Findings of Mass Shootings and Related Firearm Data
United States and Colorado | July 2022

Purpose

Recent mass shootings have again focused attention on the United States as an outlier in firearm violence among more developed counties.¹ ² They have also encouraged discourse on prevention. While we focus on mass shootings in this brief, as German Lopez reminds us in his May 26, 2022 New York Times article, “Most shootings in America never appear in national headlines. The majority of gun deaths in 2021 were suicides. Nearly half were homicides that occurred outside mass shootings; they are more typical acts of violence on streets and in homes (and most involve handguns). Mass shootings were responsible for less than 2 percent of last year’s gun deaths.”² Mass shootings are, however, what typically drive public response and dialogue. Despite personal and political beliefs about firearms and firearm access, most Americans agree that the now common mass murders of school children, grocery shoppers, and everyday workers have crossed a line. They are too much. They are too horrible.

Mass shootings are a specific type of violent crime, often with characteristics different from other violent crimes. In order to better understand mass shootings and the factors related to them, this brief explores available national and state data related to mass shootings. Data in this brief include the type and legal status of firearms used in U.S. mass shootings, firearms traced and recovered in Colorado crimes, firearm sales, shooter characteristics and motivation, and firearm policy and regulation.

Given the above, the purpose of this data brief is to provide an overview of information that can be gleaned from several publically accessible sources of data for those interested in learning about mass shootings from a public health perspective. We hope that this summary will stimulate and support continued thoughtful discourse and action about this topic of growing importance and public concern.

Data Sources

The Violence Project

The Violence Project is a valuable tool built by Jillian Peterson (Ph.D.) and James Densley (Ph.D.). Importantly, a mass shooting was excluded from Violence Project’s database if: a) 3 or fewer victims died, b) Related to gang violence or crime, or c) only family or friends involved. The Violence Project covers mass shootings from 1966 to 2022. The data used in this report was accurate and up-to-date as of March 2022. For more information about the Violence Project and methodology used to create the database, visit https://www.theviolenceproject.org/

Colorado Public Shooting Data

The Violence Project database contains a wealth of useful data on mass shooting shooters and circumstances across the United States. However, the database only represented 7 mass shootings in Colorado, and did not include several critical shootings in our community’s past. As a result, we expanded our search for data on public shootings in Colorado to include in the Colorado-specific timeline presented on page 15. Of note, we changed our search criteria from The Violence Project’s methods to include any shooting in our timeline that occurred in a public place where at least 1 person died. Many shootings in Colorado’s past have had less than 4 victims who died and we think it is critical to consider these events when examining prevention and intervention opportunities.

Colorado Firearm Sales Data

The Colorado Bureau of Investigation conducts background checks on every legal firearm purchase, reviews all concealed weapon permit applications, and reports monthly statistics of firearm sale approvals and denials through the Firearms Instacheck Unit. Illegal firearm sales and purchases are excluded from these data. These data only include legal firearm purchases, which includes both private sales and federal firearm licensed (FFL) dealer sales.

Firearm Recovery and Tracing Data

From the Bureau of Alcohol, Tobacco, and Firearms Website “Firearm traces are designed to assist law enforcement authorities in conducting investigations by tracking the sale and possession of specific firearms. Law enforcement agencies may request firearms traces for any reason, and those reasons are not necessarily reported to the federal government. Not all firearms used in crime are traced and not all firearms traced are used in crime.

Firearms selected for tracing are not chosen for purposes of determining which types, makes, or models of firearms are used for illicit purposes. The firearms selected do not constitute a random sample and should not be considered representative of the larger universe of all firearms used by criminals, or any subset of that universe. Firearms are normally traced to the first retail seller, and sources reported for firearms traced do not necessarily represent the sources or methods by which firearms in general are acquired for use in crime.”

Promote, protect and improve the lifelong health of individuals and communities in Adams, Arapahoe and Douglas Counties through the effective use of data, evidence-based prevention strategies, leadership, advocacy, partnerships, and the promotion of health equity.
This section describes characteristics of mass shootings in the United States from 1966-2022. Mass shootings were included where 4 or more victims died and the victims were not known to the shooter. The number of mass shootings by decade has increased over time. Since 2000, a greater percentage of mass shootings have occurred in retail or restaurant spaces as well as offices and schools. Fewer shootings have occurred outdoors or in government settings.

**Total mass shootings: 177**

**Primary Location**

- **33%** of mass shootings occurred at retail or restaurant locations
- **24%** of mass shootings occurred at offices or worksites
- **School shootings** accounted for **12%** of all mass shootings
- The shooters had **existing relationships** with the location or were “insiders” in the majority of office and school shootings (87%)
- Shooters were “outsiders” in **67%** of shootings in houses of worship

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U.S. Mass Shootings: Shooter Demographics

This section describes the shooters in mass shootings in the United States since 1966. Most shooters (97%) are male. Compared to the general population of males, a larger percentage of shooters are single and have some college or trade school education. Over time, the percentage of shooters aged 30 and younger has increased. In the 2020s, 55% of shooters were 21 and younger. The race/ethnicity of shooters has also changed over time (Figure 5).

- **182 shooters** have carried out 177 mass shootings in the United States from 1966-2022
- The proportion of shooters **under the age of 24** has been **increasing** since the 1990s

### Education

<table>
<thead>
<tr>
<th>Education</th>
<th>Shooter %</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than high school</td>
<td>13%</td>
<td>24</td>
</tr>
<tr>
<td>High School/GED</td>
<td>18%</td>
<td>33</td>
</tr>
<tr>
<td>Some college/trade school</td>
<td>28%</td>
<td>51</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>7%</td>
<td>12</td>
</tr>
<tr>
<td>Graduate/advanced degree</td>
<td>6%</td>
<td>11</td>
</tr>
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</table>

### Race

<table>
<thead>
<tr>
<th>Race</th>
<th>Shooter %</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>53%</td>
<td>96</td>
</tr>
<tr>
<td>Black</td>
<td>20%</td>
<td>37</td>
</tr>
<tr>
<td>Latinx</td>
<td>8%</td>
<td>15</td>
</tr>
<tr>
<td>Other Race</td>
<td>7%</td>
<td>13</td>
</tr>
<tr>
<td>Asian</td>
<td>6%</td>
<td>11</td>
</tr>
</tbody>
</table>

### Relationship

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Shooter %</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>48%</td>
<td>88</td>
</tr>
<tr>
<td>Married</td>
<td>16%</td>
<td>29</td>
</tr>
<tr>
<td>Divorced/Widowed</td>
<td>16%</td>
<td>29</td>
</tr>
<tr>
<td>Boyfriend/Girlfriend</td>
<td>15%</td>
<td>27</td>
</tr>
</tbody>
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Most mass shooting shooters are men in their mid-thirties who are not working at the time of the shooting. In more recent years, more shooters have used social media and have shown an increased interest in mass violence. About 20% of shooters are known to the FBI or police prior to the incident and almost 25% have military service backgrounds. Almost 50% of shooters leaked their plans prior to event.

- The **median age** of shooters was **33** years old.
- **Over half (56%)** of shooters were not working at the time of the shooting. In comparison, 11% of U.S. males are estimated as not working by the Bureau of Labor Statistics.
- Since 1990, 17 shooters grew up in **high-income households** with incomes of at least $150,000.
- Before the 1990s, zero shooters grew up in households with incomes of at least $150,000.
- **50%** of shooters used **social media** (since 2008).
- Shooters have displayed an **increased interest in past mass violence** in recent years.
- **14%** of shooters played **violent** video games (since 1992).

### Social Contagion

- **44%** of shooters **leaked their plans** prior to the shooting:
  - 66% leaked plans **in-person**
  - 14% leaked via **Internet/social media**
  - 50% specifically threatened a mass shooting
  - 20% shared with **coworkers**
  - 19% shared with **wife/girlfriend**
  - 18% shared with **friends/peers**

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U.S. Mass Shootings: Shooter Mental Health

Some data exist that explore shooter mental health. Most shooters experience the desire to commit suicide at some point before or during a mass shooting event. In fact, 68% had a history of mental illness, with half of shooters experiencing thought and/or mood disorders. Nearly half of all shooters used or abused substances, with alcohol being the most common substance used or abused.

Figure 9: Percent of shooters mental health experiences, 1966-2022

Looking at suicidality, mental illness, and substance abuse by age of shooter, we see a higher prevalence of prior suicidality and history of psychiatric disorder among young people aged 18-21 than other age groups. In general, substance abuse among shooters increases with age. Shooters aged 18-30 were more likely to have a diagnosed mental illness than shooters aged over 30.

Figure 11: Mental health indicators by age group, 1966-2022

- Shooters **age 18 to 21** experienced prior suicidality and had a history of other psychiatric disorders more than other age groups.\(^1\)
- About **25%** of shooters **age 22 to 24** had a problem with marijuana or other drugs.\(^1\)
- About **20%** of shooters **age 25 to 30** had a mood disorder.\(^1\)
- About **30%** of shooters **age 41 to 50** had an indication of psychiatric disorder and/or had a problem with other drugs.\(^1\)
- **15%** of shooters **age over 50** had a problem with alcohol, while having no recorded problem with marijuana or other drugs.\(^1\)

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\(^1\) The Violence Project’s Mass Shooter Database, www.theviolenceproject.org (1966-2022)
\(^2\) Colorado Department of Public Health & Environment, Vital Records Program (2010-2020)
\(^3\) Colorado Department of Public Health & Environment, Behavioral Risk Factor Surveillance System (2007-2019)
U.S. Mass Shootings: Shooter Motivation

When mass shootings occur, communities often want to know why. There are not many data that exist to answer this question, but The Violence Project provides some information. The data suggest that psychosis (delusions or hallucinations) play a role in motivating nearly 3 in 10 mass shootings. Interpersonal conflict has surpassed employment issues as the top motivator over the past two decades.

Figure 12: Role of psychosis (delusions or hallucinations) in motivating mass-shooting event, 1966-2022

- **NO ROLE**: 71.4%
- **MINOR ROLE**: 10.4%
- **MODERATE ROLE**: 8.2%
- **MAJOR ROLE**: 9.9%

Figure 13: Percent of shooters motivation in mass-shooting event, 1966-2022

- **Employment Issue**: 22%
- **Interpersonal Conflict**: 20%
- **Relationship Issue**: 14%
- **Legal Issue**: 12%
- **Economic Issue**: 11%
- **Racism/Xenophobia**: 10%
- **Fame-seeking**: 7%
- **Religious Hate**: 5%
- **Misogyny**: 4%
- **Homophobia**: 2%

Top Mass-Shooting Motivations:

- **22% Employment Issue**
- **20% Interpersonal Conflict**
- **14% Relationship Issue**

Figure 14: Shooters motivation in mass-shooting event, 1970s-1990s vs. 2000s-2020s

U.S. Mass Shootings: Shooter Motivation (continued)

Mass shootings motivated by employment issues have been declining since the 1990s, and have been replaced with an increase in motivation by interpersonal conflict, racism/xenophobia, and fame-seeking. Fame-seeking and racism/xenophobia make up the majority of motivators behind shooters aged 21 and younger, with both motivators increasing steadily since the 2000s.

Figure 15: Trend of common motivations by decade, 1966-2022

Motivations have varied over time

- Employment Issues
- Racism/Xenophobia
- Fame-seeking

Figure 16: Common shooter motivations by age, 1966-2022

- 80% of mass shootings motivated by economic issues were among shooters aged 41 and above
- 50% of mass shootings motivated by fame-seeking were among shooters aged 21 and under

Firearm Types and Legal Status of Firearms used in Mass Shootings

Figure 17. Percent of total firearm types* for firearms involved in U.S mass shootings by decade (since 1966), and by year (2014-2021)¹

Figure 18. Legal status for firearms involved in U.S mass shootings by decade (since 1966), and by year (2014-2021)¹

Assault Weapons used in Mass Shootings increased from¹
13% (1970s) → 33% (2020s)

“Assault weapons are exceptionally deadly firearms commonplace in mass shootings. They are generally capable of firing far more bullets, far faster than manual-action hunting rifles. Prohibiting assault weapons can prevent mass shooting injuries and deaths.”⁵

51% percent of firearms used in Mass Shootings since 1966 were purchased legally¹

²Everytown, https://everytownresearch.org/solution/assault-weapon-ban/

*A handgun has a short barrel; a shotgun has a long barrel and usually has a smooth bore; a rifle has a long barrel with rifling, which puts spin on the bullet, increasing accuracy and distance; an assault weapon is any semi-automatic gun that can accept a detachable ammunition magazine that has one or more additional features considered useful in military and criminal applications but unnecessary for sports or self-defense, such as a folding, telescoping or thumbhole rifle stock.
Looking at the types of firearms used in mass shootings and their legal status, we see that the majority of weapons used in mass shootings since 2010 were legally purchased; most of these weapons were assault weapons or handguns. Only seven states in the United States have bans on assault weapons.

**Figure 19. Legal status and firearm types for firearms involved in U.S mass shootings by decade (since 1966), and by year (2014-2021)**

**Assault Weapons Used in Mass Shootings** from 2014-2021:

- **83%** Legally purchased
- **18%** Illegally purchased

For mass shootings that involved at least one assault weapon, the mean number of deaths (10.3 deaths) was 68% higher than shootings without an assault weapon (6.2 deaths), and the mean number injured was 550% higher (30.7 injured vs 4.7 injured).

**Figure 20. States with assault weapon bans**

If there were still a federal Assault Weapon Ban, researchers estimate that there would be **70% fewer mass shooting casualties.**

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While assault weapons comprised 38% of firearms used in U.S. mass shootings from 2014-2021, they make up less than 1% of firearms traced and recovered in Colorado Crimes during the same time frame.\textsuperscript{7}

\textbf{Firearm Types Traced and Recovered in Colorado Crimes} \textsuperscript{7}

- **Handguns**: 77.3%
- **Rifles**: 15.1%
- **Shotguns**: 7.0%
- **Other**: 0.6%

Assault weapons are \textbf{126} times more likely to be used in a mass shooting event than a general crime.\textsuperscript{7}
Rates of crimes where firearms were traced and recovered are highest, over the past seven years, in Durango, Grand Junction, and Lakewood, Colorado. A majority of municipalities experienced increased rates of firearms traced and recovered in crimes, with Lakewood seeing the largest percent increase between 2014 and 2020. People aged 22-40 experienced the highest rate of recovery and trace in crimes.

**Rate of Firearms Traced and Recovered in Crimes by Age and Municipality in Colorado, per 100k Population, 2014-2020**

**Durango** experienced the highest rate of firearms traced and recovered in crimes for a majority of the years. Rates are increasing for most of the top 10 cities.

Individuals ages **22-40** experienced the highest rates of firearms traced and recovered in Colorado crimes.

Figure 22. Rate of firearms traced and recovered for top Colorado municipalities, 2014-2020

Figure 23. Rate of firearms traced and recovered in Colorado crimes by age group and year, 2014-2020

*Note: Only the top 10 cities were reported each year, cities that are missing a year were not in the top 10 for that year.*

*Bureau of Alcohol, Tobacco, and Firearms*
Firearm Sales in Colorado

This section describes the firearm sales in Colorado from 2011 to 2021. This data comes from the Colorado Bureau of Investigation Firearms InstaCheck Unit. In 2020, Colorado experienced record high firearm sales. The rate of firearm sales has increased 60% from 2011 to 2021. Handguns were the most frequently purchased firearm. The rate of approved concealed handgun permits in Colorado has steadily increased from 2011 to 2021.

Key Findings

- The rate of firearm sales in Colorado has increased 60% from 2011 to 2021.
- The rate of Handgun sales in Colorado has increased 78% from 2011 to 2021.
- Colorado experienced record high firearm sales in 2020.
- On average, about 2% of firearm sale requests are denied by the Colorado Bureau of Investigation.

Figure 24: Rate of annual firearm sales per 100,000 by firearm type, Colorado, 2011-2021

Figure 25: Percent breakdown of firearm sales by firearm type, Colorado, 2011-2021

- Handguns are the most common firearm type purchase in the state of Colorado, comprising more than half of annual firearm sales since 2013.
- Since 2011, the rate of approved concealed handgun permits has steadily increased in Colorado.
- The rate of approved concealed handgun permits in Colorado increased 60% from 2019 to 2021.

Figure 26: Colorado rate of concealed handgun permits per 100,000, 2011-2021

8Colorado Bureau of Investigation, Firearm InstaCheck Statistics, 2011-2021
Firearm Policy & Regulation in Colorado

This section provides an overview of firearm policies and regulation in Colorado, alongside information on shooting events in Colorado (both mass shootings and non-mass shootings). This section also includes a list of actions that would help to reduce mass shootings in Colorado. A firearm transfer refers to the purchase or change in possession of a firearm.

Figure 27: Colorado mass & non-mass shootings & major policies enacted in Colorado, 1986-2022

Mass Shooting (>3 victims died)

Non-Mass Shooting*

2022 - Prohibited: Open carry at voting locations

2021 - Expanded: Local regulation of firearms
- Expanded: Background checks & denials
- Required: Safe storage of firearms
- Required: Report lost or stolen firearms
- Created: Office of Gun Violence Prevention

2019 - Created: Extreme Risk Protection Orders (ERPOs)

2013 - Prohibited: Firearm transfer to domestic violence shooters
- Prohibited: Large capacity magazines
- Created: Fee for background check
- Created: Universal background checks

*Non-Mass Shooting: The events above were defined as incidents where a person actively attempted to kill people in a populated public space where at least 1 victim died or was injured. Workplace shootings were included.

Age Restrictions

18+ can purchase *rifles* & other *long guns*

21+ can purchase *handguns* & get *concealed carry* permit

Percent of high school students who could easily or sort of easily get a gun⁹:

*Colorado Department of Public Health & Environment, Healthy Kids Colorado Survey, 2021*

<table>
<thead>
<tr>
<th>State</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado</td>
<td>16.8%</td>
</tr>
<tr>
<td>Adams County</td>
<td>12.9%</td>
</tr>
<tr>
<td>Arapahoe County</td>
<td>14.8%</td>
</tr>
<tr>
<td>Douglas County</td>
<td>15.4%</td>
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The Colorado Bureau of Investigation denies a firearm transfer if the purchaser¹⁰-¹²...

- Convicted of certain crimes or felonies
- Under indictment for a felony
- Convicted of domestic violence (including misdemeanor)
- Subjected to a protective order restraining them from harassing, stalking, or threatening their child/intimate partner/child of partner
- Committed to mental institution or adjudicated as mental defective
- Renounced U.S. citizenship
- Unlawfully used marijuana or any depressant, stimulant, narcotic, or any other controlled substance
- Is a fugitive or an illegal alien
- Dishonorably discharged from armed forces

Note: A purchaser can appeal a firearm transfer denial within 30 days or request a new approval after 30 days. Denials due to violent crimes or felonies are not reversible.

¹⁰ https://www.shouselaw.com/co/blog/gun-laws/
¹¹ https://giffords.org/lawcenter/state-laws/firearm-prohibitions-in-colorado/
¹² Colorado Bureau of Investigation
## Opportunities to reduce mass shootings

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Accomplished in Colorado?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Background checks on all firearm sales</strong>&lt;br&gt;Colorado requires background checks for firearm sales made through licensed firearm dealer and private firearm sellers, with exceptions for temporary transfers &lt;72 hours.</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Extreme Risk Protection Orders (ERPOs) or “red flag orders”</strong>&lt;br&gt;As of 2019, people subject to an ERPO cannot purchase or possess firearms.</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Prohibit People with Dangerous Histories from having Firearms</strong>&lt;br&gt;As of June 2021, these offenses within last 5 years are prohibited: third degree assault, sexual assault, unlawful sexual contact, child abuse, violation of protective order, crime against at-risk person, harassment, bias-motivated crime, animal cruelty, possession of illegal weapon, and unlawfully providing juvenile with non-handgun firearm.</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Prohibit Large Capacity Magazines</strong>&lt;br&gt;Since 2013, large-capacity magazines are illegal to sell, transfer, or possess.</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Prohibit ammunition feeding devices for semiautomatic weapons</strong></td>
<td>✔</td>
</tr>
<tr>
<td><strong>Regulate silencers (firearm accessory)</strong>&lt;br&gt;It is a felony to possess a silencer in Colorado.</td>
<td>✔</td>
</tr>
<tr>
<td><strong>“Disarm” Hate Crimes</strong>&lt;br&gt;As of June 2021, a person that committed bias-motivated crime will fail a background check.</td>
<td>✔</td>
</tr>
<tr>
<td><strong>Restrictions on Assault Weapons</strong></td>
<td>✗</td>
</tr>
<tr>
<td><strong>Require Threat Assessment Management in schools</strong></td>
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<tr>
<td><strong>Licensing process for firearm purchasers</strong></td>
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</tr>
<tr>
<td><strong>Waiting periods from firearm purchase to transfer</strong></td>
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<tr>
<td><strong>Reporting of incidents when firearm purchase denied</strong></td>
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<tr>
<td><strong>Regulations on open carry</strong>&lt;br&gt;Colorado allows open carry everywhere except at voting locations (as of 2022).</td>
<td>✗</td>
</tr>
</tbody>
</table>

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11 https://giffords.org/lawcenter/state-laws/universal-background-checks-in-colorado/  
13 https://www.everytown.org/issues/mass-shootings/#what-are-the-solutions  
14 UC Davis Violence Prevention Research Program (VPRP)  
15 https://cssrc.colorado.gov/threat-assessment
Conclusion

Tri-County Health Department

Discussion

Not only have mass shootings increased over time, but the weapons used, the reasons motivating shooters, and the characteristics of shooters themselves have changed. Geographically, more shootings are occurring in the western and mid-western United States in places of employment, schools, and retail locations. Shooters of mass shootings tend to be younger than the general population, male, and single, and many have an interest in fame-seeking as well as a background with bullying, domestic violence, or mental illness. The frequency of assault weapons being used in U.S. mass shootings is increasing; legally-purchased handguns and assault weapons make up the majority of weapons used in recent mass shooting events. The rate of firearm sales in Colorado has increased 60% between 2011 to 2021, and Colorado experienced record high firearm sales in 2020.

Most of the policies in Colorado aimed at reducing mass shootings have been passed in the past 10 years. Ending firearm violence and mass shootings—or at least reducing their occurrence—is a large challenge and one that will require policy change. The Johns Hopkins Bloomberg School of Public Health’s Fall/Winter 2021 issue addresses this challenge and suggests “four evidence-based strategies [to] target the main drivers of gun violence”: (1) Extreme Risk Protection Orders, (2) Comprehensive Background Checks and Purchaser Licensing Laws, (3) Removing Firearms from People with Domestic Violence Restraining Orders, and (4) Data-Driven Law Enforcement Response. Colorado has several of these policies in place.

Recent years have illuminated Americans’ views of ourselves as community members, individuals, and members of democratic society. How we decide to balance differing values and roles will continue to impact the firearm violence epidemic in years to come.

"With more than 390 million guns in civilian hands, the U.S. has more firearms than people. This daunting fact can make the problem of gun violence seem unsolvable. But research... has identified laws that are already making a difference—primarily by keeping guns from people who shouldn’t have them."1

1Jensen, B. “Gun Policies That Save Lives” was published September 16, 2021. This article appeared in the Fall/Winter 2021 issue of Hopkins Bloomberg Public Health magazine. https://magazine.jhsph.edu/2021/gun-policies-save-lives