

The Next 100 Questions: A Research Agenda For Ending Gun Violence

DECEMBER 2020

The
Joyce
Foundation

TABLE OF CONTENTS

Introduction	3
Acknowledgments	6
Firearm Suicide	7
Community-Based Gun Violence	12
Intimate Partner Violence with Guns	18
Shootings by Law Enforcement	21
Mass Shootings	25
Unintentional Shootings	29
Impacts of Lawful Gun Ownership and Public Carrying on Safety	33
Limiting Gun Access to People During Periods of High Risk	38
Racial Disparities and the Role of the Criminal Justice System	42
Firearm Related Technology	47
Conclusion	52

INTRODUCTION

Each day in America around 100 people are killed with guns, and over 200 more are injured.¹ This gun violence takes multiple forms, including suicides, which account for nearly two-thirds of gun deaths; community-based gun violence; shootings by law enforcement officers, intimate partner violence, accidental shootings, and mass shootings.

And this year, on top of the devastating COVID-19 pandemic, many parts of the country are seeing increases in gun violence — even as Americans buy guns in record numbers,² including many first-time purchasers.³

But there is no vaccine that will end gun violence, and no community is immune from this public health crisis.

According to former Surgeon General Dr. David Satcher, addressing any public health crisis requires “defining and measuring the problem, determining the cause or risk factors for the problem, determining how to prevent or ameliorate the problem, and implementing effective strategies on a larger scale and evaluating the impact.”⁴ In other words, the public health approach is grounded in, and dependent upon, scientific research.

But despite the magnitude of America’s gun violence crisis, public funding for research on gun violence has fallen far short of that for other public health challenges. Beginning in the 1990s, federal lawmakers essentially eliminated public funding for research on gun violence, and scientific inquiry shrank.⁵

For more than two decades that followed, the Joyce Foundation and a small number of other private foundations kept the field afloat, supporting scientists who made important discoveries about the nature and scope of the problem and pointed to a range of solutions - including policies to reduce access to guns by those at risk, community-based programs to interrupt and deter violence, and suicide prevention strategies developed alongside gun owners.

Today, there are reasons for optimism. In 2019, with bipartisan support, the U.S. Congress approved \$25 million for new research on gun violence,⁶ and in 2020 the Centers for Disease Control and Prevention and the National Institutes of Health awarded 25 grants to leading scientists across the country. This is a good start, but there is much more to learn.

1 Kaufman EJ, Wiebe DJ, Xiong RA, Morrison CN, Seamon MJ, Delgado MK. Epidemiologic Trends in Fatal and Nonfatal Firearm Injuries in the US, 2009-2017. *JAMA Intern Med.* Published online December 07, 2020. <https://doi.org/10.1001/jamainternmed.2020.6696>

2 Federal Bureau of Investigation. “NICS Firearm Checks: Month/Year by State and Type.” File, December 1, 2020. https://www.fbi.gov/file-repository/nics_firearm_checks_-_month_year_by_state.pdf/view

3 Kravitz-Wirtz, Nicole, Amanda Aubel, Julia Schleimer, Rocco Pallin, and Garen Wintemute. “Violence, Firearms, and the Coronavirus Pandemic: Findings from the 2020 California Safety and Wellbeing Survey.” Preprint. *Public and Global Health*, October 6, 2020. <https://doi.org/10.1101/2020.10.03.20206367>.

4 Satcher, David et al., “The Public Health Approach to Eliminating Disparities in Health.” *Am J Public Health*, 98(3): 400–403 (2008), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2518593/>

5 Alcorn T. Trends in Research Publications About Gun Violence in the United States, 1960 to 2014. *JAMA Intern Med.* 2017;177(1):124–126. <https://doi.org/10.1001/jamainternmed.2016.7076>

6 Cochrane, Emily. “Congress Approves Spending Package to Avoid Shutdown, Clearing It for Trump.” *The New York Times*, December 19, 2019. <https://www.nytimes.com/2019/12/19/us/politics/government-shutdown-bill.html>

We are also encouraged that the incoming presidential administration has committed to a comprehensive approach against this “public health epidemic” of gun violence.⁷ That comprehensive approach must start with science.

Drawing on our 25-year history as a leading research funder in this area,⁸ the Joyce Foundation has assembled this research agenda to inspire and focus further investment. We reached out to scores of experts who have devoted their careers to the topic, from the fields of public health, medicine, economics, sociology, criminology, behavioral science, law, and social work, and with their input the Joyce Foundation identified **100 crucial research questions** that move us beyond well-established knowledge and that promise to yield actionable findings that could meaningfully reduce gun violence.

The report is organized around 10 critical dimensions of gun violence: six that correspond with major typologies of gun violence and four that are cross-cutting, affecting different types of violence and injury in manifold ways.⁹ The topics included in this report are:

- Firearm Suicide
- Community-Based Gun Violence
- Intimate Partner Violence with Guns
- Shootings by Law Enforcement
- Mass Shootings
- Unintentional Shootings
- Impacts of Lawful Gun Ownership and Public Carrying on Safety
- Limiting Gun Access to People During Periods of High Risk
- Racial Disparities and the Role of the Criminal Justice System
- Firearm Related Technology

This report builds on prior research agendas, like one the Institutes of Medicine (IOM) produced in 2013 in collaboration with the National Academies of Science, Engineering and Medicine.¹⁰ In the years since that publication, researchers have closed gaps in our knowledge even as they have opened up new questions. For example, the IOM did not address shootings by law enforcement, which account for a significant share of U.S. gun violence and undermine the public’s trust. Nor did the IOM give sufficient attention to the contributions that communities make to their own safety, or to the ways the U.S. criminal justice system exacerbates inequalities that fuel gun violence. This research agenda attempts to address those omissions.

7 “The Biden Plan to End Our Gun Violence Epidemic.” Accessed 1 October 2020. <https://joebiden.com/gunsafety/>

8 The Joyce Foundation. *25 Years of Impactful Grant Making*. (August 2019). <http://www.joycefdn.org/news/gun-violence-prevention-justice-reform-program-research>

9 This agenda does not include recommendations regarding improvements to the data infrastructure needed to support research and policy making. On this topic, we recommend the excellent work of our colleagues at NORC. See Roman, John K., “A Blueprint for a U.S. Firearms Data Infrastructure,” NORC at the University of Chicago, October 2020.

<https://www.norc.org/NewsEventsPublications/PressReleases/Pages/a-blueprint-for-a-u-s-firearms-data-infrastructure.aspx>

10 IOM (Institute of Medicine) and NRC (National Research Council). 2013. *Priorities for research to reduce the threat of firearm-related violence*. Washington, DC: The National Academies Press.

<https://www.nap.edu/catalog/18319/priorities-for-research-to-reduce-the-threat-of-firearm-related-violence>.

Although the primary objective of this report is to guide future research, it also highlights landmark studies published since the IOM's report in 2013. These are markers showing, even in a short time and with limited resources, how far we have come.

As we look to a future that is free from gun violence, let's recommit to investing in science, so we can answer these critical questions.

ACKNOWLEDGMENTS

In preparing this report, the Joyce Foundation benefited from the guidance of a small committee of scientific advisors, who also provided feedback on the manuscript:

- Catherine Barber, Senior Researcher, Harvard Chan School of Public Health
- Shani Buggs, Assistant Professor-in-Residence, University of California, Davis
- Nancy La Vigne, Executive Director, Task Force on Policing, The Council on Criminal Justice
- Andrew V. Papachristos, Professor of Sociology, Northwestern University
- Ali Rowhani-Rahbar, Bartley Dobb Professor for the Study and Prevention of Violence, University of Washington
- Daniel Webster, Bloomberg Professor of American Health, Johns Hopkins University
- April M. Zeoli, Associate Professor, School of Criminal Justice, Michigan State University

The manuscript was drafted by Ted Alcorn, with research assistance from Taylor Fish.

We gratefully acknowledge all their support and guidance.

FIREARM SUICIDE

In 2018, 24,432 people in the U.S. died by firearm suicide, accounting for 60 percent of the nation's gun deaths.¹¹ And the problem is worsening: over the past decade the firearm suicide rate rose 30 percent.¹² Among children and teens aged 0 to 19, firearm suicide rose 65 percent over the same period, totaling 1,297 deaths in 2018 alone.¹³ And suicide among veterans is 50 percent higher than among the non veteran population, after adjusting for other factors.¹⁴

Prior research has shown that access to firearms increases risk of suicide,^{15,16,17} a finding that is robust across numerous study designs. Case-control studies have shown that individuals are more likely to die from suicide when they own guns.¹⁸ States where a higher share of households have firearms have markedly higher firearm suicide rates and overall suicide rates than states that do not.¹⁹ Nationwide changes in access to lethal means, such as the United Kingdom's energy transition away from coal gas or Sri Lanka's bans on the most human-toxic pesticides, have corresponded with sharp drops in suicide by those methods, and limited increases in deaths due to substitution with other means.^{20,21,22}

Yet the sum of this evidence appears to have had little impact on the beliefs and behaviors of gun owners around the country. Three in ten Americans live in households with guns,²³ and an increasing number of gun owning households with children keep at least one firearm unlocked and loaded, despite evidence that this storage practice exposes children to increased risk of suicide death.²⁴

11 Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS) [online]. (2005) (Accessed December 1, 2020). www.cdc.gov/injury/wisqars.

12 Ibid.

13 Ibid.

14 U.S. Department of Veteran Affairs. "2019 National Veteran Suicide Prevention Annual Report." Washington, DC: U.S. Department of Veteran Affairs, Office of Mental Health and Suicide Prevention, 2019. <https://tinyurl.com/y534tthe>.

15 Azrael D & Miller M. (2016). Reducing suicide without affecting underlying mental health: Theoretical underpinnings and a review of the evidence base linking the availability of lethal means and suicide. In R. C. O'Connor & J. Pirkis (Eds.), *The International Handbook of Suicide Prevention*, Second Edition (pp. 637-662). West Sussex, England: John Wiley & Sons.

16 Kellermann, Arthur L. et al. "Suicide in the Home in Relation to Gun Ownership." *New England Journal of Medicine* 327, no. 7 (August 1992): 467–72. <https://doi.org/10.1056/NEJM199208133270705>.

17 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;171(12):885-895. <https://doi.org/10.7326/M19-1324>.

18 Anglemyer, Andrew, Tara Horvath, and George Rutherford. "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, no. 2 (January 2014): 101–10. <https://doi.org/10.7326/M13-1301>

19 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 Sep 15;178(6):946-55. <https://doi.org/10.1093/aje/kwt197>. Epub 2013 Aug 23. PMID: 23975641.

20 Kreitman N. The coal gas story. United Kingdom suicide rates, 1960-71. *Br J Prev Soc Med*. 1976;30(2):86-93. <https://doi.org/10.1136/jech.30.2.86>

21 Gunnell D, Fernando R, Hewagama M, Priyangika WD, Konradsen F, Eddleston M. The impact of pesticide regulations on suicide in Sri Lanka. *Int J Epidemiol*. 2007;36(6):1235-1242. <https://doi.org/10.1093/ije/dym164>.

22 Gunnell D, Knipe D, Chang SS, Pearson M, Konradsen F, Lee WJ, Eddleston M. Prevention of suicide with regulations aimed at restricting access to highly hazardous pesticides: a systematic review of the international evidence. *Lancet Glob Health*. 2017 Oct;5(10):e1026-e1037. [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(17\)30299-1/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(17)30299-1/fulltext). Epub 2017 Aug 11. PMID: 28807587.

23 Azrael, Deborah. "The Stock and Flow of U.S. Firearms." 38–57.

24 Azrael, Deborah, Joanna Cohen, Carmel Salhi, and Matthew Miller. "Firearm Storage in Gun-Ownning Households with Children: Results of a 2015 National Survey." *Journal of Urban Health* 95, no. 3 (June 2018): 295–304. <https://doi.org/10.1007/s11524-018-0261-7>.

The most effective ways of reducing firearm suicide will likely require engaging the nation's 55 million gun owners in harm-reduction practices. Counseling at-risk gun owners about reducing access to household guns (for example, by temporarily storing them away from home or having someone else hold onto the keys) is a promising intervention for reducing firearm suicide: widely adopted, researchers estimate it would save an estimated 3,600 to 3,900 lives annually.²⁵ Community-based programs that encourage safe firearm and ammunition storage practices have produced changes in gun-owner knowledge²⁶ and behavior,²⁷ which other research shows to be associated with lower risk of youth suicide.²⁸ Many states also have child access prevention laws that impose criminal liability on people who negligently store firearms.²⁹ And since 2013, 17 states and the District of Columbia have enacted extreme risk protection orders, which generally allow law enforcement or family members to request that firearms be temporarily removed from those deemed a danger to themselves or others.³⁰

25 Barber, Catherine W., and Matthew J. Miller. "Reducing a Suicidal Person's Access to Lethal Means of Suicide: A Research Agenda." *American Journal of Preventive Medicine* 47, no. 3 (September 2014): S264–72. <https://doi.org/10.1016/j.amepre.2014.05.028>.

26 Stuber, Jennifer Paige, et al. "SAFER Brief Community Intervention: A Primary Suicide Prevention Strategy to Improve Firearm and Medication Storage Behaviour." *Injury Prevention: Journal of the International Society for Child and Adolescent Injury Prevention*, October 19, 2020. <https://doi.org/10.1136/injuryprev-2020-043902>.

27 Simonetti, Joseph A., et al. "Evaluation of a Community-Based Safe Firearm and Ammunition Storage Intervention." *Injury Prevention: Journal of the International Society for Child and Adolescent Injury Prevention* 24, no. 3 (2018): 218–23. <https://doi.org/10.1136/injuryprev-2016-042292>.

28 Grossman, David C., Beth A. Mueller, and Christine Riedy. "Gun Storage Practices and Risk of Youth Suicide and Unintentional Firearm Injuries." *JAMA* 293, no. 6 (February 2005): 707–14. <https://doi.org/10.1001/jama.293.6.707>.

29 Giffords Law Center To Prevent Gun Violence. "Child Access Prevention." Giffords Law Center To Prevent Gun Violence. Accessed December 1, 2020. <https://giffords.org/lawcenter/gun-laws/policy-areas/child-consumer-safety/child-access-prevention/>.

30 Campbell, Sean, Alex Yablon, and Jennifer Mascia. "Red Flag Laws: Where the Bills Stand in Each State." *The Trace*, March 29, 2018. <https://www.thetrace.org/2018/03/red-flag-laws-pending-bills-tracker-nra/>.

Key research on firearm suicide, 2013-20

- A 2020 cohort study of California handgun purchasers found that male handgun owners had three times the suicide rate of nonowners, and female handgun owners had seven times the suicide rate of nonowners, risk that remained elevated as long as 12 years after purchase.³¹
- A 2020 controlled, multi-site, intervention trial in which parents of at-risk adolescents were counseled in the emergency room on safe storage of lethal means found the intervention produced modest but meaningful impacts on medication and firearm storage practices at home.³²
- A 2020 study that used synthetic controls methods found that permit to purchase laws were associated with reductions in firearm suicide of over 23 percent, whereas comprehensive background check laws had inconsistent effects on firearm suicide. Connecticut's firearm suicide rate fell faster after it created an extreme risk protective order than it had preceding it.³³
- In a 2018 study that characterized firearm ownership and storage practices in Washington State, mental illness did not explain the substantially increased suicide risk among individuals in firearm-owning households.³⁴
- A 2016 study found that firearm owners and non-owners have similar rates of depression, suicidal ideation, and suicide attempts. The factor associated with elevated and enduring risk of suicide was access to firearms.³⁵
- A 2016 study of Connecticut's gun risk removal law estimated that for every 10 to 11 orders issued, the law prevented one firearm suicide, averting a total 72 suicide deaths over the period studied.³⁶

Key Research Questions

That leaves numerous outstanding questions with the potential to reshape how we address gun suicide:

1. What is the impact of counseling at-risk people about limiting access to lethal means such as firearms on their risk of suicide? Lethal means counseling is widely seen as a promising harm-reduction strategy for reducing fatal suicide attempts, but researchers agree that we need to better evaluate how it reduces risk for individual gun owners and

31 Studdert, David M., et al. "Handgun Ownership and Suicide in California." *New England Journal of Medicine* 382, no. 23 (June 2020): 2220–29. <https://doi.org/10.1056/NEJMs1916744>.

32 Miller, Matthew, et al. "Changes in Firearm and Medication Storage Practices in Homes of Youths at Risk for Suicide: Results of the SAFETY Study, a Clustered, Emergency Department-Based, Multisite, Stepped-Wedge Trial." *Annals of Emergency Medicine* 76, no. 2 (2020): 194–205. <https://doi.org/10.1016/j.annemergmed.2020.02.007>.

33 Alexander D. McCourt, Cassandra K. Crifasi, Elizabeth A. Stuart, Jon S. Vernick, Rose M. C. Kagawa, Garen J. Wintemute, and Daniel W. Webster, 2020: Purchaser Licensing, Point-of-Sale Background Check Laws, and Firearm Homicide and Suicide in 4 US States, 1985–2017 *American Journal of Public Health* 110, 1546_1552, <https://doi.org/10.2105/AJPH.2020.305822>

34 Morgan ER, Gomez A, Rowhani-Rahbar A. Firearm Ownership, Storage Practices, and Suicide Risk Factors in Washington State, 2013–2016. *Am J Public Health*. 2018 Jul;108(7):882–888. <https://doi.org/10.2105/AJPH.2018.304403>. Epub 2018 May 17. PMID: 29771611; PMCID: PMC5993408.

35 Miller, Matthew, Sonja A. Swanson, and Deborah Azrael. "Are We Missing Something Pertinent? A Bias Analysis of Unmeasured Confounding in the Firearm-Suicide Literature." *Epidemiologic Reviews* 38, no. 1 (January 2016): 62–69. <https://doi.org/10.1093/epirev/mxv011>.

36 Swanson, Jeffrey W., et al. "Implementation and Effectiveness of Connecticut's Risk-Based Gun Removal Law: Does it Prevent Suicides?" *Law and Contemporary Problems* 80, no. 179 (May 2017): 179–208. <http://scholarship.law.duke.edu/lcp/vol80/iss2/8>

household members and what impact it has on the population level, along with studies to identify the most effective messengers and settings for delivering it.

2. How do options for gun storage outside the home complement lethal means counseling, and what arrangements will have the most uptake among gun owners? Encouraging gun owners to reduce their access to firearms can only do so much when they don't have an affordable, reliable location in which to store them. Gun dealers and law enforcement agencies in Colorado were among the first to be proactive about offering such services,³⁷ joined by Washington State³⁸ and Maryland,³⁹ but which services gun owners desire most is still unclear.

3. How do different gun storage practices affect suicide risk among adults? There is evidence to support storing guns locked and unloaded to reduce the risk that children will gain unauthorized access and harm themselves or someone else, but more research is needed to ascertain the extent to which gun storage practices reduce the suicide risk for adults, who make up the preponderance of victims of suicide.

4. What messengers, in which circumstances, are most effective for promoting safe firearm storage? A plausible case can be made for promoting safe gun storage in the doctor's office, at the gun dealer or shooting range, or in the classroom – but too little is known about which would have the most influence on gun owners' behavior.

"Over the last couple decades we've come to know so much more about the role guns play in suicide. Now it's imperative to develop workable strategies that help at-risk gun owners reduce their risk."

–Catherine Barber, Senior Researcher, Harvard Chan School of Public Health

5. What are the most effective ways to communicate that gun access increases risk of suicide for all household members? Over the last two decades, the share of the population who believes a gun in the home makes it more safe, rather than more dangerous, has grown precipitously,⁴⁰ in spite of voluminous evidence to the contrary.

6. There is promising albeit preliminary evidence that extreme risk protection orders reduce the risk a person subject to them will die by suicide. What would replications establish about the consistency of these findings, and the degree to which reductions vary by geography, demographics, and other variables? What are the circumstances in which these orders are most effective, and how can these programs be implemented so they are widely used?

37 Colorado Firearm Safety Coalition. "Gun Storage Map," July 29, 2019. <https://coloradofirearmsafetycoalition.org/gun-storage-map/>.

38 Harborview Injury Prevention and Research Center. "Washington Firearm Safe Storage Map." Accessed December 1, 2020. <https://hiprc.org/firearm/firearm-storage-wa/>.

39 Bongiorno, Diana M., Eric N. Kramer, Marisa D. Booty, and Cassandra K. Crifasi. "Development of an Online Map of Safe Gun Storage Sites in Maryland for Suicide Prevention." *International Review of Psychiatry*, October 2020, 1–5. <https://doi.org/10.1080/09540261.2020.1816927>.

40 McCarthy, Justin. "More Than Six in 10 Americans Say Guns Make Homes Safer." Gallup, November 7, 2014. <https://news.gallup.com/poll/179213/six-americans-say-guns-homes-safer.aspx>.

7. How should the decision be made to return guns to people once their order expires?

8. What impact do laws regulating legal gun purchases—e.g. requiring background checks or permit-to-purchase for all gun sales, or imposing waiting periods – have on gun suicide? States with these laws have lower rates of gun suicide, but the mechanism by which different policy environments affect gun suicide rates remains unclear.

9. Research is consistent that gun access increases suicide risk, but by what mechanisms? How does that vary across different demographic groups? Furthermore, how did people who die by firearm suicide obtain their guns? The limited studies available suggest a majority of people who die by suicide legally owned their firearms for a long period prior to attempting suicide. A better understanding of the source of these firearms could lead to more targeted interventions.

10. What are the risk factors driving the elevated suicide rate of veterans? Veterans account for one fifth of U.S. suicides, and a majority of these deaths involve guns. Veterans also report markedly higher rates of gun ownership than the general population, but more research is needed to devise strategies for identifying those who are most at risk.⁴¹

⁴¹ Cleveland, Emily C., Deborah Azrael, Joseph A. Simonetti, and Matthew Miller. "Firearm Ownership among American Veterans: Findings from the 2015 National Firearm Survey." *Injury Epidemiology* 4, no. 33 (December 2017). <https://doi.org/10.1186/s40621-017-0130-y>.

COMMUNITY-BASED GUN VIOLENCE

A large share of shootings and gun homicides in the U.S. are concentrated in small geographic areas and involve a fraction of the population.⁴² But the consequences of this community-based gun violence ripple outward, impacting neighborhoods, exacerbating inequalities, and undermining prosperity. This violence is persistent and pernicious, but research increasingly shows that it can be understood and, with appropriate interventions, prevented.⁴³

Community-based gun violence disproportionately affects communities of color. Black children are 10 times more likely to be killed with a gun than white children,⁴⁴ and homicide is the leading cause of death for Black men up to age 44.⁴⁵ Although Black men account for less than 6 percent of the national population,⁴⁶ they account for more than half of all gun homicide victims.⁴⁷

Gun violence is also concentrated among social networks of individuals: researchers have consistently shown that the vast majority of violence involves a fraction of the population, and the closer an individual is to other people who are victimized or perpetrate violence, the higher the risk they are to experience the same.⁴⁸ Yet even indirect exposure to community-based gun violence has deep and long-lasting effects, disrupting normal child development and contributing to chronic physical and mental illness.⁴⁹

Community-based gun violence impacts the same neighborhoods that suffer from concentrated poverty, a product of longstanding practices like redlining and other forms of structural racism.^{50,51} As a result, communities are trapped in a vicious cycle in which the violence also holds back economic activity and undercuts wealth: in Minneapolis, researchers found that each additional gun homicide was correlated with 80 fewer available jobs in the area and a \$22,000 decrease in the value of nearby homes.⁵²

42 Aufrichtig, Aliza, Lois Beckett, Jamiles Lartey, and Jan Diehm. "Want to Fix Gun Violence in America? Go Local." *The Guardian*, January 9, 2017. <https://bit.ly/2i6kaKw>

43 Abt, Thomas. *Bleeding out: The Devastating Consequences of Urban Violence-- and a Bold New Plan for Peace in the Streets*. First edition. New York: Basic Books, 2019.

44 Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS) [online]. (2005) Accessed December 1, 2020. www.cdc.gov/injury/wisqars

45 Center For Disease Control and Prevention. "From the CDC-Leading Causes of Death-Non-Hispanic Black Males 2017." Centers for Disease Control and Prevention, November 20, 2019. <https://www.cdc.gov/healthequity/lcod/men/2017/nonHispanic-black/index.htm>.

46 U.S. Census Bureau. "2019 American Community Survey." Washington, DC: U.S. Census Bureau. 2020. <https://www.census.gov/data.html>

47 Giffords Law Center to Prevent Gun Violence. "Intervention Strategies." Giffords Law Center To Prevent Gun Violence. Accessed December 1, 2020. <https://giffords.org/lawcenter/gun-laws/policy-areas/other-laws-policies/intervention-strategies/>.

48 Roberto, Elizabeth, Anthony A. Braga, and Andrew V. Papachristos. "Closer to Guns: The Role of Street Gangs in Facilitating Access to Illegal Firearms." *Journal of Urban Health* 95, no. 3 (June 2018): 372–82. <https://doi.org/10.1007/s11524-018-0259-1>.

49 Lynn-Whaley, Jennifer, and Josh Sugarmann. "The Relationship Between Community Violence and Trauma: How Violence Affects Learning, Health, and Behavior." Violence Policy Center, July 2017. <https://vpc.org/studies/trauma17.pdf>.

50 Bennis M, Ruther M, Nash N, Bozeman M, Harbrecht B, Miller K. The impact of historical racism on modern gun violence: Redlining in the city of Louisville, KY. *Injury*. 2020 Oct;51(10):2192-2198. <https://doi.org/10.1016/j.injury.2020.06.042>. Epub 2020 Jun 25. PMID: 32650980.

51 Jacoby SF, Dong B, Beard JH, Wiebe DJ, Morrison CN. The enduring impact of historical and structural racism on urban violence in Philadelphia. *Soc Sci Med*. 2018 Feb;199:87-95. <https://doi.org/10.1016/j.socscimed.2017.05.038>. Epub 2017 May 19. PMID: 28579093; PMCID: PMC7437144.

52 Irvin-Erickson, Yasemin, Mathew Lynch, Annie Gurvis, Edward Mohr, and Bing Bai. "Gun Violence Affects the Economic Health of Communities." Washington, DC : Urban Institute, June 2017. https://www.urban.org/sites/default/files/publication/90666/eigv_brief_3.pdf.

Yet the inequalities related to gun violence are often minimized in media coverage and public discourses. A recent study found that people killed in predominantly Black or Hispanic neighborhoods of Chicago were covered less by the media than victims in predominantly white neighborhoods.⁵³ People killed in primarily Black neighborhoods were also less likely to be valorized for having a family or community role than victims in white non-Hispanic neighborhoods.⁵⁴

Researchers have demonstrated the value of a growing toolkit of approaches for directly addressing this violence. Since guns used in community violence were typically acquired illegally or informally through personal networks,⁵⁵ researchers have explored measures that would better limit illegal access to firearms. State laws that require gun purchasers to first undergo a background check and obtain a permit are associated with an 11 percent reduction in gun homicides in large urban counties.⁵⁶ The strategy of focused deterrence, in which credible law enforcement and community members deliver strong anti-violence messages to groups most involved in gun violence and hold them accountable for abstaining from it, has produced significant declines in shootings in numerous cities.^{57,58,59} Interventions that rely on firearm trace data to better understand and disrupt illegal gun markets have shown promise in Los Angeles and Boston, among other places.^{60,61} And when police deter illegal weapon-carrying by conducting directed patrols in hot-spots, it reduces gun crime in the short-term without displacing it to other areas. But these approaches can also cause harm of their own, particularly when they are applied too broadly, by entangling residents in the criminal justice system and jeopardizing police-community relationships.^{62,63,64,65,66}

53 White, Kailey, Forrest Stuart, and Shannon L. Morrissey. "Whose Lives Matter? Race, Space, and the Devaluation of Homicide Victims in Minority Communities." *Sociology of Race and Ethnicity*, September 2020. <https://doi.org/10.1177/2332649220948184>.

54 Ibid.

55 Cook, Philip J., Susan T. Parker, and Harold A. Pollack. "Sources of Guns to Dangerous People: What We Learn by Asking Them." *Preventive Medicine* 79 (October 2015): 28–36. <https://doi.org/10.1016/j.ypmed.2015.04.021>.

56 Crifasi, Cassandra K., et al. "Correction to: Association between Firearm Laws and Homicide in Urban Counties." *Journal of Urban Health* 95, no. 5 (October 2018): 773–76. <https://doi.org/10.1007/s11524-018-0306-y>.

57 Anthony A. Braga and David L. Weisburd, "The Effects of 'Pulling Levers' Focused Deterrence Strategies on Crime," *Campbell Systematic Reviews* 8, no. 6 (2012): 1–90, <https://campbellcollaboration.org/better-evidence/focused-deterrence-strategies-effects-on-crime.html>.

58 Braga, Anthony A., David Weisburd, and Brandon Turchan. "Focused Deterrence Strategies Effects on Crime: A Systematic Review." *Campbell Systematic Reviews* 15, no. 3 (September 2019): e1051. <https://doi.org/10.1002/cl2.1051>.

59 National Institute of Justice. "Program Profile: Ceasefire (Oakland, Calif.)." National Institute of Justice: Crime Solutions. U.S. Department of Justice, August 2020. <https://crimesolutions.ojp.gov/ratedprograms/700>.

60 Ridgeway, Greg, et al. "Strategies for Disrupting Illegal Firearm Markets: A Case Study of Los Angeles." Washington, DC: U.S. Department of Justice, February 2013. <https://www.ncjrs.gov/pdffiles1/nij/grants/241135.pdf>.

61 Braga, Anthony A., and David M. Hureau. "Strong Gun Laws Are Not Enough: The Need for Improved Enforcement of Secondhand Gun Transfer Laws in Massachusetts." *Preventive Medicine* 79 (October 2015): 37–42. <https://doi.org/10.1016/j.ypmed.2015.05.018>.

62 National Academies of Sciences, Engineering, and Medicine. 2017. *Proactive Policing: Effects on Crime and Communities*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/24928>.

63 Koper, Christopher S., and Evan Mayo-Wilson. "Police Strategies to Reduce Illegal Possession and Carrying of Firearms: Effects on Gun Crime." *Campbell Systematic Reviews* 8, no. 1 (January 2012): 1–53. <https://doi.org/10.4073/csr.2012.11>.

64 Rosenfeld, Richard, and Robert Fornango. "The Impact of Police Stops on Precinct Robbery and Burglary Rates in New York City, 2003-2010." *Justice Quarterly* 31, no. 1 (January 2014): 96–122. <https://doi.org/10.1080/07418825.2012.712152>.

65 Sherman, Lawrence W. "Police Crackdowns: Initial and Residual Deterrence." *Crime and Justice* 12 (January 1990): 1–48. <https://doi.org/10.1086/449163>.

66 Koper, Christopher S., and Evan Mayo-Wilson. "Police Crackdowns on Illegal Gun Carrying: A Systematic Review of Their Impact on Gun Crime." *Journal of Experimental Criminology* 2 (June 2006): 227–61. <https://doi.org/10.1007/s11292-006-9005-x>.

Apart from policing, behavioral interventions and changes in physical space also play a role in reducing community gun violence. Cure Violence and other street outreach programs, which deploy outreach workers to interrupt violence and strengthen community norms of non-violence, have shown promising results in some cities^{67,68} and have also been applied in hospital settings. The presence of community-based non-profits has also been shown to affect crime rates, possibly by strengthening social cohesion and informal social control.⁶⁹ And place-based interventions such as greening vacant lots have also been shown in rigorous studies to reduce crime and violence in the immediate vicinity.⁷⁰ The broad impact of deliberate, intentionally exclusionary policies like redlining underscores the importance of solutions that address the root causes of violence and prioritize equity, rather than relying solely on targeted interventions.

67 Butts, Jeffrey A., Caterina Gouvis Roman, Lindsay Bostwick, and Jeremy R. Porter. "Cure Violence: A Public Health Model to Reduce Gun Violence." *Annual Review of Public Health* 36, no. 1 (March 2015): 39–53. <https://doi.org/10.1146/annurev-publhealth-031914-122509>.

68 Butts, Jeffrey A., and Sheyla A. Delgado. "Repairing Trust: Young Men in Neighborhoods with Cure Violence Programs Report Growing Confidence in Police." *JohnJayREC Research Brief 2017-01* (October 2017): New York, NY: John Jay College of Criminal Justice, Research and Evaluation Center. <https://johnjayrec.nyc/2017/10/02/repairing2017/>

69 Sharkey, Patrick, Gerard Torrats-Espinosa, and Delaram Takyar. "Community and the Crime Decline: The Causal Effect of Local Nonprofits on Violent Crime." *American Sociological Review* 82, no. 6 (December 2017): 1214–40. <https://doi.org/10.1177/0003122417736289>.

70 Hohl, Bernadette C., et al. "Creating Safe And Healthy Neighborhoods With Place-Based Violence Interventions." *Health Affairs* 38, no. 10 (October 2019): 1687–94. <https://doi.org/10.1377/hlthaff.2019.00707>.

Key research on community-based gun violence, 2013-20

- A 2019 cluster randomized trial of restoring vacant lots found that treated areas were associated with improved perceptions of neighborhood safety and reductions in overall crime, gun violence, and burglary.⁷¹
- A 2019 meta-analysis of focused deterrence strategies, which combine law-enforcement, community mobilization, and social services to reduce criminal behaviors, showed that they consistently produced significant declines in shootings in numerous cities.⁷²
- A 2017 quasi-experimental study of Cure Violence found that young men living in two treated catchment areas were less likely to use violence to settle disputes and more approving of law enforcement than men in comparable, untreated areas.⁷³ Other cities have had mixed experiences with the program.^{74,75}
- A set of 2017 randomized control trials of the cognitive behavioral therapy-based program Becoming A Man found that it halved participants' violent crime arrests and increased their on-time graduation rate by 19 percent.^{76,77}
- A 2017 study found that with every addition of 10 non-profit organizations focused on crime and community life per 100,000 residents, cities experienced a 9 percent reduction in murders, a 6 percent reduction in violent crime, and a 4 percent reduction in property crime.⁷⁸

Key Research Questions

Numerous outstanding research questions should be prioritized for further reducing community-based gun violence:

11. Which non-law enforcement solutions to community-based gun violence show the most impact, and under what circumstances? In particular, researchers identified the need for building a better understanding of the role community plays in reducing violence including through reducing access to illegal guns. It is also important to understand the role and perceived legitimacy of the criminal justice system in the relative success of these approaches. Researchers have also called for involving community members and local institutions more deeply in shaping the research agenda.

12. What are the mechanisms by which particularly high-risk groups and networks foment violence, and how can those mechanisms be interrupted? The social concentration of violence is well established, but additional research is needed into the dynamics that

71 Branas, Charles C., et al. "Citywide Cluster Randomized Trial to Restore Blighted Vacant Land and Its Effects on Violence, Crime, and Fear." *Proceedings of the National Academy of Sciences* 115, no. 12 (March 2018): 2946–51. <https://doi.org/10.1073/pnas.1718503115>.

72 Braga, Anthony A. "Focused Deterrence Strategies Effects on Crime." e1051.

73 Butts, Jeffrey A. "Repairing Trust."

74 Butts, Jeffrey A. "Cure Violence." 39–53

75 Webster, Daniel, Shani Buggs, Cassandra Crifasi. Estimating the effects of law enforcement and public health interventions intended to reduce gun violence in Baltimore. (January 11, 2018). <https://bit.ly/36LddGs>

76 Youth Guidance. "BAM® – Becoming A Man," 2020. <https://www.youth-guidance.org/bam/>.

77 Heller, Sara B., et al. "Thinking, Fast and Slow? Some Field Experiments to Reduce Crime and Dropout in Chicago*." *The Quarterly Journal of Economics* 132, no. 1 (February 2017): 1–54. <https://doi.org/10.1093/qje/qjw033>.

78 Sharkey, Patrick. "Community and the Crime Decline." 1214–40.

produce it, and the best approaches to disrupt those dynamics.

13. What factors explain how focused deterrence reduces group-based violence? How much do the various aspects of the intervention – coordination by law enforcement, the more credible threat of sanctions, the involvement of community, elements of procedural justice—contribute to the outcome? Does its success depend on the social structure of the groups on which it operates? What harms may it inadvertently cause?

“Community-based gun violence was both caused by and causes deep inequities, and our society has minimized it for far too long. However, with targeted research, thoughtful evaluations, and — importantly — intentional prioritization of the voices most impacted by this violence, we can give cities a toolkit of effective approaches to sustainably reduce it.” –*Shani Buggs, Assistant Professor-in-Residence, University of California, Davis*

14. How can we improve and more effectively implement violence interruption, including in medical settings? The approach is promising and offers community members a real role in fostering safety, but has yielded varied outcomes.

15. Are intensive programs that engage particularly high-risk individuals effective at reducing community gun violence? Programs like Roca Inc. in Massachusetts and Maryland, READI in Chicago, and Advance Peace in California propose to change the life courses of young people who are already deeply entangled in the criminal justice system – but can they do it? What elements of these programs account for their impact?

16. Do broader, untargeted interventions such as cash transfer programs, improved access to housing, or additional funding for primary education reduce violence? If so, by what mechanism?⁷⁹ In contrast to risk-based strategies aimed at a small segment of the population, these approaches intend to address root causes of violence.

17. How do guns move from legal ownership to the illegal supply, and how does this vary geographically? Although prisoner surveys, analyses of ATF trace data, and ethnography shed some light on this, localized research that takes into account gun market dynamics and differences in gun laws and even gun culture is needed to inform strategies to meaningfully disrupt those flows. Better data on the price of guns as transacted in underground markets could be an important measure of gun access.

18. Can police increase the rate at which they clear fatal and non-fatal shootings, and does that reduce community-based gun violence? When it comes to solving violent crimes—arguably one of the key functions of police—the most impacted communities are

79 John Jay College Research Advisory Group on Preventing and Reducing Community Violence. “Reducing Violence Without Police: A Review of Research Evidence”. New York, NY: Research and Evaluation Center, John Jay College of Criminal Justice. (November 2020) <https://johnjayrec.nyc/wp-content/uploads/2020/11/AV20201109.pdf>

underserved. In recent years, journalists have hypothesized that in this void, informal mechanisms of street justice flourish, perpetuating cycles of violence.⁸⁰

"Controlling gun violence in hard-hit communities requires an effective partnership with the police built on trust and mutual respect. Currently, gunshot victims may be reluctant to cooperate because they don't believe that the police care about solving their cases. To escape this vicious circle requires research on how the police can become – and be viewed as – more reliable partners." –Philip J. Cook, ITT/Terry Sanford Distinguished Professor Emeritus of Public Policy Studies, Duke University

19. Does diverting a gun arrestee from the correctional system to an alternative program influence their likelihood of future illegal gun carrying and re-arrest? And do such outcomes alter community-wide perceptions about the costs and benefits of illegal gun carrying? Attorneys prosecuting gun crimes face a thorny decision, weighing the consequences of providing a convincing and consistent punishment for a dangerous behavior against the harms that the criminal justice system imposes on individuals and communities caught up in it.

20. What influence do women and girls have on community-based gun violence, whether through aiding gun purchase, storage, and transport; through indirect roles in conflicts between male partners; or by establishing norms of non-violence?

21. In communities where gun violence is commonplace, what traumatizing psychological impacts does it have on individuals, families, and the collective? How long do community-wide psychological impacts last?

22. Why have some cities been more successful than others in reducing interpersonal violence with guns?

⁸⁰ Leovy, Jill. *Ghettoside: a True Story of Murder in America*. New York: Spiegel & Grau, 2015.

INTIMATE PARTNER VIOLENCE WITH GUNS

In the U.S., the majority of women murdered by intimate partners are killed with guns, and firearm availability makes abuse far more lethal.⁸¹ Tens of thousands of women are threatened or harmed with firearms each year⁸² when abusers use guns to exert power and control over them.⁸³ And after years in which rates of intimate partner homicide showed signs of decline, from 2013 to 2018 it surged by 30 percent.⁸⁴ Other family members perpetrate a significant share of domestic violence, as well.

Given the role that firearms play in this type of violence, states have responded by enacting laws to restrict abusers' access to guns. Going beyond federal law, which prohibits people convicted of a domestic violence misdemeanor or subject to certain protective orders from possessing or purchasing firearms, states have expanded the prohibiting criteria and created mechanisms to remove firearms from abusers.⁸⁵ A growing body of evidence shows these laws can be effective: where states strengthened restrictions, rates of intimate partner homicide with guns fell.^{86,87} But localities vary in their implementation and enforcement of these measures. Identifying abusers in possession of guns and enforcing and coordinating law enforcement dispossession of the weapons is also challenging, and there are few examples of how to ensure these laws reliably protect those in need.^{88,89}

81 Campbell, Jacquelyn C., et al. "Risk Factors for Femicide in Abusive Relationships: Results From a Multisite Case Control Study." *American Journal of Public Health* 93, no. 7 (July 2003): 1089–97. <https://doi.org/10.2105/AJPH.93.7.1089>.

82 Federal Bureau of Investigation. "Uniform Crime Reporting Program: Easy Access to the FBI's Supplementary Homicide Reports (SHR) 2013-2017". Washington, DC: Federal Bureau of Investigation. (2019). <https://www.ojjdp.gov/ojstatbb/ezashr/>.

83 Sorenson, Susan B., and Rebecca A. Schut. "Nonfatal Gun Use in Intimate Partner Violence: A Systematic Review of the Literature." *Trauma, Violence, & Abuse* 19, no. 4 (October 2018): 431–42. <https://doi.org/10.1177/1524838016668589>.

84 Fox, James Alan, and Emma E. Fridel. "Love and Violent Death." The Gender Policy Report. The University of Minnesota, September 22, 2020. <http://genderpolicyreport.umn.edu/love-and-violent-death/>.

85 Giffords Law Center To Prevent Gun Violence. "Domestic Violence & Firearms." Giffords Law Center To Prevent Gun Violence. Accessed December 1, 2020. <https://giffords.org/lawcenter/gun-laws/policy-areas/who-can-have-a-gun/domestic-violence-firearms/>.

86 Zeoli, A. M., and D. W. Webster. "Effects of Domestic Violence Policies, Alcohol Taxes and Police Staffing Levels on Intimate Partner Homicide in Large US Cities." *Injury Prevention* 16, no. 2 (April 2010): 90–95. <https://doi.org/10.1136/ip.2009.024620>.

87 Vigdor, Elizabeth Richardson, and James A. Mercy. "Do Laws Restricting Access to Firearms by Domestic Violence Offenders Prevent Intimate Partner Homicide?" *Evaluation Review* 30, no. 3 (June 2006): 313–46. <https://doi.org/10.1177/0193841X06287307>.

88 Seave, Paul L. "Disarming Batterers Through Restraining Orders: The Promise and the Reality in California." *Evaluation Review* 30, no. 3 (June 2006): 245–65. <https://doi.org/10.1177/0193841X06287675>.

89 Webster, Daniel W., et al. "Women with Protective Orders Report Failure to Remove Firearms from Their Abusive Partners: Results from an Exploratory Study." *Journal of Women's Health* 19, no. 1 (January 2010): 93–98. <https://doi.org/10.1089/jwh.2007.0530>.

Key research on intimate partner violence with guns, 2013-20

- A 2019 study cataloged state laws governing whether and how abusers who are prohibited from possessing firearms are deprived of having them.⁹⁰ The researchers found 49 laws in 29 states, and noted that although many states fail to specify how prohibitions are enforced, judges may still have the broad implicit authority to order dispossession to protect the safety of the petitioner.
- A 2019 study of 40 years of FBI data on homicides found that those involving firearms were more likely than non-firearm homicides to involve multiple victims, particularly those that involved intimate partners or family.⁹¹
- A 2018 review estimated that 1 million U.S. women had been shot by an intimate partner and a much larger number – 4.5 million—had been threatened by an intimate partner with a gun but not physically harmed.⁹²
- A 2018 study found that state laws prohibiting people under domestic violence restraining order from having firearms were associated with 10 percent fewer intimate partner homicides, a difference that was only statistically significant when restraining order prohibitions covered dating partners and ex parte orders and included relinquishment provisions. Prohibiting firearm possession by people who had been convicted of any violent misdemeanor was associated with the strongest protective effect, a 23 percent reduction.⁹³
- A 2018 study found that intimate partner fatalities often occur in the context of additional homicide deaths as well as the suicide of the perpetrator.⁹⁴
- A 2016 review concluded that when domestic abusers have access to firearms, intimate partner violence increases in severity and lethality – but this sometimes involves non-firearm violence so the researchers could not attribute the increase to firearm access alone.⁹⁵

Key Research Questions

That leaves a number of research questions to prioritize for reducing this type of violence:

23. What factors account for the increased risk of fatal intimate partner violence when firearms are present? Existing research finds that the presence of a firearm in a situation of domestic abuse increases fivefold the risk the female partner will be murdered,⁹⁶ but additional research is needed to understand whether risk varies between households with a single gun and multiple guns or with different gun storage practices, where firearms

90 Zeoli, April M., Shannon Frattaroli, Kelly Roskam, and Anastasia K. Herrera. "Removing Firearms From Those Prohibited From Possession by Domestic Violence Restraining Orders: A Survey and Analysis of State Laws." *Trauma, Violence, & Abuse* 20, no. 1 (January 2019): 114–25. <https://doi.org/10.1177/1524838017692384>.

91 Kivisto, Aaron J., and Megan Porter. "Firearm Use Increases Risk of Multiple Victims in Domestic Homicides." *Journal of the American Academy of Psychiatry and the Law Online* 48, no. 3 (December 2019). <https://pubmed.ncbi.nlm.nih.gov/31753965/>.

92 Sorenson, Susan B. "Nonfatal Gun Use in Intimate Partner Violence." 431–42.

93 Zeoli, April M, et al. "Analysis of the Strength of Legal Firearms Restrictions for Perpetrators of Domestic Violence and Their Associations With Intimate Partner Homicide." *American Journal of Epidemiology* 187, no. 11 (November 2018): 2365–71. <https://doi.org/10.1093/aje/kwy174>.

94 Smucker, Sierra, Rose E. Kerber, and Philip J. Cook, "Suicide and Additional Homicides Associated with Intimate Partner Homicide: North Carolina 2004–2013," *Journal of Urban Health*, Vol. 95, No. 3, 2018, pp. 337–343.

95 Zeoli, April M., Rebecca Malinski, and Brandon Turchan. "Risks and Targeted Interventions: Firearms in Intimate Partner Violence." *Epidemiologic Reviews* 38, no. 1 (January 2016): 125–139. <https://doi.org/10.1093/epirev/mxv007>.

96 Campbell, Jacquelyn C. "Risk Factors for Femicide in Abusive Relationships." 1089–97.

are owned by one or both partners, and to understand the risk to children present in the household.

24. Are people who successfully petition for domestic violence restraining orders that include firearm restrictions at reduced risk of gun violence? Research shows these laws are associated with lower rates of intimate partner homicide at the state and city levels, but researchers say it is important to establish the relationship at the individual level.

25. How can extreme risk protection orders be best applied in the context of domestic violence, and do they have a protective effect on children? A wave of states have created these orders in recent years, and although they were modeled after domestic violence restraining orders, they may be applicable in situations those traditional measures are not.

26. What makes gun surrender laws effective, and can we make them more so? There is ample documentation of the inconsistent implementation of these laws across jurisdictions, and researchers have called for more information on the share of abusers who actually relinquish their guns or have them removed, what the impact is, and what the barriers are to improving the rate of gun removals.

“When a domestic abuser has access to a gun, it greatly increases the risk to the people in their household. So, we know we need to prevent abusers from having firearms—and scientists have many opportunities to learn from states and localities about what’s working best to prevent this type of gun violence.” –April M. Zeoli,
Associate Professor, School of Criminal Justice, Michigan State University

27. Given the importance of how laws are implemented, would changes in policy and training of police, attorneys, and judges improve practices for removing guns from homes where violence is reported? Would more public accountability, such as that generated by victim advocates who track court and law enforcement proceedings, facilitate improvements?

28. Can we better identify individual risk factors for predicting intimate partner violence with guns and preventing it before it occurs? To build on existing research on risk assessment for domestic violence, researchers called for studies of the factors that predict risk among both perpetrators and victims.

29. What are the scope and epidemiology of non-fatal domestic violence with guns? Building on preliminary research that shows it is widespread, researchers called for better measurement of, characterization of, and policies directed at this type of gun violence.

30. What aspects of state laws related to domestic violence are most critical for them to be effective? Numerous studies have shown an association between strong laws and reduced rates of violence, but by what mechanisms do they operate and interact?

SHOOTINGS BY LAW ENFORCEMENT

A small but important share of gun homicides in the U.S. are carried out by law enforcement officers, contributing to the erosion of public trust and sparking fierce debate over the appropriate role of police. Historically, these shootings were systematically underreported by law enforcement and public health authorities,⁹⁷ but in recent years, journalists and advocates relying on media coverage and police reports have established that law enforcement officers shoot and kill about 1,000 people annually.^{98,99}

Police shootings are particularly salient because they can be a harsh reminder of the persistent racial biases that exist throughout the criminal justice system. In part because police interactions are so poorly documented, the circumstances of these shootings and the exact scope and nature of disparities in them is largely unknown.^{100,101} But with each new death there is additional pressure to reduce their number, with some activists calling for dissolving the institution of police altogether.

In the glare of public attention finally given to this type of gun violence, researchers have explored whether programs can identify high-risk officers and intervene to prevent violence. Police officers with a history of negligent or harmful incidents have been shown to be at higher likelihood of being involved in shootings.¹⁰² In Chicago, the police department is attempting to identify those individuals in advance and connect them to services that reduce that risk – both for others' safety and the officers themselves.¹⁰³

Police departments may also adopt agency-wide changes in training and protocol. The Police Executive Research Forum (PERF) has recommended measures to reduce unnecessary uses of force in situations that do not involve suspects armed with firearms,¹⁰⁴ although officers and chiefs have sometimes been resistant to change.¹⁰⁵ Training police in procedural justice has also been shown to reduce their use of force.¹⁰⁶ Some community advocates have called for even more expansive reforms in local, state, and federal law in order to end police violence: Campaign Zero's #cantwait campaign recommended

97 Lowery, Wesley. "How Many Police Shootings a Year? No One Knows." *Washington Post*, September 8, 2014.

<https://www.washingtonpost.com/news/post-nation/wp/2014/09/08/how-many-police-shootings-a-year-no-one-knows/>.

98 Tate, Julie, Jennifer Jenkins, and Steven Rich, "Fatal Force: Police Shootings Database." *Washington Post*, March 31, 2019. As of November 30, 2019:

<https://www.washingtonpost.com/graphics/investigations/police-shootings-database/>

99 Mapping Police Violence. "Mapping Police Violence." November 2020. <https://mappingpoliceviolence.org>.

100 "Retraction for Johnson et al. "Officer Characteristics and Racial Disparities in Fatal Officer-Involved Shootings." *Proceedings of the National Academy of Sciences* 117, no. 30 (July 2020): 18130. <https://doi.org/10.1073/pnas.2014148117>.

101 Knox, Dean, and Jonathan Mummolo. "A Widely Touted Study Found No Evidence of Racism in Police Shootings. It's Full of Errors." *Washington Post*, July 15, 2020. <https://www.washingtonpost.com/outlook/2020/07/15/police-shooting-study-retracted/>.

102 Ridgeway, Greg. "Officer Risk Factors Associated with Police Shootings: A Matched Case-Control Study." *Statistics and Public Policy* 3, no. 1 (January 2016): 1–6. <https://doi.org/10.1080/2330443X.2015.1129918>.

103 Spielman, Fran. "CPD Launches Early Intervention System Four Years in the Making." *Chicago Sun-Times*, September 1, 2020. <https://tinyurl.com/yyeg4u4j>.

104 Police Executive Research Forum. "Guiding Principles on Use of Force." Critical Issues in Policing Series. Washington, DC: Police Executive Research Forum, March 2016. <https://www.policeforum.org/assets/30%20guiding%20principles.pdf>

105 Jackman, Tom. "Protocol for Reducing Police Shootings Draws Backlash from Unions, Chiefs Group." *Washington Post*, March 31, 2016, sec. Public Safety. <https://tinyurl.com/hjpy8ja>

106 Wood, George, Tom R. Tyler, and Andrew V. Papachristos. "Procedural Justice Training Reduces Police Use of Force and Complaints against Officers." *Proceedings of the National Academy of Sciences* 117, no. 18 (May 2020): 9815–21. <https://doi.org/10.1073/pnas.1920671117>.

changes to limit police interventions, encourage accountability, and improve community relations.¹⁰⁷ And abolitionist organizations have called for reducing and eventually eliminating armed police forces altogether¹⁰⁸ in favor of place-based interventions, community-led crisis responders,¹⁰⁹ and greater investments in basic social services that address the root causes of violence.

Key research on shootings by law enforcement, 2013-20

- A 2020 study found large-scale implementation of a procedural justice training program in the Chicago Police Department reduced officers' use of force.¹¹⁰
- A 2020 review of de-escalation training in a variety of fields concluded that they have few adverse consequences and may yield slight to moderate improvements in behavior, although their impact merits further and more rigorous study.¹¹¹
- A 2019 cross sectional study found that rates of fatal shootings by police were closely associated with household levels of firearm ownership, even after controlling for other variables. The researchers hypothesized that where police are more likely to encounter armed civilians, they are more likely to use their own weapons.¹¹²
- In a study published in 2019, researchers showed that in the 27 states where the National Violent Death Reporting System was operating in 2015, it captured 97 percent of known shootings by law enforcement.¹¹³
- A 2017 cross sectional study found that states with stricter firearm laws—including universal background checks, safe storage requirements, and measures for addressing gun trafficking—had lower rates of officer-involved shootings.¹¹⁴

Key Research Questions

Many critical questions about police-involved shootings remain unanswered:

31. How are shootings by law enforcement adjudicated within their departments and the broader criminal justice system? Although data compiled by individual researchers shows that it is exceedingly rare for police officers to face disciplinary measures or criminal charges for shootings,¹¹⁵ there is no comprehensive system for tracking the cases, and no data to gauge whether the outcomes affect police behavior and the likelihood of future police shootings.

107 Campaign Zero. "Campaign Zero: We Can End Police Violence In America." Accessed December 1, 2020. <https://www.joincampaignzero.org>.

108 Critical Resistance. "Reformist Reforms vs. Abolitionist Steps in Policing." Critical Resistance, n.d. <https://tinyurl.com/y9qszrqq>

109 John Jay College Research Advisory Group on Preventing and Reducing Community Violence. "Reducing Violence Without Police."

110 Wood, George. "Procedural Justice Training." 9815–21.

111 Engel, Robin S., Hannah D. McManus, and Tamara D. Herold. "Does De-Escalation Training Work?" *Criminology & Public Policy* 19, no. 3 (2020): 721–59. <https://doi.org/https://doi.org/10.1111/1745-9133.12467>.

112 Hemenway, David, Deborah Azrael, Andrew Conner, and Matthew Miller. "Variation in Rates of Fatal Police Shootings across US States: The Role of Firearm Availability." *Journal of Urban Health* 96, no. 1 (February 2019): 63–73. <https://doi.org/10.1007/s11524-018-0313-z>.

113 Conner, Andrew, et al. "Validating the National Violent Death Reporting System as a Source of Data on Fatal Shootings of Civilians by Law Enforcement Officers." *American Journal of Public Health* 109, no. 4 (February 2019): 578–84. <https://doi.org/10.2105/AJPH.2018.304904>.

114 Kivisto, Aaron J., Bradley Ray, and Peter L. Phalen. "Firearm Legislation and Fatal Police Shootings in the United States." *American Journal of Public Health* 107, no. 7 (July 2017): 1068–75. <https://doi.org/10.2105/AJPH.2017.303770>.

115 Bialik, Carl. "An Ex-Cop Keeps The Country's Best Data Set On Police Misconduct." *FiveThirtyEight* (blog), April 22, 2015. <https://fivethirtyeight.com/features/an-ex-cop-keeps-the-countrys-best-data-set-on-police-misconduct/>.

32. What role does qualified immunity play in shielding from accountability those police officers involved in shootings? The legal principle that protects public officials from civil liability for actions that are reasonable but mistaken is increasingly characterized as overbroad.¹¹⁶

33. To what degree can mental health professionals or other clinicians supplement or replace police in responding to people in crisis—and how does that affect rates of officer-involved shootings? A handful of cities across the country have experimented with or are considering unarmed branches of emergency response,¹¹⁷ but it's unclear how much their presence reduces the population's interactions with law enforcement, and even the most well-known—Eugene, Oregon's CAHOOTS (Crisis Assistance Helping Out On The Streets)¹¹⁸ program—has never been subject to a rigorous outside evaluation.

34. How does training police in topics such as implicit bias or de-escalation affect the incidence of police shootings? Some police departments that have embraced training programs have experienced declines in use of force¹¹⁹ but they need further study. On the other hand, there are concerns that “warrior” trainings which still undergird many police academy curricula may increase officers' use of force.

35. What impact do department-level use of force policies have on police shootings? Do policies governing the circumstances where force is allowed, or the reporting required afterward, influence their frequency? What about other department-level factors such as the diversity of officers and the training and certification they undergo?

“Legitimacy is everything in public safety: where a community doesn't trust the government and its arms—very much including the police—public safety suffers. Nothing further alienates communities from the police than police killings and police violence. The road to public safety lies through what communities view as legitimate policing and police accountability.” –David Kennedy, Director, National Network for Safe Communities, John Jay College of Criminal Justice

36. Do local or statewide policies governing use of force (e.g. requiring de-escalation, reporting, or particular training) impact police shootings?

37. What characteristics of individual officers or encounters are associated with higher

116 Chung, Andrew, et al. “Special Report: For Cops Who Kill, Special Supreme Court Protection.” *Reuters*, May 30, 2020.

<https://www.reuters.com/article/us-usa-police-immunity-scotus-specialrep/special-report-for-cops-who-kill-special-supreme-court-protection-idUSKBN22K18C>

117 Tso, Sharon M. “Unarmed Models of Crisis Response Report.” Report of the Chief Legislative Analyst. Chief Legislative Analyst for the city of Los Angeles, September 18, 2020. https://clkrep.lacity.org/onlinedocs/2020/20-0769_rpt_CLA_09-18-2020.pdf.

118 White Bird Clinic, October 20, 2020. <https://whitebirdclinic.org/what-is-cahoots/>

119 Engel, Robin S., Nicholas Corsaro, Gabrielle T. Isaza, and Hannah D. McManus. “Examining the Impact of Integrating Communications, Assessment, and Tactics (ICAT) De-Escalation Training for the Louisville Metro Police Department: Initial Findings.” Cincinnati, OH: International Association of Chief of Police, University of Cincinnati Center for Police Research and Policy, October 30, 2020. <https://tinyurl.com/y2xcscgz>

rates of officer-involved shootings? Some researchers have proposed case control studies of these homicides to identify the most relevant factors.

38. What community-level characteristics are associated with rates of officer-involved shootings? The existence of stronger state gun laws such as permit-to-purchase laws are associated with lower rates of this violence, but by what mechanism might they act?

39. Do states with lax concealed carry laws— allowing residents to carry concealed, loaded handguns in public places with few if any restrictions—affect the rate of officer involved shootings? It is plausible that officers who encounter more firearms in their work are also more prone to use their own.

40. What calls for service are most likely to result in an officer-involved shooting? 911 dispatch data is fragmented and outdated¹²⁰ but if riskier calls could be identified, it is possible they could be better triaged to avoid unnecessary violence.

41. What would it take to develop a system for reporting both fatal and non-fatal officer-involved shootings that is timelier, more detailed, and more complete? The CDC's National Violent Death Reporting System (NVDRS) collects incident-level data on fatal shootings, but there is a lag in public release of the data.^{121,122}

42. Are levels of community-based gun violence influenced by police shootings, and if so, by what mechanisms? For example, can we better document how public cynicism in the legal system impinges on police work, further undermining safety?

120 Neusteter, S. Rebecca, Maris Mapolski, Mawia Khogali, and Megan O'Toole. "The 911 Call Processing System: A Review of the Literature as it Relates to Policing." New York, NY: Vera Institute of Justice, July 2019. <https://tinyurl.com/y3kn5ld3>

121 Conner, Andrew. "Validating the National Violent Death Reporting System." 578–84.

122 Barber, Catherine, et al. "Homicides by Police: Comparing Counts From the National Violent Death Reporting System, Vital Statistics, and Supplementary Homicide Reports." *American Journal of Public Health* 106, no. 5 (May 2016): 922–27. <https://doi.org/10.2105/AJPH.2016.303074>.

MASS SHOOTINGS

Mass shootings account for just a fraction of gun violence in the U.S. but figure prominently in the public imagination, creating anxiety for millions of people beyond those directly impacted and provoking countermeasures that may be ineffective or even counterproductive.

Definitions of the phenomenon vary: researchers typically categorized mass shootings as those incidents with four or more gun homicide victims,¹²³ but in 2013 the U.S. Congress defined them as having three or more killings in a single incident,¹²⁴ and other sources catalogue all incidents with four or more injured victims, regardless of whether they die.¹²⁵ Researchers have observed some major typologies of this violence: in a review of shootings with four or more homicide deaths from 1999 to 2013, the Congressional Research Service found that 40 percent were familicides, 39 percent occurred in the context of another felony crime such as a robbery, and 21 percent were the sort of indiscriminate attacks that the public often thinks of as a mass public shooting.¹²⁶ The National Institutes of Justice has also convened researchers and funded some research about this dimension of gun violence.¹²⁷ The best available data suggest the frequency of these events gradually increased beginning in the 1970s, and since 2005 the number of casualties per shooting increased more steeply.¹²⁸

The media skews public perceptions of mass shootings by giving disproportionate coverage to certain types of incidents, notably mass public shootings in which the victims are female, young, or white.¹²⁹ Overwhelming attention is focused on the mental health of perpetrators of mass shootings, but mental illness is not associated with gun violence nor is psychiatric diagnosis predictive of it.¹³⁰

Some research has addressed the nexus between mass shootings and domestic violence, although whether a history of abuse is a useful predictor of these tragedies remains unclear. In at least 54 percent of mass shootings between 2009 and 2018, the perpetrator shot a current or former intimate partner or family member.¹³¹ And an analysis of 89 mass

123 RAND Corporation. "Mass Shootings: Definitions and Trends." RAND Corporation Gun Policy in America, March 2, 2018.

<https://www.rand.org/research/gun-policy/analysis/essays/mass-shootings.html>.

124 Public Law 112-265; January 14, 2013. From <https://www.congress.gov/112/plaws/publ265/PLAW-112publ265.pdf>

125 Gun Violence Archive. "General Methodology." Gun Violence Archive. Accessed December 1, 2020.

<https://www.gunviolencearchive.org/methodology>.

126 Krouse, William J., and Daniel J. Richardson. "Mass Murder with Firearms: Incidents and Victims, 1999-2013." Library of Congress. Congressional Research Service, July 30, 2015. <https://www.hsdl.org/?view&did=787620>.

127 National Institutes of Justice. "Advancing Mass Shooting Research To Inform Practice." (April 6, 2020).

<https://nij.ojp.gov/topics/articles/advancing-mass-shooting-research-inform-practice>.

128 Duwe, Grant. "Patterns and Prevalence of Lethal Mass Violence." *Criminology & Public Policy* 19, no. 1 (February 2020): 17–35.

<https://doi.org/10.1111/1745-9133.12478>.

129 Fox, James Alan, Madison Gerdes, Grant Duwe, and Michael Rocque. "The Newsworthiness of Mass Public Shootings: What Factors Impact the Extent of Coverage?" *Homicide Studies*, (November 2020). <https://doi.org/10.1177/1088767920974412>.

130 Metzl, Jonathan M., and Kenneth T. MacLeish. "Mental Illness, Mass Shootings, and the Politics of American Firearms." *American Journal of Public Health* 105, no. 2 (February 2015): 240–49. <https://doi.org/10.2105/AJPH.2014.302242>.

131 Everytown for Gun Safety. "Mass Shootings in America 2009-2019." Everytown for Gun Safety. November 21, 2019.

<https://maps.everytownresearch.org/massshootingsreports/mass-shootings-in-america-2009-2019/>.

shooting events between 2014 and 2017 found that 28 shooters had a history of domestic violence and 61 percent of those had been involved in the justice system for domestic violence.¹³² The perpetrator's choice of weapons may contribute to the lethality of these events: assault weapons and high-capacity magazines were used in the five deadliest mass shootings occurring between 2009 and 2018.¹³³

There is some evidence that the policy environment influences the frequency of mass shootings. One recent study found that laws restricting access to large-capacity magazines and requiring handgun purchaser licensing were associated with reductions in fatal mass shootings, whereas assault weapons bans, relaxing restrictions on concealed carry of weapons, and comprehensive background checks had no impact.¹³⁴ Countermeasures that individual institutions have adopted against these incidents are also an increasingly important area of inquiry. With millions of dollars of federal funding allocated in the wake of the Sandy Hook shooting, schools 'hardened' their facilities with new security measures, drilled students to prepare for mass shootings, and allowed teachers to carry firearms – but all of these measures are unmoored from available evidence.¹³⁵ One analysis found that active shooter drills were associated with increases in depression, stress and anxiety, and psychological health problems among students subject to them, and an increase in their concerns about death.¹³⁶

132 Zeoli, April M., and Jennifer K. Paruk. "Potential to Prevent Mass Shootings through Domestic Violence Firearm Restrictions." *Criminology & Public Policy* 19, no. 1 (December 2020): 129–45. <https://doi.org/10.1111/1745-9133.12475>.

133 Everytown for Gun Safety. "Mass Shootings in America 2009-2019."

134 Webster, Daniel W., et al. "Evidence Concerning the Regulation of Firearms Design, Sale, and Carrying on Fatal Mass Shootings in the United States." *Criminology & Public Policy* 19, no. 1 (January 2020): 171–212. <https://doi.org/https://doi.org/10.1111/1745-9133.12487>.

135 Price, James H., and Jagdish Khubchandani. "School Firearm Violence Prevention Practices and Policies: Functional or Folly?" *Violence and Gender* 6, no. 3 (September 2019): 154–67. <https://doi.org/10.1089/vio.2018.0044>.

136 Everytown Research & Policy. "The Impact of Active Shooter Drills in Schools." Everytown for Gun Safety, September 3, 2020. <https://everytownresearch.org/report/the-impact-of-active-shooter-drills-in-schools/>.

Key research on mass shootings, 2013-20

- A 2019 cross-sectional study determined that states with higher rates of gun ownership and more permissive gun laws have higher rates of mass shootings: a 10-unit increase in state gun law permissiveness was associated with 11.5 percent more mass shootings.¹³⁷
- A 2019 study found that states which did not restrict access to large-capacity magazines had twice the number of mass shootings and three times the number of deaths in these incidents compared to states that restricted them.¹³⁸
- A 2019 study of school shootings that resulted in fatalities found they were more likely to occur in schools that were majority white, taught younger students, and were rural or suburban. The presence of school resource officers did not appear to have any impact on the outcomes.¹³⁹
- A 2019 review of research on mass shootings concluded that serious mental illness plays a limited role in such violence.¹⁴⁰
- A 2019 study described over 20 cases in which extreme risk protection orders had been applied, of which 13 percent involved threatened mass shootings. The authors concluded that this policy can play a role in preventing future tragedies of that nature.¹⁴¹
- A 2016 study of 157 shootings in U.S. high schools between 1994-2009 found that they reduced student enrollments and lowered math and English standardized test scores.¹⁴²

Key Research Questions

A number of research questions could advance efforts to reduce these tragedies:

43. Are there any characteristics or behaviors that identify individuals at higher risk for committing mass shootings? And are there ways to improve threat assessment and transmit information to law enforcement for use?

44. What role do perpetrators' choice of weapon play in the frequency and severity of mass shootings? How could semi-automatic firearms and large capacity magazines be more effectively regulated, or rendered safer to possess?

45. Does the existence of extreme risk protection orders reduce the frequency of mass shootings? Preliminary research suggests some people subject to these orders posed a risk for this type of behavior,¹⁴³ but more study is needed.

137 Reeping, Paul M, et al. "State Gun Laws, Gun Ownership, and Mass Shootings in the US: Cross Sectional Time Series." *BMJ* 364:l542 (March 2019). <https://doi.org/10.1136/bmj.l542>.

138 Klarevas, Louis, Andrew Conner, and David Hemenway. "The Effect of Large-Capacity Magazine Bans on High-Fatality Mass Shootings, 1990–2017." *American Journal of Public Health* 109, no. 12 (October 2019): 1754–61. <https://doi.org/10.2105/AJPH.2019.305311>.

139 Livingston, Melvin D., Matthew E. Rossheim, and Kelli Stidham Hall. "A Descriptive Analysis of School and School Shooter Characteristics and the Severity of School Shootings in the United States, 1999–2018." *Journal of Adolescent Health* 64, no. 6 (March 2019): 797–99. <https://doi.org/10.1016/j.jadohealth.2018.12.006>.

140 Skeem, Jennifer, and Edward Mulvey. "What Role Does Serious Mental Illness Play in Mass Shootings, and How Should We Address It?" *Criminology & Public Policy* 19, no. 1 (February 2020): 85–108. <https://doi.org/10.1111/1745-9133.12473>

141 Wintemute, Garen J., et al. "Extreme Risk Protection Orders Intended to Prevent Mass Shootings." *Annals of Internal Medicine* 171, no. 9 (August 2019): 655–58. <https://doi.org/10.7326/M19-2162>.

142 Beland, Louis-Philippe, and Dongwoo Kim. "The Effect of High School Shootings on Schools and Student Performance." *Educational Evaluation and Policy Analysis* 38, no. 1 (March 2016): 113–26. <https://doi.org/10.3102/0162373715590683>.

143 Wintemute, Garen J. "Extreme Risk Protection Orders." 655–58.

46. What role do other state firearm laws play in influencing the frequency of mass shootings? States with permit-to-purchase laws experience a lower frequency of mass shootings, but what factors account for this outcome?

47. Mass shootings have a psychological impact on the broader community, but what is its full extent? For example, do they influence suicide rates, induce collective anxiety, or otherwise erode the social fabric?

"Mass violence is a significant public safety issue in the United States, and mass public shootings in particular have increased in frequency and severity in recent years, with the potential to substantially undermine the public's sense of security. Addressing this difficult issue with science and evidence will be crucial to mitigating it." –Christopher S. Koper, Associate Professor and Principal Fellow of the Center for Evidence-Based Crime Policy, George Mason University

48. What factors are contributing to the gradual increase in mass shootings, and the more precipitous increase in their lethality? Are risk factors changing? For example, are cultural factors playing a larger role and psychopathology a diminishing one?

49. Is the media's coverage of mass shootings a factor in their frequency, and if so, what can be done about it?

UNINTENTIONAL SHOOTINGS

Thousands of Americans are harmed or killed each year in unintentional shootings,¹⁴⁴ and children and teens account for about 35 percent of the fatalities.¹⁴⁵ Although rates of unintentional shootings of and by children have been decreasing over the last two decades,^{146,147} they continue to occur far more frequently in the U.S. than in other comparable developed countries.¹⁴⁸

Data on unintentional gun deaths of children have traditionally been drawn from the CDC's Vital Statistics system, but medical examiners and coroners are inconsistent in how they classify these incidents on death certificates, making the data unreliable.^{149,150} (Recently, the National Violent Death Reporting System has begun providing a more accurate accounting.^{151,152}) But one fact is certain: a majority of these deaths occur in a home,¹⁵³ where the presence of a gun substantially increases the risk of unintentional injury.¹⁵⁴

In spite of volumes of evidence that storing guns locked and unloaded reduces the chances a child will be injured with them,¹⁵⁵ an estimated 4.6 million children live in homes in which at least one firearm is stored loaded and unlocked— a nearly three-fold increase over the past 15 years.¹⁵⁶ This rise in unsafely stored firearms is attributable, in part, to the growing number of adults who own guns for purposes of self- or home-protection and are reluctant to use locks or other storage devices.¹⁵⁷ Many parents may also mistakenly assume their children are ignorant of the location of firearms or unable to access them,

144 Fowler, Katherine A., Linda L. Dahlberg, Tadesse Haileyesus, and Joseph L. Annett. "Firearm Injuries in the United States." *Preventive Medicine* 79 (October 2015): 5–14. <https://doi.org/10.1016/j.jpmed.2015.06.002>.

145 Solnick, Sara J., and David Hemenway. "Unintentional Firearm Deaths in the United States 2005–2015." *Injury Epidemiology* 6, no. 1 (December 2019): 1–7. <https://doi.org/10.1186/s40621-019-0220-0>.

146 Fowler, Katherine A., et al. "Childhood Firearm Injuries in the United States." *Pediatrics* 146, no. 6 (July 2017). <https://doi.org/10.1542/peds.2016-3486>.

147 Centers for Disease Control and Prevention, National Center for Health Statistics. "Underlying Cause of Death 1999–2018 on CDC WONDER Online Database", Centers for Disease Control and Prevention. Released in 2020. Data are from the Multiple Cause of Death Files, 1999–2018, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. <http://wonder.cdc.gov/ucd-icd10.html>.

148 Richardson, Erin G., and David Hemenway. "Homicide, Suicide, and Unintentional Firearm Fatality: Comparing the United States With Other High-Income Countries, 2003." *The Journal of Trauma: Injury, Infection, and Critical Care* 70, no. 1 (January 2011): 238–43. <https://doi.org/10.1097/TA.0b013e3181dbadbf>.

149 Barber, Catherine, and David Hemenway. "Too Many or Too Few Unintentional Firearm Deaths in Official U.S. Mortality Data?" *Accident Analysis & Prevention* 43, no. 3 (May 2011): 724–31. <https://doi.org/10.1016/j.aap.2010.10.018>.

150 Luo, Michael, and Mike McIntire. "Children and Guns: The Hidden Toll (Published 2013)." *The New York Times*, September 29, 2013, sec. U.S. <https://www.nytimes.com/2013/09/29/us/children-and-guns-the-hidden-toll.html>.

151 Center For Disease Control and Prevention. "CDC's National Violent Death Reporting System Now Includes All 50 States," April 11, 2019. <https://www.cdc.gov/media/releases/2018/p0905-national-violent-reporting-system.html>.

152 The Joyce Foundation. "Full Funding of the National Violent Death Reporting System: An Investment in Saving Lives," August 2018. <http://www.joycefdn.org/news/full-funding-of-the-national-violent-death-reporting-system-an-investment-in-saving-lives>.

153 Everytown for Gun Safety. "Innocents Lost: A Year of Unintentional Child Gun Deaths." Everytown for Gun Safety, Moms Demand Action for Gun Sense in America, June 2014. <https://tinyurl.com/y6puumep>

154 Miller, Matthew, Deborah Azrael, David Hemenway, and Mary Vriniotis. "Firearm Storage Practices and Rates of Unintentional Firearm Deaths in the United States." *Accident Analysis & Prevention* 37, no. 4 (July 2005): 661–67. <https://doi.org/10.1016/j.aap.2005.02.003>.

155 Grossman, David C., "Gun storage practices and risk of youth suicide and unintentional firearm injuries". 707–714

156 Azrael, Deborah., "Firearm Storage in Gun-Ownng Households with Children." 295–304.

157 Ibid

but research shows that parents' perception of their child's access to household firearms is contradicted by children's self-reports.¹⁵⁸ Modeling suggests that up to a third of youth suicide and unintentional shooting deaths could be prevented by a modest increase in safe storage practices.¹⁵⁹

Voluntary programs promoting safe storage have shown mixed results.¹⁶⁰ In a randomized control trial in six rural communities in Alaska with a high household prevalence of firearms, installing a gun safe influenced families to store firearms more securely.¹⁶¹ Other programs that combine counseling with provision of a locking device have also been shown to improve individual firearm safety storage habits.¹⁶² But there is limited evidence that existing educational programs improve gun storage practices.^{163,164}

Legislative approaches to encourage safe gun storage have also yielded mixed evidence. Some studies have found that states with child access prevention laws, which create criminal liability for gun owners who store their guns irresponsibly, have lower rates of unintentional firearm deaths of children¹⁶⁵ as well as lower rates of youth suicide.¹⁶⁶ But these effects are inconsistent across states,¹⁶⁷ and may vary depending on the characteristics of the laws themselves.¹⁶⁸

158 Baxley, Frances, and Matthew Miller. "Parental Misperceptions About Children and Firearms." *Archives of Pediatrics & Adolescent Medicine* 160, no. 5 (May 2006): 542–47. <https://doi.org/10.1001/archpedi.160.5.542>.

159 Monuteaux, Michael C., Deborah Azrael, and Matthew Miller. "Association of Increased Safe Household Firearm Storage With Firearm Suicide and Unintentional Death Among US Youths." *JAMA Pediatrics* 173, no. 7 (July 1, 2019): 657–62. <https://doi.org/10.1001/jamapediatrics.2019.1078>.

160 United States Government Accountability Office. "Personal Firearms Programs That Promote Safe Storage and Research on Their Effectiveness." Washington, DC: United States Government Accountability Office, September 2017. <https://www.gao.gov/assets/690/687239.pdf>.

161 Grossman David C., et al. "Improving Firearm Storage in Alaska Native Villages: A Randomized Trial of Household Gun Cabinets." *American Journal of Public Health* 102, no. Suppl 2 (May 2012): S291–s297. <https://doi.org/10.2105/AJPH.2011.300421>.

162 Rowhani-Rahbar, Ali, Joseph A. Simonetti, and Frederick P. Rivara. "Effectiveness of Interventions to Promote Safe Firearm Storage." *Epidemiologic Reviews* 38, no. 1 (January 2016): 111–24. <https://doi.org/10.1093/epirev/mxv006>.

163 Simonetti, Joseph A. "Evaluation of a Community-Based Safe Firearm and Ammunition Storage Intervention." 218–23.

164 Sidman, Elanor A., et al. "Evaluation of a Community-Based Handgun Safe-Storage Campaign." *Pediatrics* 115, no. 6 (June 2005): e654–61. <https://doi.org/10.1542/peds.2004-1625>.

165 Webster, Daniel W., and Marc Starnes. "Reexamining the Association Between Child Access Prevention Gun Laws and Unintentional Shooting Deaths of Children." *Pediatrics* 106, no. 6 (December 1, 2000): 1466–69. <https://doi.org/10.1542/peds.106.6.1466>.

166 Gius, Mark. "The Impact of Minimum Age and Child Access Prevention Laws on Firearm-Related Youth Suicides and Unintentional Deaths." *The Social Science Journal* 52, no. 2 (June 1, 2015): 168–75. <https://doi.org/10.1016/j.soscij.2015.01.003>.

167 Ibid.

168 Hamilton, Emma C., et al. "Variability of Child Access Prevention Laws and Pediatric Firearm Injuries." *Journal of Trauma and Acute Care Surgery* 84, no. 4 (April 2018): 613–19. <https://doi.org/10.1097/TA.0000000000001786>.

Key research on unintentional shootings, 2013-20

- A 2019 study of unintentional firearm fatalities recorded by the National Violent Death Reporting System between 2005-15 estimated that 430 such deaths occur each year, are most frequent among older children or young adults, particularly males, and the victim is suspected to have consumed alcohol in nearly a quarter of the deaths.¹⁶⁹
- A 2018 study found that approximately 7 percent of U.S. children live in homes in which at least one firearm is stored loaded and unlocked, and the absolute number had grown nearly three-fold over the prior 15 years.¹⁷⁰
- A 2015 analysis found that the National Violent Death Reporting System captured 80 percent more fatal unintentional child injury incidents than CDC's Vital Statistics database. The study also provided insights into the circumstances of those shootings, where the vast majority of children were shot either by other children or themselves.¹⁷¹

Key Research Questions

A number of questions should be prioritized for research in this area:

50. Can rates of non-fatal and fatal unintentional shootings be measured more accurately, including by collecting data to identify differences across race, class, age, gender, and between gun owners and non-owners?

51. Is the likelihood of an unintentional shooting influenced by the physical features of a firearm, from chamber load indicators to trigger pull weight to the presence or absence of a safety? Firearms have been exempt from the purview of the Consumer Product Safety Commission since that agency's inception,¹⁷² and public health authorities do not collect much firearm-related information about unintentional shootings of children,¹⁷³ so there is little information on which if any firearm designs reduce risk.

“Safe storage of firearms reduces the risk that children will access guns and unintentionally harm themselves or someone else—but in many households with children, firearms remain readily available. It's up to researchers to help figure out how to better communicate this information, and to develop new, more workable strategies for gun-owning households to reduce their risk.” –Deborah Azrael, Director of Research, Harvard Injury Control Research Center, Harvard Chan School of Public Health

169 Solnick, Sara J. “Unintentional Firearm Deaths in the United States 2005–2015.” 1-7.

170 Azrael, Deborah. “Firearm Storage in Gun-Ownning Households with Children.” 295–304.

171 Hemenway, David, and Sara J. Solnick. “Children and Unintentional Firearm Death.” *Injury Epidemiology* 6, no. 42 (December 2015). <https://doi.org/10.1186/s40621-015-0057-0>.

172 Li, Olivia. “Cars, Toys and Aspirin Must Meet Mandatory Safety Standards. Guns Do Not.” *The Trace*, January 19, 2016. <https://www.thetrace.org/2016/01/gun-safety-standards/>.

173 Fowler, Katherine A. “Childhood Firearm Injuries in the United States.”

52. Which messages and messengers are most effective in changing gun owners' storage behaviors? Are there specific interventions that are apt for healthcare settings, and others for community settings?

53. Do youth and adult gun training courses affect risk of unintentional injury, and can requiring them (for hunting licenses, concealed carry permits, or permits-to-purchase) broaden their audience? Millions of gun owners attend educational programs, but the content of many does not reflect actual safety risks¹⁷⁴ and there has been little if any evaluation of their impacts on behavior.

54. What elements of child access prevention laws account for their impact? How are these laws implemented and enforced? How does the public's lack of awareness of these laws moderate their impact on gun storage practices?

55. Do other firearm laws influence rates of unintentional shootings? Laws affecting how guns are acquired and used, such as licensing laws or laws regulating public carry of firearms, may have wider-ranging impacts on beliefs about and behaviors with firearms that may influence rates of injury.

174 Hemenway, David, et al. "Firearms Training: What Is Actually Taught?" *Injury Prevention* 25, no. 2 (April 2019): 123–28. <https://doi.org/10.1136/injuryprev-2017-042535>.

IMPACTS OF LAWFUL GUN OWNERSHIP AND PUBLIC CARRYING ON SAFETY

To address gun violence, it is necessary to understand the lawful behaviors with guns that precede it. Gun owners are not monolithic, and variations in their beliefs and behaviors may explain observed differences in rates of injury across the country.^{175,176}

About one in five Americans owns a gun,¹⁷⁷ giving the U.S. among the highest prevalence of firearms of any country.¹⁷⁸ Although that ratio is relatively stable – household prevalence of gun ownership declined from the 1970s to the early 2000s but has since remained flat¹⁷⁹ –it masks a dynamic and evolving gun culture. Whereas gun owners once described hunting or sporting as their primary reasons for gun ownership, in the last 15 years an increasing share say the primary purpose is self- or home-defense,¹⁸⁰ and gun sales routinely spike in times of insecurity, including the COVID-19 pandemic.¹⁸¹

Changing reasons for gun ownership coincide with changing behaviors with those guns. Although a majority of Americans disapprove of carrying loaded, concealed handguns in most public places,¹⁸² an estimated nine million Americans carry guns in public each month, and three million of them carry loaded handguns every day.¹⁸³ This uptick in public gun carrying parallels dramatic changes in state laws governing the practice: whereas in 1991 15 states prohibited carrying concealed guns in public, today concealed carry is allowed in all 50 states and the District of Columbia. In 1991, only one state allowed concealed carry without a permit; today, 15 states do not require a permit to carry concealed weapons. Of the states that require permits, all but eight have so-called “shall issue” laws that require permits to be issued if the applicant meets basic standards with limited discretion by the issuer.¹⁸⁴ Although advocates of this practice have argued that arming individuals will deter crime, studies have contradicted these claims.^{185,186} Some of

175 Boine, Claire, et al. “What Is Gun Culture? Cultural Variations and Trends across the United States.” *Humanities and Social Sciences Communications* 7, no. 21 (July 2020). <https://doi.org/10.1007/s11133-018-9374-2>.

176 Shapira, Harel, and Samantha J. Simon. “Learning to Need a Gun.” *Qualitative Sociology* 41, no. 1 (March 2018): 1–20. <https://doi.org/10.1007/s11133-018-9374-2>.

177 Smith, Tom W., and Jaesok Son. “General Social Survey: Trends in Gun Ownership in the United States, 1972–2018.” Chicago, IL: NORC at the University of Chicago, March 2019. <https://gssdataexplorer.norc.org/documents/905/display>.

178 Karp, Aaron. “Estimating Global Civilian-Held Firearms Numbers.” *Small Arms Survey*, June 2018. <https://www.jstor.org/stable/resrep20049>.

179 Smith, Tom W. “General Social Survey.”

180 Parker, Kim, et al. “Guns in America: Attitudes and Experiences of Americans.” *Pew Research Center’s Social & Demographic Trends Project* (blog), June 22, 2017. <https://www.pewsocialtrends.org/2017/06/22/americas-complex-relationship-with-guns/>.

181 Depetris-Chauvin, Emilio. “Fear of Obama: An Empirical Study of the Demand for Guns and the U.S. 2008 Presidential Election.” *Journal of Public Economics* 130 (October 2015): 66–79. <https://doi.org/10.1016/j.jpubeco.2015.04.008>.

182 Wolfson, Julia A., Stephen P. Teret, Deborah Azrael, and Matthew Miller. “US Public Opinion on Carrying Firearms in Public Places.” *American Journal of Public Health* 107, no. 6 (June 2017): 929–37. <https://doi.org/10.2105/AJPH.2017.303712>.

183 Rowhani-Rahbar, Ali, et al. “Loaded Handgun Carrying Among US Adults, 2015.” *American Journal of Public Health* 107, no. 12 (October 2017): 1930–36. <https://doi.org/10.2105/AJPH.2017.304072>.

184 Everytown for Gun Safety Gun Law Navigator, https://maps.everytown.org/navigator/trends.html?dataset=permitting_process

185 National Research Council. “Firearms and Violence: A Critical Review.” Washington, DC: The National Academies Press. (2005). <https://doi.org/10.17226/10881>.

186 RAND Corporation. “Effects of Concealed-Carry Laws on Violent Crime.” RAND Corporation Gun Policy in America, April 2020. <https://www.rand.org/research/gun-policy/analysis/concealed-carry/violent-crime.html>.

the most authoritative studies show that liberalizing carry laws increases gun assaults and homicides and does not reduce other types of crime.^{187,188} And people who carry guns outside the home have also been shown to be at elevated risk of being shot¹⁸⁹ or losing their firearm to theft.¹⁹⁰

Changes in laws governing self-defense, most notably the proliferation of ‘Stand Your Ground’ laws, have also affected rates of gun violence. Florida’s implementation of such a law in 2005 was associated with a significant increase in justifiable and unlawful firearm homicides.^{191,192} The law also appears to have exacerbated existing racial biases: people who used the defense in cases involving white victims were twice as likely to be convicted compared to people who used it in cases where the victims were non-white.¹⁹³

About 61 percent of people who own guns and 14 percent of people who don’t report having undergone some formal firearm training.¹⁹⁴ Such courses could educate them about responsible behaviors that reduce violence – but requirements and contents of these courses vary widely, and studies have found that certain gun safety training programs yield no change in storage practices.^{195,196} Only 15 percent of gun owners reported receiving training on suicide prevention, for which they are at particular risk.¹⁹⁷

187 Siegel, Michael, et al. “Easiness of Legal Access to Concealed Firearm Permits and Homicide Rates in the United States.” *American Journal of Public Health* 107, no. 12 (December 2017): 1923–29. <https://doi.org/10.2105/AJPH.2017.304057>.

188 Donohue, John J., Abhay Aneja, and Kyle D. Weber. “Right-to-Carry Laws and Violent Crime: A Comprehensive Assessment Using Panel Data and a State-Level Synthetic Control Analysis.” *Journal of Empirical Legal Studies* 16, no. 2 (June 2019): 198–247. <https://doi.org/10.1111/jels.12219>.

189 Branas, Charles C., et al. “Investigating the Link Between Gun Possession and Gun Assault.” *American Journal of Public Health* 99, no. 11 (November 2009): 2034–40. <https://doi.org/10.2105/AJPH.2008.143099>.

190 Hemenway, David, Deborah Azrael, and Matthew Miller. “Whose Guns Are Stolen? The Epidemiology of Gun Theft Victims.” *Injury Epidemiology* 4, no. 11 (December 2017). <https://doi.org/10.1186/s40621-017-0109-8>.

191 Humphreys, David K., Antonio Gasparrini, and Douglas J. Wiebe. “Association Between Enactment of a ‘Stand Your Ground’ Self-Defense Law and Unlawful Homicides in Florida.” *JAMA Internal Medicine* 177, no. 10 (October 2017): 1523–24. <https://doi.org/10.1001/jamainternmed.2017.3433>.

192 Humphreys, David K., Antonio Gasparrini, and Douglas J. Wiebe. “Evaluating the Impact of Florida’s ‘Stand Your Ground’ Self-Defense Law on Homicide and Suicide by Firearm: An Interrupted Time Series Study.” *JAMA Internal Medicine* 177, no. 1 (January 2017): 44–50. <https://doi.org/10.1001/jamainternmed.2016.6811>.

193 Ackermann, Nicole, et al. “Race, Law, and Health: Examination of ‘Stand Your Ground’ and Defendant Convictions in Florida.” *Social Science & Medicine* 142 (October 2015): 194–201. <https://doi.org/10.1016/j.socscimed.2015.08.012>.

194 Rowhani-Rahbar, Ali, et al. “Formal Firearm Training among Adults in the USA: Results of a National Survey.” *Injury Prevention* 24, no. 2 (April 2018): 161–65. <https://doi.org/10.1136/injuryprev-2017-042352>.

195 Berrigan, John, Deborah Azrael, David Hemenway, and Matthew Miller. “Firearms Training and Storage Practices among US Gun Owners: A Nationally Representative Study.” *Injury Prevention* 25, no. Suppl 1 (September 2019): i31–38. <https://doi.org/10.1136/injuryprev-2018-043126>.

196 Crifasi, Cassandra K., et al. “Storage Practices of US Gun Owners in 2016.” *American Journal of Public Health* 108, no. 4 (April 2018): 532–537. <https://doi.org/10.2105/AJPH.2017.304262>.

197 Rowhani-Rahbar, Ali, et al. “Formal Firearm Training among Adults in the USA.” 161–65.

Key research on lawful gun ownership and public carrying, 2013-20

- A 2020 study provided an empirical framework for measuring “gun culture” and found that the beliefs and behaviors of gun owners varied by state. As a ‘recreational’ culture declined nationwide in recent years, a ‘self-defense’ culture rose in its wake.¹⁹⁸
- A 2019 study found that states which adopt shall-issue laws liberalizing who can carry concealed, loaded handguns in public experienced a statistically significant increase in overall violent crime.¹⁹⁹
- A 2017 study showed that 8 percent of gun owners possessed 39 percent of the country’s total gun stock, and 2.5 percent of gun owners reported having a gun stolen from them, totalling some 500,000 annually.²⁰⁰
- A 2017 study of basic firearm safety courses documented the variety of topics they were most likely to cover—encouraging gun ownership, gun carrying, gun use in self-defense, and membership in a gun rights group— and found that just 10 percent include content about preventing suicide or domestic violence.²⁰¹
- A 2016 study of Florida’s Stand Your Ground law showed it was associated with a 24 percent increase in homicides and a 31.6 percent increase in gun homicides, with no significant change in rates of suicide or suicide by firearm.²⁰²
- A 2014 systematic review and meta-analysis of 16 studies measuring the relationship between firearm access and risk of suicide or homicide found gun access was consistently associated with elevated rates of death. The researchers concluded they had strong evidence to estimate that odds of suicide increased by a factor of 3.24, and moderate evidence that odds of homicide victimization doubled.²⁰³

Key Research Questions

Unaddressed questions that should be prioritized include:

56. How does the practice of carrying a gun in public affect rates of gun injury of any type, for the carrier and the community? There are numerous plausible impacts to be considered, including rates of defensive gun use, risk of gun theft including from motor vehicles, or by causing intimidation and fear.

57. What motivates different subpopulations to carry firearms in public? Can we measure these behaviors across groups (e.g. by gender, race, ethnicity, age) and over times?

58. What more can we learn about the circumstances in which concealed carry permit holders shoot other people?

59. Are there specific locales or circumstances that impact the safety of public carry? For example, for people who are intoxicated or in venues where people are intoxicated, is there additional justification for limiting public carry?

198 Boine, Claire. “What Is Gun Culture?”

199 Donohue, John J. “Right-to-Carry Laws and Violent Crime.” 198–247.

200 Azrael, Deborah. “The Stock and Flow of U.S. Firearms.” 38–57.

201 Hemenway, David. “Firearms Training: What Is Actually Taught?” 123–28.

202 Humphreys, David K. “Evaluating the Impact of Florida’s ‘Stand Your Ground’.” 44–50.

203 Anglemeyer, Andrew. “The accessibility of firearms and risk for suicide.” 101–10.

60. How common is open carry, and what are its impacts on rates of injury, and perceptions of safety? How does it impact other behaviors and participation in activities where guns are openly carried?

61. In recent years, numerous states have eliminated a requirement that people have a permit to carry concealed, loaded guns in public. How has this impacted public safety?

62. Attempts to measure defensive gun use through self-report have been vulnerable to dramatically overestimating its frequency and mischaracterizing events as socially beneficial that are actually harmful or illegal.^{204,205} Are there ways to measure the frequency and character of defensive gun use, including its deterrence of crime, that are not subject to these biases?

“The contemporary gun culture in the United States is rapidly evolving. Over recent decades, there have been dramatic shifts in the reasons people own guns and in the state policies that govern gun carrying. Rigorous research to examine the health and safety implications of those changes will inform policies and practices, and save lives.” –*Ali Rowhani-Rahbar, Bartley Dobb Professor for the Study and Prevention of Violence, University of Washington*

63. What impact do laws meant to keep people at risk from possessing guns have on the general population’s access to firearms? Is it feasible to measure the impact of waiting periods on the right to self defense?

64. How do laws liberalizing public carry and its increasing popularity as a practice affect perceptions of safety by the population? Do increases in public carry motivate other legal and illegal possessors to carry firearms in return?

65. Do other factors that influence perceptions of safety, such as policing strategies, affect residents’ demand for firearms?

66. In Florida, the passage of a Stand Your Ground Law in 2005 has been shown to have increased violence and exacerbated racial disparities there. Have similar laws had the same impact in other states? Do laws with different characteristics have different effects?

67. Particularly during periods of elevated gun sales, do first-time gun buyers pose elevated risks to themselves or to their communities?

68. Would providing gun owners with incentives to adopt safer behaviors—for example by requiring insurance or reporting of firearm thefts—meaningfully reduce the availability of

204 Hemenway D, Azrael D, Miller M. Gun use in the United States: results from two national surveys. *Inj Prev.* 2000;6(4):263-267.

<https://doi.org/10.1136/ip.6.4.263>

205 RAND. “The Challenges of Defining and Measuring Defensive Gun Use.” (March 2018).

<https://www.rand.org/research/gun-policy/analysis/essays/defensive-gun-use.html>

firearms to illegal possessors?

69. Are there objective means of measuring the judgment and skill of people seeking to carry concealed firearms in public, for example using virtual reality technology, to assess how they would manage a situation of potential threat? Would such a test help law enforcement make more evidence-based decisions about who should be able to carry loaded, concealed guns in public?

LIMITING GUN ACCESS TO PEOPLE DURING PERIODS OF HIGH RISK

Limiting access to firearms for people believed to be at high risk of misusing them is arguably the prevailing paradigm for reducing gun violence in the U.S. The cornerstone of the country's gun laws is the FBI's National Instant Criminal Background Check System (NICS), which gun dealers use tens of thousands of times each day to screen would-be gun buyers against the criteria established by law for who can legally acquire and own guns. Since its inception, the system has blocked more than 3.5 million sales to prohibited persons,²⁰⁶ and over that time the federal government has spent billions of dollars to operate the system and maintain the records it relies on.²⁰⁷ In 2019 alone, NICS conducted 28.3 million background checks, more than any prior year—and a record that 2020 had already surpassed by October.²⁰⁸

Despite the investment, the system is rife with loopholes that allow prohibited individuals to obtain guns. If a background check cannot be completed in three business days, federal law allows gun sellers to complete the sale. These 'default proceeds' are more likely than other gun sales to result in denial once the check is finally completed.²⁰⁹ In 2019, federal law enforcement retrieved 2,989 guns sold to individuals in this way who had ultimately been determined to be prohibited.²¹⁰ And during the early months of the COVID-19 pandemic, when record high background check requests overwhelmed the system,²¹¹ the number of background checks delayed more than three days rose 54 percent, allowing four times as many gun sales to proceed to people prohibited from having them as in the year prior.²¹²

Furthermore, federal law only requires licensed gun dealers to conduct checks, leaving it to states' discretion whether so-called private sellers can transfer guns without them, frequently via online forums or at gun shows. The best recent estimate is that 22 percent of gun purchasers obtained firearms without a background check, amounting to millions of unregulated transfers each year.²¹³

There is a growing awareness that the existing criteria for screening would-be gun buyers

206 Karberg, Jennifer C. "Background Checks for Firearm Transfers, 2015 - Statistical Tables." Washington, DC: The Bureau of Justice Statistics of the U.S. Department of Justice, November 2017. <https://www.bjs.gov/content/pub/pdf/bcft15st.pdf>.

207 Yablon, Alex. "Congress Pledged More Than a Billion Dollars to Fix the Federal Background Check System. But Only a Fraction of the Funds Have Been Spent." The Trace, July 27, 2015. <https://www.thetrace.org/2015/07/nics-background-check-congress-spending/>.

208 Federal Bureau of Investigation. "NICS Firearm Checks: Month/Year." File, December 1, 2020. https://www.fbi.gov/file-repository/nics_firearm_checks_-_month_year.pdf/view.

209 Everytown for Gun Safety. "Close the Charleston Loophole." Everytown for Gun Safety. Accessed December 1, 2020. <https://everytown.org/solutions/close-the-charleston-loophole/>.

210 U.S. Department of Justice, Federal Bureau of Investigation. "National Criminal Instant Background Check System (NICS) Section 2019 Operations Report." Washington, DC: U.S. Department of Justice, 2020. <https://www.fbi.gov/file-repository/2019-nics-operations-report.pdf/view>.

211 Levine, Phillip B., and Robin McKnight. "Three Million More Guns: The Spring 2020 Spike in Firearm Sales." The Brookings Institution, July 13, 2020. <https://www.brookings.edu/blog/up-front/2020/07/13/three-million-more-guns-the-spring-2020-spike-in-firearm-sales/>.

212 Everytown for Gun Safety. "Breaking: Everytown FOIA Shows That 'Thousands' of Guns Have Likely Been Sold to Prohibited Purchasers During the Pandemic Due to the Charleston Loophole." Everytown for Gun Safety, September 15, 2020. <https://tinyurl.com/y3gwhs7h/>.

213 Miller, Matthew, Lisa Hepburn, and Deborah Azrael. "Firearm Acquisition Without Background Checks: Results of a National Survey." *Annals of Internal Medicine* 166, no. 4 (February 2017): 233–39. <https://doi.org/10.7326/M16-1590>.

are both over- and under-inclusive of people likely to pose a risk.²¹⁴ There is remarkably little research on what impact a background check denial has on a would-be gun buyer's subsequent behavior or likelihood of future arrest.^{215,216} But there are clearly opportunities to increase both the specificity and sensitivity of prohibiting criteria. For example, recent research has shown that alcohol-related convictions such as driving under the influence are associated with a significant increase in risk of arrest for a violent or firearm-related crime – yet in many states, people with such convictions are not barred from owning guns.^{217,218}

Screening gun buyers at the point of sale may be an efficient way to regulate access, but it does not affect firearms that people already have in their possession. California is at the forefront of addressing this gap: its Armed and Prohibited Persons System (APPS) allows law enforcement to identify gun owners who have become prohibited and proactively remove the guns.²¹⁹ Although the state has been working through a large backlog of armed prohibited individuals,²²⁰ the operation is undergoing a federally-funded, cluster-randomized trial to gauge its effectiveness at reducing gun violence.²²¹

214 The Consortium for Risk-Based Firearm Policy. “Guns, Public Health, and Mental Illness: An Evidence-Based Approach for Federal Policy,” December 11, 2013. <https://efsgv.org/wp-content/uploads/2014/10/Final-Federal-Report.pdf>.

215 Tien, James M., Michael F. Cahn, David M. Einstein, and Ke Pei. “Recidivism of Denied Prospective Firearm Purchasers.” National Institute of Justice, January 2008. <https://www.ncjrs.gov/pdffiles1/bjs/grants/222677.pdf>.

216 Wright, Mona A., Garen J. Wintemute, and Frederick P. Rivara. “Effectiveness of Denial of Handgun Purchase to Persons Believed to Be at High Risk for Firearm Violence.” *American Journal of Public Health* 89, no. 1 (January 1999): 88–90. <https://doi.org/10.2105/AJPH.89.1.88>.

217 Wintemute, Garen J., et al. “Firearms, Alcohol and Crime: Convictions for Driving under the Influence (DUI) and Other Alcohol-Related Crimes and Risk for Future Criminal Activity among Authorised Purchasers of Handguns.” *Injury Prevention* 24, no. 1 (February 1, 2018): 68–72. <https://doi.org/10.1136/injuryprev-2016-042181>.

218 Kagawa, Rose M. C., et al. “Association of Prior Convictions for Driving Under the Influence With Risk of Subsequent Arrest for Violent Crimes Among Handgun Purchasers.” *JAMA Internal Medicine* 180, no. 1 (January 2020): 35–43. <https://oag.ca.gov/sites/all/files/agweb/pdfs/publications/apps-2019.pdf?>

219 California Department of Justice. “Armed and Prohibited Persons System 2018 Annual Report to the Legislature.” California Department of Justice, Office of the Attorney General, March 2019. <https://tinyurl.com/yxdjgvsd>

220 Ibid.

221 Wintemute, Garen J., et al. “Evaluation of California’s Armed and Prohibited Persons System: Study Protocol for a Cluster-Randomised Trial.” *Injury Prevention* 23, no. 5 (October 2017): 358. <https://doi.org/10.1136/injuryprev-2016-042194>.

Key research on limiting gun access to people in periods of high risk, 2013-20

- A 2019 retrospective, longitudinal cohort study of first-time handgun purchasers in California found that of those with prior convictions for driving under the influence, 9 percent were subsequently arrested for murder, rape, robbery, or aggravated assault during a 13-year follow-up period, compared to 2 percent of the purchasers with no prior criminal history.²²²
- A 2018 study found that prior alcohol-related convictions were associated with a fourfold to fivefold increase in risk of violent or firearm-related arrest.²²³
- A 2017 study, in which researchers interviewed 140 people detained in the Los Angeles County Jail for firearm offenses, found many were unfamiliar with age requirements, licensing, and laws regulating ammunition, calling into question how such measures can act as a deterrent.²²⁴
- A 2013 study of state prison inmates in 13 states with weak gun laws found that 40 percent of people convicted of gun offenses were in illegal possession of the firearm, but an additional 29 percent would have been prohibited if the state adopted laws equivalent to those of the most restrictive U.S. state, New Jersey. A person's status is consequential, the study found: whereas one in five people legally qualified to purchase guns bought them directly from a licensed dealer, only one in twenty who was prohibited from purchasing guns reported doing so.²²⁵

Key Research Questions

This leaves numerous important questions ripe for study:

70. How do existing criteria for firearm prohibition correspond with risk? And how does that risk change as time passes after the prohibiting event? The bedrock of federal gun prohibitors were established by the 1968 Gun Control Act, when little research was available on risk factors for violence.

71. Are there criteria that would better correspond with likelihood of firearm and violent offending? Could these be operationalized to reduce violence in settings outside the point of sale of firearms, for example through clinical interventions?

72. How has a tenfold increase in prohibiting mental health records submitted to the background check system over the last decade affected rates of gun violence? If it has not, what is the reason?

73. Many prohibitions on gun ownership are based on prior criminal convictions. To what extent are racial biases in the criminal justice system reflected in these criteria? It is well established that the criminal justice system is riddled with bias, but there is little known

222 Kagawa, Rose M. C. "Association of Prior Convictions for Driving Under the Influence." 35–43.

223 Wintemute, Garen J. "Firearms, Alcohol and Crime." 68–72.

224 Melissa Barragan, et al. "Prohibited Possessors and the Law: How Inmates in Los Angeles Jails Understand Firearm and Ammunition Regulations." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 3, no. 5 (2017): 141–63. <https://doi.org/10.7758/rsf.2017.3.5.07>.

225 Vittes, Katherine A., Jon S. Vernick, and Daniel W. Webster. "Legal Status and Source of Offenders' Firearms in States with the Least Stringent Criteria for Gun Ownership." *Injury Prevention* 19, no. 1 (February 2013): 26–31. <https://doi.org/10.1136/injuryprev-2011-040290>.

about the rate at which different population subgroups are barred from having guns as a consequence. What is the impact of these prohibitions on the individuals prohibited, and on the broader population?

74. As rates of crime and arrest decline nationwide, is the impact of existing prohibitions changing?

75. What are the impacts associated with different state- and county-level processes for issuing permits to purchase firearms or carry concealed weapons? Where law enforcement have discretion, what influences the decision to approve or deny, and how consistent are they? What are the impacts of these processes on different subgroups, including racial and ethnic minorities?

76. What factors most influence the different observed outcomes of permit-to-purchase laws and universal background check requirements? How effective are these policies in limiting access to firearms, and by whom?

77. What impact does establishing a firearm registry, which links information on guns and owners, have on gun violence? Would it improve efforts to crack down on interstate gun trafficking? California's system, and its applications, could be subject to much additional study.

“Collectively, our country invests many millions of dollars each year in measures to keep guns away from people during periods of high risk. Through rigorous research, we can better understand how many lives these measures have saved, and identify shortcomings in policies or their application that should be strengthened.” -Daniel Webster, Bloomberg Professor of American Health, Johns Hopkins University

78. Do waiting periods that delay gun purchases a number of days affect gun violence? Over the years a handful of states have adopted or discontinued these policies but the research on their impact remains limited. Given that most firearm suicide decedents acquired their guns long before their death,²²⁶ what is the impact of waiting periods on suicide?

79. How do prohibited persons obtain their guns? Could a data collection akin to the Arrestee Drug Abuse Monitoring Program²²⁷ ascertain details about sources of crime guns, including the reasons for demand and the frequency that illegal carrying results in brandishing or violence?

226 Kellermann, Arthur L. “Suicide in the Home.” 467–72.

227 National Institute of Justice. “NIJ’s Drugs and Crime Research: Arrestee Drug Abuse Monitoring Programs.” (May 6, 2012). <https://bit.ly/3goQCCU>

RACIAL DISPARITIES AND THE ROLE OF THE CRIMINAL JUSTICE SYSTEM

Violence is enormously destructive for the individuals involved and the wider community of which they are part, and the public rightfully takes a strong interest in deterring violent behaviors. Historically, the government's primary response to gun violence has been policing and prosecuting illegal gun possession, carrying, and misuse. The U.S. criminal justice system is rife with racial biases and disparate enforcement practices that disproportionately and negatively affect communities of color.^{228,229} And because those caught up in this response are overwhelmingly young people, the impacts can have life-long consequences.²³⁰ It is imperative to come to a better understanding of the role the criminal justice system can play in promoting community safety and preventing gun violence while also dismantling the long-standing injustices it has exacerbated or introduced.

There is a growing awareness of how gun violence enforcement efforts could inadvertently widen disparities and harm populations they are meant to protect.^{231,232,233} Some of the practices of greatest concern involve how illegal gun possession is policed. Illegal gun enforcement strategies that rely on pedestrian or traffic stops have repeatedly been shown to be racially biased^{234,235} and can severely undermine community trust.²³⁶ When New York City implemented a practice of stop, question, and frisk from 2002 to 2013, it resulted in the recovery of guns in less than one percent of stops, disproportionately targeted young Black and Latino men,²³⁷ and did not meaningfully contribute to reductions in crime.^{238,239}

228 Mitchell, Ojmarrh, and Doris L. MacKenzie. "The Relationship between Race, Ethnicity, and Sentencing Outcomes: A Meta-Analysis of Sentencing Research." Washington, DC: U.S. Department of Justice. December 2004. <https://www.ncjrs.gov/pdffiles1/nij/grants/208129.pdf>.

229 National Research Council. "The Growth of Incarceration in the United States: Exploring Causes and Consequences." Washington, DC: The National Academies Press, April 2014. <https://doi.org/10.17226/18613>.

230 Bazelon E. "De Blasio Doesn't Get It. Not Everyone Who Carries a Gun is a Shooter." New York Times. (July 11, 2019). Available at: <https://nyti.ms/2vY2yIS>

231 Hureau, David M. "Seeing Guns to See Urban Violence: Racial Inequality & Neighborhood Context." The Square One Project, October 2019. <https://squareonejustice.org/wp-content/uploads/2019/10/roundtable-oct-2019-Hureau-SeeingGunstoSeeUrbanViolenceFINAL.pdf>.

232 Swanson, Jeffrey W. "The Color of Risk Protection Orders: Gun Violence, Gun Laws, and Racial Justice." *Injury Epidemiology* 7, no. 46 (August 2020). <https://doi.org/10.1186/s40621-020-00272-z>.

233 Race can influence the implementation of interventions even without the involvement of the criminal justice system, as in the case of extreme risk protection orders, which are issued through a civil judicial process. In a study done in the Seattle area, Black individuals were overrepresented in gun removal orders by a factor of nearly two to one compared to their share of the county population. See: Frattaroli, Shannon, et al. "Extreme Risk Protection Orders in King County, Washington: The Epidemiology of Dangerous Behaviors and an Intervention Response." *Injury Epidemiology* 7, no. 44 (December 2020). <https://doi.org/10.1186/s40621-020-00270-1>.

234 Gelman, Andrew, Jeffrey Fagan, and Alex Kiss. "An Analysis of the New York City Police Department's 'Stop-and-Frisk' Policy in the Context of Claims of Racial Bias." *Journal of the American Statistical Association* 102, no. 479 (September 2007): 813–23. <https://doi.org/10.1198/016214506000001040>.

235 National Academies of Sciences, Engineering, and Medicine. "The Results of Our Nationwide Analysis of Traffic Stops and Searches." The Stanford Open Policing Project, 2020. <https://doi.org/10.17226/24928>

236 Ibid.

237 New York Civil Liberties Union. "Stop-and-Frisk in the de Blasio Era." New York: New York Civil Liberties Union, March 2019. https://www.nyclu.org/sites/default/files/field_documents/20190314_nyclu_stopfrisk_singles.pdf

238 Keating, Dan, and Harry Stevens. "Bloomberg Said 'Stop and Frisk' Decreased Crime. Data Suggests It Wasn't a Major Factor in Cutting Felonies." *Washington Post*, February 2020, sec. National Analysis. <https://tinyurl.com/yxpmt7qb>

239 MacDonald, John, Jeffrey Fagan, and Amanda Geller. "The Effects of Local Police Surges on Crime and Arrests in New York City." Edited by Brion Maher. *PLoS ONE* 11, no. 6 (June 2016): e0157223. <https://doi.org/10.1371/journal.pone.0157223>.

These practices can foster distrust and cynicism that undermine residents' willingness to engage in the collective actions necessary to control future crime, further eroding safety.²⁴⁰

Prosecutors and judges also play important roles, and debates over mandatory minimum sentences for illegal gun carrying are a case in point. Trivial disputes can spin into serious violence when a gun is present, so researchers have hypothesized that deterring illegal gun carrying can reduce gun violence.²⁴¹ Some jurisdictions have adopted mandatory minimum penalties in an effort to increase the deterrent effect on illegal gun carrying, although criminologists have determined that the swiftness and certainty of punishment are more important than its severity for deterring future misbehavior.²⁴²

But mandatory minimum sentences for illegal gun carrying contribute to mass incarceration.²⁴³ The U.S. Sentencing Commission determined that people convicted under charges carrying mandatory minimum penalties contributed significantly to the federal prison population, and a disproportionate share of them were Black (who also received longer average sentences than other offenders).²⁴⁴

Recognizing the disparities and harmful consequences of lengthy mandatory minimum sentences, a few prosecutors' offices around the country are making efforts to better distinguish between the risk profiles of arrestees so they can tailor their responses accordingly, diverting some into programs that can address their needs rather than punish them.^{245,246} Among people who carry guns illegally, prior criminal history may not be a good indicator of likelihood of future involvement in violence. One study of people arrested for illegal gun possession in Boston did not find their arrest records differed substantially from those of people who have committed serious crimes such as murder, robbery, and assault²⁴⁷ – but there may be other heterogeneity within the group.

240 Kirk, David S., and Mauri Matsuda. "Legal Cynicism, Collective Efficacy, and The Ecology of Arrest." *Criminology* 49, no. 2 (May 2011): 443–72. <https://doi.org/10.1111/j.1745-9125.2011.00226.x>.

241 Ludwig, Jens. "Better Gun Enforcement, Less Crime." *Criminology* 4, no. 4 (November 2005): 677–716. <https://onlinelibrary.wiley.com/doi/10.1111/j.1745-9133.2005.00352.x>

242 Everytown Research & Policy. "Strategies for Reducing Gun Violence in American Cities." Everytown for Gun Safety, June 2016. <https://everytownresearch.org/report/strategies-for-reducing-gun-violence-in-american-cities/>.

243 National Research Council. "The Growth of Incarceration in the United States."

244 U.S. Sentencing Commission. "Mandatory Minimum Penalties for Firearms Offenses in the Federal Criminal Justice System." U.S. Sentencing Commission, March 2018. https://www.ussc.gov/sites/default/files/pdf/research-and-publications/research-publications/2018/20180315_Firearms-Mand-Min.pdf.

245 Yablon, Alex. "Larry Krasner's Lonely, Radical Crusade." *The Trace*, January 2020. <https://www.thetrace.org/2020/01/larry-krasner-gun-violence-reform-philadelphia-district-attorney/>.

246 Raskin, Sam. "DA Eric Gonzalez Defends Diversion Program NYPD Says Is Used Too Often When Guns Are Involved." *BKLYNER* (blog), July 2019. <https://tinyurl.com/y5kq697f>.

247 Braga, Anthony A., and Philip J. Cook. "The criminal records of gun offenders." *Georgetown Journal of Law & Public Policy* 14, no. 1 (2016). *Gale Academic OneFile* (accessed December 3, 2020). <https://tinyurl.com/y245d4j9>

It is therefore a priority to find ways to prevent gun violence while mitigating and reversing the harms caused by the criminal justice system.²⁴⁸ Some reformers promote procedural justice, which calls on police officers to respond to the needs of the community, promote transparency, and treat the public with dignity and respect.²⁴⁹ Training police in procedural justice has been shown to change behaviors and reduce uses of force.^{250,251} Community-oriented policing that fosters positive, non-enforcement contact between the police and the public has also been shown to improve residents' attitudes toward the police and willingness to cooperate with them.²⁵² And there are abundant methods for addressing gun violence, whether community-based or place-based or otherwise, that do not involve law enforcement at all.

Key research on racial disparities and the role of the criminal justice system, 2013-20

- A 2018 report by the U.S. Sentencing Commission found that about 30 percent of recent firearm convictions carried a mandatory minimum penalty, that people convicted under charges carrying these penalties received extremely long sentences and made up 15 percent of the federal prison population, and that Black offenders accounted for a disproportionate share of people penalized in this way and received longer average sentences than other offenders.²⁵³
- A 2016 study showed that after a highly publicized act of police violence against an unarmed Black man in Milwaukee, the population was significantly less likely to call 911 to report crimes, an effect that lasted more than a year and was most pronounced in Black neighborhoods.²⁵⁴
- A 2016 analysis of the criminal records of adults arrested for gun crimes in Boston found that nearly two-thirds were prohibited by current state or federal law from possessing guns. In a comparison between those arrested for illegal gun possession and those arrested for violent gun crimes (homicide, robbery, assault), the researchers could detect no significant differences in prior criminal history, and suggested this made it difficult to distinguish between the two groups.²⁵⁵

248 American Public Health Association. "Addressing Law Enforcement Violence as a Public Health Issue." Policy Statement. American Public Health Association, November 2018. <https://tinyurl.com/y74qjqom>

249 Wood, George. "Procedural Justice Training Reduces Police Use of Force." 9815–21.

250 Ibid.

251 Tyler, Tom R., Phillip Atiba Goff, and Robert J. MacCoun. "The Impact of Psychological Science on Policing in the United States: Procedural Justice, Legitimacy, and Effective Law Enforcement." *Psychological Science in the Public Interest* 16, no. 3 (December 2015): 75–109. <https://doi.org/10.1177/1529100615617791>.

252 Peyton, Kyle, Michael Sierra-Arévalo, and David G. Rand. "A Field Experiment on Community Policing and Police Legitimacy." *Proceedings of the National Academy of Sciences* 116, no. 40 (October 2019): 19894–98. <https://doi.org/10.1073/pnas.1910157116>.

253 U.S. Sentencing Commission. "Mandatory Minimum Penalties."

254 Desmond, Matthew, Andrew V. Papachristos, and David S. Kirk. "Police Violence and Citizen Crime Reporting in the Black Community." *American Sociological Review* 81, no. 5 (October 2016): 857–76. <https://doi.org/10.1177/0003122416663494>.

255 Braga, Anthony A. "The criminal records of gun offenders."

Key Research Questions

Crucial research questions to prioritize include:

80. Are there racial disparities in prohibitions on gun ownership? To what extent are disparities the product of underlying racial bias in the criminal justice system, on which some of the prohibitions are based?

81. What disparities exist in enforcement of gun offenses, including rates of arrest, conviction, and sentencing? What measures could be taken to eliminate them?

82. How can police be more effective and more just in their contributions to community safety? How do law enforcement routinely police guns, what effects does this have on their legitimacy in the eyes of the community, and what improvements should police departments make—from rethinking gun crime units to implementing community policing?

83. Journalists have pointed to racial disparities in clearance rates for fatal and non-fatal shootings; can scientists confirm and characterize them? How can they be addressed?

84. Does requiring police to report more detail about pedestrian and traffic stops, and additional oversight of them, shrink racial disparities in these practices? These proactive enforcement strategies—often adopted as a means of preventing gun violence but with the potential to corrode trust between residents and police—have reflected racial biases nearly everywhere they are employed.²⁵⁶

85. How would shifting resources from police to community-driven strategies affect rates of gun violence? In the historic protests of 2020 following a series of high-profile officer-involved shootings, policymakers faced a chorus of calls to “defund the police,” which many interpreted to mean disaggregating from police forces those activities better handled by other unarmed responders.²⁵⁷

“We’ll never end gun violence if our public policy responses themselves do harm. It’s imperative we build a more just response to gun violence, one that uplifts individuals and communities.” –*Andrew V. Papachristos, Professor of Sociology, Northwestern University*

86. How can prosecutors be more effective and more just in their contributions to community safety?²⁵⁸ What role do enhanced penalties or mandatory minimums for illegal gun possession or federal prosecution of gun crimes have on community safety?

256 Pierson, Emma, et al. “A Large-Scale Analysis of Racial Disparities in Police Stops across the United States.” *Nature Human Behaviour* 4, no. 7 (June 2020): 736–45. <https://doi.org/10.1038/s41562-020-0858-1>.

257 Alcorn, Ted. “The Bumpy Road to Police Abolition.” *The Appeal*, June 2020. <https://theappeal.org/the-bumpy-road-to-police-abolition/>.

258 Foxx, Kim, et al. “Building Safe, Thriving Communities: Research-Based Strategies For Public Safety.” NYU School of Law Center on Race, Inequality, and the Law, October 2020. <https://tinyurl.com/y6xk9v8e>

87. What is the impact of diverting people arrested for illegal gun possession into alternative to incarceration programs? How do alternative approaches impact long term outcomes for individuals and communities? And are such programs acceptable to survivors of gun violence?

88. How has underinvestment in basic public services like education and housing in communities of color contributed to violence, and could additional investment reduce it?

FIREARM RELATED TECHNOLOGY

Changes in vehicular design and roadways helped reduce U.S. automotive fatalities by more than 80 percent,²⁵⁹ so the design of firearms and accessories, as well as the technologies for investigating firearm crimes, hold enormous promise for gun violence prevention. But firearm safety technology has been static for decades and gun manufacturers, which are exempt from most regulations and liability, have little incentive to innovate.²⁶⁰ Instead, during that same period manufacturers have marketed increasingly more lethal firearms to consumers.²⁶¹ At the same time, new distributed methods of manufacturing threaten to undermine existing controls on firearm production if regulators do not keep up with them.

The physical design of guns has manifold implications for safety, shaping who can access and use them, how they can be carried, and how lethal they are.^{262,263} Concerns about the proliferation of assault weapons and high-capacity magazines led Congress to restrict new sales of some of these technologies in 1994, before allowing the law to expire in 2004. That law had glaring loopholes and its impact on the use of these technologies in crimes was mixed,²⁶⁴ but some states maintain their own restrictions.

For decades, technologists have envisioned personalized firearms, also known as “smart guns,” that would be accessible only to authorized users and thereby prevent unintentional injury and gun theft. In recent years inventors have prototyped versions that rely on fingerprint or RFID unlocking technology.^{265,266,267} But gun rights groups have viewed the technologies skeptically and fought regulations meant to encourage them,^{268,269} and some public health researchers have expressed concern that by introducing firearms into more households, the technology would increase risks of suicide and embolden domestic

259 Kahane, Charles J. “Lives Saved by Vehicle Safety Technologies and Associated Federal Motor Vehicle Safety Standards, 1960 to 2012: Passenger Cars and LTVs.” Washington, DC: U.S. Department of Transportation, National Highway Traffic Safety Administration, January 2015.

<https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812069>.

260 Giffords Law Center To Prevent Gun Violence. “Smart Guns.” Giffords Law Center To Prevent Gun Violence. Accessed December 1, 2020.

<https://giffords.org/lawcenter/gun-laws/policy-areas/child-consumer-safety/smart-guns/>.

261 Sugarmann, Josh, and Kirsten Rand. “The Militarization of the U.S. Civilian Firearms Market.” Violence Policy Center, June 2011.

<https://vpc.org/studies/militarization.pdf>.

262 Braga, Anthony A., and Philip J. Cook. “The Association of Firearm Caliber With Likelihood of Death From Gunshot Injury in Criminal Assaults.” *JAMA Network Open* 1, no. 3 (July 2018): e180833. <https://doi.org/10.1001/jamanetworkopen.2018.0833>.

263 Klarevas, Louis. “The Effect of Large-Capacity Magazine Bans.” 1754–61.

264 Koper, Christopher S., Daniel J. Woods, and Jeffrey A. Roth. “Updated Assessment of the Federal Assault Weapons Ban: Impacts on Gun Markets and Gun Violence, 1994-2003.” Washington, DC: U.S. Department of Justice, July 2004. <https://www.ncjrs.gov/pdffiles1/nij/grants/204431.pdf>.

265 Freskos, Brian. “A New Generation of Entrepreneurs Thinks It Can Revive the Smart Gun.” The Trace, January 21, 2019.

<https://www.thetrace.org/2019/01/a-new-generation-of-entrepreneurs-thinks-it-can-revive-the-smart-gun/>.

266 Biofire. “Building the Future of Firearms to Prevent Gun Violence.” Biofire. Accessed December 4, 2020. <https://biofire.io/about>.

267 LodeStar. “LodeStar Works - Personal Authentication Technology—Unlocked.” LodeStar. Accessed December 4, 2020.

<https://lodestarworks.com/>

268 Rosenwald, Michael S. “Calif. Store’s Smart-Gun Sales Prompt Furious Backlash.” *Washington Post*, March 6, 2014, sec. National.

https://www.washingtonpost.com/local/california-smart-gun-store-prompts-furious-backlash/2014/03/06/43432058-a544-11e3-a5fa-55f0c77bf39c_story.html.

269 Mosendz, Polly, Austin Carr, and Neil Weinberg. “The Smart Gun Doesn’t Exist for the Dumbest Reasons.” *Bloomberg Businessweek*, April 2019.

<https://tinyurl.com/yyp8lgttd>

abusers.^{270,271} In surveys, gun owners have expressed modest interest in the technology, but true market demand for it is largely untested.²⁷²

Technological change also has the potential to undermine existing gun safety laws. Advances in distributed manufacturing have made it possible for nearly anyone to acquire the means for 3D-printing or milling firearms, evading the laws and regulations governing gun manufacturers and dealers. A thriving market has also emerged for unfinished receivers of firearms, which are not regulated as guns but can be made operable in a few simple steps. These “ghost guns” are untraceable but traded widely,²⁷³ and have begun appearing at crime scenes across the country^{274,275} including at least one school shooting.²⁷⁶

Technologies for investigating gun crimes are also advancing. The federal government has invested hundreds of millions of dollars in the National Integrated Ballistic Information Network (NIBIN), a system for documenting unique markings on shell casings and other materials found at crime scenes and thereby matching them with other ballistic material recovered around the country.²⁷⁷ But there is as of yet little research on its impact on gun crime and violence^{278,279} Microstamping, a technology that promises to make it even easier to match expelled bullets and casings with the weapons that fired them,²⁸⁰ and which has been touted by the American Bar Association²⁸¹ and former president Barack Obama,²⁸² has not been implemented, so its promise remains entirely theoretical.

Acoustic gunshot detection technologies, which use auditory sensors to locate gunfire

270 Sorenson, Susan B., and Douglas J. Wiebe. “Weapons in the Lives of Battered Women.” *American Journal of Public Health* 94, no. 8 (August 2004): 1412–17. <https://doi.org/10.2105/ajph.94.8.1412>.

271 Carey, Teresa. “Smart Guns Exist. Why Aren’t They on the Market?” PBS NewsHour. PBS, May 24, 2018. <https://www.pbs.org/newshour/science/smart-guns-exist-why-arent-they-on-the-market>.

272 Crifasi, Cassandra K., et al. “Desirability of Personalized Guns Among Current Gun Owners.” *American Journal of Preventive Medicine* 57, no. 2 (August 2019): 191–96. <https://doi.org/10.1016/j.amepre.2019.02.024>.

273 Campbell, Sean. “Plans for 3D-Printed Guns Are Still Accessible on Twitter and YouTube.” *The Trace*, May 17, 2019. <https://www.thetrace.org/2019/05/3d-printed-guns-twitter-youtube-social-media-platforms/>.

274 Giffords Law Center to Prevent Gun Violence. “The Dangers of Ghost Guns - Factsheet.” Giffords Law Center to Prevent Gun Violence. Accessed December 1, 2020. <https://giffords.org/wp-content/uploads/2020/05/Giffords-Ghost-Gun-Explainer-Factsheet.pdf>.

275 United States Government Accountability Office. “Firearms Trafficking U.S. Efforts to Combat Firearms Trafficking to Mexico Have Improved, but Some Collaboration Challenges Remain.” Washington, DC: United States Government Accountability Office, January 2016. <https://www.gao.gov/assets/680/674570.pdf>

276 Bates, Josiah. “Authorities Warn More Criminals Are Using ‘Ghost Guns’ to Get Around Tough Gun Laws.” *Time*, November 2019. <https://time.com/5737227/saugus-shooter-ghost-gun/>

277 The Bureau of Alcohol, Tobacco, Firearms and Explosives. “National Integrated Ballistic Information Network (NIBIN) FACT SHEET.” Washington, DC: The Bureau of Alcohol, Tobacco, Firearms and Explosives, June 2020. <https://www.atf.gov/resource-center/docs/undefined/nibin-fact-sheet-june-2020/download>

278 The Marshall Project. “This Machine Could Prevent Gun Violence — If Only Cops Used It.” *The Marshall Project*, October 6, 2016. <https://www.themarshallproject.org/2016/10/06/this-machine-could-prevent-gun-violence-if-only-cops-used-it>.

279 Police Executive Research Forum. “The ‘Crime Gun Intelligence Center’ Model: Case Studies of the Denver, Milwaukee, and Chicago Approaches to Investigating Gun Crime.” Washington, DC: Police Executive Research Forum, May 2017. <https://tinyurl.com/yymok8nm>

280 Lizotte, Todd E., and Orest Ohar. “Forensic Firearm Identification of Semiautomatic Handguns Using Laser Formed Microstamping Elements.” edited by Fred M. Dickey and Richard A. Beyer, 70700K. San Diego, California, USA, 2008. <https://doi.org/10.1117/12.796521>.

281 Collings, Robert B. “Microstamping Technology.” *American Bar Association*, August 2010. https://www.americanbar.org/groups/public_interest/gun_violence/policy/10A115/.

282 Obama, Barack. “Barack Obama: Guns Are Our Shared Responsibility.” *The New York Times*, January 8, 2016, sec. Opinion. <https://www.nytimes.com/2016/01/08/opinion/president-barack-obama-guns-are-our-shared-responsibility.html>.

in real-time and accelerate police response times,²⁸³ have also been embraced by police departments across the country. While they are shown to detect a greater share of gunfire than is otherwise reported to the police, there is little evidence they impact violent crime²⁸⁴ or increase case resolution.²⁸⁵ And such technologies have been criticized as uninvited surveillance that intrudes on privacy.²⁸⁶

Key research on firearm-related technology, 2013-20

- A 2020 longitudinal study in St. Louis, MO, found that implementation of an acoustic gunshot detection system increased demands for police resources but did not significantly reduce violent crime.²⁸⁷
- A 2019 study found that mass shootings involving large-capacity magazines resulted in 62 percent more deaths, on average, and states that did not restrict large-capacity magazines experienced significantly more high-fatality mass shootings and more deaths than states that restricted access to them.²⁸⁸
- A 2019 evaluation of acoustic gunshot detection in three cities found that on average, the technology generated a more comprehensive measure of shots fired than calls-for-service data and resulted in faster response times. The authors found mixed evidence that the technology affected crime rates both within and across cities.²⁸⁹
- A 2018 cross sectional study found that the case-fatality rate of gun assaults significantly increased as the caliber of the gun increased.²⁹⁰
- A 2016 study that employed acoustic gunshot detection data in Washington, DC, and Oakland, CA, found that only 12 percent of gunfire resulted in a 911 call and only 2 to 7 percent of incidents resulted in a reported firearm assault.²⁹¹

Key Research Questions

This leaves numerous vital questions to be addressed:

89. Can gun manufacturers be incentivized to accelerate development and distribution of locking devices such as biometric safes and other personalized devices, and would that motivate more gun owners to consistently store their guns safely? What types of new firearm safety technologies would be most appealing to gun owners?

283 La Vigne, Nancy G., Paige S. Thompson, Daniel S. Lawrence, and Margaret Goff. "Implementing Gunshot Detection Technology: Recommendations for Law Enforcement and Municipal Partners." Urban Institute, October 2019. <https://tinyurl.com/y2lbvgpe>

284 Mares, Dennis, and Emily Blackburn. "Acoustic Gunshot Detection Systems: A Quasi-Experimental Evaluation in St. Louis, MO." *Journal of Experimental Criminology*, January 2020. <https://doi.org/10.1007/s11292-019-09405-x>.

285 Choi, Kyung-Shick, Mitch Librett, and Taylor J. Collins. "An Empirical Evaluation: Gunshot Detection System and Its Effectiveness on Police Practices." *Police Practice and Research* 15, no. 1 (May 2013): 48–61. <https://doi.org/10.1080/15614263.2013.800671>.

286 Hedges, Ronald J., Maverick James, and Maria Ermakova. "Electronic Evidence in Criminal Investigations and Actions: Representative Court Decisions and Supplementary Materials," December 2017. <https://tinyurl.com/y6phrzs>

287 Mares, Dennis, et al. "Acoustic Gunshot Detection Systems."

288 Klarevas, Louis. "The Effect of Large-Capacity Magazine Bans." 1754–61.

289 La Vigne, Nancy G. "Implementing Gunshot Detection Technology."

290 Braga, Anthony A. "The Association of Firearm Caliber With Likelihood of Death." e180833.

291 Carr, Jillian, and Jennifer L. Doleac. "The Geography, Incidence, and Underreporting of Gun Violence: New Evidence Using Shotspotter Data." SSRN Scholarly Paper. Rochester, NY: Social Science Research Network, April 26, 2016. <https://papers.ssrn.com/abstract=2770506>.

90. How do available storage technologies compare with one another in terms of preventing unauthorized access to guns in real-world settings? Researchers often fail to distinguish between a wide variety of locking devices – from trigger locks to cable locks to safes – but how do they work in practice and under what circumstances are they effective?

91. What design elements could be integrated into firearms to further promote safe storage? Could health insurance companies play a role by incentivizing their use? Might building standards require storage devices akin to ordinances that have normalized smoke and carbon monoxide alarms?

92. Can a reliable, affordable, marketable personalized firearm be developed—one that can only be discharged by authorized users?²⁹² What impact would such a firearm have on household firearm prevalence? What impact would it have on all types of firearm injury, including suicide, homicide, intimate partner violence?

93. Are there other ways that a firearm could be designed to be inoperable during a suicide attempt or unauthorized use?

94. What can be done to increase the utility of gun tracing technologies and processes for identifying trafficking pathways and illegal markets? Since the mid-1990s, law enforcement agencies have embraced crime gun tracing and now submit nearly half a million guns to ATF a year seeking information on their provenance.²⁹³ But a significant share are unsuccessful due to problems in the tracing process, and the aggregate trace data has rarely been put to strategic use for fighting gun trafficking.^{294,295}

95. Can ballistics matching be used more effectively and strategically? Are there opportunities for combining it with trace data to disrupt gun trafficking? Various law enforcement agencies have embraced NIBIN and outside experts agree it is a promising technology, but its impact on crime and violence remains unclear.^{296,297}

96. What is the potential impact of microstamping, which more closely links discharged cartridge casings with the gun that fired them?

97. What is the evidence of the use of policing technologies for more closely monitoring and responding to illegal gun use, including acoustic gunshot detection, CCTV feeds, and processes for bringing them together and acting on them such as Chicago's Strategic Decision Support Centers? How are officers trained to use these technologies, and what are the policies governing their use? Do these and other technologies introduce racial

292 Simonetti, Joseph A., Ali Rowhani-Rahbar, and Frederick P. Rivara. "The Road Ahead for Personalized Firearms." *JAMA Internal Medicine* 177, no. 1 (January 2017): 9–10. <https://doi.org/10.1001/jamainternmed.2016.6718>.

293 The Bureau of Alcohol, Tobacco, Firearms and Explosives. "eTrace Factsheet." Washington, DC: The Bureau of Alcohol, Tobacco, Firearms and Explosives, June 2020. <https://www.atf.gov/resource-center/fact-sheet/fact-sheet-etrace-internet-based-firearms-tracing-and-analysis>

294 City of Chicago. "Gun Trace Report 2017." Chicago, IL: City of Chicago, October 2017.

<https://www.chicago.gov/content/dam/city/depts/mayor/Press%20Room/Press%20Releases/2017/October/GTR2017.pdf>.

295 Suplina, Nicholas, and Lacey Keller. "Target on Trafficking: New York Gun Crime Analysis." Office of the Attorney General of the State of New York (October 2016). <https://targettrafficking.ag.ny.gov>.

296 The Marshall Project. "This Machine Could Prevent Gun Violence."

297 The Policing Project. "A Closer Look at NIBIN: A Study In Evaluating Worth." The Policing Project, October 30, 2018. <https://www.policingproject.org/news-main/2018/10/30/a-closer-look-at-nibin>.

biases or undercut community trust?

“An array of new technologies hold promise in addressing gun crime and violence, from tools like ballistic imaging to alterations in the physical design of firearms themselves. We need more rigorous research to advance our understanding of how to implement these innovations for real-world impact.” –Nancy La Vigne, Executive Director, Task Force on Policing, The Council on Criminal Justice

98. How often are ‘ghost guns’ used in crimes, what steps can be taken to halt the proliferation of these technologies, and what impact have these measures had?

99. The calibers of America’s gun stock have been increasing,²⁹⁸ and higher calibers of firearms and ammunition are more lethal.²⁹⁹ How has this trend affected population safety, and what are the implications for policymakers?

100. Do regulations or taxes on ammunition sales affect community safety? In 2016, California voters passed by ballot measure a background check requirement for ammunition sales,³⁰⁰ and although its future is in the hands of the courts,³⁰¹ its impact could have implications for regulation of ammunition elsewhere in the country.

298 Sanger-Katz, Margot, and Quoc Trung Bui. “People Kill People. But the Bullets Seem to Matter. (Published 2019).” *The New York Times*, March 27, 2019, sec. The Upshot. <https://www.nytimes.com/interactive/2019/03/27/upshot/deadly-bullets-guns.html>.

299 Braga, Anthony A. “The Association of Firearm Caliber With Likelihood of Death.” e180833.

300 McGreevy, Patrick. “What Makes Prop. 63 Different than the Gun Control Laws Passed over Summer, and How That’s Split Gun Control Supporters.” *Los Angeles Times*, October 25, 2016. <https://www.latimes.com/politics/la-pol-ca-proposition-63-overlap-20161025-snap-story.html>.

301 Associated Press. “Court Reinstates California Ammunition Purchase Law.” *U.S. News and World Report*, April 25, 2020. <https://www.usnews.com/news/politics/articles/2020-04-25/court-reinstates-california-ammunition-purchase-law>.

CONCLUSION

The Joyce Foundation hopes this compendium of critical research questions will inform public and private sector efforts to build the science of gun violence prevention. While comprehensive, this list should not be considered exhaustive. The research topics identified in this report are intended to lead to actionable findings within the next five years. With this evidence, policy makers and practitioners can focus on the strategies that promise to have the most impact in reducing gun deaths and injuries and promoting safe and just communities.

Questions about this report can be addressed to info@joycefdn.org.

An aerial photograph of a city at dusk. The sky is a mix of deep blue and purple, with some clouds. The city below is illuminated by a grid of streetlights, creating a pattern of bright yellow and white lines that recede into the distance. The overall mood is serene and urban.

TheJoyceFoundation

www.joycefdn.org

 @JoyceFdn