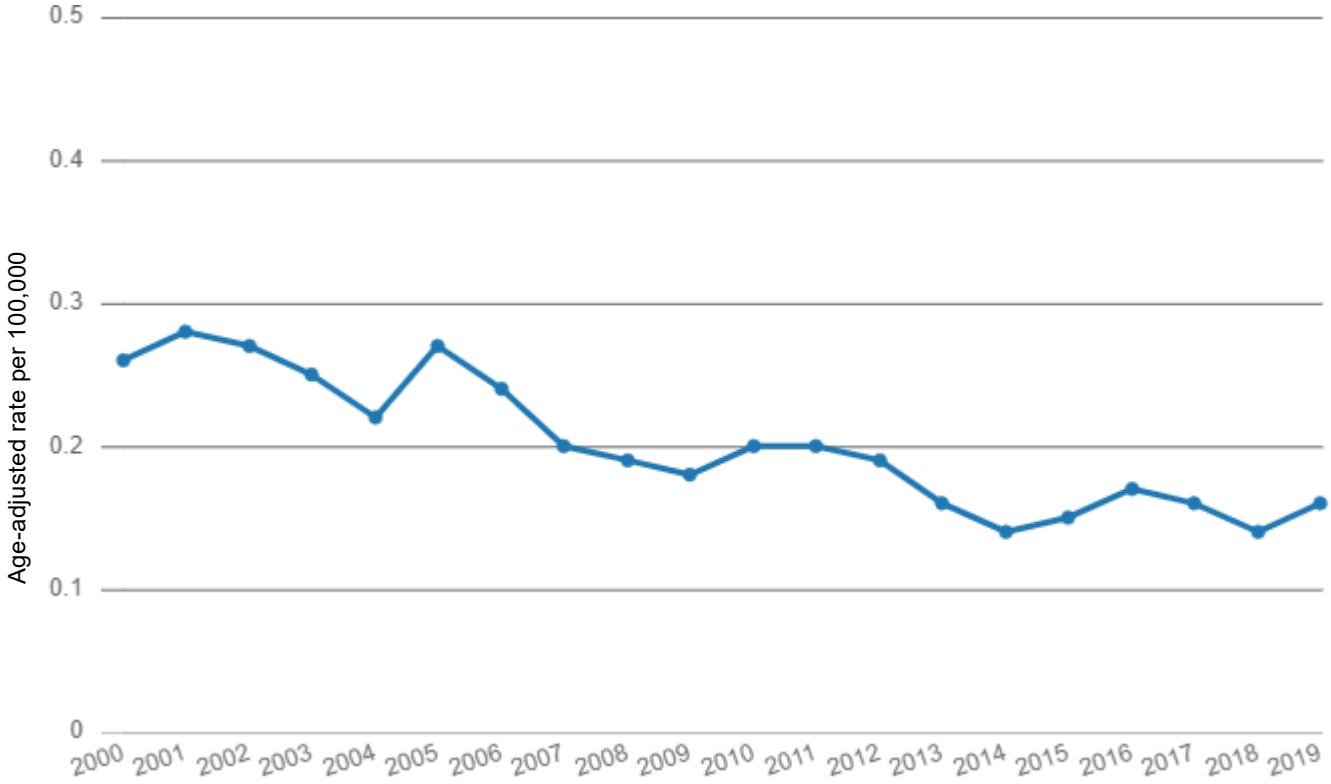
Although there are still far too many unintentional firearm deaths, the number of unintentional firearm deaths has decreased over the past two decades. In the first decade of the 21st century, there were 691 annual unintentional firearm deaths (all ages); in contrast, in the second decade (2010-2019), there were 512 annual unintentional firearm deaths (all ages), a 35% decrease. Similarly, the number of unintentional firearm deaths among children and teens (ages 0-19) dropped by 23%, from an average of 154 annually from 2000-2009 to 118 annually from 2010-2019.[34] The expansion of interventions to improve safer firearm storage and handling practices may contribute to further decreases in unintentional firearm deaths in the years to come.

UNINTENTIONAL FIREARM DEATHS IN THE UNITED STATES, 2000-2019



Source: CDC WONDER.

UNINTENTIONAL FIREARM DEATH RATE IN THE UNITED STATES, 2000-2019



Source: CDC WONDER.

All rates listed are age-adjusted in order to allow for accurate comparisons between populations with differing age distributions.

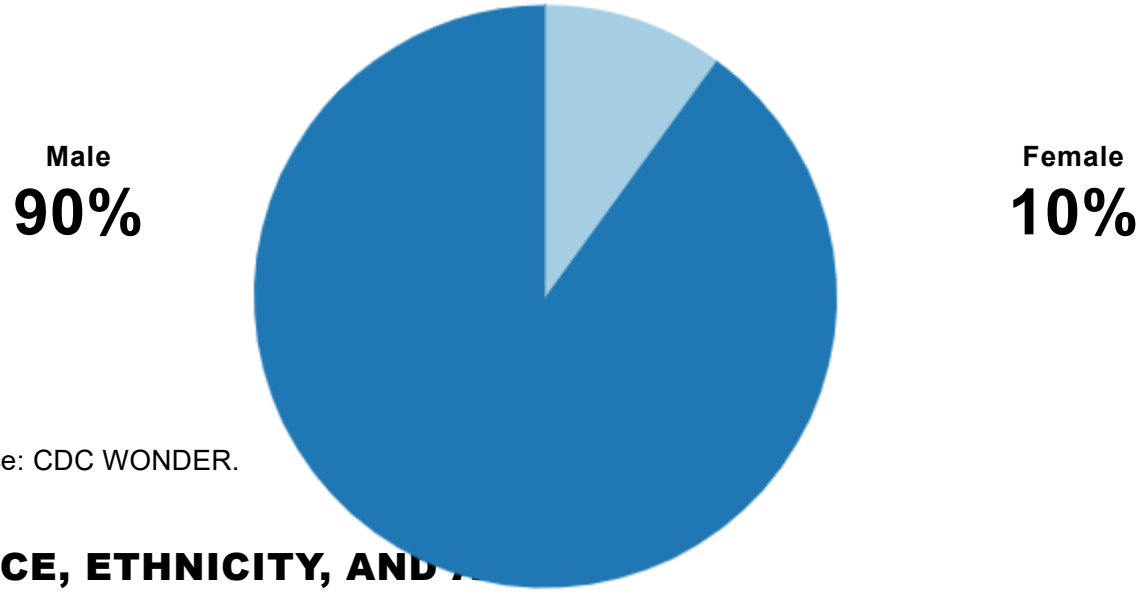
DISPARITIES ACROSS DEMOGRAPHICS

Across all ages, races, and ethnicities, males die from unintentional shootings more often than females. Among males, Black men ages 20-34 are at the highest risk of dying from an unintentional shooting. Among females, Black females ages 0-19 are at the highest risk of dying from an unintentional shooting.[35]

BY SEX

The vast majority of victims of unintentional shootings are male. In 2019, 90% of unintentional gun death victims were male.[36] For both self-inflicted and other-inflicted unintentional gun deaths, the lowest percentage of male victims occurs in the youngest age group: those 0 to 9 years old.[37]

UNINTENTIONAL FIREARM DEATHS BY SEX, 2019



Source: CDC WONDER.

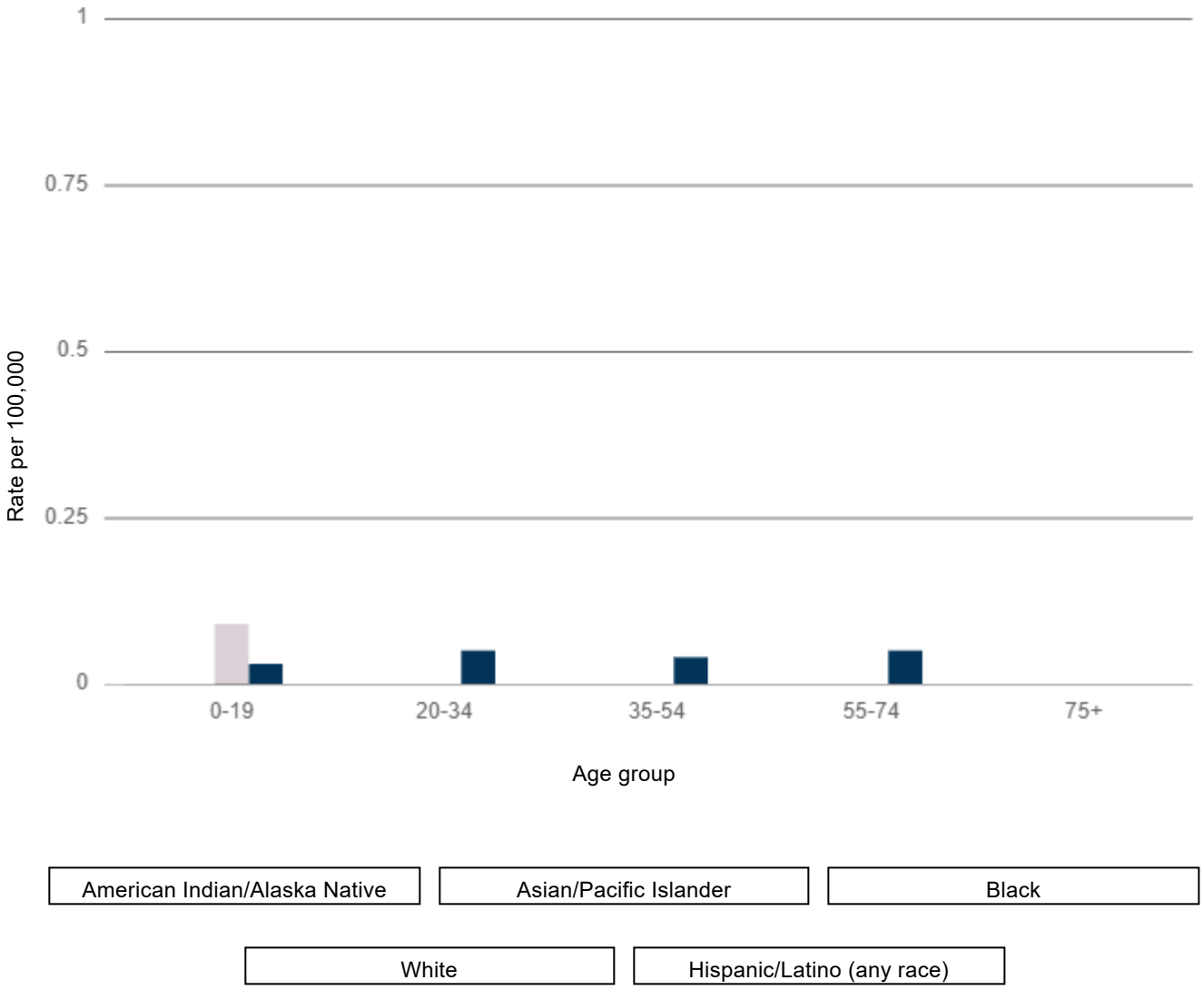
BY RACE, ETHNICITY, AND A

Half (52%) of unintentional firearm deaths occur under the age of 35. Nearly one-quarter of all unintentional firearm decedents are 0-19 years old and 28% of all unintentional firearm decedents are 20-34 years old.[38]

One study found that victims were more likely to be unintentionally shot by someone else the younger they were. Over three quarters (78%) of unintentional firearm deaths for children 0-14 were caused by someone else while the majority of unintentional shootings among older Americans were self-inflicted.[39]

It is important to note that when looking at unintentional gun deaths for both males and females by age, race, and ethnicity, the subgroups have few deaths and as a result, much of the data is unreliable or suppressed. Black males ages 20-34 are at highest risk. For females, Black youth ages 0-19 are at highest risk, though the rates for all races and ethnicities for women are small. Rates of unintentional gun deaths for White women are similar across most of the lifespan.[40]

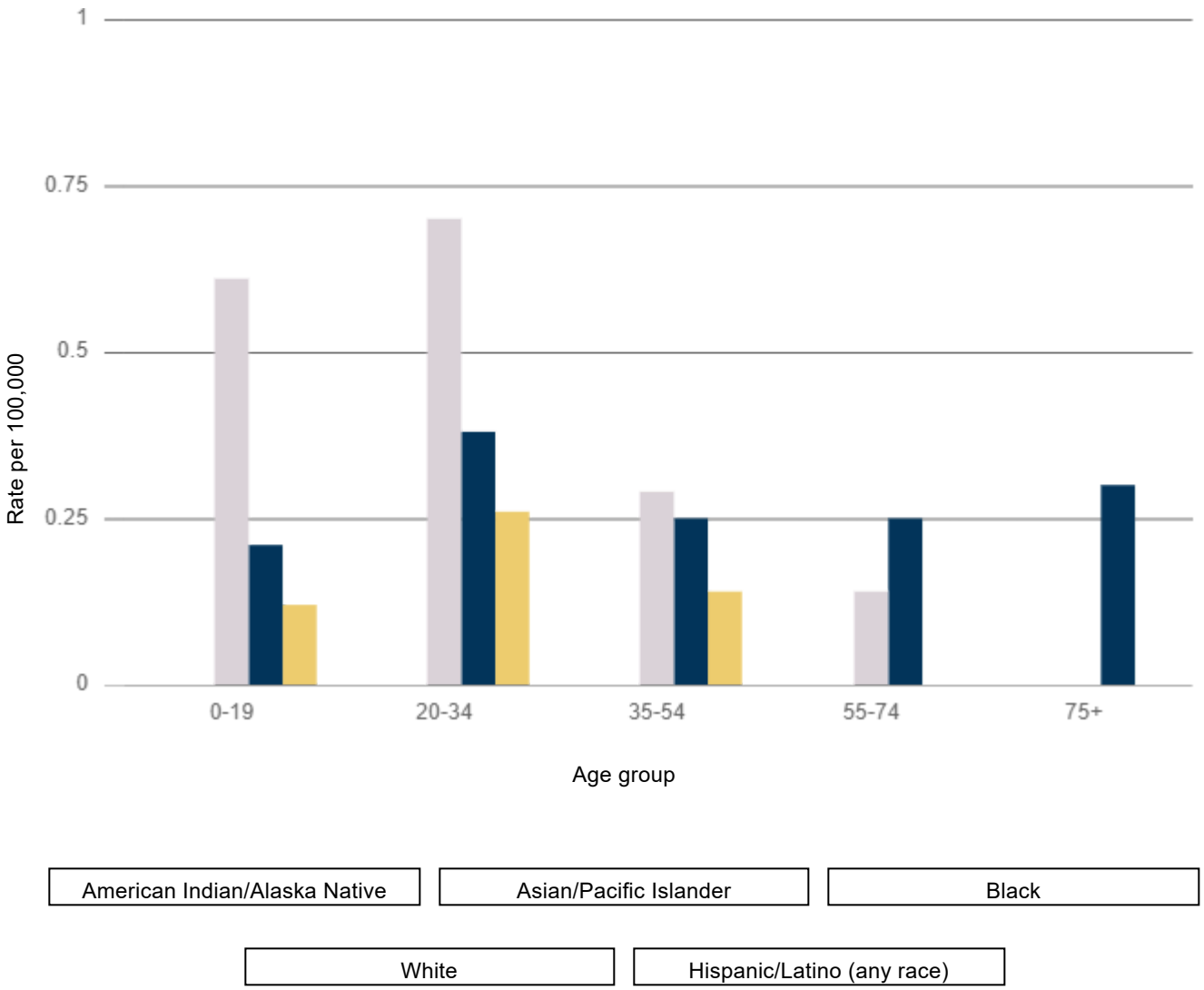
FEMALE UNINTENTIONAL FIREARM DEATH RATES BY RACE, ETHNICITY, AND AGE, 2015-2019



Source: CDC WONDER.

Note: The CDC considers unintentional firearm death rates based on fewer than 20 deaths “statistically unreliable” and suppresses unintentional firearm death rates based on fewer than 10 deaths. Fewer than 20 unintentional firearm death rates were reported during this time period for the following races and Hispanic Origin category and therefore are omitted from the above chart: American Indian/ Alaska Native females all ages; Asian/ Pacific Islander females all ages; Black females ages 20-34, 35-54, 55-74, 75+; White females ages 75+; and Hispanic/Latino females all ages.

MALE UNINTENTIONAL FIREARM DEATH RATES BY RACE, ETHNICITY, AND AGE, 2015-2019



Source: CDC WONDER.

Note: The CDC considers unintentional firearm death rates based on fewer than 20 deaths “statistically unreliable” and suppresses unintentional firearm death rates based on fewer than 10 deaths. Fewer than 20 unintentional firearm death rates were reported during this time

period for the following races and Hispanic Origin category and therefore are omitted from the above chart: American Indian/ Alaska Native males all ages; Asian/ Pacific Islander males all ages; Black males ages 75+; and Hispanic/Latino males 55-74, 75+.

GEOGRAPHICAL VARIATIONS

There is wide regional variation in where unintentional shootings occur. More than half of all individuals who die by unintentional gun injuries live in the South.[41] Individuals who live in the South are more than three times more likely to die by an unintentional shooting compared to those living in the Northeast.[42] In 2019, the five states with the highest rates of unintentional shooting deaths were all in the South. Alabama had the highest unintentional death rate, followed by Kentucky, North Carolina, Missouri, and Georgia. This regional variation may be linked to the strength of state gun violence prevention laws. For example, states in the Northeast region tend to have stronger gun laws than states in the South.[43] States with strong gun laws have been found to be associated with lower unintentional firearm injuries.[44]

RECOMMENDATIONS

Enact and implement programs and practices that promote safer firearm storage and handling.

Easy access to firearms, particularly unsecured firearms and the presence of firearms in risky situations, increases risk of unintentional injury and death by firearm. Mitigating access with safer storage practices and through evidence-based policy prevents unintentional gun violence. Shifting behaviors related to firearm storage and handling practices may contribute to further decreases in unintentional firearm injuries and deaths in the years to come. We recommend:

- **Safer storage:** Safely storing and thereby reducing access to firearms is an unintentional injury prevention strategy supported by researchers, healthcare professionals, and gun owners alike. For at-home firearm storage, firearms should be stored locked and unloaded, ammunition should be stored and locked separately from firearms, and the key or lock combination should be inaccessible to children and adolescents or others at elevated risk of harm to self or others. Storing firearms outside of the home is the safest option.
- **Safety technologies:** Technological solutions have the potential to reduce firearm injury. We encourage the development and evaluation of technological solutions to improving the safety of firearms and storage devices.

- **Lethal means safety counseling:** Lethal means safety counseling is an evidence-based healthcare intervention that is effective in preventing unintentional firearm injuries and deaths. Lethal means safety counseling helps providers work collaboratively with gun-owning patients and their families to reduce risk of injury by improving their patients' safer storage practices. Healthcare professionals should be trained on lethal means safety counseling as an unintentional injury prevention intervention. All patients and parents/guardians of pediatric patients should be asked about firearms access and provided safer storage information. Patients at elevated risk of unintentional injury, such as individuals with dementia or conditions impairing cognition and judgment, should receive more in-depth lethal means safety counseling. See Lethal Means Safety Counseling (https://efsgv.org/learn/policies/lethal-means-safety-counseling/) for more information.

- **Extreme risk laws:** Extreme risk laws empower law enforcement and the people closest to an individual at elevated risk of harm to self or others to intervene to help prevent gun tragedies before they occur. These state laws allow law enforcement, and in some states family and household members, among others, to petition a judge to temporarily limit an individual's access to firearms if they are at elevated risk of violence. Extreme risk laws may be an appropriate mechanism for removing firearms from an individual who is at high risk for unintentional injury, including individuals living with dementia or other conditions impairing cognition and judgment. Every state should have its own extreme risk law and continuously monitor and evaluate the law to ensure equitable implementation and ongoing effectiveness. See Extreme Risk Laws (https://efsgv.org/learn/policies/extreme-risk-laws/) for more information.

- **Avoid alcohol and other substances when accessing guns:** Just like driving a car, alcohol and other substances increase risk of violence and injury. Firearm access should be limited after consuming alcohol and other substances.

RESOURCES

EDUCATIONAL MATERIALS

- Firearm Child Access Prevention in Virginia (http://efsgv.org/wp-content/uploads/2019/06/Virginia-Child-Access-Prevention-June-2019.pdf)

RESEARCH

- () Fowler KA, Dahlberg LL, Haileyesus T, & Annest JL. (2015). Firearm injuries in the United States. (https://www.ncbi.nlm.nih.gov/pubmed/26116133)*Preventive Medicine.*

- () Gani F, Sakran JV, & Canner JK. (2017). Emergency department visits for firearm-related injuries in the United States, 2006–14. (https://www.healthaffairs.org/doi/abs/10.1377/hlthaff.2017.0625)*Health Affairs. Appendix 13.*
- () Guetschow B, Lilienthal M, & Willey M. (2018). Unintentional firearm injuries remain prevalent over a 12 year experience at a rural midwestern level 1 trauma center. (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6047385/)*Iowa Orthopaedic Journal.*
- () Hemenway D, Barber C, & Miller M. (2010). Unintentional firearm deaths: a comparison of other-inflicted and self-inflicted shootings (https://www.ncbi.nlm.nih.gov/pubmed/20441829). *Accident Analysis and Prevention.*
- () Hemenway D & Solnick SJ. (2015). Children and unintentional firearm death. (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4602049/)*Injury Epidemiology.*
- () Miller M, Azrael D, & Hemenway D. (2001). Firearm availability and unintentional firearm deaths. (https://www.sciencedirect.com/science/article/abs/pii/S0001457500000610) *Accident Analysis and Prevention.*
- () Miller M, Azrael D, & Hemenway D. (2002). Firearm availability and unintentional firearm deaths, suicide, and homicide among 5-14 year olds. (https://www.ncbi.nlm.nih.gov/pubmed/11834986) *Journal of Trauma.*
- () Miller M, Azrael D, Hemenway D, & Vriniotis M. (2005). Firearm storage practices and rates of unintentional firearm deaths in the United States. (https://www.ncbi.nlm.nih.gov/pubmed/15949457) *Accident Analysis and Prevention.*
- () Solnick SJ & Hemenway D. (2019). Unintentional firearm deaths in the United States 2005–2015. (https://www.ncbi.nlm.nih.gov/pubmed/31637153) *Injury Epidemiology.*
- () Wiebe DJ. (2003). Firearms in US homes as a risk factor for unintentional gunshot fatality. (https://www.ncbi.nlm.nih.gov/pubmed/12850071) *Accident Analysis and Prevention.*

ADDITIONAL RESOURCES

- () American Academy of Pediatrics's Gun Safety and Children (https://www.aap.org/en-us/about-the-aap/aap-press-room/campaigns/gun-safety/Pages/default.aspx)
- () Firearm Safety Among Children and Teens (FACTS) Consortium's "Safe Storage" video (https://youtu.be/tExYuQKaFec)
- () How Gun Policies Affect Unintentional Injuries and Deaths (https://www.rand.org/research/gun-policy/analysis/unintentional-injuries.html) from the RAND Corporation

- () Harvard Injury Control Research Center's (https://www.hsph.harvard.edu/hicrc/firearms-research/gun-threats-and-self-defense-gun-use/) information on "Accidents"
- () The National Crime Prevention Council and the Advertising Council's Lock It Up campaign (https://www.safefirearmsstorage.org/)
- () Safe States's Injury Prevention Inventory: Unintentional Firearm Injury (https://www.safestates.org/page/IPI_UninFirearm_pg15)

Last updated February 2021

1. Injury Prevention (https://www.sophe.org/focus-areas/injury-prevention/). Society for Public Health Education.
2. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2019 (http://wonder.cdc.gov/ucd-icd10.html).
3. Hemenway D, Barber C, & Miller M. (2010). Unintentional firearm deaths: a comparison of other-inflicted and self-inflicted shootings (https://www.ncbi.nlm.nih.gov/pubmed/20441829). *Accident Analysis and Prevention*.
4. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2018 (http://wonder.cdc.gov/ucd-icd10.html).
5. Solnick SJ & Hemenway D. (2019). Unintentional firearm deaths in the United States 2005–2015 (https://www.ncbi.nlm.nih.gov/pubmed/31637153). *Injury Epidemiology.*
6. National Violent Death Reporting System (NVDRS) (https://www.cdc.gov/violenceprevention/datasources/nvdrs/index.html). Centers for Disease Control and Prevention.
7. Gani F, Sakran JV, & Canner JK. (2017). Emergency department visits for firearm-related injuries in the United States, 2006–14 (https://www.healthaffairs.org/doi/abs/10.1377/hlthaff.2017.0625). *Health Affairs.* Appendix 13.
8. Barber C & Hemenway D. (2011). Too Many or Too Few Unintentional Firearm Deaths in Official U.S. Mortality Data? (https://www.ncbi.nlm.nih.gov/pubmed/21376860) *Accident Analysis and Prevention*.

9. Solnick SJ & Hemenway D. (2019). Unintentional firearm deaths in the United States 2005–2015 (https://www.ncbi.nlm.nih.gov/pubmed/31637153). *Injury Epidemiology.*

10. Solnick SJ & Hemenway D. (2019). Unintentional firearm deaths in the United States 2005–2015 (https://www.ncbi.nlm.nih.gov/pubmed/31637153). *Injury Epidemiology.*

11. Wiebe DJ. (2003). Firearms in US homes as a risk factor for unintentional gunshot fatality (https://www.ncbi.nlm.nih.gov/pubmed/12850071). *Accident Analysis and Prevention.*

12. Miller M, Azrael D, & Hemenway D. (2001). Firearm availability and unintentional firearm deaths (https://www.sciencedirect.com/science/article/abs/pii/S0001457500000610). *Accident Analysis and Prevention*

13. Miller M, Azrael D, Hemenway D, & Vriniotis M. (2005). Firearm storage practices and rates of unintentional firearm deaths in the United States (https://www.ncbi.nlm.nih.gov/pubmed/15949457). *Accident Analysis and Prevention.*

14. Miller M, Azrael D, Hemenway D, & Vriniotis M. (2005). Firearm storage practices and rates of unintentional firearm deaths in the United States (https://www.ncbi.nlm.nih.gov/pubmed/15949457). *Accident Analysis and Prevention.*

15. Miller M, Azrael D, & Hemenway D. (2002). Firearm availability and unintentional firearm deaths, suicide, and homicide among 5-14 year olds. (https://www.ncbi.nlm.nih.gov/pubmed/11834986) *Journal of Trauma.*

16. Per the study authors, Gun availability was assessed using three measures: (1) Cook's Index, calculated using mortality statistics among the adult U.S. population, and defined as the average of two proportions: (1/2) (firearm suicides/all suicides) (firearm homicides/all homicides) (2) FS/S, the percentage of suicides among adults that are firearm suicides; and (3) the percentage of households that reported owning a firearm in the BRFSS survey of a nonrandom 21 states (Household gun).

17. Kalesan B, Villarreal MD, Keyes KM, & Galea S. (2016). Gun ownership and social gun culture (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4809774/). *Injury Prevention*.

18. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2018 (http://wonder.cdc.gov/ucd-icd10.html). 5-year-average for 2014-2018.

19. Johnson RM, Miller M, Vriniotis M, Azrael D, & Hemenway D. (2006). Are Household Firearms Stored Less Safely in Homes With Adolescents?: Analysis of a National Random Sample of Parents (https://www.ncbi.nlm.nih.gov/pubmed/16894076). *Archives of Pediatric & Adolescent Medicine.*

20. Giffords Law Center. Safe Storage (https://lawcenter.giffords.org/gun-laws/policy-areas/child-consumer-safety/safe-storage/).

21. Grossman DC, Mueller BA, Riedy C, Dowd MD, Villaveces A, Prodzinski J, et al. (2005). Gun storage practices and risk of youth suicide and unintentional firearm injuries (https://pubmed.ncbi.nlm.nih.gov/15701912/). *Journal of the American Medical Association*.

22. Barkin SL, Finch SA, Ip EH, Scheindlin B, Craig JA, Steffes J, & Wasserman RC. (2008). Is office-based counseling about media use, timeouts, and firearm storage effective? Results from a cluster-randomized, controlled trial (https://www.ncbi.nlm.nih.gov/pubmed/18595960). *Pediatrics.*

23. McGinty EE & Webster DW. (2017). The roles of alcohol and drugs in firearm violence (https://www.ncbi.nlm.nih.gov/pubmed/28055044). *JAMA Internal Medicine*.

24. Solnick SJ & Hemenway D. (2019). Unintentional firearm deaths in the United States 2005–2015 (https://www.ncbi.nlm.nih.gov/pubmed/31637153). *Injury Epidemiology.*

25. Galluzzi K & Warner-Maron I. (2018). Guns and older adults: The physicians role (https://jaoa.org/article.aspx?articleid=2716918). *The Journal of the American Osteopathic Association.*

26. Betz ME, McCourt AD, Vernick JS, Ranney ML, & Wintemute GJ. (2018). Firearms and dementia (https://www.ncbi.nlm.nih.gov/pubmed/30452572). *Annals of Internal Medicine*.

27. Betz ME, McCourt AD, Vernick JS, Ranney ML, & Wintemute GJ. (2018). Firearms and dementia (https://www.ncbi.nlm.nih.gov/pubmed/30452572). *Annals of Internal Medicine*.

28. Galluzzi K & Warner-Maron I. (2018). Guns and older adults: The physician's role (https://jaoa.org/article.aspx?articleid=2716918). *The Journal of the American Osteopathic Association.*

29. Galluzzi K & Warner-Maron I. (2018). Guns and Older Adults: The Physician's Role (https://jaoa.org/article.aspx?articleid=2716918). *The Journal of the American Osteopathic Association.*

30. Betz ME, McCourt AD, Vernick JS, Ranney ML, & Wintemute GJ. (2018). Firearms and dementia (https://www.ncbi.nlm.nih.gov/pubmed/30452572). *Annals of Internal Medicine*.

31. Alzheimer's Association. (2017). Firearm Safety (https://www.alz.org/national/documents/topicsheet_firearm_safety.pdf).

32. Gani F, Sakran JV, & Canner JK. (2017). Emergency department visits for firearm-related injuries in the United States, 2006–14 (https://www.healthaffairs.org/doi/abs/10.1377/hlthaff.2017.0625). *Health Affairs.* Appendix 13.

33. Gani F, Sakran JV, & Canner JK. (2017). Emergency department visits for firearm-related injuries in the United States, 2006–14 (https://www.healthaffairs.org/doi/abs/10.1377/hlthaff.2017.0625). *Health Affairs.* Appendix 13.

34. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2019 (http://wonder.cdc.gov/ucd-icd10.html).

35. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2019 (http://wonder.cdc.gov/ucd-icd10.html).

36. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2019 (http://wonder.cdc.gov/ucd-icd10.html).

37. Solnick S & Hemenway D. (2019). Unintentional firearm deaths in the United States 2005–2015 (https://www.ncbi.nlm.nih.gov/pubmed/31637153). Injury Epidemiology.

38. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2019 (http://wonder.cdc.gov/ucd-icd10.html).

39. Hemenway D, Barber C, & Miller M. (2010). Unintentional firearm deaths: a comparison of other-inflicted and self-inflicted shootings (https://www.ncbi.nlm.nih.gov/pubmed/20441829). *Accident Analysis and Prevention*.

40. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2019 (http://wonder.cdc.gov/ucd-icd10.html).

41. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2019 (http://wonder.cdc.gov/ucd-icd10.html).

42. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2019 (http://wonder.cdc.gov/ucd-icd10.html).

43. According to the U.S Census Bureau, (https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf) The South region consists of: TX OK AR LA MS AL TN KY WV VA DC MD DE NC SC GA FL. Most of these states have weak gun laws.

44. Simonetti JA, Rowhani-Rahbar A, Mills B, Young B, & Rivara FP. (2015). State firearm legislation and nonfatal firearm injuries. (https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2015.302617)*American journal of public health.*

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Sandy Hook Families Settle Lawsuits Against Lanza Estate For $1.5M

By DAVE ALTIMARI
AUG 06, 2015 AT 8:55 AM

The two lawsuits made similar claims -- that Nancy Lanza purchased a Bushmaster AR-15 and kept it in her Yogananda Street home where her son had access to it. (Stephen Dunn)

The families of 16 victims of the Sandy Hook school shooting will receive about $94,000 each to settle two lawsuits against the estate of the shooter's mother, Nancy Lanza.

Documents filed Monday in Probate Court show that the families have agreed to equally divide a $1.5 million homeowner's insurance policy that Lanza had on the Newtown home she shared with her son, Adam Lanza. Each family will get $93,750, records show. The lawsuits were filed by the families of 16 of those who died in the massacre and two who survived.

On Dec. 14, 2012 , Adam Lanza walked into Sandy Hook Elementary School and gunned down 26 people, including 20 first graders, using a Bushmaster AR-15 assault weapon that his mother had purchased legally. He had already killed his mother before going to the school – shooting her several times with a rifle as she slept in her bed at their Yogananda Street home.

The lawsuits made essentially the same claim — that Nancy Lanza purchased the Bushmaster and kept it in her home, where her 20-year-old son had access to it. State police reports said the Bushmaster was kept in a gun safe that was in a room adjacent to Adam Lanza's bedroom and that he had unlimited access to it.

[Related] Alex Jones appears for questioning in Connecticut for Sandy Hook lawsuit »

The lawsuits allege that Nancy Lanza "knew or should have known that [Adam Lanza's] mental and emotional condition made him a danger to others."

The claims were made in two separate lawsuits filed against the estate of Nancy Lanza, which is still open in Probate Court. Stamford attorney Samuel Starks is the estate's administrator.

The lead plaintiffs in the lawsuits, were the parents of James Mattioli and the estate of Rachel D'Avino.

The settlements must be approved by Probate Judge Joseph Egan before they can be finalized in Superior Court, but lawyers familiar with the case said that should be completed by the end of this month. All the lawyers on the case worked pro bono so the families could get all the proceeds.

Two other lawsuits filed as a result of the shootings are still pending.

Many of the same families also are suing Remington Outdoor Co., the distributor of the Bushmaster, in federal court. That lawsuit claims that the Bushmaster, which can fire up to 30 rounds a minute and is capable of piercing body armor, shouldn't have been entrusted to the general public because it is a military assault weapon.

LATEST CONNECTICUT

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Racist graffiti repeatedly found in bathrooms at West Hartford high school

The other lawsuit is against the town of Newtown and alleges that the town did not take enough steps to secure the school. The lawsuit alleges that Lauren Rousseau, a substitute teacher killed, did not have a key to her room and was unable to lock the door before Lanza entered the classroom.

He killed 14 of the 15 people in that room. The rest were killed in an adjacent classroom. Lanza killed himself using one of the handguns that he had brought into the building. He fired 155 shots in less than five minutes.

The house on Yogananda Street where Nancy and Adam Lanza lived was torn down a few months ago. A bank purchased it for $1 from the estate and turned it over to the town.

A previous version of this story indicated that two of the plaintiffs were teachers who survived the shooting. They withdrew their claims.

MAN WHO SHOT INTRUDER IN HIS HOME SUED FOR WRONGFUL DEATH

Posted by Charles Gilman | Dec 15, 2020 | 0 Comments

A judge has decided that a man who shot and killed an intruder in his home, can be sued by the dead man's family.

The wrongful death lawsuit seeks $505,000 from the man who came home to find his front door kicked in and a nearly naked man in his living room. Police declined to prosecute the resident, but a judge, last month, said the civil case can move ahead.

In June 2012, an Oregon man returned to his home with his girlfriend after an evening out. They found his front door kicked in and a nearly naked intruder on the sofa. According to police reports, the 33-year-old intruder attacked the man and started strangling him. With his girlfriend's help, the man broke free and reached for a handgun he had hidden in the sofa. He shot the intruder once in the back at close range. All three were reportedly intoxicated at the time of the incident and the couple told police they did not know the intruder.

Last year, a lawsuit was filed against the resident on behalf of the parents and son of the intruder. The lawsuit alleges that the resident used reckless and excessive force against the intruder. The family's attorney suggested the resident provoked a confrontation by entering his own home after finding the door kicked in, instead of remaining outside and calling the police. However, the resident's attorney, arguing to throw out the case, said that Washington state law allows the use of defensive deadly force in such circumstances. In addition, his attorney argued, statutes defend against civil claims when the person who was harmed was committing a felony and that his conduct was "a substantial factor contributing to his death."

However, the judge sided with the family of the intruder, saying there was not definitive proof that the intruder attacked the couple before being shot.

In their bid for damages, the family cited loss of life and loss of "companionship and support" from the dead man. In a civil suit, there are two types of damages: compensatory (or actual damages) and punitive damages. Compensatory damages are money awarded to compensate for actual losses such as future earnings, medical bills, and funeral expenses. Punitive damages are considered punishment and awarded when the defendant's behavior is found to be especially harmful. The compensation in a wrongful death lawsuit is intended to cover the earnings of the deceased, as well as attempt to provide emotional comfort for loved ones and support the person for whom the earnings would have provided.

Earlier this year, a wrongful death lawsuit was filed against a Montana homeowner who shot and killed an intruder. The homeowner said the intruder was moving toward him and he feared for his life. The lawsuit claims the intruder was running away when he was shot.

In 2011, the family of a burglar who was shot and killed while breaking into a Colorado car lot was awarded almost $269,500 in their wrongful death lawsuit.

No matter the circumstances, if you have been injured or a loved one killed as a result of someone else's reckless behavior, you may be entitled to compensation. Call the offices of trial attorneys Charles Gilman and Briggs Bedigian at 1-800-529-6162 or contact them online. The firm handles cases in Maryland, Pennsylvania, and Washington, D.C.

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ABOUT THE AUTHOR

CHARLES GILMAN

As managing partner and co-founder of Gilman & Bedigian, it is my mission to help our clients recover and get their lives back on track. I strongly believe that every person who is injured by a wrongful act deserves compensation, and I will do my utmost to bring recompense to those who need and deserve it.

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CONNECT

Burglar sues Calif. homeowner, 90, who returned fire

BY BARRY LEIBOWITZ
OCTOBER 26, 2012 / 9:30 AM / CBS NEWS

Jay Leone
FACEBOOK VIA CBS SAN FRANCISCO

(CBS) GREENBRAE, Calif. - A Northern California homeowner who police say survived being shot in the jaw during a burglary is now getting a "punch in the gut": The burglary suspect is suing him for returning fire.

The Marin Independent Journal reported the suspect alleges that Jay Leone, who is 90-years-old, negligently shot the intruder.

According to CBS San Francisco, suspect Samuel Cutrufelli is charged with two counts of attempted murder after Leone was shot in the face on Jan. 3. Police said Cutrufelli was wounded when Leone returned fire.

Leone has vowed to countersue. In an exclusive January interview at his bedside at Marin General Hospital, Leone told CBS San Francisco he had to outwit the burglar who held him captive at gunpoint.

According to Leone, the incident began when Cutrufelli kicked in the door, of his Marin County home. Leone said he was ordered not to move as the house was scoured for valuables. But after awhile, Leone insisted that he had to use the bathroom, and convinced his captor to let him go, CBS San Francisco reported.

It was a ruse. Leone had a .357 revolver stashed in the bathroom. He grabbed it and ran back and pointed it at the burglar.

The burglar fired once, hitting Leone in the cheek.

"He opened up on me," said Leone. "He got me on the first shot."

Leone, a former Marin County Sheriff's deputy, paused before returning fire. The gunman begged for his life, but Leone emptied his weapon anyway.

"After he shot me, I looked him straight in the eye," said Leone. "He says, 'Don't kill me. Don't kill me... I've got a daughter!' I said, 'f- you ... pow, pow, pow, pow!'"

The ordeal wasn't over. Three of those shots hit their mark, but still the gunman rushed Leone and tried to shoot the 90-year-old with his own weapon.

"Sure enough, he wrestled me to the floor, put the gun to my head, pulled the trigger, and it went, 'click,'" Leone said. "And then he got all panicky. He ran out the door."

Cutrufelli called police claiming he had shot himself. They took him to a hostpial for treatment, but also arrested him on suspicion of burglary and attempted murder.

Now, he's suing the 90-year-old man he allegedly tried to kill.

RESEARCH | SOCIETY OF ACTUARIES | WEB EXCLUSIVES

Firearm Risk: An Insurance Perspective

Actuaries can apply their skills to help quantify firearm-related risk

KRISTEN MOORE AND CRAIG REYNOLDS

JUNE/JULY 2018

In the 2017–2021 Society of Actuaries (SOA) Strategic Plan, the SOA promises its stakeholders that actuaries will "provide trusted and objective actuarial research, analysis and insight on important societal issues."[1] Firearm deaths and injuries are a significant problem in the United States and an important societal issue with actuarial and insurance aspects. Indeed, the American Medical Association recently called firearm violence "a public health crisis" and called for a comprehensive public health response and solution.[2]

Gun violence in America exacts a significant toll on our society in both human and economic terms. The economic cost of firearms directly affects the financial outcomes of insurers and taxpayers. Actuaries are well positioned to study the mortality and morbidity related to firearms, yet there is little on the topic in actuarial and insurance literature.

In this article, we provide a brief overview to introduce actuaries to the scope of firearm deaths and injuries, and we examine the extent to which actuaries and insurance professionals have studied or addressed the issue. We compare firearm risk to risks that are often considered in the underwriting process for life and homeowners insurance. We find that the death rate for firearms is material, largely not considered in insurance underwriting, and larger than at least one factor that is considered in insurance underwriting. We outline open research questions and encourage actuaries to apply their skills and talents to quantifying firearm-related risk.

We deliberately do not take a stand on policy issues related to firearms. Rather, we focus on the associated insurance risks, share known data and call for further research.

GUN DEATHS AND INJURIES IN THE UNITED STATES: FREQUENCY AND COST

We summarize the frequency of fatal and nonfatal gunshot wounds in a series of tables and graphs. The data for Figures 1–4 were extracted from the Centers for Disease Control and Prevention (CDC) Web-based

Injury Statistics Query and Reporting System (WISQARS).[3] In Figure 1, we show the annual average number of fatal and nonfatal gunshot wounds (GSW) in the United States during the period 2010–2015. The graph in Figure 2 shows the year-by-year data. In both figures, we include the number of auto fatalities for comparison. Firearm fatalities are the third leading cause of injury-related death, just behind motor vehicle fatalities.[4] Indeed, in recent years, the difference between the two has been less than 0.5 percent, and firearm fatalities have now exceeded automobile fatalities in 21 states.[5,6]

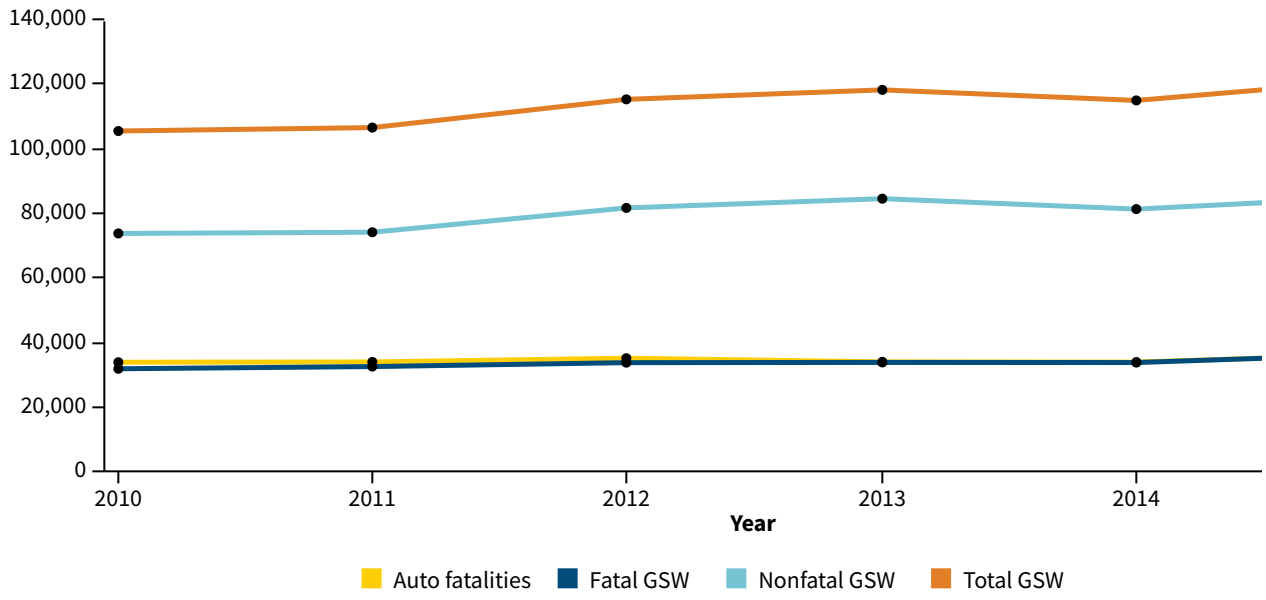
Figure 1: Annual Average Number of Fatal and Nonfatal Gunshot Wounds, 2010–2015

		Gunshot Wounds (GSW)		
	Auto Fatalities	Fatal GSW	Nonfatal GSW	Total GSW
Annual Average 2010–2015	34,351	33,511	79,846	113,357

Source: Centers for Disease Control and Prevention Web-based Injury Statistics Query and Reporting System (WISQARS)

Figure 2: Annual Number of Fatal and Nonfatal Gunshot Wounds, 2010–2015>

Hover Over Image for Specific Data



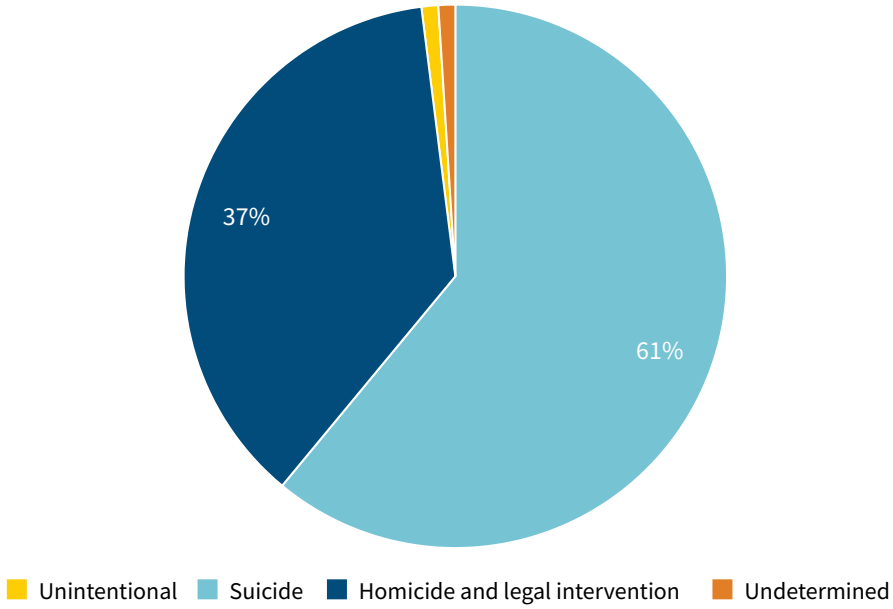
Source: Centers for Disease Control and Prevention Web-based Injury Statistics Query and Reporting System (WISQARS)

In Figures 3 and 4, we show fatal and nonfatal GSW by intent for 2015. We note that suicides account for 61 percent of fatal GSW. This is stable over the six-year period: 61 to 64 percent of fatal GSW were attributable to suicide. In both figures, legal intervention (deaths or injuries “inflicted by police or other law enforcement agents, including military on duty, in the course of arresting or attempting to arrest lawbreakers, suppressing disturbances, maintaining order and performing other legal actions”) is grouped

with homicide or assault. Such incidents comprise only a small fraction, approximately 1 percent, of fatal and nonfatal GSW in 2015 (484 fatalities and 912 nonfatal GSW).

Figure 3: Fatal Gunshot Wounds by Intent, 2015

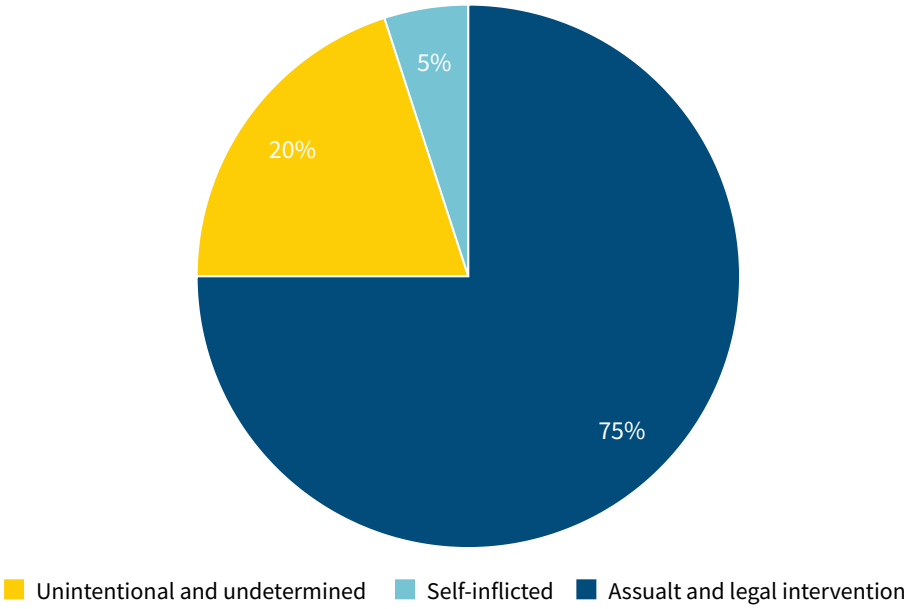
Hover Over Image for Specific Data



Source: Centers for Disease Control and Prevention Web-based Injury Statistics Query and Reporting System (WISQARS)

Figure 4: Nonfatal Gunshot Wounds by Intent, 2015

Hover Over Image for Specific Data



Source: Centers for Disease Control and Prevention Web-based Injury Statistics Query and Reporting System (WISQARS)

Estimates of the cost of gun violence vary. In recent studies, Spitzer et al. found that between 2006 and 2014, the average annual cost of initial inpatient hospitalizations for GSW was $734.6 million.[7] Gani et al.

estimated the average emergency department and inpatient charges for the same period at $2.8 billion per year.[8] The first figure is based on hospital costs while the second is based on charges; the cost-to-charge adjustment was not applied in Gani et al. For more data on cost, we refer the interested reader to Salemi et al.,[9] Lee et al.,[10] Livingston et al.,[11] Cook and Ludwig,[12] and Peek-Asa et al.[13] We emphasize that these studies capture only an initial snapshot of the cost of treating GSW; they exclude follow-up care such as procedures and treatments to address complications, rehabilitation, physical or occupational therapy, mental health care and so on. These snapshots fail to capture the potential "long-tailed" nature of claims related to GSW.

ARE ACTUARIES AND INSURERS CONSIDERING FIREARM RISK?

In this section, we describe the extent to which actuaries and insurers are studying or quantifying firearm risk. We found only one article in an actuarial journal. However, there is evidence that some actuaries and insurance companies are recognizing firearm-related risk through their product offerings, pricing and underwriting decisions in at least a limited way. We have summarized these findings:

- Lemaire used multiple decrement techniques to compute the reduction in life expectancy and the increase in life insurance premiums in the United States due to firearm violence.[14] To the best of our knowledge, this is the only paper in the actuarial scholarly literature related to firearm risk.
- As states began passing laws to allow school staff members to carry firearms, some insurance companies responded by terminating liability or workers' compensation coverage, or by imposing premium increases per armed staff member.[15]
- At least three companies offer Workplace Violence Expense Insurance to cover expenses associated with incidents of workplace violence.[16,17,18] Moreover, Workplace Violence and Active Shooter Response are active areas of risk management.[19]
- Some companies offer gun liability insurance. Indeed, the National Rifle Association (NRA) endorses a line of personal firearms liability insurance as well as self-defense insurance, which provides coverage in the event that a policyholder uses his or her gun in an act of self-defense.[20,21]
- Bills were introduced in four states (Hawaii, New Hampshire, New York and California) to mandate liability insurance for gun owners.[22] On the other hand, a Florida law passed in 2014 prohibits insurance companies from using firearm ownership as a factor in insurance underwriting.[23] We did not find evidence that actuaries had analyzed or weighed in on these legislative measures.

DO FIREARMS INTRODUCE RISK?

There is extensive literature on this topic, including individual-level studies, ecological studies, survey papers and meta-analyses. Multiple studies have concluded that a firearm in the home is a risk factor for suicide, domestic violence homicide and accidental shootings, and that higher levels of gun prevalence are positively associated with higher homicide rates. We refer readers to the papers by Hemenway,[24] Hepburn and Hemenway,[25] Miller et al.[26] and Stroebe;[27] the meta-analysis by Anglemeyer et al.,[28] and the references contained therein; as well as the recent article in *Scientific American*.[29]

Again, there is an extensive body of literature that addresses this question, but one can visualize the association between the firearm death rate and gun prevalence in Figure 5, which is based on publicly available data.[30,31] This relationship is approximate, as estimates and measures of gun ownership vary.

Figure 5: Firearm Death Rate Versus Firearm Ownership Rate by State, 2013

Sources: Xu, J., S. L. Murphy, K. D. Kochanek, and B. A. Bastian. 2016. "Deaths: Final Data for 2013." *National Vital Statistics Reports* 64 (2). *http://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_02.pdf* PDF.
Kalesan, B., M. D. Villarreal, K. M. Keyes, and S. Galea. 2016. "Gun Ownership and Social Gun Culture." *Injury Prevention* 22 (3): 216–220. *http://dx.doi.org/10.1136/injuryprev-2015-041586.*

We, along with the authors cited previously in this article, emphasize that none of the studies prove causation, but rather a statistical association. In their literature review on firearm availability and homicide, Hepburn and Hemenway wrote, "None of the studies prove causation, but the available evidence is consistent with the hypothesis that increased gun prevalence increases the gun death rate."[32]

IS FIREARM RISK COMPARABLE TO OTHER INSURANCE UNDERWRITING FACTORS?

In this section, we compare firearm risk to other factors that are used in the underwriting of life insurance and homeowners insurance. We note that we are considering only risk and the financial impact of covered risks, not the social and political forces that influence the selection of underwriting criteria.

For life insurance, risky avocations such as private aviation, scuba diving and rock climbing might be considered in the underwriting process, though firearm ownership generally is not. Using publicly available data, Tavernier and Vadiveloo computed a death rate per million "participants" in various risky avocations and compared that to a death rate per gun owner.[33] The calculations are detailed in Tavernier and Vadiveloo's paper titled "Firearms as an Underwriting Characteristic;" however, since this source is an unpublished student thesis, we walk through some of the calculations and cite their original sources as well. The results are summarized in Figure 6.

Figure 6: Fatality Rates for Firearms Versus Scuba Diving

Risk	Deaths per Million Participants	Life Insurance Underwriting Factor
Scuba diving	164	Yes
Firearm in the home	240–450	No

Source: The authors' own calculations and data from Tavernier, R., and J. Vadiveloo. 2017. "Firearms as an Underwriting Characteristic." Undergraduate Student Thesis. Department of Mathematics, University of Connecticut.

For scuba diving, the estimated death rate is given as 16.4 per 100,000 scuba divers.[34]

For firearms, we estimate a death rate attributable to firearm ownership. More specifically, for the numerator, we must estimate the number of deaths that are attributable to firearm ownership. For the denominator, we must estimate the number of gun owners or gun-owning households.

Of course, not all gun deaths result from the fact that an individual chose to engage in the possibly-risky activity of firearm ownership. If a woman accidentally kills herself while cleaning her gun, one can argue that her death was attributable to her choice of risky avocation. However, if one is the victim of a random gun murder, his gun ownership status could be independent of his cause of death. Thus, the correct choice for the numerator is unclear. For that reason, we use a range of 18,000 to 33,000. At the maximum, our numerator includes all firearm deaths. At the minimum, we include only suicides.[35] However, since we are thinking specifically in the context of insurance, we reduce the number of suicides from 20,000 to 18,000 to reflect the fact that some suicides would occur during the suicide exclusion period. Based on Tables 1 and 3 of Tseng's study,[36] Tavernier and Vadiveloo proposed a reduction of 10 percent.[37] Of course, not all

firearm victims are insured—nor are all scuba participants. But this analysis is still useful as a measure of relative risk.

In addition to the variation in the numerator, there is considerable variation in the denominator, as estimates of the number of gun owners vary. The challenges of quantifying gun ownership, availability, prevalence and use are detailed in Hepburn and Hemenway's paper,[38] as well as Chapter 3 of the National Research Council's review.[39] We choose denominators ranging from 40 million to 75 million. At the low end, we use the General Social Survey's (GSS) estimate of a 32 percent gun ownership rate multiplied by the 126 million households in the United States.[40,41] At the high end, other sources suggest the total number of gun owners is as high as 75 million.[42]

This variability produces a wide range for our estimated death rate attributable to firearm ownership. If we include only the adjusted number of suicides (18,000) in the numerator, our estimate ranges from 240 to 450 gun deaths per million gun owners. If the numerator included accidental shootings and domestic violence homicide, for example, the estimated death rates would be higher. If we include all gun deaths (33,000) in the numerator, the range of estimates increases to 440 to 825 deaths per million gun owners. However, as we remarked previously, some gun deaths are completely independent of one's gun ownership status.

Despite the wide range in our estimated death rate attributable to gun ownership, it is worth noting that, even at the low end, the death rate attributable to firearms of 240 deaths per million gun owners is 46 percent higher than the death rate attributable to scuba diving. The latter is used in life insurance underwriting, while the former is not.

Furthermore, while using death rates "per participant" might be an appropriate measure for assigning an insurance rating class once participation has been confirmed, the overall death rate per million of a population might be more relevant when deciding which activities to ask about on an insurance application. Given that the scuba participation rate is much lower than the gun ownership rate, a decision to ask about scuba participation and not gun ownership seems difficult to justify.

For homeowners insurance, risky features in the home such as swimming pools, trampolines and aggressive breed dogs are generally considered in the underwriting process, while firearm ownership is not.[43,44] It is natural to ask whether the risk of a firearm in the home is comparable to the risk of these other household features.

Estimates of the number of trampoline-related injuries range from 100,000 per year[45] to 295,000 per year.[46] Some of these injuries might result in a homeowners claim. We did not find a reliable estimate of the number of household trampolines; thus, we did not calculate a loss rate.

For life insurance, risky avocations such as private aviation, scuba diving and rock climbing might

As we pointed out previously, there are about 113,000 fatal and nonfatal GSW per year. Not all firearm-related losses would result in a homeowners claim, as intentional and illegal acts would be excluded. However, some suicides, homicides, assaults, unintentional shootings and even mass shootings could result in a homeowners claim against the gun owner's policy. In addition, firearm theft could result in a homeowners claim. The Department of Justice (DOJ) estimates that approximately 232,000 guns were stolen per year during the six-year period from 2005–2010,[47] while Hemenway et al. estimate 250,000 gun theft incidents per year, with about 380,000 guns stolen.[48]

be considered in the underwriting process, though firearm ownership generally is not.

In computing a homeowners loss rate due to firearms, the correct choice for the numerator is unclear. But beyond examining claim frequency for household risks, one should also examine claim severity. Homeowners claims related to firearms could include high-dollar liability settlements. For example, the mass shootings in Columbine, Colorado, and Newtown, Connecticut, resulted in homeowners settlements.[49,50] But even more "routine" gun accidents could lead to significant settlements.

In the next section under "Claims Analysis," we recommend a systematic study of the frequency and severity of firearm-related claims for homeowners and other lines of business.

OPEN RESEARCH QUESTIONS

There is a clear need for unbiased and objective research on the economic impact of firearms. Webster et al. point out: "Gunfire from assaults, suicides and unintentional shootings exacts an enormous burden on public health globally. The available science, however, is limited to answer many important questions necessary for mounting successful efforts to reduce gun violence. Certain data are lacking, and there are numerous analytical challenges to deriving unbiased estimates of policy impacts. Significant investments in research over the long term are warranted to answer questions central to successful prevention of gun violence."[51] Similarly, in their 300-page critical review of the literature on firearms and violence, the National Research Council of the National Academy of Sciences observes, "One theme that runs throughout our report is the relative absence of credible data central to addressing even the most basic questions about firearms and violence."[52]

Actuaries can provide high-quality, objective, relevant, quantitative research that can be used by our stakeholders as input for recommendations and decisions on this key societal issue. Toward that end, we propose three important avenues for future research.

Claims Analysis

The cost of gun violence directly affects the financial outcomes of life, health, disability, workers' compensation, commercial and personal liability, and homeowners insurers, as well as American

taxpayers. Actuaries should examine the frequency and severity of firearm-related claims across lines of insurance business in order to analyze insurers' exposure to firearm risk.

Data availability and coding of firearm-related claims present significant issues. Moreover, health claims related to nonfatal GSW might be long-tailed, and claims related to follow-up procedures and treatments might not be linked to the original treatment episode. The proposed analysis is challenging. However, the Insurance Information Institute has meticulously tracked the frequency and severity of dog bite liability claims over the last 12 years.[53] If insurers can track the data for dog bites, surely they can make progress on tracking firearm-related claims.

Total Health Care Cost of Treating Gunshot Wounds

Earlier in this article, we presented several different estimates of, and references about, the costs of treating GSW. Many researchers have quantified the cost of treatment in the emergency department as well as the initial inpatient hospitalization, but, as researchers point out, these costs are just the tip of the iceberg.[54] The studies we cited exclude treatment costs such as physical and occupational therapy, follow-up treatment and procedures for complications, mental health care, nursing care and so on. Actuaries should follow the claims of gunshot survivors longitudinally to quantify the total health care cost of treating GSW.

Mortality Study

Hepburn and Hemenway remark, "Most striking is the paucity of individual-level studies … For example, there are no studies that follow a large cohort of individuals with known characteristics, comparing homicide victimization rates of those with a gun in the home, and those without."[55]

Wintemute et al. published a related study using California handgun purchase data. In particular, they studied a cohort of 238,292 people who had purchased a handgun in California in 1991 and examined the mortality experience of the group through the end of 1996. They computed standardized mortality ratios and found that the purchase of a handgun was associated with a substantial increase in the risk of suicide by firearm, suicide by any method and female homicide.[56]

Actuaries should examine whether a mortality differential exists between members of gun-owning households and the general and insured population. More specifically, actuaries should examine cohorts of gun-owning households in select states, compute mortality rates by age and sex, and compare them to a standard table for the state or region.

> *Actuaries can provide high-quality, objective, relevant, quantitative research that can be used by our stakeholders as input for recommendations and decisions on this key societal issue.*

A CALL TO ACTION FOR ACTUARIES

Actuarial input on the public health crisis of gun violence is consistent with the history and mission of our profession. The Surgeon General's reports on smoking and health were controversial; however, this did not deter actuaries from studying the issue.[57] When the AIDS crisis arose in the 1980s, the SOA established a task force to study the impact of AIDS on the insurance industry. The task force produced a 300-page report.[58] Among the many recommendations in the report, the task force recommended that AIDS-related claims be tracked, just as we are recommending that firearm-related claims be tracked across lines of business. Additionally, actuaries are currently studying other important and timely issues such as obesity and climate change.[59,60]

Beginning with the Dickey Amendment of 1996, government entities have been restricted in their ability to fund research related to firearms. Stark and Shah explain, "Although the legislation does not ban gun-related research outright, it has been described as casting a pall over the research community." Indeed, researchers estimate that the field receives just 1.6 percent of the funding one would expect, given its impact on mortality.[61] This makes the contributions of actuaries more urgent.

Actuaries have unique skills in measuring and managing risk. We are experts in mortality analysis, skilled in data analytics and model building, and we can analyze the problem objectively. As a profession, we must employ our skills and talents to help address the economic, mortality and morbidity impact of gun violence.

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REFERENCES:

1. Society of Actuaries. "The 2017–2021 Strategic Plan Development Process." 2017–2021 Strategic Plan. Accessed June 25, 2018. *https://www.soa.org/strategic-planning/default/*.

2. American Medical Association. 2016. "AMA Calls Gun Violence 'A Public Health Crisis.'" June 14. Accessed April 13, 2018. *https://www.ama-assn.org/ama-calls-gun-violence-public-health-crisis.*

3. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. 2018. "Welcome to WISQARS." Injury Prevention & Control. May 3. Accessed February 15, 2018. *www.cdc.gov/injury/wisqars*.

4. Xu, J., S. L. Murphy, K. D. Kochanek, and B. A. Bastian. 2016. "Deaths: Final Data for 2013." *National Vital Statistics Reports* 64 (2). *http://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_02.pdf* PDF.

5. Supra note 3.

6. Stewart, M. 2016. "Gun Deaths Are Now Outpacing Traffic Deaths in 21 States, and Counting." *HuffPost.* January 15. *http://www.huffingtonpost.com/entry/guns-deaths-car-deaths_us_56991b31e4b0ce4964242c47*.

7. Spitzer, S. A., K. L. Staudenmayer, L. Tennakoon, D. A. Spain, and T. G. Weiser. 2017. "Costs and Financial Burden of Initial Hospitalizations for Firearm Injuries in the United States, 2006–2014." *American Journal of Public Health* 107 (5): 770–774. *https://ajph.aphapublications.org/doi/10.2105/AJPH.2017.303684*.

8. Gani, F., J. V. Sakran, and J. K. Canner. 2017. "Emergency Department Visits for Firearm-related Injuries in the United States, 2006–14." *Health Affairs* 36 (10): 1729–1738. *https://www.healthaffairs.org/doi/10.1377/hlthaff.2017.0625*.

9. Salemi, J. L., V. Jindal, R. E. Wilson, M. F. Mogos, M. H. Aliyu, and H. M. Salihu. 2015. "Hospitalizations and Healthcare Costs Associated With Serious, Non-lethal Firearm-related Violence and Injuries in the United States, 1998–2011." *Family Medicine and Community Health* 3 (2): 8–19. *http://www.ingentaconnect.com/content/cscript/fmch/2015/00000003/00000002/art00003*.

10. Lee, J., S. A. Quraishi, S. Bhatnagar, R. D. Zafonte, and P. T. Masiakos. "The Economic Cost of Firearm-related Injuries in the United States From 2006 to 2010." *Surgery* 155 (5): 894–898. *https://www.surgjournal.com/article/S0039-6060(14)00060-9/fulltext*.

11. Livingston, D. H., R. F. Lavery, M. C. Lopreiato, D. F. Lavery, and M. R. Passannante. 2014. "Unrelenting Violence: An Analysis of 6,322 Gunshot Wound Patients at a Level I Trauma Center." *The Journal of Trauma and Acute Care Surgery* 76 (1): 2–11. *https://journals.lww.com/jtrauma/pages/articleviewer.aspx?year=2014&issue=01000&article=00002&type=abstract*.

12. Cook, P.J., and J. Ludwig. 2006. "The Social Costs of Gun Ownership." *Journal of Public Economics* 90 (1): 379–391. *https://www.sciencedirect.com/science/article/abs/pii/S0047272705000411*.

13. Peek-Asa, C., B. Butcher, and J. E. Cavanaugh. 2017. "Cost of Hospitalization for Firearm Injuries by Firearm Type, Intent and Payer in the United States." *Injury Epidemiology* 4 (1). *https://injepijournal.springeropen.com/articles/10.1186/s40621-017-0120-0*.

14. Lemaire, J. 2005. "The Cost of Firearm Deaths in the United States: Reduced Life Expectancies and Increased Insurance Costs." *The Journal of Risk and Insurance* 72 (3): 359–374. *https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1539-6975.2005.00128.x*.

15. Frankel, T. C. 2018. "One Roadblock to Arming Teachers: Insurance Companies." *The Washington Post*. May 26. *https://www.washingtonpost.com/business/economy/one-roadblock-to-arming-teachers-insurance-companies/2018/05/26/59d6c704-5f7e-11e8-8c93-8cf33c21da8d_story.html?noredirect=on&utm_term=.ea0941514380*.

16. Chubb Group of Insurance Companies. 2013. "ForeFront Portfolio 3.0: Workplace Violence Expense Insurance." September. Accessed April 27, 2018. *http://www.chubb.com/businesses/csi/chubb13750.pdf* PDF.

17. XL Group. 2016. "XL Catlin Unveils Workplace Violence Insurance Coverage for U.S. Businesses." February 3. Accessed April 27, 2018. *http://xlgroup.com/press/xl-catlin-unveils-workplace-violence-insurance-coverage-for-us-businesses*.

18. Great American Insurance Group. 2013. "Workplace Violence Insurance: Serious Issues, Important Coverage." Accessed April 13, 2018. *https://www.greatamericaninsurancegroup.com/docs/default-source/executive-liability/usa/2352-eld-workplace-violence-insurance-sell-sheet.pdf?sfvrsn=4*.

19. Metzner, R. 2012. "Preventing Workplace Violence." *Risk Management Monitor*. November 30. *http://www.riskmanagementmonitor.com/2012-a-year-of-workplace-violence*.

20. National Rifle Association. “Personal Firearms Liability Insurance.” Accessed April 14, 2018. *https://mynrainsurance.com/insurance-products/liability-personal-firearms.*

21. Lockton Affinity. NRA Carry Guard. Accessed April 14, 2018. *https://lockton.nracarryguard.com/.*

22. Gore, L. 2016. “Mandatory Gun Insurance Before Lawmakers in 4 States.” AL.com. February 9. *http://www.al.com/news/index.ssf/2016/02/mandatory_gun_insurance_before.html.*

23. Vote Smart. “SB 424—Prohibits Insurance Increases for Gun Owners—Florida Key Vote.” Accessed August 16, 2017. *http://votesmart.org/bill/17865/50390#.V7NTLj4rLEU.*

24. Hemenway, D. 2011. “Risks and Benefits of a Gun in the Home.” *American Journal of Lifestyle Medicine* 5 (6): 502–511. *http://journals.sagepub.com/doi/abs/10.1177/1559827610396294*.

25. Hepburn, L. M., and D. Hemenway. 2004. “Firearm Availability and Homicide: A Review of the Literature.” *Aggression and Violent Behavior* 9 (4): 417–440. *https://www.ncjrs.gov/App/publications/Abstract.aspx?id=206421*.

26. Miller, M., D. Hemenway, and D. Azrael. 2007. “State-level Homicide Victimization Rates in the U.S. in Relation to Survey Measures of Household Firearm Ownership, 2001–2003.” *Social Science & Medicine* 64 (3): 656–664. *https://www.sciencedirect.com/science/article/pii/S0277953606004898?via%3Dihub*.

27. Stroebe, W. 2013. “Firearm Possession and Violent Death: A Critical Review.” *Aggression and Violent Behavior* 18 (6): 709–721. *https://www.sciencedirect.com/science/article/pii/S1359178913000797*.

28. Anglemyer, A., T. Horvath, and G. Rutherford. 2014. “The Accessibility of Firearms and Risk for Suicide and Homicide Victimization Among Household Members: A Systematic Review and Meta-analysis.” *Annals of Internal Medicine* 160 (2): 101–110. *http://annals.org/aim/fullarticle/1814426/accessibility-firearms-risk-suicide-homicide-victimization-among-household-members-systematic*.

29. Moyer, M. W. 2017. “More Guns Do Not Stop More Crimes, Evidence Shows.” *Scientific American*. October 1. *https://www.scientificamerican.com/article/more-guns-do-not-stop-more-crimes-evidence-shows/*.

30. Supra note 4 PDF.

31. Kalesan, B., M. D. Villarreal, K. M. Keyes, and S. Galea. 2016. “Gun Ownership and Social Gun Culture.” *Injury Prevention* 22 (3): 216–220. *http://dx.doi.org/10.1136/injuryprev-2015-041586.*

32. Supra note 25.

33. Tavernier, R., and J. Vadiveloo. 2017. “Firearms as an Underwriting Characteristic.” Undergraduate Student Thesis. Department of Mathematics, University of Connecticut.

34. Vann, R.D., and Lang, M.A. (eds). 2011. *Recreational Diving Fatalities*. Proceedings of the Divers Alert Network 2010 April 8–10 Workshop. Durham, N.C.: Divers Alert Network. *https://www.diversalertnetwork.org/files/Fatalities_Proceedings.pdf* PDF.

35. Supra note 3.

36. Tseng, S. H. 2004. “The Effect of Life Insurance Policy Provisions on Suicide Rates.” December 15. Accessed April 28, 2018. *emptormaven.com/img/lifetseng.pdf* PDF.

37. Supra note 33.

38. Supra note 25.

39. National Research Council. 2005. *Firearms and Violence: A Critical Review*. Washington, D. C.: The National Academies Press. *https://doi.org/10.17226/10881*.

40. Smith, T. W., and J. Son. 2015. "Trends in Gun Ownership in the United States, 1972–2014." NORC at the University of Chicago. March. Accessed April 13, 2018. *http://www.norc.org/PDFs/GSS%20Reports/GSS_Trends%20in%20Gun%20Ownership_US_1972-2014.pdf* PDF.

41. United States Census Bureau. 2017. "America's Families and Living Arrangements: 2017." Accessed April 13, 2018. *https://www.census.gov/data/tables/2017/demo/families/cps-2017.html*.

42. Beckett, L. 2016. "Gun Inequality: U.S. Study Charts Rise of Hardcore Super Owners." *The Guardian*. September 19. *https://www.theguardian.com/us-news/2016/sep/19/us-gun-ownership-survey*.

43. Hill, Catey. 2012. "11 Riskiest Dog Breeds for Homeowners and Renters." *Forbes*. May 30. *https://www.forbes.com/sites/cateyhill/2012/05/30/11-riskiest-dog-breeds-for-homeowners-and-renters/#2df04abb36d9*.

44. Esurance. "Trampolines and Homeowners Insurance: Are You Covered?" Accessed June 8, 2018. *https://www.esurance.com/info/homeowners/trampolines-and-homeowners-insurance*.

45. Loder, R. T., W. Schultz, and M. Sabatino. 2014. "Fractures From Trampolines: Results From a National Database, 2002 to 2011." *Journal of Pediatric Orthopaedics* 34 (7): 683–690. *https://insights.ovid.com/crossref?an=01241398-201410000-00005*.

46. American Academy of Orthopaedic Surgeons. 2017. "Orthopaedic Surgeons Warn Parents and Young Children About the Dangers of Trampolines." July 19. Accessed April 13, 2018. *http://newsroom.aaos.org/patient-resources/prevent-injuries-america/trampoline-safety.htm*.

47. Bureau of Justice Statistics. 2012. "About 1.4 Million Guns Stolen During Household Burglaries and Other Property Crimes From 2005 Through 2010." Office of Justice Programs. November 8. Accessed April 13, 2018. *https://www.bjs.gov/content/pub/press/fshbopc0510pr.cfm*.

48. Hemenway, D., D. Azrael, and M. Miller. 2017. "Whose Guns Are Stolen? The Epidemiology of Gun Theft Victims." *Injury Epidemiology* 4 (1). *https://injepijournal.springeropen.com/articles/10.1186/s40621-017-0109-8*.

49. Mitchell, R. W. 2001. "Columbine Settlement Rattles Insurer Groups." *National Underwriter* 105 (19): 18.

50. Altimari, D. 2015. "Sandy Hook Families Settle Lawsuits Against Lanza Estate for $1.5M." *Hartford Courant*. August 6. Accessed April 13, 2018. *http://www.courant.com/news/connecticut/hc-sandy-hook-lawsuit-settled-20150803-story.html.*

51. Webster, D. W., M. Cerdá, G. J. Wintemute, and P. J. Cook. 2016. "Epidemiologic Evidence to Guide the Understanding and Prevention of Gun Violence." *Epidemiologic Reviews* 38 (1): 1–4. *https://academic.oup.com/epirev/article/38/1/1/2754874*.

52. Supra note 39.

53. Insurance Information Institute. 2017. "Spotlight on: Dog Bite Liability." April 3. *https://www.iii.org/issue-update/dog-bite-liability*.

54. Bansal, D. G. 2017. “Initial Hospital Costs for Gunshot Wounds Just ‘Tip of the Iceberg.’” Stanford Medicine News Center. March 21. Accessed April 14, 2018. *http://med.stanford.edu/news/all-news/2017/03/initial-hospital-costs-from-gunshot-wounds-total-6-billion-over-nine-years.html*.

55. Supra note 25.

56. Wintemute, G. J., C. A. Parham, J. J. Beaumont, M. Wright, and C. Drake. 1999. “Mortality Among Recent Purchasers of Handguns.” *The New England Journal of Medicine* 341 (21): 1583–1589. *https://www.nejm.org/doi/full/10.1056/NEJM199911183412106*.

57. Cowell, M. J., and B. L. Hirst. 1980. “Mortality Differences Between Smokers and Nonsmokers.” *Transactions of the Society of Actuaries* 32: 185–213. *https://www.soa.org/Library/Research/Transactions-Of-Society-Of-Actuaries/1980/January/tsa80v328.aspx*.

58. Society of Actuaries AIDS Task Force. 1988. “The Impact of AIDS on Life and Health Insurance Companies: A Guide for Practicing Actuaries.” *Transactions of the Society of Actuaries* 40 (2): 839–1159. *https://www.soa.org/library/tsa/1980-89/TSA88V40PT25.pdf* PDF.

59. Behan, D. F., and S.H. Cox. 2010. “Obesity and Its Relation to Mortality and Morbidity Costs.” Society of Actuaries. December. Accessed April 14, 2018. *https://www.soa.org/research-reports/2011/research-obesity-relation-mortality/*.

60. Actuaries Climate Index. Accessed April 14, 2018. *http://actuariesclimateindex.org/home/*.

61. Stark, D. E., and N. H. Shah. 2017. “Funding and Publication of Research on Gun Violence and Other Leading Causes of Death.” *Journal of the American Medical Association* 317 (1): 84–85. *https://jamanetwork.com/journals/jama/fullarticle/2595514*.

Exhibit 8

COUNCIL AGENDA: 01/25/2022

FILE: 22-045

ITEM: 4.1

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: HONORABLE CITY COUNCIL **FROM:** Mayor Sam Liccardo

SUBJECT: **GUN HARM REDUCTION ORDINANCE** **DATE:** January 24, 2022

Approved  Date: January 24, 2022

REPLACEMENT/ SUPPLEMENTAL MEMORANDUM

Recommendation:

Adopt the recommendations and findings contained in the (a) January 21, 2022 Memorandum of Councilmembers Carrasco, Cohen, Peralez, Vice Mayor Jones, and myself, (b) January 21, 2022 Memorandum of Councilmember Peralez, and (c) the following recommendations from Councilmember Dev Davis' January 21, 2022 Memorandum, as modified below:

1. (#2a) Return in the Spring with a presentation to the Council about the extent to which SJPD and partners at the District Attorney's Office are fully enforcing existing firearm-related laws, and specifically:
    a. Identify what resource, legal, or other constraints inhibit full enforcement, if any; including the use of the Armed Prohibited Persons (APPS) database for Penal Code Section 12021 arrests,
    b. Identify any proposed solutions to those constraints.
2. (#2b) Return in March a ghost gun ban that closes existing loopholes in the California Unsafe Handgun Act, as previously directed by Council on June 29, 2021.
3. (#3) Continue the direction from the Council's June 29, 2021 direction to build on partnerships with law enforcement that better inform our community about Gun Violence Restraining Orders and how community members can avail themselves of them. Return to council in the Spring with specific recommendations for public information and outreach about safe storage laws, GVRO's, and this Gun Harm Reduction ordinance.

4. (#5) Respond to Council's June 29, 2021 direction to strengthen partnerships to enable more frequent gun buy-back programs, such as the event scheduled this Spring at the County Government Center.
5. (#6) Identify and apply for grants to support gun safety education and buyback programs

Discussion:

I appreciate Councilmember Davis' expression of concern for addressing the impacts of gun violence throughout our community with ideas other than that which the Council has an opportunity to vote for on January 25th. Many of those ideas have already been vetted and approved by the Council through its vote and direction from June 29, 2021. However, several assertions made within the memorandum appear to be based on inaccurate assumptions, and lead to misleading conclusions.

I typically would not take the time to provide a written rebuttal to a colleague's memo, but this policy is one for which we have been repeatedly threatened with litigation, rendering the factual accuracy of the written record of great importance. Given the substantial public interest in this matter, moreover, it seems imperative to ensure that we're all debating the same, accurate set of facts. To be fair, Councilmember Davis' memo was issued before the memorandum signed by four colleagues and myself provided further refinement of the initiative, and in some cases, she may not have had all the information prior to the issuance of her own statement.

- **Police Workload**

For example, she writes that this proposal "adds an already overtaxed police department with yet another layer of bureaucracy and paperwork." In fact, there is no paperwork for any officer to complete, no files to manage, and no bureaucracy to navigate. The police only become involved if they see a gun or have other reason to believe a person has a gun, such as because of the statements of a witness. At that time, the office may ask the individual if they have proof of insurance, and of having paid a fee. If an attestation document is presented, the interaction will conclude. If the individual fails to present a document, then the officer issues a citation. Doing so involves little more labor or paperwork than the issuance of a parking ticket.

- **Insurance**

Next, Councilmember Davis asserts that "requiring a fee…given to a non-profit that may or may not be legally able to certify insurance coverage for a resident is not the way to reduce gun harm." Councilmember Davis again appears to be confused about the proposal. If this ordinance required the designated nonprofit organization to "certify insurance coverage," she'd be right—but it doesn't. The non-profit organization has no role in certifying anyone's insurance coverage, nor in anything else having to do with liability insurance. Every gun owner completes an attestation of coverage, and is required to keep their self-attestation form with the gun. This argument lacks merit.

Councilmember Davis next asserts that the "insurance that may or may not be available to everyone," but our team's outreach to more than fifteen insurance companies offering rental and homeowner insurance revealed that every policy included liability coverage for firearm possession. Most did so at no additional cost. Those who cannot afford any insurance for financial reasons can complete a waiver that enables their exemption under the ordinance.

- **A "Revival" of the Mayor's Gang Prevention Task Force**

Next, Councilmember Davis writes that she:

> "recommend[s] reinstating/reviving the Mayor's Gang Prevention Task Force, to at least facilitate interagency connections and information sharing. In the past, illegal gun use was addressed during multi-agency meetings of the Mayor's Gang Prevention Task Force. What has happened to that once very successful group? The last gang hotspot map on our city's website is from April 2015. The last workplan listed online is for 2015-2017."

Councilmember Davis' claim of the demise of the Mayor's Gang Prevention Task Force, in the words of Mark Twain, appears greatly exaggerated. We will have a meeting of the MGPTF policy team this Thursday, January 27th, and I invite Councilmember Davis to attend, as other councilmembers routinely do so. She can find the agenda and zoom here: https://sanjose.legistar.com/MeetingDetail.aspx?ID=924922&GUID=69D8BAE3-F54A-4E57-A826-5CF2B065E8FE&Options=info%7C&Search=&Refresh=1. While the Policy Team meets only quarterly–the last meeting was in the Fall, but she can review the video of that meeting through the City website—the MGPTF Technical Team continues to meet monthly, and it is the forum that provides for the most direct and substantive interagency collaboration. Contrary to the suggestion that there is no updated "Hot Spot" map, the latest "Hot Spot" map for 2022 can be found on the PRNS website here: https://www.sanjoseca.gov/your-government/departments/parks-recreation-neighborhood-services/gang-intervention. The update to the MGPTF's Strategic Workplan—which can be found on the PRNS website—will be completed this summer.

- **Oakland's Ceasefire and Community-Based Violence-Reduction Measures**

Councilmember Davis also points out that "[a] similar program in Oakland was shown in a quasi-experimental study to be effective in reducing total shootings and gang involved shootings and is rated as an effective solution to crime by the US Department of Justice." The program to which she refers, Ceasefire, will sound familiar to many who have been involved with our own Mayor's Gang Prevention Task Force since its launch in San Jose in the 1990's: a collaboration of law enforcement, community-based organizations, social service agencies, the courts (and in San Jose's case, schools), working together on multidisciplinary prevention and intervention initiatives to reduce violence. A dramatic point of difference, however is funding; Oakland's Ceasefire relies upon a steady source of government funding from two consecutive tax measures, Measure Y and Measure Z, the latter of which supplanted the former in 2014. While the Ceasefire model is hardly new to us, San Jose lacks any independent resource to fully fund many effective community-based violence prevention programs, but instead draws from the

General Fund and occasional grants to do so. Obviously, the passage of an ordinance that generated fees to help fund community-based based violence-reduction programs would help enormously—which is precisely the point of the proposed measure.

Moreover, it bears noting that although the grass seems greener elsewhere; it's often not; last year, Oakland had 134 homicides, while San Jose had 31 homicides in a city that has more than twice Oakland's population. In other words, Oakland's homicide rate appears approximately nine (9) times higher than San Jose's.

- **Gun Violence Restraining Orders**

Councilmember Davis next urges that "We do have laws in place that address gun harm that are unevenly enforced. Let's work on using and enforcing those laws. Gun Violence Restraining Orders (GVRO) are law in California..." I appreciate Councilmember Davis' attention to GVRO's, which were already the extensive subject of our Council-approved proposal last June, and I expect the City Manager and SJPD to inform us about our progress in moving forward with several of the recommendations. The implication of Councilmember Davis' statement, however—that little has been done to actually implement GVRO's—is mistaken. Due to the good work led by District Attorney Jeff Rosen and Supervising Deputy DA Marisa McKeown, Santa Clara County has the second-highest number of GVRO's issued of any county in California.

Our efforts to reinforce that work through the Council's June action has begun to bear fruit; the DA's office has conducted trainings for all of our BEST non-profit providers participating in the (still active) Mayor's Gang Prevention Task Force. The DA has also trained more than 1,000 police officers countywide, the greatest number being members of SJPD. We will participate in more collaborations to get the word out about GVRO's, and I look forward to hearing more through the City Manager's update.

- **Ghost Guns**

Councilmember Davis urges that "[w]e should be pursuing prosecution and jail time for anyone in possession of ghost guns that circumvent regulation." I completely agree, which is why we already obtained Council approval for a ghost gun ban last June, and we hope that an ordinance will be brought back to Council as soon as possible in the weeks ahead. Our City Attorney assured me that her team is working on getting the final ordinance on ghost guns to the Council soon.

- **Lack of Incarceration of Arrestees at the Jail**

Councilmember Davis recites a concern that I also share, which is that "We should listen to our public safety officers out on the streets who feel defeated when a suspect is released from custody sooner than the arresting officer has time to finish the initial arrest report." I welcome any participation from Councilmember Davis or other colleagues on my repeated efforts to address the public safety impacts of lack of use of the County jail for post-arrest detention, and of zero-bail-release policies of judges. I have publicly criticized judges who have released defendants charged with homicide and child molestation without bail, and I have had no fewer

than a half-dozen private conversations with the Presiding Judge and other key judges in Santa Clara County on the subject. My recent conversation with Judge Daniel Nishigaya has made it apparent that there will be reforms in processes to ensure a single judge will handle bail hearings, to employ a more consistent approach.

I have also raised this issue with senior county officials, particularly with regard to release of methamphetamine-addicted arrestees back to the streets after the commission of felony crimes, and will continue to urge the use of the jail for appropriate and constitutional pretrial detention, particularly in light of the County's inability to provide sufficient inpatient, detoxification beds to address the very real methamphetamine crisis that afflicts our community. I welcome Councilmember Davis and any colleagues to join me in these advocacy efforts, but none of those issues—involving the County Pretrial Services and Behavioral Health policy, Judges, the DA, and others—preclude us from doing something about elements of the problem over which the City actually has some control.

- **Unresolved "Details" or "Structure"**

Finally, Councilmember Davis opines that the "Mayor and City Attorney are asking us to pass an ordinance where all the details and structure are to be 'worked out later.'" In fact, the shape of proposal has been largely resolved after two years of extensive consultation and research with the assistance of numerous legal experts, public health practitioners, gun violence organizations, and many members of the community. Councilmember Davis does not identify which "details or structure" she finds missing, and from the erroneous assumptions elsewhere in her memorandum, it's quite possible there are additional misunderstandings on her part. Nonetheless, any remaining minor details of implementation can be resolved through the City Manager's regulatory authority, as is routine with the approval of any new policy, in the six months prior to implementation of the ordinance.

Exhibit 9

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

City Council Meeting
Amended Agenda

Tuesday, January 25, 2022

1:30 PM

Virtual Meeting - https://sanjoseca.zoom.us/j/99346843938

SAM LICCARDO, MAYOR
CHAPPIE JONES, VICE MAYOR, DISTRICT 1
SERGIO JIMENEZ, DISTRICT 2
RAUL PERALEZ, DISTRICT 3
DAVID COHEN, DISTRICT 4
MAGDALENA CARRASCO, DISTRICT 5
DEV DAVIS, DISTRICT 6
MAYA ESPARZA, DISTRICT 7
SYLVIA ARENAS, DISTRICT 8
PAM FOLEY, DISTRICT 9
MATT MAHAN, DISTRICT 10

The City of San José is committed to open and honest government and strives to consistently meet the community's expectations by providing excellent service, in a positive and timely manner, and in the full view of the public.

Welcome to the San José City Council meeting!

This Agenda contains both a Consent Calendar section for routine business items that require Council approval, and general business items arranged to correspond with San José's City Service Areas (CSAs). City Service Areas represent the policy-making level for strategic planning, policy setting, and investment decisions in the critical functions the City provides to the community. They are:

- **Strategic Support** - The internal functions that enable the CSAs to provide direct services to the community in an effective and efficient manner.

- **Public Safety** - Commitment to excellence in public safety by investing in neighborhood partnerships as well as prevention, enforcement, and emergency preparedness services.

- **Transportation & Aviation Services** - A safe and efficient transportation system that contributes to the livability and economic health of the City; and provide for the air transportation needs of the community and the region at levels that is acceptable to the community.

- **Environmental and Utility Services** - Manage environmental services and utility systems to ensure a sustainable environment for the community.

- **Neighborhood Services** - Serve, foster, and strengthen community by providing access to lifelong learning and opportunities to enjoy life.

- **Community & Economic Development** - Manage the growth and change of the community in order to create and preserve healthy neighborhoods and ensure a diverse range of employment and housing opportunities.

You may speak to the City Council about any discussion item that is on the agenda, and you may also speak during Open Forum on items that are not on the agenda and are within the subject matter jurisdiction of the City Council or Successor Agency to the Redevelopment Agency Board. If you wish to speak to the City Council, please refer to the following guidelines:

- **Fill out a Yellow Speaker's Card and submit it to the City Clerk seated at the front table. Do this before the meeting or before the item is heard.** This will ensure that the name on the card is called for the item(s) that you wish to address, and it will help ensure the meeting runs smoothly for all participants by calling speakers in an orderly manner.
- When the Council reaches your item on the agenda, the Mayor will open the public hearing and call your name. Please address the Council from the podium, which is located to the left of the City Clerk's table.

- o Each speaker generally has two minutes to speak per item. The total amount of time allocated for public testimony for each public speakers or for an agenda item may be limited at the Mayor's discretion, depending on the number of speakers or the length of the agenda. (California Government Code Section 54954.3; Council Policy 0-37)
- o To assist you in tracking your speaking time, there is a display on the podium. The green light turns on when you begin speaking; the yellow light turns on when you have 30 seconds left; and the red light turns on when your speaking time is up.

Please be advised that, by law, the City Council is unable to discuss or take action on issues presented during Open Forum. According to State Law (the Brown Act) items must first be noticed on the agenda before any discussion or action.

The San José City Council meets every Tuesday at 1:30 p m. and Tuesday at 6 p.m. as needed, unless otherwise noted. The City Council, or less than a quorum, may adjourn any regular, special or adjourned meeting to a later date, time and place specified in the order of adjournment. If all members are absent, the City Clerk may declare the meeting adjourned to a stated date, time and place. If you have any questions, please direct them to the City Clerk's staff seated at the tables just below the dais. Thank you for taking the time to attend today's meeting. We look forward to seeing you at future meetings.

Agendas, Staff Reports and some associated documents for City Council items may be viewed on the Internet at https://www.sanjose legistar.com/Calendar.aspx. Council Meetings are televised live and rebroadcast on Channel 26.

All public records relating to an open session item on this agenda, which are not exempt from disclosure pursuant to the California Public Records Act, that are distributed to a majority of the legislative body will be available for public inspection at the Office of the City Clerk at San José City Hall, 200 E. Santa Clara Street, Tower 14th Floor, San José, CA 95113 at the same time that the public records are distributed or made available to the legislative body. Any draft contracts, ordinances and resolutions posted on the Internet site or distributed in advance of the Council meeting may not be the final documents approved by the City Council. Please go to the Clerk's Records Database https://records.sanjoseca.gov/Pages/Search.aspx for the final document, or you many also contact the Office of the City Clerk at (408) 535-1260 or CityClerk@sanjoseca.gov.

American Disability Act: To request an alternative format agenda under the Americans with Disabilities Act for City-sponsored meetings, events or printer materials, please call (408) 535-1260 as soon as possible, but at least three business days before the meeting. Accommodations: Any member of the public who needs accommodations should email the ADA Coordinator at ADA@sanjoseca.gov or by calling (408) 535-8430. The ADA Coordinator will use their best efforts to provide reasonable accommodations to provide as much accessibility as possible while also maintaining public safety in accordance with the City procedure for resolving reasonable accommodation requests.

On occasion the City Council may consider agenda items out of order.

*** COVID-19 NOTICE ***

Consistent with AB 361 and City of San Jose Resolution Nos. 79485, 80237, 80266, 80290, 80323 and 80343, Councilmembers may be teleconferencing from remote locations.

How to observe the Meeting (no public comment):

1) Cable Channel 26,
2) https://www.sanjoseca.gov/news-stories/watch-a-meeting, or
3) https://www.youtube.com/CityofSanJoseCalifornia

How to submit written Public Comment before the City Council Meeting:

1) Use the eComment tab located on the City Council Agenda page. eComments are also directly sent to the ilegislate application used by City Council and staff.
2) By email to city.clerk@sanjoseca.gov by 10:00 a.m. the day of the meeting. Those emails will be attached to the Council Item under "Letters from the Public." Please identify the Agenda Item Number in the subject line of your email.

How to submit written Public Comment during the City Council Meeting:

1) Email during the meeting to councilmeeting@sanjoseca.gov, identifying the Agenda Item Number in the email subject line. Comments received will be included as a part of the meeting record but will not be read aloud during the meeting.

How to provide spoken Public Comment during the City Council Meeting:

1) By Phone: (888) 475 4499. Webinar ID is 993 4684 3938. Click *9 to raise a hand to speak. Click *6 to unmute when called.
Alternative phone numbers are: US: +1 (213) 338-8477 or +1 (408) 638-0968 or (877) 853-5257 (Toll Free)
2) Online at: https://sanjoseca.zoom.us/j/99346843938
a. Use a current, up-to-date browser: Chrome 30+, Firefox 27+, Microsoft Edge 12+, Safari 7+. Certain functionality may be disabled in older browsers including Internet Explorer. Mute all other audio before speaking. Using multiple devices can cause an audio feedback.
b. Enter an email address and name. The name will be visible online and will be used to notify you that it is your turn to speak.
c. When the Mayor calls for the item on which you wish to speak, click on "raise hand." Speakers will be notified shortly before they are called to speak.
d. When called, please limit your remarks to the time limit allotted.

- Call to Order and Roll Call

9:30 a.m.- Closed Session

22-007 Closed Session Agenda

Attachments Closed Session Agenda

1:30 p.m.- Regular Session

6:00 p.m.- Evening Session - Cancelled (The item for 6pm is on the afternoon agenda, and NOT CANCELLED)

*The previously scheduled Evening Session has been cancelled.

- Pledge of Allegiance
- Invocation (District 1)

Brandon Luu, Board Member, San José Poetry Center

- Orders of the Day

To be heard after Ceremonial Items

Items recommended to be added, dropped, or deferred are usually approved under Orders of the Day unless the Council directs otherwise.

- Closed Session Report

To be heard after Ceremonial Items

1. CEREMONIAL ITEMS

1.1 Presentation of a proclamation recognizing January 25, 2022 as International Holocaust Remembrance Day. (Jimenez)

1.2 Presentation of a proclamation declaring January 24, 2022 as International Day of Education. (Peralez)

2. CONSENT CALENDAR

Notice to the public: There will be no separate discussion of Consent Calendar items as they are considered to be routine by the City Council and will be adopted by one motion. If a member of the City Council requests discussion on a particular item, that item may be removed from the Consent Calendar and considered separately.

2.1 Approval of City Council Minutes.

22-092 **Approval of City Council Minutes.**

Recommendation: (a) City Council Special Meeting - Climate Smart San José Minutes of November 8, 2021.
CEQA: Not a Project, File No. PP17-009, Staff Reports, Assessments, and Annual Reports, and Informational Memos that involve no approvals of any City action.

Attachments (a) 11/8/2021 CC SM Draft Minutes

2.2 Final Adoption of Ordinances.

22-044 **Final Adoption of Ordinances.**

Recommendation: (a) Ordinance No. 30712 - An Ordinance of the City of San José Rezoning Certain Real Property of Approximately 2.77 Gross Acres Situated on the South Side of East Santa Clara Street, East of South 26th Street, and North of Shortridge Avenue (1260 East Santa Clara Street; APNs: 467-33-001, 467-33-002, 467-33-003, 467-33-004, 467-33-006, 467-33-007, and 467-33-008) from the CG Commercial General Zoning District and LI Light Industrial Zoning District to a CP(PD) Planned Development Zoning District.
[Passed for Publication on 1/11/2022 - Item 10.2(b) (21-2649)]
(b) Ordinance No. 30713 - An Ordinance of the City of San José Rezoning Certain Real Property of Approximately 0.69 Gross Acre Situated on the East Side of South Winchester Boulevard Approximately 270 Feet South of Fireside Drive (1212-1224 South Winchester Boulevard) (APNs: 279-17-020 & 279-17-021) from the R-1-8 Single-Family Residence Zoning District to the CP Commercial Pedestrian Zoning District.
[Passed for Publication on 1/11/2022 - Item 10.3(b) (21-2650)]

2.3 Approval of Council Committee Minutes.

22-093 **Approval of Council Committee Minutes.**

Recommendation: (a) Special Neighborhood Services and Education Committee Meeting Minutes of November 4, 2021.
(b) Regular Neighborhood Services and Education Committee Meeting Minutes of December 9, 2021.
(c) Regular Neighborhood Services and Education Committee Meeting Minutes of January 13, 2022.
(d) Joint County of Santa Clara/Public Safety, Finance and Strategic Support Committee Special Meeting - Gender-Based Violence and Child Sexual Abuse Minutes of November 5, 2021.
(e) Regular Public Safety, Finance and Strategic Support Committee Meeting Minutes of November 18, 2021.
(f) Regular Public Safety, Finance and Strategic Support Committee Meeting Minutes of December 16, 2021.
(g) Regular Joint Meeting for the Rules and Open Government Committee and Committee of the Whole Meeting Minutes of November 17, 2021.
(h) Regular Joint Meeting for the Rules and Open Government Committee and Committee of the Whole Meeting Minutes of December 1, 2021.
(i) Regular Joint Meeting for the Rules and Open Government Committee and Committee of the Whole Meeting Minutes of December 8, 2021.
(j) Regular Joint Meeting for the Rules and Open Government Committee and Committee of the Whole Meeting Minutes of January 5, 2022.
(k) Regular Joint Meeting for the Rules and Open Government Committee and Committee of the Whole Meeting Minutes of January 12, 2022.
(l) Regular Community and Economic Development Committee Meeting Minutes of November 22, 2021.
(m) Regular Smart Cities and Service Improvements Committee Meeting Minutes of December 2, 2021.
(n) Regular Transportation and Environment Committee Meeting Minutes of December 6, 2021.
CEQA: Not a Project, File No. PP17-009, Staff Reports, Assessments, Annual Reports, and Informational Memos that involve no approvals of any City action.

Attachments
(a) 11/04/2021 NSE Minutes
(b) 12/09/2021 NSE Minutes
(c) 1/13/2022 NSE Minutes
(d) 11/05/2021 Special Joint SCC/PSFSS
(e) 11/18/2021 PSFSS Minutes
(f) 12/16/2021 PSFSS Minutes
(g) 11/17/2021 ROGC Minutes
(h) 12/01/2021 ROGC Minutes
(i) 12/08/2021 ROGC Minutes
(j) 01/05/2022 ROGC Minutes
(k) 01/12/2022 ROGC Minutes
(l) 11/22/2021 CED Minutes
(m) 12/02/2021 Smart Cities Minutes
(n) 12/06/2021 T&E Minutes

2.4 Mayor and Council Excused Absence Requests.

2.5 City Council Travel Reports.

2.6 Report from the Council Liaison to the Retirement Boards.

2.7 22-022 **Calling for Municipal Elections on June 7, 2022 and November 8, 2022.**

Recommendation: Adopt a resolution calling for a Regular Municipal Election on June 7, 2022 and a Run-Off Municipal Election on November 8, 2022, if necessary, for the purpose of electing a Mayor and Council Members for Districts 1, 3, 5, 7, and 9 and requesting consolidation with the County of Santa Clara.
CEQA: Not a Project, File No. PP17-008, General Procedure and Policy Making resulting in no changes to the physical environment.
(City Clerk)

Attachments
Memorandum
Resolution

2.8 22-025 **Retroactive Approval of City Hall Tower and Rotunda Lighting Events During January 2022 and February 2022 in Colors Associated with the Celebration of Dr. Martin Luther King Jr. Day, and Tet Vietnamese and Chinese New Year Festivals.**

Recommendation: Retroactively approve City Hall Tower and Rotunda lighting scheduled from January 2, 2022 through February 12, 2022 in colors associated with the celebration of Martin Luther King Jr. Day, and Tết Vietnamese and Chinese New Year festivals as a Ceremonial Item.
CEQA: Not a Project, File No. PP17-011, Temporary Special Events resulting in no changes to the physical environment. (City Manager)

Attachments Memorandum

2.9 22-026 **Actions Related to California Volunteers for the CaliforniansForAll Youth Workforce Development Program.**

Recommendation:

(a) Adopt a resolution authorizing the City Manager to:
(1) Accept the $13,976,741 grant from California Volunteers for the CaliforniansForAll Youth Workforce Development initiative to continue and expand the Resilience Corps Program; and
(2) Negotiate and execute any documents necessary to accept the grant.
(b) Adopt the following 2021-2022 Funding Sources Resolution and Appropriation Ordinance Amendments in the General Fund:
(1) Increase the estimate for Revenue from Federal Government appropriation by $1,911,903; and
(2) Establish the CaliforniansForAll Youth Workforce Program City-wide appropriation to the Office of Economic Development and Cultural Affairs in the amount of $1,911,903.
(c) Adopt a resolution authorizing the City Manager to negotiate and execute agreements with San Jose Conservation Corps, San Jose Public Library Foundation, and as needed to Keep Coyote Creek Beautiful, Trash Punx, Our City Forest, Veggielution, San Jose Downtown Association, Goodwill of Silicon Valley and Guadalupe River Park Conservancy to implement the program in a combined amount not to exceed the grant award.
CEQA: Not a Project, File No. PP17-010, City Organizational and Administrative Activities resulting in no changes to the physical environment. (Economic Development and Cultural Affairs/City Manager)

Attachments Memorandum
Resolution

2.10 22-027 **Actions Related to the Purchase Orders for Trucking and Debris and Asphalt Hauling Services.**

Recommendation: Adopt a resolution authorizing the City Manager to:
(a) Execute purchase orders with One Stop, Inc. dba San José Transport (Gilroy, CA), 101 Trucking, Inc, (Gilroy, CA), and Alviso Rock, Inc (Alviso, CA) for trucking and debris and asphalt hauling services for an initial twelve-month period, starting on or about January 26, 2022 and ending on or about January 25, 2023, for a total cumulative compensation not-to exceed amount of $593,000; and
(b) Exercise up to four additional one-year options to extend the initial term of the purchase orders with the last option year ending on or about January 25, 2027, subject to the annual appropriation of funds.
CEQA: Not a Project, File No. PP17-003, Agreements/Contracts (New or Amended) resulting in no physical changes to the environment.
(Finance)

Attachments Memorandum
TPAC Supplemental Memorandum, 1/14/2022

2.11 22-028 **Actions Related to the Purchase Orders for Elgin Crosswing and Broom Bear Street Sweeper Rental Services.**

Recommendation: Adopt a resolution authorizing the City Manager to:
(a) Execute purchase orders with Owen Equipment Sales, Inc. (Fairfield, CA) and Municipal Maintenance Equipment, Inc. (Sacramento, CA) for Elgin Crosswing and Broom Bear street sweeper rental services for an initial twelve-month period, starting on or about January 26, 2022 and ending on or about January 25, 2023 for a combined maximum not-to exceed compensation of $500,000; and
(b) Exercise up to four additional one-year options to extend the initial term of the purchase orders with the last option year ending on or about January 25, 2027, subject to the annual appropriation of funds.
CEQA: Not a Project, File No. PP17-003, Agreements/Contracts (New or Amended resulting in no physical changes to the environment.
(Finance)

Attachments Memorandum

2.12 22-029 **Actions Related to the Purchase Order with Carahsoft Technology Corp., for a Capital Project Management System.**

Recommendation: Adopt a resolution authorizing the City Manager to:
(a) Execute a purchase order with Carahsoft Technology Corp. (Reston, VA) to provide a capital project management system for the Department of Public Works, including related professional services such as implementation, training, maintenance, and support, for a maximum compensation not to exceed $139,090 during the initial one-year term beginning on or about January 26, 2022 through January 31, 2023; and
(b) Exercise up to five additional one-year options to extend the term of the purchase order through January 31, 2028, subject to the appropriation of funds.
CEQA: Not a Project, File No. PP17-003, Agreements/Contracts (New or Amended) resulting in no physical changes to the environment. (Finance)

Attachments Memorandum

2.13 22-030 **Actions Related to the Purchase Order with Geveko Markings, Inc. for Preformed Thermoplastic Pavements Striping Materials.**

Recommendation: Adopt a resolution authorizing the City Manager to:
(a) Execute a purchase order with Geveko Markings, Inc. (Gainesville, GA) for preformed thermoplastic pavement striping materials for a twelve-month period, starting on or about January 26, 2022 and ending on January 11, 2023, for an amount not to exceed $935,868; and
(b) Exercise up to four additional one-year options to extend the initial term of the purchase order with the last option year ending on or about January 25, 2027, subject to the appropriation of funds.
CEQA: Not a Project, File No. PP17-003, Agreements/Contracts (New or Amended) resulting in no physical changes to the environment. (Finance)

Attachments Memorandum

2.14 22-031 **Actions Related to the Purchase Order with R.A.C. Services, LLC for Enhanced Maintenance and Ambassador Services at St. James Park.**

Recommendation: Adopt a resolution authorizing the City Manager to:
(a) Execute a purchase order with R.A.C. Services, LLC (Gilroy, CA) for enhanced maintenance and ambassador services at St. James Park for an initial twelve-month period starting on or about January 26, 2022 and ending on or about January 25, 2023, for an amount not-to exceed $125,000; and
(b) Exercise up to four additional one-year options to extend the initial term of the purchase order with the last option year ending on or about January 25, 2027, subject to the annual appropriation of funds.
CEQA: Not a Project, File No. PP17-003, Agreements/Contracts (New or Amended) resulting in no physical changes to the environment. (Finance)

Attachments Memorandum

2.15 22-032 **Amendment to the Turnkey Parkland and Excess Credit Agreement for the Flea Market Project.**

Recommendation: Approve the First Amendment to the "Turnkey Parkland and Excess Credit Agreement" to:
(a) Allow for a one-time payment of $4,072,599.32 to the City to fund and pursue construction of phase one improvements of Bruzzone Park and Mercado Park; and
(b) Confirm excess credits (to be applied toward future development in the Flea Market South).
CEQA: Environmental Impact Report for the Flea Market Planned Development Rezoning and General Plan Amendment and addenda thereto, File No. PDC03-108 and GP06-04-01, City Council Resolution No. 73956 and 73738. Council District 4. (Parks, Recreation and Neighborhood Services)

Attachments Memorandum
Agreement

2.16 22-033 **Master Agreements with IMEG Corp., Salas O'Brien Engineers Inc., and Advance Design Consultants Inc. for Mechanical, Electrical and Plumbing Consultant Services.**

Recommendation: Approve master consultant agreements with IMEG Corp., Salas O'Brien Engineers, Inc., and Advance Design Consultants, Inc for mechanical, electrical, and plumbing consultant services, from the date of execution through December 31, 2024, in a total amount not to exceed $1,000,000 for each agreement, subject to the appropriation of funds.
CEQA: Not a Project, File No. PP17-002, Consultant services for design, study, inspection, or other professional services with no commitment to future action. (Public Works)

Attachments Memorandum
Agreement - IMEG Corp
Agreement - Salas O'Brien Engineers
Agreement - Advance Design Consultants

2.17 22-034 **Actions Related to the 9112 - All Inclusive Rotary PlayGarden Project.**

Recommendation: (a) Report on bids and award of construction contract for the 9112 - All Inclusive Rotary PlayGarden Project to the low bidder, Redwood Engineering Construction, Inc., for the base bid in the amount of $1,698,000 and approve a ten percent contingency in the amount of $169,800.
(b) Adopt the following Appropriation Ordinance amendments in the Subdivision Park Trust Fund:
(1) Increase the All Inclusive Rotary PlayGarden Project appropriation to the Parks, Recreation and Neighborhood Services Department in the amount of $816,000; and
(2) Decrease the Matching Grant Reimbursement Reserve by $816,000.
CEQA: Categorically Exempt, File No. PP19-002, CEQA Guidelines Section 15301 Existing Facilities. Council District 3. (Public Works/Parks, Recreation and Neighborhood Services/City Manager)

Attachments Memorandum

2.18 22-052 **Retroactive Approval of Summerdale Dumpster Day Sponsored by Council District 4 as a City Council Sponsored Special Event to Expend City Funds and Accept Donations of Materials and Services for the Event.**

Recommendation: As recommended by the Rules and Open Government Committee on January 12, 2022:
(a) Retroactively approve the Summerdale Dumpster Day scheduled on January 22, 2022 as a City Council sponsored Special Event and approve the expenditure of funds; and
(b) Approve and accept donations from various individuals, businesses, or community groups to support the event.
CEQA: Not a Project, File No. PP17-011, Temporary Special Events resulting in no changes to the physical environment. (Cohen)
[Rules Committee referral 1/12/2022 - Item G.1.a]

Attachments Memorandum

2.19 22-056 **Retroactive Approval of Fiesta Navideña Sponsored by Council District 5 as a City Council Sponsored Special Event to Expend City Funds and Accept Donations of Materials and Services for the Event.**

Recommendation: As recommended by the Rules and Open Government Committee on January 12, 2022:
(a) Retroactively approve the Fiesta Navideña scheduled on December 4, 2021 as a City Council sponsored Special Event and approve the expenditure of funds; and
(b) Approve and accept donations from various individuals, businesses, or community groups to support the event.
CEQA: Not a Project, File No. PP17-011, Temporary Special Events resulting in no changes to the physical environment. (Carrasco)
[Rules Committee referral 1/12/2022 - Item G.1.b]

Attachments Memorandum

2.20 22-063 **Retroactive Approval of Multiple Special Events Sponsored by Council District 2 as City Council Sponsored Special Events to Expend City Funds and Accept Donations of Materials and Services for the Events.**

Recommendation: As recommended by the Rules and Open Government Committee on January 12, 2022:
(a) Retroactively approve the Walnut Mobile Home Park Toy Drive held on December 22, 2021 as a City Council sponsored Special Event.
(b) Retroactively approve the Southside Community Center Rotary Senior Luncheon held on December 3, 2021 as a City Council sponsored Special Event.
(c) Retroactively approve the Cottle to Lean Neighborhood Dumpster Day held on November 13, 2021 as a City Council sponsored Special Event.
(d) Approve the expenditure of District 2 office budget funds to purchase gift cards, toys and other materials for the events; and
(e) Approve and accept donations from various individuals, businesses, or community groups to support the event.
CEQA: Not a Project, File No. PP17-011, Temporary Special Events resulting in no changes to the physical environment. (Jimenez)
[Rules Committee referral 1/12/2022 - Item G.1.c]

Attachments Memorandum

2.21 22-079 **Boards and Commissions Appointment.**

Recommendation: Approve the following Boards and Commissions appointment:
(a) Arts Commission:
(1) Citywide Seat: Jannet Peace to a term ending June 30, 2024.
CEQA: Not a Project, File No. PP17-010, City Organizational and Administrative Activities resulting in no changes to the physical environment. (City Clerk)
[Rules Committee referral 1/19/2022 - Item A.1.a]

Attachments Memorandum
Conflicts of Interest Memorandum
Application

3. STRATEGIC SUPPORT

3.1 Report of the City Manager, Jennifer Maguire (Verbal Report)

22-035 (a) City Manager's COVID-19 Update (Verbal Report).
(b) City Manager's Report on Other City Matters (Verbal Report).

Attachments Presentation - est. 20 minutes

3.2 Labor Negotiations Update.

Accept Labor Negotiations Update.
TO BE HEARD AT 9:30 A.M.

3.3 22-036 **Annual Report on City Services 2020-2021**.

Recommendation: Accept the Annual Report on City Services for 2020-2021.
CEQA: Not a Project, File No. PP17-009, Staff Reports, Assessments, Annual Reports, and Informational Memos that involve no approvals of any City action. (City Auditor)

Attachments Annual Report
Presentation - est. 15 minutes

3.4 22-013 **Appeals Hearing Board Interview.**

Recommendation: Interview applicant for appointment to the Appeals Hearing Board:
(a) Appoint applicant to one of the vacant seats on the Appeals Hearing Board for a full term from January 1, 2022 to December 31, 2025;
(b) If any vacancy remains, direct the City Clerk to continue recruitment efforts and bring forward additional applicants for consideration within 90 days.
CEQA: Not a Project, File No. PP17-010, City Organizational and Administrative Activities resulting in no changes to the physical environment. (City Clerk)

Attachments Memorandum
Conflicts of Interest Memorandum
Application

3.5 22-037 **Definition of Racial Equity.**

Recommendation: Adopt a resolution accepting the proposed definition of racial equity: "Both a process and an outcome, racial equity is designed to center anti-racism, eliminate systemic racial inequities, and rooted in the acknowledgement of the City of San Jose's historical and existing practices that have led to discrimination and injustices to Black, Indigenous, Latino/a/x, Asian, and Pacific Islander communities.
The racial equity process is an explicit, intentional, and continual practice of prioritizing psychologically safe spaces and a sense of belonging for racial groups that have been most negatively impacted in policies and practices. It is action that prioritizes liberation and measurable change, and centers lived experiences of all impacted racial groups.
As an outcome, racial equity is achieved when race can no longer be used to predict life outcomes, and everyone can prosper and thrive."
CEQA: Not a Project, File No. PP17-009, Staff Reports, Assessments, Annual Reports, and Informational Memos that involve no approvals of any City action. (City Manager)

Attachments
Memorandum
Resolution
Presentation - est. 5 minutes
Letters from the Public

3.6 22-038 **SJC Guadalupe Gardens Fencing Project and Temporary Closure of Spring Street and Asbury Streets. - DEFERRED**

Recommendation: (a) Accept report on Guadalupe Gardens Fencing including security and activation measures and authorize the City Manager to:
(1) Execute a pilot program to limit trail access to unauthorized vehicles on Guadalupe River Park trail;
(2) Develop a Request for Proposals for potential programming and stewardship partners for the Guadalupe Gardens area;
(3) Receive feedback on the Prototype Park Concept Plan; and
(4) Allocate the SJC Guadalupe Gardens Fencing Project fund in the amount of $1,500,000 for protecting the land and authorized uses.
(b) Adopt a resolution delegating authority to the Director of Public Works to award the construction contract for the 9821 - SJC Guadalupe Gardens Fencing Project, in an amount not greater than $1,500,000.
CEQA: Categorically Exempt, File No. ER21-005, CEQA Guidelines 15303(e). New Construction or Conversion of Small Structures and PP17-007, Preliminary direction to staff and eventual action requires approval from decision-making body. (Airport/Parks, Recreation and Neighborhood Services/Public Works/Transportation/City Manager)
DEFERRED TO 2/8/2022 PER ADMINISTRATION

3.7 22-039 **Report on Procurement of Insurance Products for Continuation of an Owner-Controlled Insurance Program for the San Jose-Santa Clara Regional Wastewater Facility.**

Recommendation: Adopt a resolution authorizing the Director of Finance to:
(a) Purchase insurance policies for the San José-Santa Clara Regional Wastewater Facility Capital Improvement Program with total cost not to exceed $7,221,283 including estimated insurance premiums of $4,661,872 and a total maximum deductible $2,559,411, as well as a cash collateral fund of $1,496,471 with premiums to be paid in four (4) annual installments, and subject to the annual appropriation of funds, as follows:
(1) Federal Insurance Company: Commercial General Liability Insurance and Workers' Compensation Insurance with a Program Agreement Endorsement stipulating terms of the cash collateral fund management;
(2) Allied World Assurance Company, Inc.: Commercial Excess Liability Insurance;
(3) Endurance Risk Solutions Assurance Company: Commercial Excess Liability Insurance;
(4) Liberty Surplus Insurance Corporation: Commercial Excess Liability Insurance;
(5) Great American Assurance Company: Commercial Excess Liability Insurance;
(6) Westchester Surplus Lines Insurance Company: Commercial Excess Liability Insurance;
(7) Ironshore Specialty Insurance Company: Contractors Pollution Liability Insurance;
(8) Berkley Assurance Company: Owners Protective Professional Liability Insurance; and
(b) Either renew an existing, or secure quotes and purchase a new, Master Builder's Risk Insurance policy with special endorsement for Flood to provide builder's risk coverage through 2026 as necessary, with a projected $906,000 in premiums, the cost of which is included in the estimated insurance premiums above.
CEQA: Not a Project, File No. PP17-003, Agreements/Contracts (New or Amended) resulting in no physical changes to the environment. (Finance/Environmental Services)

Attachments Memorandum
TPAC Supplemental Memorandum, 1/14/2022
Resolution

4. PUBLIC SAFETY SERVICES

4.1 22-045 **Gun Harm Reduction Ordinance. - TO BE HEARD AT 6:00 P.M.**

Recommendation: Consider approving an ordinance amending Title 10 of the San José Municipal Code to add Part 6 to Chapter 10.32 to reduce gun harm by requiring gun owners to obtain and maintain liability insurance and to provide for a fee to apply to gun harm reduction programs.
CEQA: Not a Project, File No. PP17-008, General Procedure and Policy Making resulting in no changes to the physical environment.
(City Attorney)
TO BE HEARD AT 6:00 P.M.

Attachments
Memorandum
Supplemental Memorandum, 1/19/2022
Supplemental Memorandum, 1/21/2022
Replacement Supplemental Memorandum, 1/24/2022
Memorandum from Davis, 1/21/2022
Memorandum from Liccardo, Jones, Cohen & Carrasco, 1/21/202
Memorandum from Peralez, 1/21/2022
Memorandum from Arenas, 1/25/2022
Ordinance
Letters from the Public - 1 of 12
Letters from the Public - 2 of 12
Letters from the Public - 3 of 12
Letters from the Public - 4 of 12
Letters from the Public - 5 of 12
Letters from the Public - 6 of 12
Letters from the Public - 7 of 12
Letters from the Public - 8 of 12
Letters from the Public - 9 of 12
Letters from the Public - 10 of 12
Letters from the Public - 11 of 12
Letters from the Public - 12 of 12
eComments Final

5. TRANSPORTATION & AVIATION SERVICES

5.1 22-040 **Amendment to the Agreements for On-Call Architectural and Engineering Consultant Services.**

Recommendation: Adopt a resolution authorizing the City Manager to negotiate and execute:
(a) An amendment to the Kimley-Horn and Associates, Inc.'s existing On-Call Architectural and Engineering Consultant Services Master Agreement at Norman Y. Mineta San José International Airport (SJC and Airport) to increase the maximum compensation by $2,300,000; and
(b) An amendment to the Jviation, Inc.'s existing On-Call Architectural and Engineering Consultant Services Master Agreement at Norman Y. Mineta San José International Airport to decrease maximum compensation by $2,300,000.
CEQA: Not a Project, File No. PP17-002, Consultant services for design/study/ inspection, or other professional services with no commitment to future action. (Airport)

Attachments Memorandum

5.2 22-041 **Community Forest Management Plan.**

Recommendation: Adopt a resolution approving the Community Forest Management Plan.
CEQA: Not a Project, File No. PP17-002, Consultant services for design, study, inspection, or other professional services with no commitment to future action. (Transportation)
[Deferred from 12/14/2021 - Item 5.1 (21-2567)]

Attachments
Memorandum
Attachment A - Community Forest Management Plan
Attachment B - Strategic Plan
Memorandum from Liccardo, Carrasco, Davis, Esparza, Cohen, 1
Memorandum from Mahan, 1/25/2022
Resolution
Presentation - est. 15 minutes
Letters from the Public - 1 of 2
Letters from the Public - 2 of 2

6. ENVIRONMENTAL & UTILITY SERVICES

7. NEIGHBORHOOD SERVICES

8. COMMUNITY & ECONOMIC DEVELOPMENT

8.1 22-042 **Approval of a Downtown High-Rise Residential Tax and Fee Waiver for the Carlysle at 51 Notre Dame Street.**

Recommendation: Conduct a public hearing to approve an economic development tax and fee waiver in connection with a reduction in construction taxes and the Affordable Housing Impact Fee for a downtown residential high-rise at 51 Notre Dame Street in the amount of $4,390,599 pursuant to California Government Code Section 53083 and Open Government Resolution No. 77135 Section 2.3.2.6.C.
CEQA: Addendum to the Downtown Strategy 2040 Final Environmental Impact Report and addenda thereto, Planning File No. SP20-020. Council District 3. (Economic Development and Cultural Affairs/Housing)

Attachments
Memorandum
Memorandum from Peralez, 1/24/2022
Presentation - est. 5 minutes
Letters from the Public

9. REDEVELOPMENT – SUCCESSOR AGENCY

10. LAND USE

Notice to the public: There will be no separate discussion of Land Use Consent Calendar (Item 10.1) as they are considered to be routine by the City Council and will be adopted by one motion. If a member of the City Council requests discussion on a particular item, that item will be removed from the Land Use Consent Calendar (Item 10.1) and considered separately.

10.1 Land Use on Consent Calendar

(a) 22-043 **Reorganization/Detachment from the City of San José of Approximately 9.56-Gross Acres Consisting of Two Parcels Located on the Easterly Side of Saratoga Creek Along Lawrence Expressway Between Highway 280 and Bollinger Road (Doyle No. 7). - TO BE HEARD IMMEDIATELY AFTER CONSENT**

Recommendation: Adopt a resolution supporting the reorganization of territory designated as Doyle No. 7 which involves detachment from the City of San José of approximately 9.56 gross acres of land located at the easterly side of Saratoga Creek along Lawrence Expressway between Highway 280 and Bollinger Road, and the detachment of the same from the affected special districts.
CEQA: Categorically Exempt, File No. ER22-004, CEQA Guidelines Section 15305 Minor Alterations in Land Use Limitations. Council District 1. (Planning, Building and Code Enforcement)
TO BE HEARD IMMEDIATELY AFTER CONSENT

Attachments Memorandum
Resolution

END OF CONSENT CALENDAR

10 Land Use - Regular Agenda

- Open Forum

Members of the Public are invited to speak on any item that does not appear on today's Agenda and that is within the subject matter jurisdiction of the City Council.

- Adjournment

CITY OF SAN JOSE CODE OF CONDUCT FOR PUBLIC MEETINGS IN THE COUNCIL CHAMBERS AND COMMITTEE ROOMS

The Code of Conduct is intended to promote open meetings that welcome debate of public policy issues being discussed by the City Council, their Committees, and City Boards and Commissions in an atmosphere of fairness, courtesy, and respect for differing points of view.

1. Public Meeting Decorum:

a) Persons in the audience will refrain from behavior which will disrupt the public meeting. This will include making loud noises, clapping, shouting, booing, hissing or engaging in any other activity in a manner that disturbs, disrupts or impedes the orderly conduct of the meeting.
b) Persons in the audience will refrain from creating, provoking or participating in any type of disturbance involving unwelcome physical contact.
c) Persons in the audience will refrain from using cellular phones and/or pagers while the meeting is in session.
d) Appropriate attire, including shoes and shirts are required in the Council Chambers and Committee Rooms at all times.
e) Persons in the audience will not place their feet on the seats in front of them.
f) No food, drink (other than bottled water with a cap), or chewing gum will be allowed in the Council Chambers and Committee Rooms, except as otherwise pre-approved by City staff.
g) All persons entering the Council Chambers and Committee Rooms, including their bags, purses, briefcases and similar belongings, may be subject to search for weapons and other dangerous materials.

2. Signs, Objects or Symbolic Material:

a) Objects and symbolic materials, such as signs or banners, will be allowed in the Council Chambers and Committee Rooms, with the following restrictions: § No objects will be larger than 2 feet by 3 feet.
   -No sticks, posts, poles or other such items will be attached to the signs or other symbolic materials.
   -The items cannot create a building maintenance problem or a fire or safety hazard.

b) Persons with objects and symbolic materials such as signs must remain seated when displaying them and must not raise the items above shoulder level, obstruct the view or passage of other attendees, or otherwise disturb the business of the meeting.
c) Objects that are deemed a threat to persons at the meeting or the facility infrastructure are not allowed. City staff is authorized to remove items and/or individuals from the Council Chambers and Committee Rooms if a threat exists or is perceived to exist. Prohibited items include, but are not limited to: firearms (including replicas and antiques), toy guns, explosive material, and ammunition; knives and other edged weapons; illegal drugs and drug paraphernalia; laser pointers, scissors, razors, scalpels, box cutting knives, and other cutting tools; letter openers, corkscrews, can openers with points, knitting needles, and hooks; hairspray, pepper spray, and aerosol containers; tools; glass containers; and large backpacks and suitcases that contain items unrelated to the meeting.

CITY OF SAN JOSE CODE OF CONDUCT FOR PUBLIC MEETINGS IN THE COUNCIL CHAMBERS AND COMMITTEE ROOMS (CONT'D.)

3. Addressing the Council, Committee, Board or Commission:

a) Persons wishing to speak on an agenda item or during open forum are requested to complete a speaker card and submit the card to the City Clerk or other administrative staff at the meeting.
b) Meeting attendees are usually given two (2) minutes to speak on any discussion item and/or during open forum; the total amount of time allocated for public testimony for each public speaker or for an agenda item is in the discretion of the Chair of the meeting and may be limited when appropriate. (California Government Code Section 54954.3; Council Policy 0-37) Applicants and appellants in land use matters are usually given more time to speak. Speakers using a translator will be given twice the time allotted to ensure non-English speakers receive the same opportunity to directly address the Council, Committee, Board or Commission.
c) Speakers should discuss only the agenda item when called to speak for that item, and only topics related to City business when called to speak during open forum on the agenda.
d) Speakers' comments should be addressed to the full body. Requests to engage the Mayor, Council Members, Board Members, Commissioners or Staff in conversation will not be honored. Abusive language is inappropriate.
e) Speakers will not bring to the podium any items other than a prepared written statement, writing materials, or objects that have been inspected by security staff.
f) If an individual wishes to submit written information, he or she may give it to the City Clerk or other administrative staff at the meeting.
g) Speakers and any other members of the public will not approach the dais at any time without prior consent from the Chair of the meeting.

Failure to comply with this Code of Conduct which will disturb, disrupt or impede the orderly conduct of the meeting may result in removal from the meeting and/or possible arrest.

Exhibit 10

Incidence and Cost of Firearm Injuries in San Jose, CA

January 19, 2022

Pacific Institute for Research and Evaluation
4061 Powder Mill Road, Suite 350
Beltsville, MD 20705-3113
www.pire.org

Prepared by:
Ted R Miller, PhD
David I Swedler, PhD
Bruce A Lawrence, PhD

The City of San José is considering legislation that would reduce the public cost of firearm injury. This report examines how many firearm injuries occur annually in the city and how much the city spends responding to them. It then analyzes the number of guns in the city and uses that information to calculate the city's annual firearm injury spending per gun. A report appendix provides the costs of firearm injuries in San José from the perspectives of society and of Federal, state, county, and city governments combined.

Gunfire Annually Kills or Injures More Than 200 People in San José

Annually, more than 200 people are killed or injured by gunfire in San José. Assaults and homicides are the most common. Almost 30% of those injured die. Suicide deaths by firearm also are frequent. Unintentional gunshot wounds tend to be less serious. Notably, those incidents virtually all involve a single bullet. Table 1 summarizes official statistics on the average annual number of firearm deaths and injuries in San José over the most recent 6 years of data. The table uses 6-year averages to protect confidentiality.

Table 1. Average Annual Number of People Killed or Injured by Gunfire in San José

	Deaths	Nonfatal Hospital Inpatient Admissions	Emergency Department Treated & Discharged Without Admission	Total
Assault/Homicide/Legal Intervention	28	32	29	89
Self-Inflicted/Suicide	28	3	*	31
Unintentional/Undetermined	2	25	59	86
Total	58	60	88	206

* Included with unintentional/undetermined to meet minimum count requirements that protect confidentiality.

Source: Tabulations of 2013-2019 Vital Statistics Multiple Cause of Death data and 2013-2018 California Hospital Discharge and Emergency Department Discharge Data censuses.

Many people are assaulted or robbed at gunpoint but not injured. Annually between 2017 and 2019, San José police responded to an average of 869 firearm robberies and assaults without physical injury.

Annually, San José Spends at Least $7,937,000 Responding to Shootings

The primary costs that the City of San José incurs in responding to a shooting are for fire department and police response including police investigation and participation in the criminal justice process. Table 2 summarizes those costs. The San José Fire Department delivered emergency medical services to 48 shooting victims in 2018, 57 in 2019, and 82 in 2020, with an average annual cost of $137,000. The fire department response volume for gunshot injuries in this calculation comes from the department's call database that includes a variable indicating if calls responded to a shooting. The $2,199 cost per call in 2020 is a performance measure reported in the 2021 department budget.

The annual police response costs totaled $7,800,000 annually. Of that amount, 72% involved homicides. The police cost estimates come from US average police response costs by crime from Hunt et al.[1] as refined by Miller et al.[2] The Hunt simulation model builds police costs per crime from the average police spending per capita in California in 2010 ($235.29 from Table A1). To adapt its estimates to San José, we therefore multiplied its mean costs by type of incident times the ratio of per capita costs in San José in 2020 versus the state in 2010. The San José per capita cost of $434.49 was computed as the average police cost per sworn officer hour of $144.34 according to the police budget office multiplied times 2080 hours per year times 1,151 sworn officers in 2020 times the ratio of 1.274 (sworn and nonsworn police labor payments) per sworn officer labor payment in the San José Police Department in 2016.[3] Hunt gave police costs for homicide, aggravated assault, motor vehicle crash, and a few other offenses. We did not vary police costs of an aggravated assault depending on whether the victim was injured, meaning our assault costs for cases with injury may be an underestimate. More likely than not, the police time required for a suicide or unintentional shooting death is comparable to the time required by an aggravated assault, whereas other nonfatal shootings involve modest costs comparable to a motor vehicle crash. Conservatively, we do not attribute any costs to robberies and assaults involving firearms but no injuries as these crimes might have happened even if the perpetrator lacked firearm access. The cost is even more conservative because it omits police costs of weapons violations and gun thefts. No data are available on the frequency of those crimes.

Table 2. Costs the City of San José Incurs Annually Responding to Firearm Injuries

	Unintentional/ Undetermined	Suicide Act	Homicide/ Assault	Total
Fire Department EMS	$69,403	$10,136	$57,531	$137,071
Police Fatal Injury Response	$29,224	$624,663	$5,680,080	$6,333,967
Police Nonfatal Injury Response	$135,072	$4,556	$1,329,692	$1,469,320
Total	$233,699	$639,355	$7,067,303	$7,940,358

50,000-55,000 Households in San José Own Guns

We estimate that between 50,000 and 55,000 households in San Jose own guns. This count was calculated using two approaches that have different limitations. Both approaches yielded counts for Santa Clara County in 2013-2015 (the most recent data available) that were used to calculate San José's share, then adjusted to account for firearms acquired in 2016-2020.

The first approach uses State of California background check data that show 363,725 guns were sold in Santa Clara County (SCC) between 2002 and 2015.[4] The County treats that count as the number of guns in SCC. The resulting count, however, has wide uncertainty because (a) people in SCC bought some of their guns before 2002, (b) some SCC residents purchased guns elsewhere and brought them to SCC, (c)

[1] Hunt PE, Saunders J, Kilmer B. Estimates of law enforcement costs by crime type for benefit-cost analyses. *Journal of Benefit-Cost Analysis, 10*(1), 95-123, 2019.
[2] Miller TR, Cohen M, Swedler D, Ali B, Hendrie D. Incidence and costs of personal and property crimes in the United States, 2017. *Journal of Benefit Cost Analysis. 12*(1), 24-54, 2021.
[3] Hyland S. Justice expenditure and employment extracts, 2016 – Preliminary. NCJ Number 254126, Bureau of Justice Statistics. 2019. https://bjs.ojp.gov/sites/g/files/xyckuh236/files/media/document/jeee16p.zip
[4] Santa Clara County Public Health. Guns in Santa Clara County. April 2018. The State requires that all gun sales in California go through its system.

some purchasers in SCC did not live in SCC and brought the guns they purchased elsewhere, (d) some SCC residents who purchased guns in SCC moved out of the County or stored their guns out of county, e.g., at a vacation home, (e) some people moved to SCC and brought guns with them, (f) some guns were sold in transactions outside SCC or were stolen and transported into or out of SCC, and (g) some guns were decommissioned (i.e., they became inoperative, were destroyed, or were otherwise removed from the stock of guns in San Jose). The count also excludes "ghost guns" that owners built themselves from parts they bought or printed on a 3-D printer.

The second approach uses 2013-14 Behavioral Risk Factor Surveillance System survey data that found 11% of households in Santa Clara County owned guns[5] (70,424 households when 11% is multiplied by the Census Bureau count of 640,215 households in SCC in 2015[6]). A national survey calculates that the average gun owner owns 4.8 guns, while Federal gun excise tax data adjusted for some guns being decommissioned arrived at an average of 5.16.[7] Multiplying the number of households with guns in SCC times the number of guns per household with guns yields a range of 338,034 to 363,545 guns in SCC in 2015.

These two approaches using different methods and data yield virtually identical counts when one uses the 5.16 average count of guns per household with guns. The similarity of results strengthens confidence in the accuracy of the calculated count.

The figures calculated above for Santa Clara County can be used to estimate the number of gun-owning households in San José . This calculation also can be approached in two ways. If we apply the 11% ownership rate to the 2014 household count of 325,114 for San José.[8] It yields a range of 164,856 to 177,298 guns in San José in 2014. Alternatively, we can build on published findings that the number of guns in a jurisdiction tracks the number of suicide deaths by firearm in the jurisdiction.[9,10] That alternative can be used with either the survey-based or sales-based SCC counts. It indicates that San José had 154,530 to 166,274 guns in 2015. Across the 5 calculated counts, the mean number of guns in San José in 2014-15 is 165,830, with a range from 154,530 to 177,298.

From 2015 to 2020, the number of guns in California rose by 55.3%. With that growth rate, people in San José owned 257,500 guns in 2020, with a range from 240,000 to 287,000. Dividing by the number of guns per household, 50,000 to 55,500 household owned guns.

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[5] Idem.

[6] https://www.census.gov/quickfacts/fact/table/santaclaracountycalifornia,sanjosecitycalifornia/INC110219? , accessed June 2021.

[7] Azrael D, Hepburn L, Hemenway D, Miller M. The stock and flow of US firearms: results from the 2015 National Firearms Survey. RSF: The Russell Sage Foundation Journal of the Social Sciences. 2017;3(5):38–57. The 5.16 average was computed by extending Table A1 in the article from 2013 to 2015, then multiplying the 4.8 average for 2015 from the survey by the 285-million-gun count from Table A1 divided by the 265 million survey count.

[8] https://www.sanjoseca.gov/home/showpublisheddocument/23765/636689378693570000 , accessed August 2021. A 2015 count is not readily available.

[9] Miller M, Barber C, White RA, Azrael D. Firearms and suicide in the United States: is risk independent of underlying suicidal behavior? Am J Epidemiol. 15;178(6):946-955, 2013.

[10]

San José Incurs an Annual Average Costs of $151 per Gun-owning Household Providing Services to Fatal and Nonfatal Firearm Injury Shooters and Victims

Dividing the total annual costs by the number of gun-owning household reveals that San José spends an average of $151 per gun-owning household providing injury-related services to firearm injury shooters and those they shoot. Given the range around the number of guns in the city, the cost per gun-owning household has an uncertainty range of $143 to $159. These figures incorporate a conservative estimate of total city expenditures on shooting response. The cost per gun averages $31, with a range from $28 to $33.

ACKNOWLEDGEMENT

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APPENDIX: COSTS OF FIREARM INJURIES IN SAN JOSÉ TO SOCIETY AND GOVERNMENT

Annually Firearm Injuries in San José Cost $442 Million

We assessed the cost to society of gunfire in San José. Firearm deaths and injuries in San José annually impose losses valued at $442 million (Table 3). That's $432 per San José resident. Societal costs are comprehensive. The total includes costs paid by victims and their families, perpetrators, employers, insurers, and taxpayers. The value of pain, suffering, and lost quality of life accounts for the largest share of societal costs, with work losses of victims and perpetrators also large. Direct out-of-pocket costs total $35 million annually. These costs encompass medical and mental health care, police and emergency services, victim services, criminal justice, and employer spending because workers are absent temporarily or need to be replaced due to death or permanent disability.

Table 3. Annual Cost of Firearm Injury by Cost Category in San José, CA, 2013-2019

Cost Category	Annual Cost	% of Total
Direct	$35,068,500	8%
Lost Work	$78,275,000	18%
Quality of Life	$328,355,500	74%
Total	$441,699,000	100%

Source: Computations by Ted Miller, Pacific Institute for Research and Evaluation, 2021.

The societal costs here are tied to specific shootings. They exclude prevention costs and the impact on residents and businesses when gunfire harms neighborhoods.

Homicide and assault cause most (57%) of the firearm costs, followed by suicide acts (37%) and unintentional shootings (6%), per Table 4. The cost per shooting is highest for suicides, since so many of those incidents are fatal.

Table 4. Annual Incidence and Societal Cost of Firearm Injury by Intent in San José, CA, 2013-2019

	People Shot	Cost/Person Shot	Total Cost	Cost to Federal, State & Local Government
Homicide/Assault/ Legal Intervention	89	$2,851,000	$253,828,000	$34,180,000
Suicide	31	$5,238,000	$164,122,000	$4,298,000
Unintentional/Undetermined	86	$290,000	$24,749,000	$1,260,000
Total	206	$2,151,000	$441,699,000	$39,738,000

Source: Computations by Ted Miller, Pacific Institute for Research and Evaluation, 2021.

Governments across all levels pay almost $40 million annually due to firearm injuries in San José (Table 4). The taxpayer bill includes contributions to the costs of acute and long-term health care; public services including emergency response, victim assistance, incident investigation, and perpetrator adjudication and sanctioning; as well as tax revenue lost when someone is killed or unable to work.

The societal cost assessment used a peer-reviewed framework for costing gun violence that PIRE developed more than 20 years ago and periodically updates.[11] This framework consists of an economic analysis of direct out-of-pocket costs across the continuum of public services and employer responses associated with injury and death, as well as indirect cost data following an event. Direct costs include police, emergency response, hospital-related expenses, healthcare claims, family mental health services, court, criminal justice, and employer costs. Indirect costs include victim loss of wages and the estimated value of lost quality of life. For most of these cost elements, we use injury cost models and methods that we developed and have widely published to price injuries from all causes. That model is documented in considerable detail.[12] Other costs were adapted from our well-known crime cost model.[13] The indirect costs of fatalities were computed for each victim in San José, taking account of the victim's age and sex, then summed.

As explained above, we incorporated police and fire department EMS costs that are specific to San José. For other cost categories, the current estimates use national average costs per firearm incident by intent and severity adjusted to San José prices. We are working with Santa Clara County public health staff to

[11] Miller TR, Cohen MA**.** Costs of gunshot and cut/stab wounds in the United States, with some Canadian comparisons. *Accident Analysis and Prevention. 29*(3):329-341, 1997. Follman M, Lurie J, Lee J, West J. The True Cost of Gun Violence in America: The data the NRA doesn't want you to see. Mother Jones. 2015.

[12] Zonfrillo MR, Spicer RS, Lawrence BA, Miller TR. Incidence and costs of injuries to children and adults in the United States. *Injury Epidemiology. 5*(1), article 37, 2018. Miller TR, Pindus NM, Douglass JB, Rossman SB. Databook on nonfatal injury: Incidence, costs, and consequences. Washington, DC: The Urban Institute Press, 1993. Lawrence BA, Miller TR. Medical and work loss cost estimation methods for the WISQARS cost of injury module. Calverton, MD: PIRE, 2014. https://www.researchgate.net/publication/265162679_Medical_and_Work_Loss_Cost_Estimation_Methods_for_the_WISQARS_Cost_of_Injury_Module .

[13] Miller TR, Cohen MA, Wiersema B. Victim costs and consequences—A new look. Washington, DC: National Institute of Justice, 1996. Miller TR, Cohen M, Swedler D, Ali B, Hendrie D. Incidence and costs of personal and property crimes in the United States, 2017. *Journal of Benefit Cost Analysis. 12*(1), 24-54, 2021.

update the medical costs by applying our models to local hospital data, as well as to replace selected other direct costs with local data.

About PIRE and Dr. Miller

The Pacific Institute for Research and Evaluation (PIRE) is an independent, nonprofit organization merging scientific knowledge and proven practice to create solutions that improve the health, safety, and well-being of individuals, communities, and nations around the world. PIRE's mission is to promote, undertake, and evaluate activities, studies, and programs that improve individual and public health, welfare, and safety.

Founded in 1974, PIRE has a longstanding reputation for research integrity. Its work is funded with a balance of National Institutes of Health (NIH) grants, other federal grants and contracts, and foundation awards. PIRE has held a NIH/National Institute on Alcohol Abuse and Alcoholism Center Grant -- Berkeley's Prevention Research Center -- since 1980.

Ted R Miller, PhD, is a widely cited health economist who has more than 30 years of experience studying the costs of injury and violence. He has published more than 350 books and journal articles on the costs of societal ills and savings from prevention. Dr. Miller received the Excellence in Science and Distinguished Career Awards from the Injury Control and Emergency Health Services Section of the American Public Health Association and the Vision Award from the State and Territorial Injury Prevention Director's Association. He is a Principal Research Scientist at PIRE and an Adjunct Professor at the Curtin University School of Public Health.

Exhibit 11

The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL ARTICLE

Handgun Ownership and Suicide in California

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ABSTRACT

BACKGROUND

Research has consistently identified firearm availability as a risk factor for suicide. However, existing studies are relatively small in scale, estimates vary widely, and no study appears to have tracked risks from commencement of firearm ownership.

METHODS

We identified handgun acquisitions and deaths in a cohort of 26.3 million male and female residents of California, 21 years old or older, who had not previously acquired handguns. Cohort members were followed for up to 12 years 2 months (from October 18, 2004, to December 31, 2016). We used survival analysis to estimate the relationship between handgun ownership and both all-cause mortality and suicide (by firearm and by other methods) among men and women. The analysis allowed the baseline hazard to vary according to neighborhood and was adjusted for age, race and ethnic group, and ownership of long guns (i.e., rifles or shotguns).

RESULTS

A total of 676,425 cohort members acquired one or more handguns, and 1,457,981 died; 17,894 died by suicide, of which 6691 were suicides by firearm. Rates of suicide by any method were higher among handgun owners, with an adjusted hazard ratio of 3.34 for all male owners as compared with male nonowners (95% confidence interval [CI], 3.13 to 3.56) and 7.16 for female owners as compared with female nonowners (95% CI, 6.22 to 8.24). These rates were driven by much higher rates of suicide by firearm among both male and female handgun owners, with a hazard ratio of 7.82 for men (95% CI, 7.26 to 8.43) and 35.15 for women (95% CI, 29.56 to 41.79). Handgun owners did not have higher rates of suicide by other methods or higher all-cause mortality. The risk of suicide by firearm among handgun owners peaked immediately after the first acquisition, but 52% of all suicides by firearm among handgun owners occurred more than 1 year after acquisition.

CONCLUSIONS

Handgun ownership is associated with a greatly elevated and enduring risk of suicide by firearm. (Funded by the Fund for a Safer Future and others.)

From the Stanford Law School (D.M.S.), School of Medicine (D.M.S, Y.Z., L.P., E.E.H.), and Department of Political Science (J.A.R.), Stanford University, Stanford, and the School of Medicine, University of California at Davis, Sacramento (G.J.W.) — all in California; the Department of Epidemiology, Erasmus Medical Center, Rotterdam, the Netherlands (S.A.S.); the Melbourne School of Population and Global Health, University of Melbourne, Melbourne, VIC, Australia (M.J.S.); and the Bouvé College of Health Sciences, Northeastern University, Boston (M.M.). Address reprint requests to Dr. Studdert at Stanford Health Policy, 615 Crothers Way, Stanford, CA 94305.

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Suicide attempts are often impulsive acts, driven by transient life crises.[1,2] Most attempts are not fatal, and most people who attempt suicide do not go on to die in a future suicide.[3,4] Whether a suicide attempt is fatal depends heavily on the lethality of the method used,[5-8] and firearms are extremely lethal.[6-8]

These facts focus attention on firearm access as a risk factor for suicide, especially in the United States, which has a higher prevalence of civilian-owned firearms than any other country[9] and one of the highest rates of suicide by firearm.[10] In 2018, 24,432 suicides by firearm occurred in the United States.[11] Handguns are used in approximately three quarters of suicides by firearm.[12-14]

Ecologic[15-17] and case–control[18-25] studies have consistently shown a positive association between firearm availability and suicide. Collectively, the evidence indicates that the risk of suicide is three times as high when there is firearm access as when there is not — an excess risk attributable to higher rates of suicide by firearm, not of suicide by other methods.[17,26-29] However, the evidence base has gaps and limitations. For example, the case–control studies are relatively small in scale and prone to mismeasurement of firearm availability and, with one apparent exception,[25] rely on data from the 1980s and 1990s.

We tracked firearm ownership and mortality over 12.2 years in a cohort of 26.3 million adult residents of California. Nearly 700,000 cohort members acquired their first handgun during the study period (October 18, 2004, through December 31, 2016). Our goal was to estimate the effect of handgun ownership on their risk of suicide.

METHODS

STUDY OVERSIGHT AND REPORTING

Our study was approved by the institutional review board at Stanford University, and the results are reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.[30] A checklist of the items recommended in the STROBE guidelines is provided in Table S21 in the Supplementary Appendix, available with the full text of this article at NEJM.org.

DATA

We formed the cohort by linking information on handgun transfers and all-cause mortality among adults in California to a series of historical extracts of the California Statewide Voter Registration Database (SVRD). The SVRD enumerates all registered voters in the state. The state must keep the SVRD up to date with new registrations and deregistrations (e.g., relocations and deaths). Thus, at the date of an extract, the SVRD consists of adults known to be alive and residing in California. We obtained 13 historical extracts of the SVRD spaced approximately 1 year apart and spanning our study period; the extracts included approximately 74% of residents of the state who were eligible to vote in California and 61% of all adult residents (Table S2).

Virtually all lawful transfers of firearms in California — including transfers between private parties, gifts, and loans — must be transacted through a licensed firearms dealer.[31] Dealers relay details of the transfers and transferees electronically to the California Department of Justice, where the information is archived in the Dealer Record of Sale (DROS) database. People who move to California with firearms are required to report or transfer their weapons within 60 days after arrival,[32] and these reports are also entered into the database. Although this regimen has governed handgun transfers for decades, transfers of long guns (rifles and shotguns) were not routinely archived until January 1, 2014.[33] We obtained records of the 9.1 million handgun and long-gun transfers archived in the DROS database over a 32-year period (from January 1, 1985, through December 31, 2016).

The California Death Statistical Master Files are the state's official mortality records. They contain detailed information on deaths of state residents, wherever the deaths occur. We obtained data on all deaths reported in the study period.

DATA CLEANING AND LINKAGE

Data-cleaning processes are described in Parts B and C in the Supplementary Appendix. We linked firearm acquisition and mortality records to the SVRD extracts at the individual level; the linkage methods are described elsewhere.[34]

KEY MEASURES

Causes of death were coded according to the *International Classification of Diseases, 10th Revision*, in which suicides are specified according to method (Sections X60–X84), including suicide by firearm (Sections X72–X74). DROS data indicated which cohort members acquired handguns and the dates of acquisition. The age and sex of cohort members were derived from the SVRD. Race and ethnic group and missing values for sex were imputed with use of validated methods[35,36] (see Sections XIII and XIV in the Supplementary Appendix). We geocoded residential addresses and then assigned them to census tracts — geographically contiguous areas designed to approximate small neighborhoods.[37]

Using DROS data, we constructed three additional variables. First, to identify cohort members who already owned a handgun, we linked data on handgun transfers in the 19.8 years leading up to the study period. Second, we created a time-varying variable that indicated the cumulative number of handguns owned (based on acquisitions and deacquisitions) and used it to identify "divestments" — transfers of the last known handgun a cohort member owned. Finally, we flagged cohort members who had acquired long guns with an indicator variable that switched on at the date of their first-known long-gun acquisition. (For additional details on all study variables, see Part B in the Supplementary Appendix.)

DATA-SET STRUCTURE AND OBSERVATION AND EXPOSURE TIME

The final analytic data set was at the person–period level. It excluded cohort members who had acquired one or more handguns before coming under observation during the study period and cohort members with missing census tracts or birth dates (Fig. S1). We also excluded observation time from registrants younger than 21 years of age, the minimum age for lawful handgun acquisition in California.[38]

Cohort members entered the cohort on the date of the SVRD extract in which each first appeared as a registrant at the age of 21 years or older. Observation time ended on the day before the next extract in which they did not appear,[39] at the time of death, or at the end of the study period, whichever came first. We defined exposure as beginning on the date of first handgun acquisition, although acquirers were not eligible to take possession of the weapon until 10 days later, owing to California's mandatory waiting period.[40] Exposure time continued until observation time ended, except among divesters, for whom it ended on the date of divestment, at which time their nonexposure time recommenced.

STATISTICAL ANALYSIS

We used Cox proportional-hazards models to calculate hazard ratios estimating the relationship between handgun ownership and mortality (all-cause mortality, suicide, suicide by firearm, and suicide by other methods). The predictor of interest was a binary variable distinguishing exposed person-time (periods of handgun ownership) from unexposed person-time (periods of nonownership). The models allowed the baseline hazard to vary according to census tract and was adjusted for age at baseline, sex, race and ethnic group, and long-gun ownership. We plotted survival curves using the Kaplan–Meier method and estimated adjusted survival curves using inverse probability weighting.[41]

We tested for unmeasured confounding in two ways. First, we conducted negative control outcome analyses.[42] In these analyses, we used the same modeling approach and exposure time used in our main analyses, but the outcomes were three causes of death (lung cancer, endocarditis, and alcoholic liver disease) that are more common among people who smoke, inject drugs, or have alcohol-use disorder, respectively — established risk factors for suicide[43-47] that could not be measured directly in our data. Thus, a finding of no association between handgun ownership and these three causes of death would suggest minimal bias from confounding by these unmeasured behaviors in our main analyses. Second, we conducted bias analyses to calculate how strong the associations would need to be between an unmeasured confounder and our exposure and outcome variables, respectively, to explain our main results. In these analyses, we used the E-value calculator developed by VanderWeele and colleagues.[48,49]

In addition, we probed the effect of having anchored the cohort to registered voters in California. Handgun acquirers in the cohort were

Table 1. Characteristics of the Study Sample According to Handgun-Ownership Status.*

Characteristic	Owners (N = 676,425)	Nonowners (N = 25,637,011)
Sex — no. (%)		
Male	528,111 (78.1)	11,324,350 (44.2)
Female	147,250 (21.8)	14,165,318 (55.3)
Missing	1,064 (0.2)	147,345 (0.6)
Age — yr†		
Mean (median)	41 (38)	43 (40)
Range	21–110	21–110
Race or ethnic group — no. (%)		
White	505,539 (74.7)	15,550,513 (60.7)
Hispanic	107,731 (15.9)	5,766,667 (22.5)
Asian	28,033 (4.1)	1,788,910 (7.0)
Black	30,490 (4.5)	2,239,863 (8.7)
Other	1,091 (0.2)	54,011 (0.2)
Missing	3,541 (0.5)	237,047 (0.9)
Residential location — no. (%)‡		
Urban	560,399 (82.8)	23,173,886 (90.4)
Suburban	78,285 (11.6)	1,716,930 (6.7)
Large rural town	21,727 (3.2)	443,986 (1.7)
Small rural town	16,012 (2.4)	302,048 (1.2)
Missing	2 (<0.01)	161 (<0.01)

* Handgun owners are defined as cohort members who acquired their first handgun on record (ever or since January 1, 1985) before coming under observation in the study period (October 18, 2004, through December 31, 2016). Nonowners are defined as cohort members for whom there was no recorded acquisition of a handgun between January 1, 1985, and the end of the study period. Percentages may not total 100 because of rounding.
† Values refer to cohort members' age on the first day they came under observation.
‡ Categories for residential locations are based on rural–urban commuting area (RUCA) codes (see Section III in the Supplementary Appendix). Values refer to cohort members' residential location on the day they entered the cohort. Missing values arise from census tracts that could not be mapped to RUCA codes from the 2010 Census.

weighted to represent all handgun acquirers in the state during the study period, not merely those who were registered voters, and nonacquirers were weighted to resemble all adult nonacquirers statewide. (For additional information about the generalizability and sensitivity analyses, see Sections VII and VIII in the Supplementary Appendix.)

Statistical analyses were performed with the use of R software, version 3.5.1 (R Foundation for Statistical Computing), and Stata software, version 14.1 (StataCorp). Confidence intervals for the hazard ratios were not adjusted for multiple comparisons. For additional details regarding the statistical analyses, see Section V in the Supplementary Appendix.

RESULTS

SAMPLE CHARACTERISTICS

The study sample comprised 26,313,436 people who were followed for an average of 6.9 years; 676,425 (2.6%) of them acquired one or more handguns during the study period. Handgun owners were younger than nonowners at baseline (mean age, 41 years vs. 43 years) and were more likely to be male (78.1% vs. 44.2%), white (74.7% vs. 60.7%), and residing outside an urban area (17.2% vs. 9.6%) (Table 1).

FREQUENCY AND RATE OF DEATH AND SUICIDE

A total of 1,457,981 cohort members died during the study period (Table 2); 17,894 died by suicide,

Table 2. Counts, Crude Rates, and Adjusted Hazard Ratios for All-Cause Mortality and Suicide among Cohort Members, According to Handgun Ownership Status.

Cause of Death	Owners		Nonowners		Adjusted Hazard Ratio (95% CI)‡
	Deaths*	Crude Rate†	Deaths*	Crude Rate†	
All causes	10,863	382.94	1,447,118	820.91	0.80 (0.79–0.82)
Male	9,343	409.60	697,731	910.11	0.81 (0.79–0.83)
Female	1,500	271.78	739,924	747.99	0.72 (0.68–0.76)
Suicide	1,354	47.73	16,540	9.38	3.67 (3.46–3.89)
Male	1,132	49.63	11,376	14.84	3.34 (3.13–3.56)
Female	219	39.68	5,107	5.16	7.16 (6.22–8.24)
Suicide by firearm	1,200	42.30	5,491	3.11	9.08 (8.48–9.73)
Male	1,003	43.97	4,575	5.97	7.82 (7.26–8.43)
Female	194	35.15	900	0.91	35.15 (29.56–41.79)
Suicide by other methods	154	5.43	11,049	6.27	0.68 (0.58–0.80)
Male	129	5.66	6,801	8.87	0.64 (0.55–0.76)
Female	25	4.53	4,207	4.25	1.01 (0.68–1.50)

* Death counts for handgun owners refer to deaths among cohort members during a period in which they owned one or more handguns. Death counts for nonowners refer to deaths among cohort members during a period in which they did not own a handgun. Sex-specific totals for all-cause mortality, suicide, and firearm suicide do not sum to the overall total because the overall total includes cohort members with missing values for sex.

† Rate denominators for handgun owners consist of the exposure time they contributed while owners. Rate denominators for nonowners consist of the sum of nonexposure time contributed by handgun owners in their nonownership periods and the nonexposure time contributed by nonowners throughout their observation period.

‡ Adjusted hazard ratios were estimated with the use of Cox proportional-hazards models in which baseline hazards were stratified according to census tract. The models were controlled for age at cohort entry, sex (overall models only), race and ethnic group, and ownership of rifles or shotguns. Complete estimates from the 12 models are shown in Tables S16–S19.

of which 6691 were suicides by firearm. Men accounted for 70% of the suicides and 83% of the suicides by firearm. A firearm was used in 89% of the suicides among handgun owners and 33% of those among nonowners.

Handgun owners had lower rates of all-cause mortality than nonowners but substantially higher rates of suicide (Table 2). The rate of suicide by any method among male handgun owners was three times as high as that among male nonowners (hazard ratio, 3.34; 95% confidence interval [CI], 3.13 to 3.56), and the corresponding rate among female handgun owners was seven times as high as that among female nonowners (hazard ratio, 7.16; 95% CI, 6.22 to 8.24). These elevated suicide rates among handgun owners were attributable to much higher rates of suicide by firearm. Men who owned handguns had a rate of suicide by firearm that was nearly eight times as high as that among male nonowners (hazard ratio, 7.82; 95% CI, 7.26 to 8.43) and a lower rate of suicide by other methods (hazard ratio, 0.64; 95% CI, 0.55 to 0.76). The rate of suicide by firearm among female handgun owners was 35 times as high as the rate among women who did not own handguns (hazard ratio, 35.15; 95% CI, 29.56 to 41.79) and the rate of suicide by other methods was similar in the two groups of women (hazard ratio, 1.01; 95% CI, 0.68 to 1.50). (Complete estimates from these models are available in Tables S16 through S19.)

TEMPORALITY OF THE RISK OF SUICIDE BY FIREARM

Handgun owners had higher rates of suicide by firearm than nonowners throughout the study period, but the magnitude of this difference changed over time (Fig. 1 and Fig. S6). One suicide by firearm occurred among owners during the 10-day waiting period, followed by 9 on the day owners became eligible to take possession of their weapons and 102 in the first week thereafter. From the first day of eligibility through the 30th day after purchase, the rate of suicide by firearm among owners was 471 per 100,000

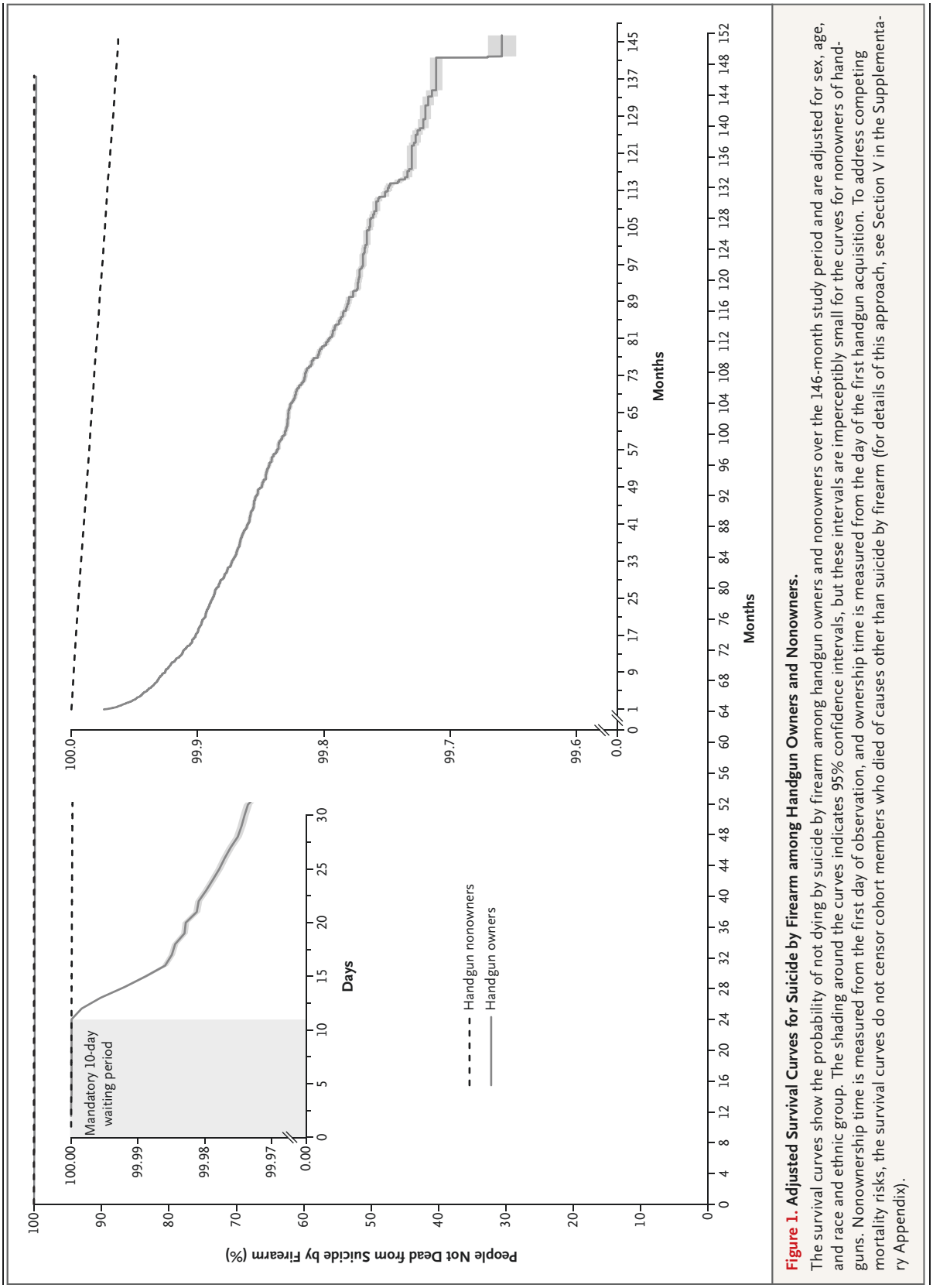

Figure 1. Adjusted Survival Curves for Suicide by Firearm among Handgun Owners and Nonowners.

The survival curves show the probability of not dying by suicide by firearm among handgun owners and nonowners over the 146-month study period and are adjusted for sex, age, and race and ethnic group. The shading around the curves indicates 95% confidence intervals, but these intervals are imperceptibly small for the curves for nonowners of handguns. Nonownership time is measured from the first day of observation, and ownership time is measured from the day of the first handgun acquisition. To address competing mortality risks, the survival curves do not censor cohort members who died of causes other than suicide by firearm (for details of this approach, see Section V in the Supplementary Appendix).

Table 3. Counts, Crude Rates, and Adjusted Hazard Ratios for Suicide by Firearm among Handgun Owners, According to Time Period after First Handgun Acquisition.*

Suicides by Firearm	Period Since First Handgun Acquisition						
	1–10 Days	11–30 Days	31–90 Days	91–365 Days	366 Days–3 Yr	4–6 Yr	7–12.2 Yr
Suicides — no./total no. (%)	1/1200 (0.08)	172/1200 (14.33)	154/1200 (12.83)	251/1200 (20.92)	309/1200 (25.75)	194/1200 (16.17)	119/1200 (9.92)
Crude rate per 100,000 person-years	5.41	470.80	147.30	60.71	45.87	18.55	14.28
Adjusted hazard ratio (95% CI)	4.59 (0.82–25.52)	100.10 (55.75–179.90)	16.62 (12.98–21.29)	12.40 (10.48–14.67)	5.35 (4.64–6.17)	1.58 (1.34–1.86)	2.61 (2.14–3.19)

* "Acquisition" refers to the time of the application to purchase. California requires a 10-day (240-hour) waiting period from the date and time of the application to purchase to the time at which the purchaser is permitted to take possession of the firearm.

person-years (hazard ratio, 100.10; 95% CI, 55.75 to 179.90), and these suicides accounted for 14% of all suicides by firearm among owners during the study period (Table 3). The rate of suicide by firearm among owners declined in subsequent periods but remained elevated over the long term, with 52% of all suicides by firearm among owners occurring after the first year of ownership.

SENSITIVITY AND GENERALIZABILITY ANALYSES

Handgun owners did not have higher rates of death from alcoholic liver disease than nonowners (hazard ratio, 0.83; 95% CI, 0.72 to 0.95), and owners 50 years of age or older did not have higher rates of death from lung cancer (hazard ratio, 0.86; 95% CI, 0.79 to 0.93); mortality from endocarditis was higher among owners than among nonowners, but the confidence interval included 1 (hazard ratio, 1.60; 95% CI, 0.93 to 2.76) (Table S20). The bias analyses showed that a putative confounder would need to be very large to nullify the positive association detected between ownership and suicide; for example, it would need to both increase the risk of suicide by a factor of six and be six times more common among handgun owners than nonowners (E values: overall, 6.80; men, 6.14; women, 13.80) (Table S5). Analyses weighted to make the cohort more closely resemble the total adult population of California (i.e., with inclusion of people who were not registered to vote) produced estimates of the association between handgun ownership and suicide risk that were very similar to those in our main results (Table S6).

DISCUSSION

In this study of firearm ownership and mortality in a cohort of 26.3 million adult residents of California, we found an elevated risk of suicide among a large sample of first-time handgun owners. This risk was driven by a much higher rate of suicide by firearm — not by higher rates of suicide by other methods. Handgun owners' risk of suicide by firearm peaked in the period immediately after their first handgun acquisition but remained relatively high 12 years later, and the long-term risk accounted for a majority of the excess suicides by firearm among owners.

Nearly all previous studies of the relationship between firearm access and suicide have detected positive associations. These studies have limitations. In ecologic analyses, grouping people reduces information and may mask important individual-level differences between exposure and outcome.[50] Risk estimates from case–control studies range widely, in part because many have analyzed only a few hundred suicides.[18-20,22,25] Psychological autopsy, the standard method for determining gun access in case–control studies,[18,20-22,24] is vulnerable to recall bias, with proxies of recent victims of gunshot injuries plausibly more likely to report access than proxies of controls.[51] Some case–control studies have used dead controls[22,24] or drawn controls from a population other than that of the cases[21,22,24,25]; both approaches are potential sources of bias. Finally, case–control studies are ill-suited to measuring temporal changes in risk.

Cohort studies are well suited to measuring

temporal changes, but the absence of centralized information on gun ownership has long impeded their conduct in the United States. In one previous cohort study involving recent purchases of handguns,[52] the rates of suicide by firearm among male and female handgun purchasers exceeded those in the general population, including gun owners (age-standardized mortality ratios of 3.23 and 15.50, respectively); the study did not adjust for other characteristics.

Our study is many times larger than previous ones and is unusual in estimating risks among first-time gun owners, accounting for divestment, and separately analyzing risks of suicide by firearm in both men and women. Our risk estimates are larger than those reported in some previous studies. However, direct comparisons are limited by the facts that case–control studies produce different measures of risk and that most define exposure as a gun in the home rather than personal ownership.

Although women accounted for only 16% of all suicides by firearm and had substantially lower suicide rates than men, the risk of suicide by firearm among female handgun owners (as compared with female nonowners) was substantially greater than that among male handgun owners (as compared with male nonowners). Women attempt suicide more frequently than men but have fewer completed suicides, largely because the means they tend to use (e.g., poisons) are less lethal than those men tend to use (e.g., guns or hanging).[5,7,8] Handgun ownership may impose a particularly high relative risk of suicide for women because of the pairing of their higher propensity to attempt with ready access to and familiarity with an extremely lethal method.

The lower risk of all-cause mortality detected among handgun owners should not be interpreted as a protective effect because it stems largely from owners' lower rates of death from common chronic diseases (e.g., cancer or heart disease) that do not have a clear relationship to handgun ownership. Two other explanations are more plausible. First, handgun acquisition involves participation in commerce. In California, this includes personal appearance at a dealer, which necessitates a degree of physical mobility and well-being. Second, handguns are expensive. People who can afford to buy them are wealthier,[53] and wealth is positively associated with health.

Unmeasured confounding is a threat to causal inference in observational studies.[54] Our bias analyses indicate that to substantially attenuate or erase the elevated rates of suicide by firearm we observed among handgun owners, any confounding difference between owners and nonowners would need to be as strong a predictor of suicide as well-established risk factors (e.g., major depressive disorders) and nearly an order of magnitude more common among handgun owners than nonowners, even after adjustment for the covariates accounted for in our analyses. What trait could reach that mark? One possibility is suicidal intent — owners who acquired handguns for the purpose of ending their life. Suicidal intent probably explains at least part of the spike in suicides by firearm soon after acquisition. However, intent is less plausible as an explanation for the elevated risk of suicide by firearm among owners over the longer term, when most occurred.

More generally, we were not able to adjust for mental illness; although it is a major risk factor for suicide, it is unlikely to be a strong confounder. Several national studies[55-57] have found that gun owners (or people with access to guns) and nonowners have similar rates of depression, suicidal ideation, and suicide attempts (for a review of these studies, see Section VI in the Supplementary Appendix). Moreover, our negative control outcome analyses did not detect consistent evidence of residual confounding from this source.

Our study has other limitations. First, we will have misclassified some handgun owners as unexposed because, for example, they acquired their handguns unlawfully or before our data on acquisition histories began. Such misclassification should bias toward the null any differences in the risk of death detected between owners and nonowners. Second, we only partially accounted for long-gun ownership, although the implications of this are mitigated by the fact that approximately three quarters of suicides by firearm involve handguns[12-14] and less than 20% of firearm owners in California own only long guns.[53] Finally, generalizability outside California is unknown. California has stricter gun laws than many other states, including universal background checks, a waiting period, and various prohibitions on firearm purchasing by people with severe mental illness.[58] Our results may underestimate the association between handgun

ownership and suicide in states without such safeguards.

Fifty-nine people were killed in the mass shooting in Las Vegas in 2017, the deadliest in U.S. history. Approximately the same number die each day in the United States from suicide by firearm. Many of these deaths are preventable. Our study bolsters and extends the message from previous research: ready access to firearms, particularly handguns, is a major risk factor for suicide. Health care providers and policymakers should be aware of this risk. This information is also important for current and prospective firearm owners seeking to weigh the risks and perceived benefits of ownership.

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REFERENCES

1. Kessler RC, Borges G, Walters EE. Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. Arch Gen Psychiatry 1999;56:617-26.
2. Rimkeviciene J, O'Gorman J, De Leo D. Impulsive suicide attempts: a systematic literature review of definitions, characteristics and risk factors. J Affect Disord 2015;171:93-104.
3. Owens D, Horrocks J, House A. Fatal and non-fatal repetition of self-harm: systematic review. Br J Psychiatry 2002;181:193-9.
4. Nordentoft M, Mortensen PB, Pedersen CB. Absolute risk of suicide after first hospital contact in mental disorder. Arch Gen Psychiatry 2011;68:1058-64.
5. Spicer RS, Miller TR. Suicide acts in 8 states: incidence and case fatality rates by demographics and method. Am J Public Health 2000;90:1885-91.
6. Shenassa ED, Catlin SN, Buka SL. Lethality of firearms relative to other suicide methods: a population based study. J Epidemiol Community Health 2003;57:120-4.
7. Miller M, Azrael D, Hemenway D. The epidemiology of case fatality rates for suicide in the northeast. Ann Emerg Med 2004;43:723-30.
8. Conner A, Azrael D, Miller M. Suicide case-fatality rates in the United States, 2007 to 2014: a nationwide population-based study. Ann Intern Med 2019 December 3 (Epub ahead of print).
9. Karp A. Estimating global civilian-held firearms numbers: briefing paper. Geneva: Small Arms Survey, 2018 (http://www.smallarmssurvey.org/weapons-and-markets/tools/global-firearms-holdings.html).
10. Global Burden of Disease 2016 Injury Collaborators. Global mortality from firearms, 1990-2016. JAMA 2018;320:792-814.
11. Centers for Disease Control and Prevention. Web-based Injury Statistics Query and Reporting System (WISQARS) (www.cdc.gov/injury/wisqars).
12. California Department of Public Health. EpiCenter: California injury data online (http://epicenter.cdph.ca.gov).
13. Centers for Disease Control and Prevention. National Violent Death Reporting System (NVDRS) (https://www.cdc.gov/injury/wisqars/nvdrs.html).
14. Hanlon TJ, Barber C, Azrael D, Miller M. Type of firearm used in suicides: findings from 13 states in the National Violent Death Reporting System. J Adolesc Health 2019;65:366-70.
15. Miller M, Hemenway D. The relationship between firearms and suicide: a review of the literature. Aggress Violent Behav 1999;4:59-75.
16. Miller M, Lippmann SJ, Azrael D, Hemenway D. Household firearm ownership and rates of suicide across the 50 United States. J Trauma 2007;62:1029-34.
17. Miller M, Barber C, White RA, Azrael D. Firearms and suicide in the United States: is risk independent of underlying suicidal behavior? Am J Epidemiol 2013;178:946-55.
18. Kellermann AL, Rivara FP, Somes G, et al. Suicide in the home in relation to gun ownership. N Engl J Med 1992;327:467-72.
19. Cummings P, Koepsell TD, Grossman DC, Savarino J, Thompson RS. The association between the purchase of a handgun and homicide or suicide. Am J Public Health 1997;87:974-8.
20. Conwell Y, Duberstein PR, Connor K, Eberly S, Cox C, Caine ED. Access to firearms and risk for suicide in middle-aged and older adults. Am J Geriatr Psychiatry 2002;10:407-16.
21. Wiebe DJ. Homicide and suicide risks associated with firearms in the home: a national case-control study. Ann Emerg Med 2003;41:771-82.
22. Kung HC, Pearson JL, Liu X. Risk factors for male and female suicide decedents ages 15-64 in the United States: results from the 1993 National Mortality Follow-back Survey. Soc Psychiatry Psychiatr Epidemiol 2003;38:419-26.
23. Grassel KM, Wintemute GJ, Wright MA, Romero MP. Association between handgun purchase and mortality from firearm injury. Inj Prev 2003;9:48-52.
24. Dahlberg LL, Ikeda RM, Kresnow MJ. Guns in the home and risk of a violent death in the home: findings from a national study. Am J Epidemiol 2004;160:929-36.
25. Dempsey CL, Benedek DM, Zuromski KL, et al. Association of firearm sue, accessibility, and storage practices with suicide risk among US army soldiers. JAMA Netw Open 2019;2(6):e195383.
26. Stroebe W. Firearm possession and violent death: a critical review. Aggress Violent Behav 2013;18:709-21.
27. Anglemyer A, Horvath T, Rutherford G. The accessibility of firearms and risk for suicide and homicide victimization among household members: a systematic review and meta-analysis. Ann Intern Med 2014;160:101-10.
28. Miller M, Swanson SA, Azrael D. Are we missing something pertinent? A bias analysis of unmeasured confounding in the firearm-suicide literature. Epidemiol Rev 2016;38:62-9.
29. The relationship between firearm availability and suicide. Santa Monica, CA: RAND, March 2, 2018 (https://www.rand.org/research/gun-policy/analysis/essays/firearm-availability-suicide.html).
30. von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for report-

ing observational studies. Lancet 2007;370:1453-7.
31. California Penal Code §§26500, 27545.
32. California Penal Code §§17000, 27560.
33. California Penal Code §§11106, 26905.
34. Zhang Y, Holsinger EE, Prince L, et al. Assembly of the LongSHOT cohort: public record linkage on a grand scale. Inj Prev 2020;26:153-8.
35. Imai K, Khanna K. Improving ecological inference by predicting individual ethnicity from voter registration records. Polit Anal 2016;24:263-72.
36. Mullen L, Blevins C, Schmidt B. Package 'gender': predict gender from names using historical data. November 9, 2019 (https://cran.r-project.org/web/packages/gender/gender.pdf).
37. United States Census Bureau. Geographic areas reference manual. November 2004 (https://www.census.gov/programs-surveys/geography/guidance/geographic-areas-reference-manual.html).
38. California Penal Code §27505.
39. Lesko CR, Edwards JK, Cole SR, Moore RD, Lau B. When to censor? Am J Epidemiol 2018;187:623-32.
40. California Penal Code §§26815, 27540.
41. Cole SR, Hernán MA. Adjusted survival curves with inverse probability weights. Comput Methods Programs Biomed 2004;75:45-9.
42. Lipsitch M, Tchetgen Tchetgen E, Cohen T. Negative controls: a tool for detecting confounding and bias in observational studies. Epidemiology 2010;21:383-8.
43. Poorolajal J, Darvishi N. Smoking and suicide: a meta-analysis. PLoS One 2016;11(7):e0156348.
44. Wilcox HC, Conner KR, Caine ED. Association of alcohol and drug use disorders and completed suicide: an empirical review of cohort studies. Drug Alcohol Depend 2004;76:Suppl:S11-S19.
45. Murphy GE. Psychiatric aspects of suicidal behavior. In: Hawton K, van Heeringen K, eds. The international handbook of suicide and attempted suicide. Chichester, United Kingdom: John Wiley, 2000:135-46.
46. Norström T, Rossow I. Alcohol consumption as a risk factor for suicidal behaviour: a systematic review of associations at the individual and at the population level. Arch Suicide Res 2016;20:489-506.
47. Darvishi N, Farhadi M, Haghtalab T, Poorolajal J. Alcohol-related risk of suicidal ideation, suicide attempt, and completed suicide: a meta-analysis. PLoS One 2015;10(5):e0126870.
48. VanderWeele TJ, Ding P. Sensitivity analysis in observational research: introducing the E-value. Ann Intern Med 2017;167:268-74.
49. Mathur MB, Ding P, Riddell CA, VanderWeele TJ. Website and R package for computing E-values. Epidemiology 2018;29(5):e45-e47.
50. Wakefield J. Ecologic studies revisited. Annu Rev Public Health 2008;29:75-90.
51. Pirkis J, Nicholas A, Gunnell D. The case for case-control studies in the field of suicide prevention. Epidemiol Psychiatr Sci 2019;29:e62.
52. Wintemute GJ, Parham CA, Beaumont JJ, Wright M, Drake C. Mortality among recent purchasers of handguns. N Engl J Med 1999;341:1583-9.
53. Kravitz-Wirtz N, Pallin R, Miller M, Azrael D, Wintemute GJ. Firearm ownership and acquisition in California: findings from the 2018 California Safety and Well-being Survey. Inj Prev 2019 December 5 (Epub ahead of print).
54. Hernán MA, Robins JM. Causal inference. Boca Raton, FL: Chapman & Hall/CRC, 2020.
55. Sorenson SB, Vittes KA. Mental health and firearms in community-based surveys: implications for suicide prevention. Eval Rev 2008;32:239-56.
56. Ilgen MA, Zivin K, McCammon RJ, Valenstein M. Mental illness, previous suicidality, and access to guns in the United States. Psychiatr Serv 2008;59:198-200.
57. Miller M, Barber C, Azrael D, Hemenway D, Molnar BE. Recent psychopathology, suicidal thoughts and suicide attempts in households with and without firearms: findings from the National Comorbidity Study Replication. Inj Prev 2009;15:183-7.
58. Giffords Law Center to Prevent Gun Violence. Annual gun law scorecard (http://gunlawscorecard.org/).

Exhibit 12

Unintentional Shootings

“Unintentional” is the description used in public health for an injury or death that was not caused purposely (in contrast with suicide and homicide, in which there is an intent to cause harm). Unintentional shootings can be self-inflicted or inflicted by someone else and can happen to Americans of all ages. Unintentional injuries and deaths are often called “accidents,” which can imply that nothing could be done to stop them from happening; we do not use “accident” terminology because gun violence is preventable. We must reduce unintentional gun deaths and injuries by, among other things, educating people about the risk that guns pose in the home, avoiding alcohol and gun use, training on proper firearm use, and advocating for safer storage.

Quick Facts about Unintentional Shootings

Each year, nearly 500 people die from unintentional firearm injuries — more than one person every single day.

Unintentional firearm injuries account for 37% of nonfatal firearm injuries but less than 2% of all gun deaths.

Americans are four times more likely to die from an unintentional gun injury than people living in other high-income countries.

Unsafely stored firearms increase the risk of unintentional firearm deaths.

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Citations: CDC WONDER Database; Gani, Sakran, & Canner (2017); Solnick & Hemenway (2019); Weibe (2003); Miller, Azrael, & Hemenway (2001); Miller, Azrael, & Hemenway (2005).

UNINTENTIONAL SHOOTINGS, NOT ACCIDENTS

The public health approach is centered on the idea of prevention. As the Society for Public Health Education puts it, “Injuries are not accidents — they are not random incidents. Injuries have identified risk and protective factors making them preventable.”[1]

Unintentional deaths and injuries are often called accidents, which can imply that nothing could be done to stop them from happening. For this reason, we do not use “accident” terminology because gun violence is preventable.

This framework applies to other injuries like car crashes, falls, and drownings. Words matter!

BACKGROUND

In 2019, 486 Americans died from unintentional firearm injuries — about 1.2% of total gun deaths.[2]

Unintentional is the description used in public health for an injury or death that was not caused purposely (in contrast with suicide and homicide, in which there is an intent to cause harm). Unintentional shootings can be self-inflicted or inflicted by someone else. About half of all unintentional gun deaths are caused by another person pulling the trigger.[3] Each year, nearly 500 people die from unintentional firearm injuries — more than one person every single day.[4]

Much like other forms of gun violence, unintentional gun deaths are more likely to occur in the United States than in other high-income countries. Americans are four times more likely to die from an unintentional gun injury than those in comparable countries.[5]

THE CDC PLAYS A VITAL ROLE IN PROVIDING PUBLIC HEALTH DATA TO RESEARCHERS

Researchers need robust and reliable data on unintentional gun injuries and fatalities to study and develop solutions to address the epidemic of gun violence in the United States. The Centers for Disease Control and Prevention (CDC) is the federal agency responsible for protecting the health of Americans by ensuring that data is properly collected to develop solutions to our nation’s public health crises, including gun violence. The CDC’s National Violent Death Reporting System (NVDRS) plays an instrumental role to gun violence prevention advocates and researchers. The NVDRS uses death

certificates, police reports, and hospital records to report information about the victim, the cause of death, and the circumstances surrounding their death.[6] The CDC makes this data publicly available and easily accessible through their Web-based Injury Statistics Query and Reporting System (WISQARS).

MISCLASSIFICATION OF UNINTENTIONAL GUN INJURIES AND DEATHS

Although the CDC releases data on firearm injuries and deaths in the U.S., the data, especially related to firearm injuries, is not reliable. As a result of a lack of a robust and reliable data source, there are often misclassifications for firearm injuries and deaths. Due to these misclassifications and underreporting of gun injuries and deaths, we do not know the true burden of unintentional firearm injuries and deaths in the U.S.

According to a 2017 study, over half (50.2%) of all nonfatal gun injuries are assaults and over one-third (36.7%) are unintentional injuries. However, the unintentional category may be overreported because those with gun injuries may not admit that they were assaulted to either avoid law enforcement scrutiny or out of fear of retaliation.[7]

Data problems exist for fatal injuries, too. A 2011 study found that “As much as 38% of true cases of unintentional firearm deaths were missed, as were 42% of cases reported as false-positives.”[8] The study authors write, “In answer to the question, ‘Are there too many or too few unintentional firearm deaths in official mortality data?’ the best answer is, ‘Both.’ Many true accidents are missed, while many suicides and homicides are mistakenly reported as accidents.”

There is a critical need for accurate data on the burden of gun violence in the United States.

CIRCUMSTANCES IN WHICH UNINTENTIONAL SHOOTINGS CAN HAPPEN

One study found that, across all ages, the most common circumstances in which an unintentional gun death occurs are:[9]

- Playing with a gun (28.3%),
- Believing that the gun was not loaded (17.2%), and
- Hunting (13.8%).

This study also found that nearly a quarter of those who died from an unintentional firearm injury — and nearly half of all 20-29-year-olds who died from unintentional shootings — had consumed alcohol.[10]

GUN OWNERSHIP AND UNINTENTIONAL FIREARM DEATHS

Studies show that higher rates of household gun ownership and availability of guns are associated with higher rates of unintentional firearm deaths.[11,12,13] There is an association between unsafely stored firearms and unintentional gun deaths — one study found that states with higher rates of unsafely stored guns have higher rates of unintentional gun deaths.[14]

Children ages 5-14 were more likely to die from unintentional gun injuries if they lived in states where guns are more prevalent.[15,16] This trend holds for adults, too. A 2013 survey found that in New York, 10.3% of the adult population owns guns while 48.9% of Alabama's adult population owns guns.[17] Alabama's unintentional firearm death rate is 48 times that of New York.[18]

PREVENTING UNINTENTIONAL SHOOTINGS

SAFER STORAGE OF FIREARMS

Evidence shows that parents of adolescents — the most at-risk group in terms of unintentional firearm deaths — were more likely than parents of younger children to keep guns in the home stored unsafely (unlocked, loaded, or both).[19]

If a person chooses to store their firearm in the home, it is important to always practice safe firearm storage. For at-home firearm storage, it is widely recommended to store firearms locked and unloaded, store and lock ammunition separately from firearms, and ensure the key or lock combination is inaccessible to children or others who may be at risk for injury.

Safely storing and reducing access to firearms for the gun owner and other individuals, especially children, in the home is an unintentional injury prevention strategy supported by researchers, healthcare professionals, and gun owners alike. While there is no safer storage law at the federal level, various safer storage laws exist at the state level.[20]

Healthcare providers can also play a role in preventing unintentional firearm injuries by improving their patients' safer storage practices through lethal means safety counseling. Studies show that healthcare providers influencing patients' gun storage practices can substantially lower the risk of firearm-related injury.[21] For example, researchers found that for every five gun-owning parents whose child's pediatrician gave them lethal means safety counseling and free cable locks, two parents reported using

the cable locks six months later.[22] In addition to parents, lethal means safety counseling should be given to individuals who have risk factors for unintentional firearm injury, including people with risky alcohol or substance use and individuals with dementia or conditions impairing cognition and judgment.

To learn more, visit our page on lethal means safety counseling (https://efsgv.org/learn/policies/lethal-means-safety-counseling/).

ALCOHOL AND UNINTENTIONAL SHOOTINGS

Guns should never be handled after consuming alcohol and other substances. Alcohol use is a risk factor for all forms of gun violence, including unintentional injuries and deaths.[23] Alcohol can impair judgment and lead to violent behavior. Adding firearms to this already dangerous situation can be deadly.

Indeed, evidence shows that alcohol use is common in unintentional firearm deaths. A 2019 study found that nearly a quarter of those who died from an unintentional firearm injury — and nearly half of all 20-29-year-olds who died from unintentional shootings — had consumed alcohol.[24] For the oldest age group in the study (adults aged 60 or older), alcohol was involved in 11.3% of unintentional gun deaths.

DEMENTIA AND UNINTENTIONAL SHOOTINGS

Older adults living with dementia or conditions impairing cognition and judgment may be at an increased risk of firearm injury and death.[25] One-third of adults 65 and older own guns, and another 12% live in a household with a gun.[26] It is estimated that 60% of people living with dementia live in a household with a gun.[27]

People living with dementia who have a firearm in the home may pose a risk to themselves and others. Dementia may make a person unable to safely handle a firearm, and also may result in misperceptions of actual threats.[28] Further, dementia, and other diseases, could impair logical thinking and emotional control.[29]

Just as family members may consult with older relatives' physicians about concerns about their ability to drive or live alone, family members may also express concerns about their relatives' ability to use a firearm.[30] The Alzheimer's Association recommends removing firearms from the home of someone living with dementia to prevent unintentional shootings, recognizing that storing or locking up a firearm may not be enough.[31] Extreme risk laws may be an appropriate mechanism for removing firearms from an individual living with dementia. This tool has the potential to prevent all forms of gun violence, including unintentional shootings.

To learn more, visit our page on extreme risk laws. (https://efsgv.org/learn/policies/extreme-risk-laws/)

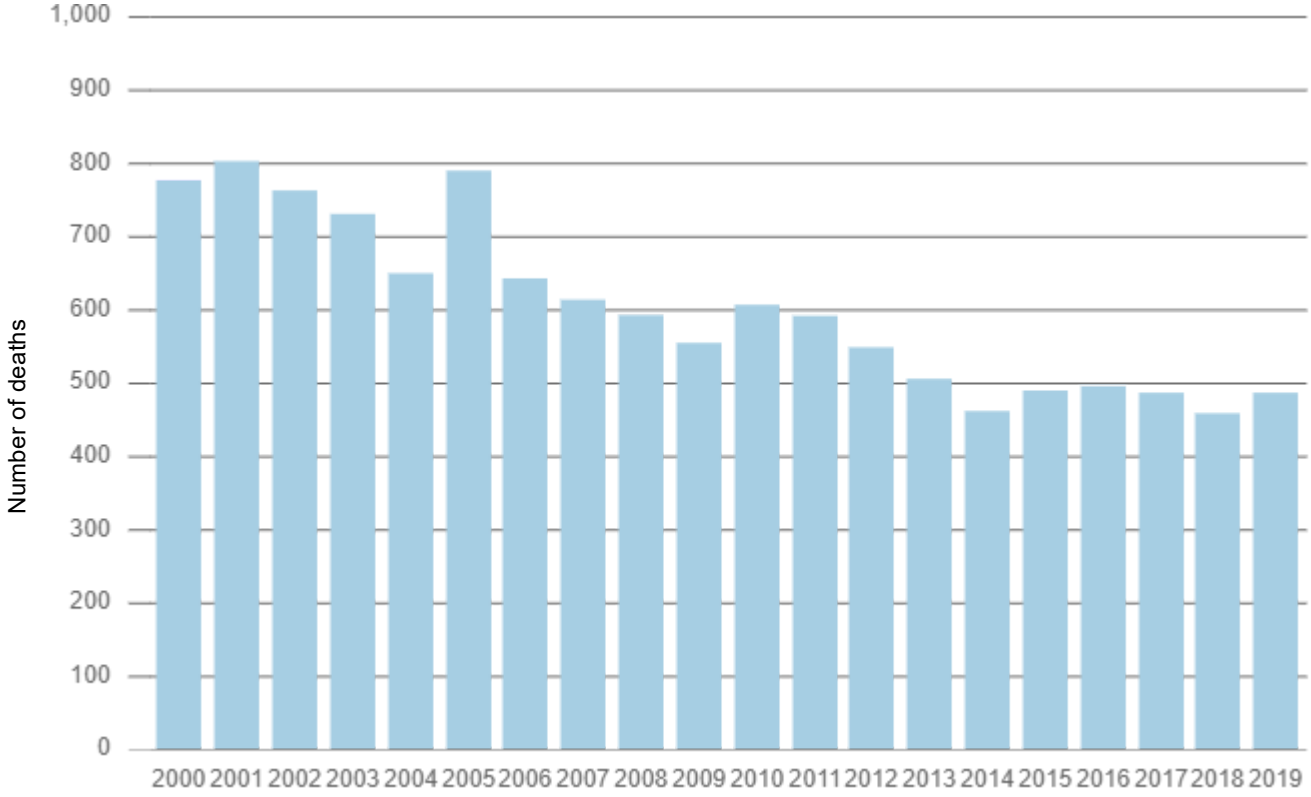
UNINTENTIONAL GUN INJURIES IN THE UNITED STATES

Annually, more than 27,000 individuals are admitted to the emergency department for unintentional firearm injuries. The vast majority of these individuals, more than 26,000, do not succumb to their injuries and die. In fact, unintentional firearm injuries account for 37% of all nonfatal firearm injuries but less than 2% of all gun deaths.[32] The lethality of unintentional firearm injuries is far less than any other type of gun violence. According to Nationwide Emergency Department Sample (NEDS) and CDC data, two out of every 100 unintentional firearm injuries are fatal.[33] However, as previously mentioned, some nonfatal injuries classified as unintentional may actually be the result of an assault. Regardless, the vast majority of unintentional firearms injuries are not fatal.

UNINTENTIONAL FIREARM DEATHS IN THE UNITED STATES

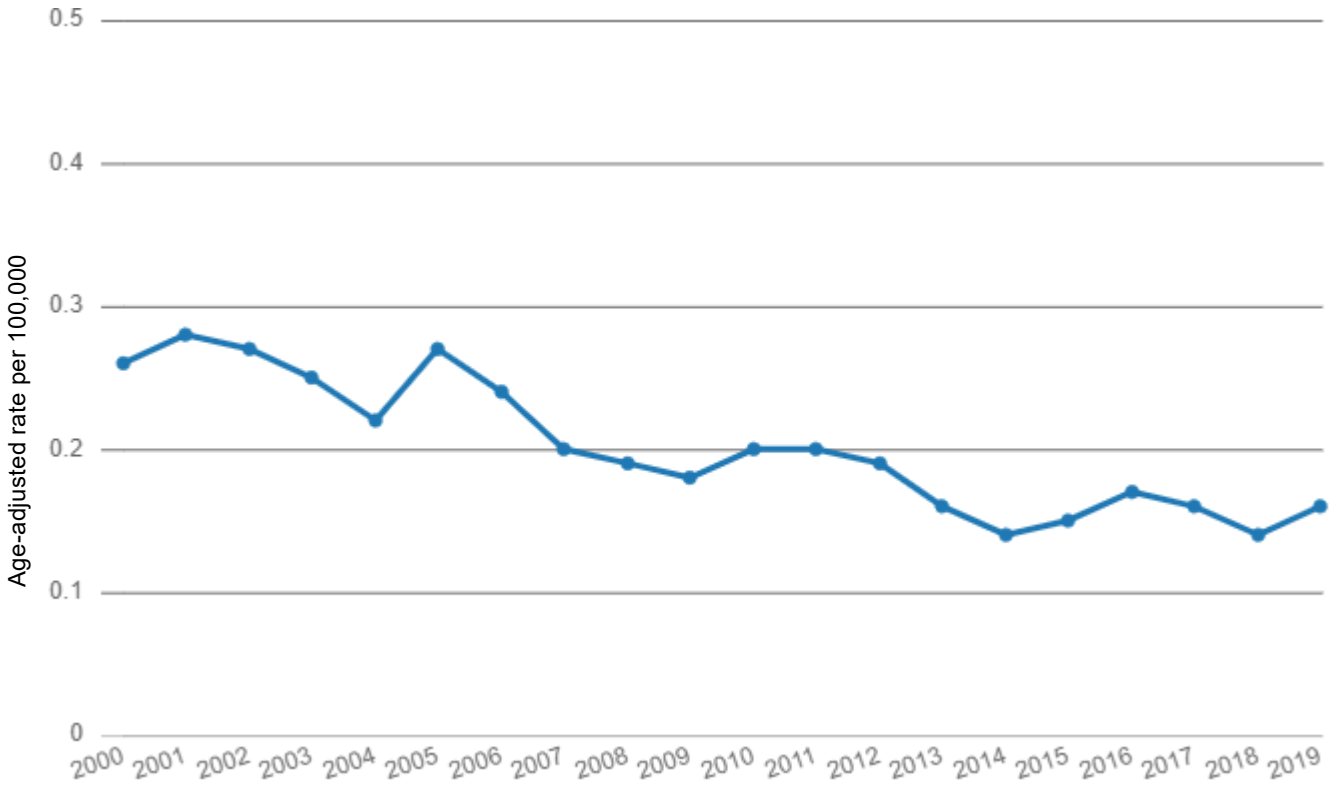
Although there are still far too many unintentional firearm deaths, the number of unintentional firearm deaths has decreased over the past two decades. In the first decade of the 21st century, there were 691 annual unintentional firearm deaths (all ages); in contrast, in the second decade (2010-2019), there were 512 annual unintentional firearm deaths (all ages), a 35% decrease. Similarly, the number of unintentional firearm deaths among children and teens (ages 0-19) dropped by 23%, from an average of 154 annually from 2000-2009 to 118 annually from 2010-2019.[34] The expansion of interventions to improve safer firearm storage and handling practices may contribute to further decreases in unintentional firearm deaths in the years to come.

UNINTENTIONAL FIREARM DEATHS IN THE UNITED STATES, 2000-2019



Source: CDC WONDER.

UNINTENTIONAL FIREARM DEATH RATE IN THE UNITED STATES, 2000-2019



Source: CDC WONDER.

All rates listed are age-adjusted in order to allow for accurate comparisons between populations with differing age distributions.

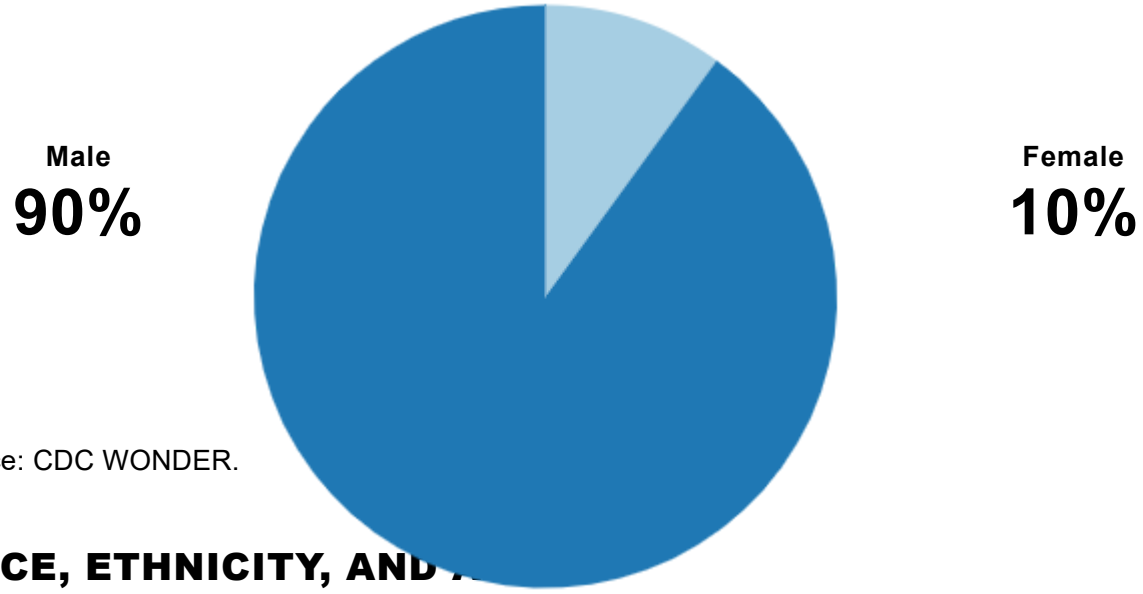
DISPARITIES ACROSS DEMOGRAPHICS

Across all ages, races, and ethnicities, males die from unintentional shootings more often than females. Among males, Black men ages 20-34 are at the highest risk of dying from an unintentional shooting. Among females, Black females ages 0-19 are at the highest risk of dying from an unintentional shooting.[35]

BY SEX

The vast majority of victims of unintentional shootings are male. In 2019, 90% of unintentional gun death victims were male.[36] For both self-inflicted and other-inflicted unintentional gun deaths, the lowest percentage of male victims occurs in the youngest age group: those 0 to 9 years old.[37]

UNINTENTIONAL FIREARM DEATHS BY SEX, 2019



Source: CDC WONDER.

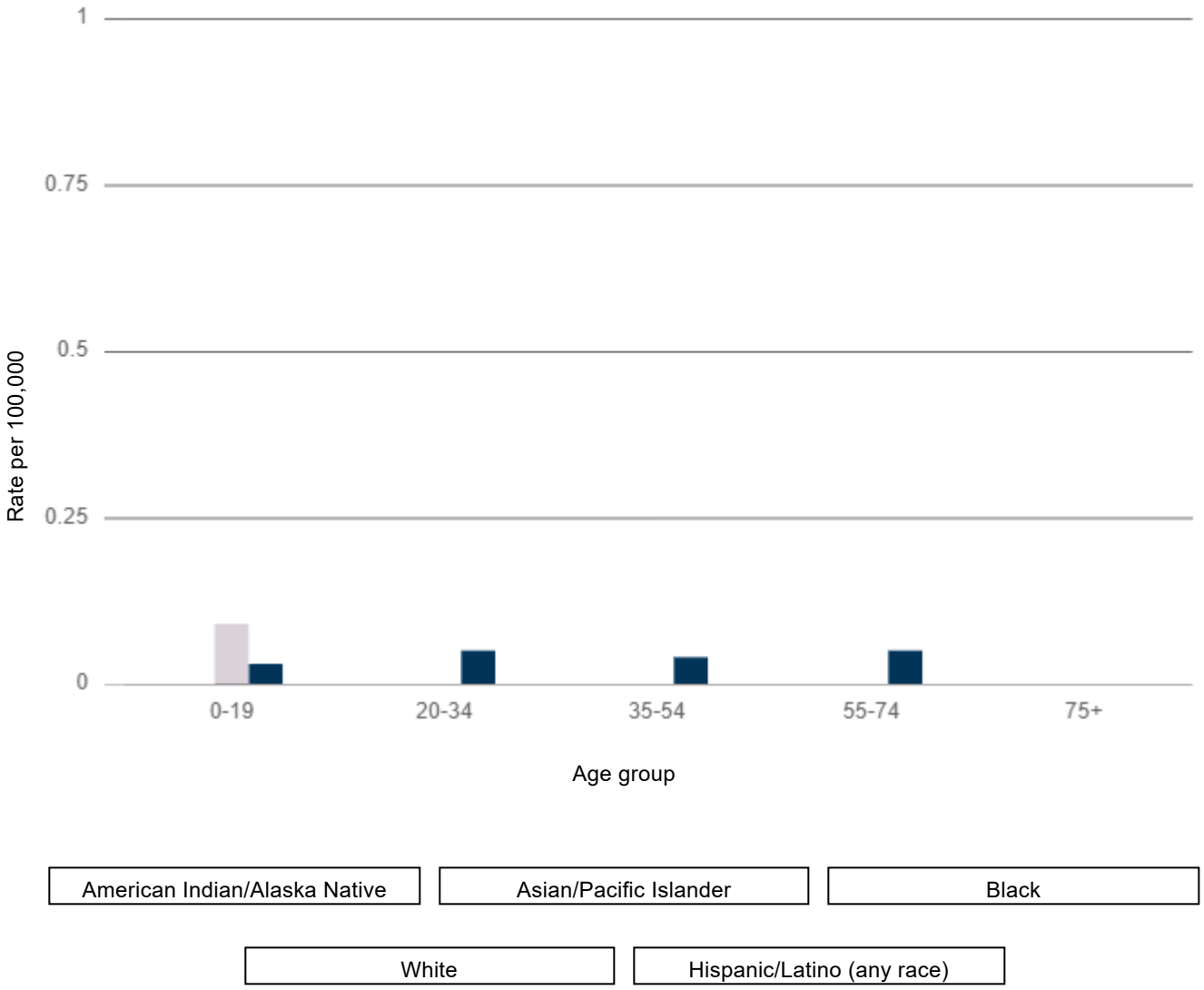
BY RACE, ETHNICITY, AND A

Half (52%) of unintentional firearm deaths occur under the age of 35. Nearly one-quarter of all unintentional firearm decedents are 0-19 years old and 28% of all unintentional firearm decedents are 20-34 years old.[38]

One study found that victims were more likely to be unintentionally shot by someone else the younger they were. Over three quarters (78%) of unintentional firearm deaths for children 0-14 were caused by someone else while the majority of unintentional shootings among older Americans were self-inflicted.[39]

It is important to note that when looking at unintentional gun deaths for both males and females by age, race, and ethnicity, the subgroups have few deaths and as a result, much of the data is unreliable or suppressed. Black males ages 20-34 are at highest risk. For females, Black youth ages 0-19 are at highest risk, though the rates for all races and ethnicities for women are small. Rates of unintentional gun deaths for White women are similar across most of the lifespan.[40]

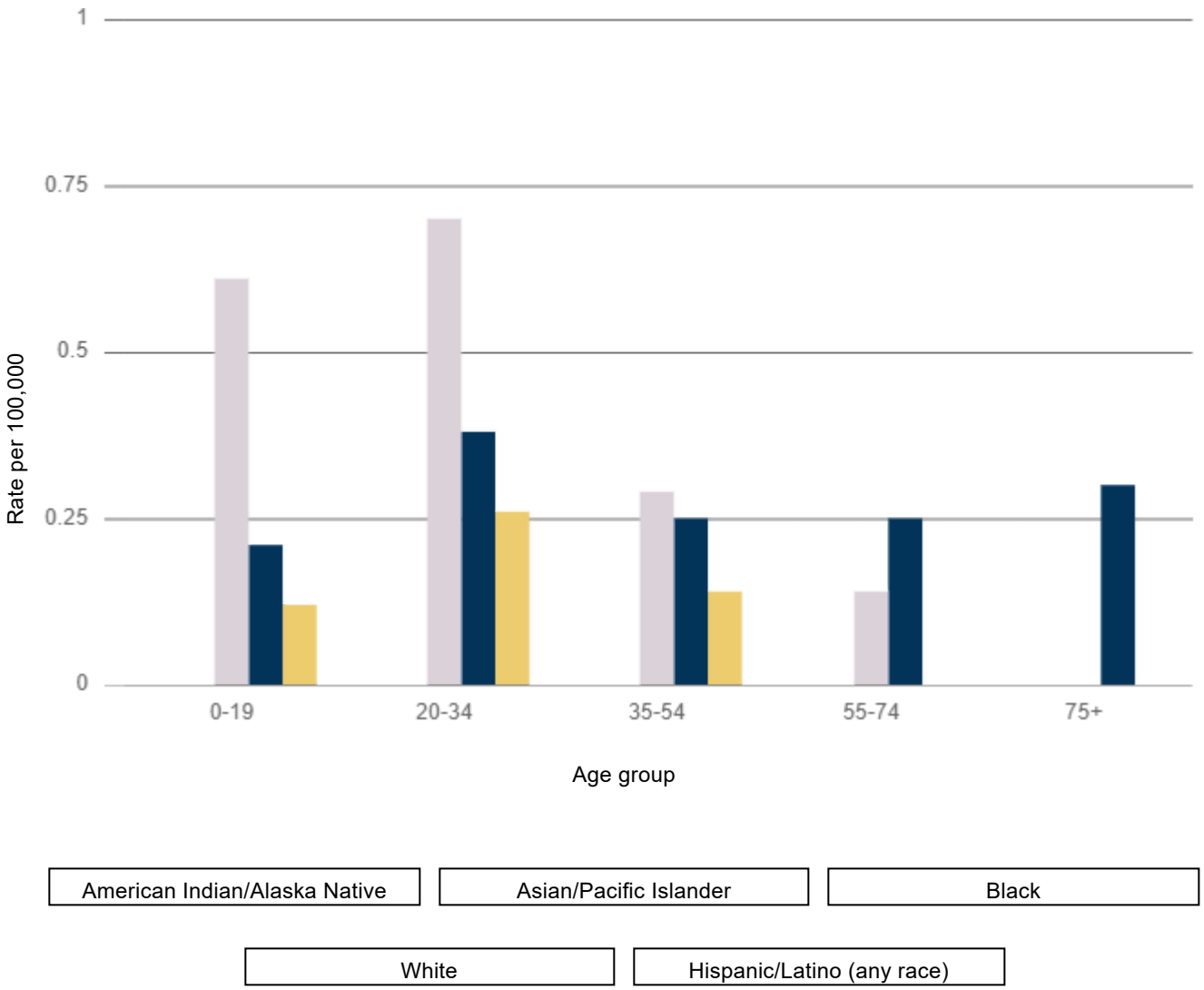
FEMALE UNINTENTIONAL FIREARM DEATH RATES BY RACE, ETHNICITY, AND AGE, 2015-2019



Source: CDC WONDER.

Note: The CDC considers unintentional firearm death rates based on fewer than 20 deaths “statistically unreliable” and suppresses unintentional firearm death rates based on fewer than 10 deaths. Fewer than 20 unintentional firearm death rates were reported during this time period for the following races and Hispanic Origin category and therefore are omitted from the above chart: American Indian/ Alaska Native females all ages; Asian/ Pacific Islander females all ages; Black females ages 20-34, 35-54, 55-74, 75+; White females ages 75+; and Hispanic/Latino females all ages.

MALE UNINTENTIONAL FIREARM DEATH RATES BY RACE, ETHNICITY, AND AGE, 2015-2019



Source: CDC WONDER.

Note: The CDC considers unintentional firearm death rates based on fewer than 20 deaths “statistically unreliable” and suppresses unintentional firearm death rates based on fewer than 10 deaths. Fewer than 20 unintentional firearm death rates were reported during this time

period for the following races and Hispanic Origin category and therefore are omitted from the above chart: American Indian/ Alaska Native males all ages; Asian/ Pacific Islander males all ages; Black males ages 75+; and Hispanic/Latino males 55-74, 75+.

GEOGRAPHICAL VARIATIONS

There is wide regional variation in where unintentional shootings occur. More than half of all individuals who die by unintentional gun injuries live in the South.[41] Individuals who live in the South are more than three times more likely to die by an unintentional shooting compared to those living in the Northeast.[42] In 2019, the five states with the highest rates of unintentional shooting deaths were all in the South. Alabama had the highest unintentional death rate, followed by Kentucky, North Carolina, Missouri, and Georgia. This regional variation may be linked to the strength of state gun violence prevention laws. For example, states in the Northeast region tend to have stronger gun laws than states in the South.[43] States with strong gun laws have been found to be associated with lower unintentional firearm injuries.[44]

RECOMMENDATIONS

Enact and implement programs and practices that promote safer firearm storage and handling.

Easy access to firearms, particularly unsecured firearms and the presence of firearms in risky situations, increases risk of unintentional injury and death by firearm. Mitigating access with safer storage practices and through evidence-based policy prevents unintentional gun violence. Shifting behaviors related to firearm storage and handling practices may contribute to further decreases in unintentional firearm injuries and deaths in the years to come. We recommend:

- **Safer storage:** Safely storing and thereby reducing access to firearms is an unintentional injury prevention strategy supported by researchers, healthcare professionals, and gun owners alike. For at-home firearm storage, firearms should be stored locked and unloaded, ammunition should be stored and locked separately from firearms, and the key or lock combination should be inaccessible to children and adolescents or others at elevated risk of harm to self or others. Storing firearms outside of the home is the safest option.
- **Safety technologies:** Technological solutions have the potential to reduce firearm injury. We encourage the development and evaluation of technological solutions to improving the safety of firearms and storage devices.

- **Lethal means safety counseling:** Lethal means safety counseling is an evidence-based healthcare intervention that is effective in preventing unintentional firearm injuries and deaths. Lethal means safety counseling helps providers work collaboratively with gun-owning patients and their families to reduce risk of injury by improving their patients' safer storage practices. Healthcare professionals should be trained on lethal means safety counseling as an unintentional injury prevention intervention. All patients and parents/guardians of pediatric patients should be asked about firearms access and provided safer storage information. Patients at elevated risk of unintentional injury, such as individuals with dementia or conditions impairing cognition and judgment, should receive more in-depth lethal means safety counseling. See Lethal Means Safety Counseling (https://efsgv.org/learn/policies/lethal-means-safety-counseling/) for more information.

- **Extreme risk laws:** Extreme risk laws empower law enforcement and the people closest to an individual at elevated risk of harm to self or others to intervene to help prevent gun tragedies before they occur. These state laws allow law enforcement, and in some states family and household members, among others, to petition a judge to temporarily limit an individual's access to firearms if they are at elevated risk of violence. Extreme risk laws may be an appropriate mechanism for removing firearms from an individual who is at high risk for unintentional injury, including individuals living with dementia or other conditions impairing cognition and judgment. Every state should have its own extreme risk law and continuously monitor and evaluate the law to ensure equitable implementation and ongoing effectiveness. See Extreme Risk Laws (https://efsgv.org/learn/policies/extreme-risk-laws/) for more information.

- **Avoid alcohol and other substances when accessing guns:** Just like driving a car, alcohol and other substances increase risk of violence and injury. Firearm access should be limited after consuming alcohol and other substances.

RESOURCES

EDUCATIONAL MATERIALS

- Firearm Child Access Prevention in Virginia (http://efsgv.org/wp-content/uploads/2019/06/Virginia-Child-Access-Prevention-June-2019.pdf)

RESEARCH

- () Fowler KA, Dahlberg LL, Haileyesus T, & Annest JL. (2015). Firearm injuries in the United States. (https://www.ncbi.nlm.nih.gov/pubmed/26116133)*Preventive Medicine.*

- () Gani F, Sakran JV, & Canner JK. (2017). Emergency department visits for firearm-related injuries in the United States, 2006–14. (https://www.healthaffairs.org/doi/abs/10.1377/hlthaff.2017.0625)*Health Affairs. Appendix 13.*
- () Guetschow B, Lilienthal M, & Willey M. (2018). Unintentional firearm injuries remain prevalent over a 12 year experience at a rural midwestern level 1 trauma center. (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6047385/)*Iowa Orthopaedic Journal.*
- () Hemenway D, Barber C, & Miller M. (2010). Unintentional firearm deaths: a comparison of other-inflicted and self-inflicted shootings (https://www.ncbi.nlm.nih.gov/pubmed/20441829). *Accident Analysis and Prevention.*
- () Hemenway D & Solnick SJ. (2015). Children and unintentional firearm death. (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4602049/)*Injury Epidemiology.*
- () Miller M, Azrael D, & Hemenway D. (2001). Firearm availability and unintentional firearm deaths. (https://www.sciencedirect.com/science/article/abs/pii/S0001457500000610) *Accident Analysis and Prevention.*
- () Miller M, Azrael D, & Hemenway D. (2002). Firearm availability and unintentional firearm deaths, suicide, and homicide among 5-14 year olds. (https://www.ncbi.nlm.nih.gov/pubmed/11834986) *Journal of Trauma.*
- () Miller M, Azrael D, Hemenway D, & Vriniotis M. (2005). Firearm storage practices and rates of unintentional firearm deaths in the United States. (https://www.ncbi.nlm.nih.gov/pubmed/15949457) *Accident Analysis and Prevention.*
- () Solnick SJ & Hemenway D. (2019). Unintentional firearm deaths in the United States 2005–2015. (https://www.ncbi.nlm.nih.gov/pubmed/31637153) *Injury Epidemiology.*
- () Wiebe DJ. (2003). Firearms in US homes as a risk factor for unintentional gunshot fatality. (https://www.ncbi.nlm.nih.gov/pubmed/12850071) *Accident Analysis and Prevention.*

ADDITIONAL RESOURCES

- () American Academy of Pediatrics's Gun Safety and Children (https://www.aap.org/en-us/about-the-aap/aap-press-room/campaigns/gun-safety/Pages/default.aspx)
- () Firearm Safety Among Children and Teens (FACTS) Consortium's "Safe Storage" video (https://youtu.be/tExYuQKaFec)
- () How Gun Policies Affect Unintentional Injuries and Deaths (https://www.rand.org/research/gun-policy/analysis/unintentional-injuries.html) from the RAND Corporation

- () Harvard Injury Control Research Center's (https://www.hsph.harvard.edu/hicrc/firearms-research/gun-threats-and-self-defense-gun-use/) information on "Accidents"
- () The National Crime Prevention Council and the Advertising Council's Lock It Up campaign (https://www.safefirearmsstorage.org/)
- () Safe States's Injury Prevention Inventory: Unintentional Firearm Injury (https://www.safestates.org/page/IPI_UninFirearm_pg15)

Last updated February 2021

1. Injury Prevention (https://www.sophe.org/focus-areas/injury-prevention/). Society for Public Health Education.
2. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2019 (http://wonder.cdc.gov/ucd-icd10.html).
3. Hemenway D, Barber C, & Miller M. (2010). Unintentional firearm deaths: a comparison of other-inflicted and self-inflicted shootings (https://www.ncbi.nlm.nih.gov/pubmed/20441829). *Accident Analysis and Prevention*.
4. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2018 (http://wonder.cdc.gov/ucd-icd10.html).
5. Solnick SJ & Hemenway D. (2019). Unintentional firearm deaths in the United States 2005–2015 (https://www.ncbi.nlm.nih.gov/pubmed/31637153). *Injury Epidemiology.*
6. National Violent Death Reporting System (NVDRS) (https://www.cdc.gov/violenceprevention/datasources/nvdrs/index.html). Centers for Disease Control and Prevention.
7. Gani F, Sakran JV, & Canner JK. (2017). Emergency department visits for firearm-related injuries in the United States, 2006–14 (https://www.healthaffairs.org/doi/abs/10.1377/hlthaff.2017.0625). *Health Affairs.* Appendix 13.
8. Barber C & Hemenway D. (2011). Too Many or Too Few Unintentional Firearm Deaths in Official U.S. Mortality Data? (https://www.ncbi.nlm.nih.gov/pubmed/21376860) *Accident Analysis and Prevention*.

9. Solnick SJ & Hemenway D. (2019). Unintentional firearm deaths in the United States 2005–2015 (https://www.ncbi.nlm.nih.gov/pubmed/31637153). *Injury Epidemiology.*

10. Solnick SJ & Hemenway D. (2019). Unintentional firearm deaths in the United States 2005–2015 (https://www.ncbi.nlm.nih.gov/pubmed/31637153). *Injury Epidemiology.*

11. Wiebe DJ. (2003). Firearms in US homes as a risk factor for unintentional gunshot fatality (https://www.ncbi.nlm.nih.gov/pubmed/12850071). *Accident Analysis and Prevention.*

12. Miller M, Azrael D, & Hemenway D. (2001). Firearm availability and unintentional firearm deaths (https://www.sciencedirect.com/science/article/abs/pii/S0001457500000610). *Accident Analysis and Prevention*

13. Miller M, Azrael D, Hemenway D, & Vriniotis M. (2005). Firearm storage practices and rates of unintentional firearm deaths in the United States (https://www.ncbi.nlm.nih.gov/pubmed/15949457). *Accident Analysis and Prevention.*

14. Miller M, Azrael D, Hemenway D, & Vriniotis M. (2005). Firearm storage practices and rates of unintentional firearm deaths in the United States (https://www.ncbi.nlm.nih.gov/pubmed/15949457). *Accident Analysis and Prevention.*

15. Miller M, Azrael D, & Hemenway D. (2002). Firearm availability and unintentional firearm deaths, suicide, and homicide among 5-14 year olds. (https://www.ncbi.nlm.nih.gov/pubmed/11834986) *Journal of Trauma.*

16. Per the study authors, Gun availability was assessed using three measures: (1) Cook's Index, calculated using mortality statistics among the adult U.S. population, and defined as the average of two proportions: (1/2) (firearm suicides/all suicides) (firearm homicides/all homicides) (2) FS/S, the percentage of suicides among adults that are firearm suicides; and (3) the percentage of households that reported owning a firearm in the BRFSS survey of a nonrandom 21 states (Household gun).

17. Kalesan B, Villarreal MD, Keyes KM, & Galea S. (2016). Gun ownership and social gun culture (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4809774/). *Injury Prevention*.

18. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2018 (http://wonder.cdc.gov/ucd-icd10.html). 5-year-average for 2014-2018.

19. Johnson RM, Miller M, Vriniotis M, Azrael D, & Hemenway D. (2006). Are Household Firearms Stored Less Safely in Homes With Adolescents?: Analysis of a National Random Sample of Parents (https://www.ncbi.nlm.nih.gov/pubmed/16894076). *Archives of Pediatric & Adolescent Medicine.*

20. Giffords Law Center. Safe Storage (https://lawcenter.giffords.org/gun-laws/policy-areas/child-consumer-safety/safe-storage/).

21. Grossman DC, Mueller BA, Riedy C, Dowd MD, Villaveces A, Prodzinski J, et al. (2005). Gun storage practices and risk of youth suicide and unintentional firearm injuries (https://pubmed.ncbi.nlm.nih.gov/15701912/). *Journal of the American Medical Association*.

22. Barkin SL, Finch SA, Ip EH, Scheindlin B, Craig JA, Steffes J, & Wasserman RC. (2008). Is office-based counseling about media use, timeouts, and firearm storage effective? Results from a cluster-randomized, controlled trial (https://www.ncbi.nlm.nih.gov/pubmed/18595960). *Pediatrics.*

23. McGinty EE & Webster DW. (2017). The roles of alcohol and drugs in firearm violence (https://www.ncbi.nlm.nih.gov/pubmed/28055044). *JAMA Internal Medicine*.

24. Solnick SJ & Hemenway D. (2019). Unintentional firearm deaths in the United States 2005–2015 (https://www.ncbi.nlm.nih.gov/pubmed/31637153). *Injury Epidemiology.*

25. Galluzzi K & Warner-Maron I. (2018). Guns and older adults: The physicians role (https://jaoa.org/article.aspx?articleid=2716918). *The Journal of the American Osteopathic Association.*

26. Betz ME, McCourt AD, Vernick JS, Ranney ML, & Wintemute GJ. (2018). Firearms and dementia (https://www.ncbi.nlm.nih.gov/pubmed/30452572). *Annals of Internal Medicine*.

27. Betz ME, McCourt AD, Vernick JS, Ranney ML, & Wintemute GJ. (2018). Firearms and dementia (https://www.ncbi.nlm.nih.gov/pubmed/30452572). *Annals of Internal Medicine*.

28. Galluzzi K & Warner-Maron I. (2018). Guns and older adults: The physician's role (https://jaoa.org/article.aspx?articleid=2716918). *The Journal of the American Osteopathic Association.*

29. Galluzzi K & Warner-Maron I. (2018). Guns and Older Adults: The Physician's Role (https://jaoa.org/article.aspx?articleid=2716918). *The Journal of the American Osteopathic Association.*

30. Betz ME, McCourt AD, Vernick JS, Ranney ML, & Wintemute GJ. (2018). Firearms and dementia (https://www.ncbi.nlm.nih.gov/pubmed/30452572). *Annals of Internal Medicine*.

31. Alzheimer's Association. (2017). Firearm Safety (https://www.alz.org/national/documents/topicsheet_firearm_safety.pdf).

32. Gani F, Sakran JV, & Canner JK. (2017). Emergency department visits for firearm-related injuries in the United States, 2006–14 (https://www.healthaffairs.org/doi/abs/10.1377/hlthaff.2017.0625). *Health Affairs.* Appendix 13.

33. Gani F, Sakran JV, & Canner JK. (2017). Emergency department visits for firearm-related injuries in the United States, 2006–14 (https://www.healthaffairs.org/doi/abs/10.1377/hlthaff.2017.0625). *Health Affairs.* Appendix 13.

34. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2019 (http://wonder.cdc.gov/ucd-icd10.html).

35. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2019 (http://wonder.cdc.gov/ucd-icd10.html).

36. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2019 (http://wonder.cdc.gov/ucd-icd10.html).

37. Solnick S & Hemenway D. (2019). Unintentional firearm deaths in the United States 2005–2015 (https://www.ncbi.nlm.nih.gov/pubmed/31637153). Injury Epidemiology.

38. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2019 (http://wonder.cdc.gov/ucd-icd10.html).

39. Hemenway D, Barber C, & Miller M. (2010). Unintentional firearm deaths: a comparison of other-inflicted and self-inflicted shootings (https://www.ncbi.nlm.nih.gov/pubmed/20441829). *Accident Analysis and Prevention*.

40. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2019 (http://wonder.cdc.gov/ucd-icd10.html).

41. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2019 (http://wonder.cdc.gov/ucd-icd10.html).

42. Centers for Disease Control and Prevention, National Center for Health Statistics. About Underlying Cause of Death, 1999-2019 (http://wonder.cdc.gov/ucd-icd10.html).

43. According to the U.S Census Bureau, (https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf) The South region consists of: TX OK AR LA MS AL TN KY WV VA DC MD DE NC SC GA FL. Most of these states have weak gun laws.

44. Simonetti JA, Rowhani-Rahbar A, Mills B, Young B, & Rivara FP. (2015). State firearm legislation and nonfatal firearm injuries. (https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2015.302617)*American journal of public health.*

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Exhibit 13

Sandy Hook Families Settle Lawsuits Against Lanza Estate For $1.5M

By DAVE ALTIMARI
AUG 06, 2015 AT 8:55 AM

The two lawsuits made similar claims -- that Nancy Lanza purchased a Bushmaster AR-15 and kept it in her Yogananda Street home where her son had access to it. (Stephen Dunn)

The families of 16 victims of the Sandy Hook school shooting will receive about $94,000 each to settle two lawsuits against the estate of the shooter's mother, Nancy Lanza.

Documents filed Monday in Probate Court show that the families have agreed to equally divide a $1.5 million homeowner's insurance policy that Lanza had on the Newtown home she shared with her son, Adam Lanza. Each family will get $93,750, records show. The lawsuits were filed by the families of 16 of those who died in the massacre and two who survived.

On Dec. 14, 2012 , Adam Lanza walked into Sandy Hook Elementary School and gunned down 26 people, including 20 first graders, using a Bushmaster AR-15 assault weapon that his mother had purchased legally. He had already killed his mother before going to the school – shooting her several times with a rifle as she slept in her bed at their Yogananda Street home.

The lawsuits made essentially the same claim — that Nancy Lanza purchased the Bushmaster and kept it in her home, where her 20-year-old son had access to it. State police reports said the Bushmaster was kept in a gun safe that was in a room adjacent to Adam Lanza's bedroom and that he had unlimited access to it.

[Related] Alex Jones appears for questioning in Connecticut for Sandy Hook lawsuit »

The lawsuits allege that Nancy Lanza "knew or should have known that [Adam Lanza's] mental and emotional condition made him a danger to others."

The claims were made in two separate lawsuits filed against the estate of Nancy Lanza, which is still open in Probate Court. Stamford attorney Samuel Starks is the estate's administrator.

The lead plaintiffs in the lawsuits, were the parents of James Mattioli and the estate of Rachel D'Avino.

The settlements must be approved by Probate Judge Joseph Egan before they can be finalized in Superior Court, but lawyers familiar with the case said that should be completed by the end of this month. All the lawyers on the case worked pro bono so the families could get all the proceeds.

Two other lawsuits filed as a result of the shootings are still pending.

Many of the same families also are suing Remington Outdoor Co., the distributor of the Bushmaster, in federal court. That lawsuit claims that the Bushmaster, which can fire up to 30 rounds a minute and is capable of piercing body armor, shouldn't have been entrusted to the general public because it is a military assault weapon.

LATEST CONNECTICUT

Alex Jones appears for questioning in Connecticut for Sandy Hook lawsuit

New state grant to aid redevelopment near Hartford's Dunkin' Donuts Park, 11 other towns and cities

Racist graffiti repeatedly found in bathrooms at West Hartford high school

The other lawsuit is against the town of Newtown and alleges that the town did not take enough steps to secure the school. The lawsuit alleges that Lauren Rousseau, a substitute teacher killed, did not have a key to her room and was unable to lock the door before Lanza entered the classroom.

He killed 14 of the 15 people in that room. The rest were killed in an adjacent classroom. Lanza killed himself using one of the handguns that he had brought into the building. He fired 155 shots in less than five minutes.

The house on Yogananda Street where Nancy and Adam Lanza lived was torn down a few months ago. A bank purchased it for $1 from the estate and turned it over to the town.

A previous version of this story indicated that two of the plaintiffs were teachers who survived the shooting. They withdrew their claims.

Exhibit 14

MAN WHO SHOT INTRUDER IN HIS HOME SUED FOR WRONGFUL DEATH

Posted by Charles Gilman | Dec 15, 2020 | 0 Comments

A judge has decided that a man who shot and killed an intruder in his home, can be sued by the dead man's family.

The wrongful death lawsuit seeks $505,000 from the man who came home to find his front door kicked in and a nearly naked man in his living room. Police declined to prosecute the resident, but a judge, last month, said the civil case can move ahead.

In June 2012, an Oregon man returned to his home with his girlfriend after an evening out. They found his front door kicked in and a nearly naked intruder on the sofa. According to police reports, the 33-year-old intruder attacked the man and started strangling him. With his girlfriend's help, the man broke free and reached for a handgun he had hidden in the sofa. He shot the intruder once in the back at close range. All three were reportedly intoxicated at the time of the incident and the couple told police they did not know the intruder.

Last year, a lawsuit was filed against the resident on behalf of the parents and son of the intruder. The lawsuit alleges that the resident used reckless and excessive force against the intruder. The family's attorney suggested the resident provoked a confrontation by entering his own home after finding the door kicked in, instead of remaining outside and calling the police. However, the resident's attorney, arguing to throw out the case, said that Washington state law allows the use of defensive deadly force in such circumstances. In addition, his attorney argued, statutes defend against civil claims when the person who was harmed was committing a felony and that his conduct was "a substantial factor contributing to his death."

However, the judge sided with the family of the intruder, saying there was not definitive proof that the intruder attacked the couple before being shot.

In their bid for damages, the family cited loss of life and loss of "companionship and support" from the dead man. In a civil suit, there are two types of damages: compensatory (or actual damages) and punitive damages. Compensatory damages are money awarded to compensate for actual losses such as future earnings, medical bills, and funeral expenses. Punitive damages are considered punishment and awarded when the defendant's behavior is found to be especially harmful. The compensation in a wrongful death lawsuit is intended to cover the earnings of the deceased, as well as attempt to provide emotional comfort for loved ones and support the person for whom the earnings would have provided.

Earlier this year, a wrongful death lawsuit was filed against a Montana homeowner who shot and killed an intruder. The homeowner said the intruder was moving toward him and he feared for his life. The lawsuit claims the intruder was running away when he was shot.

In 2011, the family of a burglar who was shot and killed while breaking into a Colorado car lot was awarded almost $269,500 in their wrongful death lawsuit.

No matter the circumstances, if you have been injured or a loved one killed as a result of someone else's reckless behavior, you may be entitled to compensation. Call the offices of trial attorneys Charles Gilman and Briggs Bedigian at 1-800-529-6162 or contact them online. The firm handles cases in Maryland, Pennsylvania, and Washington, D.C.

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ABOUT THE AUTHOR

CHARLES GILMAN

As managing partner and co-founder of Gilman & Bedigian, it is my mission to help our clients recover and get their lives back on track. I strongly believe that every person who is injured by a wrongful act deserves compensation, and I will do my utmost to bring recompense to those who need and deserve it.

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