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THE CITY OF SUNNYVALE, THE MAYOR OF
8 SUNNYVALE, ANTHONY SPITALERI in his
official capacity, THE CHIEF OF THE
9 SUNNYVALE DEPARTMENT OF PUBLIC
SAFETY, FRANK GRGURINA, in his official
10 capacity

11 UNITED STATES DISTRICT COURT
12 NORTHERN DISTRICT OF CALIFORNIA
13 SAN JOSE DIVISION
14

15 LEONARD FYOCK,
SCOTT HOCHSTETLER,
16 WILLIAM DOUGLAS,
DAVID PEARSON, BRAD SEIFERS, and
17 ROD SWANSON,

18 Plaintiffs,

19 v.

20 THE CITY OF SUNNYVALE, THE
MAYOR OF SUNNYVALE,
21 ANTHONY SPITALERI in his official
capacity, THE CHIEF OF THE
22 SUNNYVALE DEPARTMENT OF
PUBLIC SAFETY, FRANK GRGURINA,
23 in his official capacity, and DOES 1-10

24 Defendants.
25

Case No. 13-cv-05807 RMW

**DECLARATION OF JOHN J. DONOHUE III
IN SUPPORT OF SUNNYVALE'S
OPPOSITION TO PLAINTIFFS' MOTION
FOR PRELIMINARY INJUNCTION**

Action Filed: Dec. 16, 2013

26 I, John J. Donohue III, declare as follows:

27 1. I am the C. Wendell and Edith M. Carlsmith Professor of Law at Stanford Law
28 School. After earning a law degree from Harvard and a Ph.D in economics from Yale, I have

1 been a member of the legal academy since 1986, previously holding tenured positions at both
2 Yale Law School and Northwestern Law School. My research and writing uses empirical
3 analysis to determine the impact of law and public policy in a wide range of areas, including civil
4 rights and antidiscrimination law, employment discrimination, crime and criminal justice, and
5 school funding. I have written extensively about the relationship between rates of violent crime
6 and gun control. My complete credentials, experience, and background are stated in my
7 curriculum vitae, a true and correct copy of which is attached as Exhibit A.

8 2. I am familiar with the social science literature concerning gun ownership rates.
9 The General Social Science Survey (GSS) is an annual survey conducted by the National Opinion
10 Research Center, which is headquartered at the University of Chicago. The GSS is widely
11 regarded by social science researchers as the most reliable indicator of national social trends, in
12 part because of its professional implementation of face-to-face interviews using a very large
13 sample size (the latest GSS data comes from 57,061 respondents versus roughly 1000 in a typical
14 telephone survey) with a high response rate (always in excess of 70 percent versus telephone
15 survey responses which have fallen below 10 percent in recent surveys). *See* Pew Research
16 Center, "Assessing the Representativeness of Public Opinion Surveys," (May 15, 2012);
17 [http://www.people-press.org/2012/05/15/assessing-the-representativeness-of-public-opinion-](http://www.people-press.org/2012/05/15/assessing-the-representativeness-of-public-opinion-surveys/)
18 [surveys/](http://www.people-press.org/2012/05/15/assessing-the-representativeness-of-public-opinion-surveys/).

19 3. GSS data from 2012, the most recent year that data is available, states that 34% of
20 American households have at least one gun. In 2010, GSS data showed that 33% of American
21 households had at least one gun. *See* Miller *et al.*, "Firearms and Violent Death in the United
22 States," in Reducing Gun Violence in America, Webster and Vernick, eds. (Johns Hopkins
23 University Press 2013) (attached as Exhibit B). A 1994 national survey showed that 35% of
24 households owned guns. Cook & Ludwig, Guns in America: National Survey on Private
25 Ownership and Use of Firearms, National Institute of Justice: Research in Brief (May 1997)
26 (reporting that 35% of households own guns, according to 1994 survey, and that ownership of
27 private firearms is highly concentrated among a small percentage of gun owners) (attached as
28 Exhibit C).

1 4. This is a considerable drop from the approximately 50% of United States
2 households with one or more guns in the late 1970s, as reflected in GSS surveys. *See Miller et al.*
3 Other national surveys show similar results, such as research by the Pew Research Center and the
4 National Behavioral Risk Factor Surveillance System. These studies consistently find a persistent
5 decline in household gun ownership over the past several decades. A recent report from the Pew
6 Research Center states:

7 The Pew Research Center has tracked gun ownership since 1993,
8 and our surveys largely confirm the General Social Survey trend.
9 In our December 1993 survey, 45% reported having a gun in their
10 household; in early 1994, the GSS found 44% saying they had a
11 gun in their home. A January 2013 Pew Research Center survey
found 33% saying they had a gun, rifle or pistol in their home, as
did 34% in the 2012 wave of the General Social Survey.
[<http://www.people-press.org/2013/03/12/section-3-gun-ownership-trends-and-demographics>.]

12 5. Other surveys have differed from the GSS's conclusion that 34% of American
13 households had guns in 2012. The most recent Gallup survey found that 43% of American
14 households have at least one gun, as do 29% of American adults. There is no consensus about
15 why these estimates differ, although it should be noted that the Gallup polls are far smaller
16 surveys based on less reliable telephone interviews with dramatically lower response rates than
17 the GSS. Nonetheless, every survey of gun ownership conducted over time – including Gallup
18 polls – show that the percentage of household with guns today is lower than it was two decades
19 ago.

20 6. There is strong evidence that gun ownership is concentrated. Researchers
21 analyzing the results of a 2004 national survey found that 48% of individual gun owners,
22 corresponding to 13% of the US adult population, reported owning four or more firearms, and the
23 20% of gun owners who owned the most guns possessed about 65% of the nation's guns. *See*
24 Hepburn et al., "The US Gun Stock: Results from the 2004 National Firearms Survey," *Injury*
25 *Prevention* 2007;13:15-19 (attached as Exhibit D); *see also* Cook & Ludwig, *supra* (reporting
26 based on 1994 survey that 74% of gun owners possessed two or more guns and that the top 20%
27 of firearms owners possessed 55% of all firearms).

28 7. The FBI publishes records of the number of background checks requested, and

1 such background checks are often initiated pursuant to a desired purchase of firearms. With only
2 a couple of exceptions, the trend has been for the number of background checks conducted each
3 year to grow every year. *See* National Instant Criminal Background Check System (NICS)
4 Operations 2012, available at [http://www.fbi.gov/about-us/cjis/nics/reports/2012-operations-](http://www.fbi.gov/about-us/cjis/nics/reports/2012-operations-report)
5 [report](http://www.fbi.gov/about-us/cjis/nics/reports/2012-operations-report). Gun industry trade groups also cite increased background checks and an increase in
6 collections of the federal excise taxes collected on the sale of firearms and ammunition as
7 reflecting strong demand for firearms. *See, e.g.,* National Shooting Sports Foundation, "NSSF
8 Says 2012 Firearms Sales Outlook Promising After Record-Setting Year," (Jan. 18, 2012),
9 available at <http://nssf.org/newsroom/releases/show.cfm?PR=011812.cfm&path=2012>.

10 8. Because reliable social science data shows that the number of households that own
11 guns has likely dropped in recent decades, and certainly has not grown, it seems most likely that
12 robust gun sales can be attributed not to increasingly broad gun ownership but instead largely to
13 purchases of guns by members of households that previously owned guns, as well as to those who
14 are purchasing guns in anticipation that certain gun bans will be enacted with grandfather clauses
15 that will allow them to profit from the higher prices that follow when the supply of certain
16 weapons or LCMs is restricted.

17 9. I am not aware of any current social science research providing an estimate for the
18 number of American households that own large-capacity magazines or LCMs (defined as an
19 ammunition feeding device with the capacity to hold more than 10 rounds of ammunition) or for
20 the number of LCMs in private hands in America.

21 10. It is reasonable to assume that consumer demand for large-capacity magazines is
22 similar to demand for firearms generally. If that is the case, then LCM ownership by household is
23 also likely to be concentrated, with increased numbers of LCMs held by a declining share of
24 households. This would be consistent with a January 2013 New York Times/CBS News poll of
25 1,110 adults nationwide showing that nearly two-thirds of Americans favored a ban on high-
26 capacity magazines. [[http://www.nytimes.com/2013/02/19/us/politics/lawmakers-look-at-ban-on-](http://www.nytimes.com/2013/02/19/us/politics/lawmakers-look-at-ban-on-high-capacity-gun-magazines.html?_r=1&)
27 [high-capacity-gun-magazines.html?_r=1&.](http://www.nytimes.com/2013/02/19/us/politics/lawmakers-look-at-ban-on-high-capacity-gun-magazines.html?_r=1&)]

28 11. A review of the resolution of mass shootings in the U.S. suggests that bans on

1 large capacity magazines can be crucial to saving lives by forcing mass shooters to pause and
 2 reload ammunition. Citizens have frequently taken advantage of a perpetrator stopping to reload
 3 his weapon to tackle him or otherwise subdue him in at least 20 separate shootings in the United
 4 States since 1991, notably including the December 7th, 1993 shooting of passengers on a Long
 5 Island Railroad car,¹ the October 29th, 1994 shooting near the grounds of the White House,² and
 6 the January 8th, 2011 shooting in Tucson, AZ that targeted U.S. Congresswoman Gabby
 7 Giffords.³ In many other incidents, targeted victims were able to escape while a shooter reloaded.
 8 Perhaps the most vivid illustration of this benefit was seen when 11 children at Sandy Hook
 9 Elementary School were able to escape while Adam Lanza reloaded his 30 round LCM.⁴

10 I declare under penalty of perjury under the laws of the State of California that the
 11 foregoing is true and correct. Executed this 28 day of January, 2014, in Stanford, California.

12
 13 
 14 John J. Donohue III

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 21 ¹ "DEATH ON THE L.I.R.R.: The Rampage; Gunman in a Train Aisle Passes Out Death," *The*
 22 *New York Times*, December 9, 1993 - [http://www.nytimes.com/1993/12/09/nyregion/death-on-](http://www.nytimes.com/1993/12/09/nyregion/death-on-the-lirr-the-rampage-gunman-in-a-train-aisle-passes-out-death.html)
 23 [the-lirr-the-rampage-gunman-in-a-train-aisle-passes-out-death.html](http://www.nytimes.com/1993/12/09/nyregion/death-on-the-lirr-the-rampage-gunman-in-a-train-aisle-passes-out-death.html) (9-millimeter pistol, 15 round
 24 magazine).

25 ² "Public Report of the White House Security Review," Department of the Treasury, 1995 -
 26 <http://www.fas.org/firp/agency/ustreas/ussst/t1pubrpt.html> (Chinese-made SKS semiautomatic
 27 rifle, 30 round magazine).

28 ³ "Crowd members took gunman down," *Los Angeles Times*, January 9, 2011 -
<http://articles.latimes.com/2011/jan/09/nation/la-na-arizona-shooting-heroes-20110110> (9mm
 Glock handgun, 30 round extended magazine).

⁴ "Legislative Leaders Say Bipartisan Agreement Could Yield Nation's Strongest Gun-Control
 Bill," *The Hartford Courant*, April 1, 2013. - [http://articles.courant.com/2013-04-01/news/hc-](http://articles.courant.com/2013-04-01/news/hc-gun-deal-newtown-0413-20130401_1_adam-lanza-gun-owners-assault-rifle)
[gun-deal-newtown-0413-20130401_1_adam-lanza-gun-owners-assault-rifle](http://articles.courant.com/2013-04-01/news/hc-gun-deal-newtown-0413-20130401_1_adam-lanza-gun-owners-assault-rifle) (Bushmaster .223
 caliber rifle, high capacity 30 round magazine).

EXHIBIT A

To

**Declaration of John J. Donohue III in
Support of Sunnyvale's Opposition to
Plaintiffs' Motion for Preliminary
Injunction**

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<http://www.law.stanford.edu/directory/profile/528/John%20J.%20Donohue%20III/>

EMPLOYMENT

Full-time Positions

- Stanford Law School, C. Wendell and Edith M. Carlsmith Professor of Law, September 2010 to the present.
- Yale Law School, Leighton Homer Surbeck Professor of Law, July 2004 to August 2010.
- Stanford Law School, Professor of Law, September 1995 to June 2004.
 - William H. Neukom Professor of Law, February 2002 – June 2004.
 - John A. Wilson Distinguished Faculty Scholar, March 1997 – January 2002.
 - Academic Associate Dean for Research, since July 2001 – July 2003.
 - Stanford University Fellow, September 2001 – May 2003.
- Northwestern University School of Law:
 - Class of 1967 James B. Haddad Professor of Law, September 1994-August 1995
 - Harry B. Reese Teaching Professor, 1994-1995
 - Professor of Law, May 1991-September 1994
 - Associate Professor, May 1989-May 1991
 - Assistant Professor, September 1986-May 1989.
- Research Fellow, American Bar Foundation, September 1986-August 1995.
- Associate Attorney, Covington & Burling, Washington, D.C., October 1978-July 1981 (including last six months as Attorney, Neighborhood Legal Services)
- Law Clerk to Chief Justice T. Emmet Clarie, U.S. District Court, Hartford, Connecticut, September 1977-August 1978.

Temporary Appointments

- Visiting Professor, Bocconi University, Milan, Italy, October- November 2012.
- 2011 Faculty Scholar in Residence, University of Denver Sturm College of Law, April 21-22, 2011.
- Visiting Fellow, The Milton Friedman Institute for Research in Economics, University of Chicago, October 2009
- Schmidheiny Visiting Professor of Law and Economics, St. Gallen University, November – December, 2007.
- Visiting Lecturer in Law and Economics, Gerzensee Study Center, Switzerland, June 2007.
- Visiting Professor, Tel Aviv University School of Law, May 2007.
- Herbert Smith Visitor to the Law Faculty, University of Cambridge, England, February 2006.
- Visiting Professor, Harvard Law School, January 2003.

- Fellow, Center for Advanced Studies in the Behavioral Sciences, Stanford, California, Academic year 2000-01.
- Visiting Professor, Yale Law School, Fall, 1999.
- Professor, Center for the Study of American Law in China, Renmin University Law School, Beijing, July 1998.
- Visiting Professor of Law and Economics, University of Virginia, January 1997.
- Lecturer, Tooin University School of Law, Yokohama, Japan, May-June 1996.
- Cornell Law School, Distinguished Visiting Fellow in Law and Economics, April 8-12, 1996 and September 25-29, 2000
- Visiting Professor, University of Chicago Law School, January 1992-June 1992.
- Visiting Professor of Law and Economics, University of Virginia Law School, January 1990-May 1990.
- Fellow, Yale Law School Program in Civil Liability, July 1985-August 1986.
- Private Practice (part-time), New Haven, Connecticut, September 1981-August 1986.
- Instructor in Economics, Yale College, September 1983-August 1985.
- Summer Associate, Donovan Leisure Newton & Irvine, New York, Summer 1982.
- Summer Associate, Perkins, Coie, Stone, Olsen & Williams, Seattle, Washington, Summer 1976.
- Research Assistant, Prof. Laurence Lynn, Kennedy School of Government, Harvard University, Summer 1975.
- LSAT Tutor, Stanley Kaplan Education Center, Boston, Massachusetts; Research Assistant, Prof. Philip Heymann, Harvard Law School; Research Assistant, Prof. Gordon Chase, Harvard School of Public Health. (During Law School).

EDUCATION

Yale University, 1981-1986

- University Fellow in Economics; M.A. 1982, M. Phil. 1984, Ph.D. 1986.
 - Dissertation: "A Continuous-Time Stochastic Model of Job Mobility: A Comparison of Male-Female Hazard Rates of Young Workers." Awarded with Distinction by Yale.
 - Winner of the Michael E. Borus Award for best social science dissertation in the last three years making substantial use of the National Longitudinal Surveys--awarded by the Center for Human Research at Ohio State University on October 24, 1988.
- National Research Service Award, National Institute of Health.
- Member, Graduate Executive Committee; Graduate Affiliate, Jonathan Edwards College.

Harvard Law School, 1974-1977 (J.D.)

- Graduated Cum Laude.
- Activities: Law Clerk (Volunteer) for Judge John Forte, Appellate Division of the District Court of Central Middlesex; Civil Rights, Civil Liberties Law Review; Intra-mural Athletics; Clinical Placement (Third Year): (a) First Semester: Massachusetts Advocacy Center; (b) Second Semester: Massachusetts Attorney General's Office--Civil Rights and Consumer Protection Divisions. Drafted comments for the Massachusetts Attorney General on the proposed U.S. Department of Justice settlement of its case against Bechtel Corporation's adherence to the Arab Boycott of Israeli companies.

Hamilton College, 1970-1974 (B.A.)

- Departmental Honors in both Economics and Mathematics
 - Phi Beta Kappa (Junior Year)
- Graduated fourth in class with the following academic awards:
 - Brockway Prize
 - Edwin Huntington Memorial Mathematical Scholarship
 - Fayerweather Prize Scholarship
 - Oren Root Prize Scholarship in Mathematics
- President, Root-Jessup Public Affairs Council.

PUBLICATIONS

Books and Edited Volumes:

- Law and Economics of Discrimination, Edward Elgar Publishing, 2013.
- Employment Discrimination: Law and Theory, Foundation Press, 2005, 2009 (2d edition) (with George Rutherglen).
- Economics of Labor and Employment Law: Volumes I and II, Edward Elgar Publishing, 2007. http://www.e-elgar.co.uk/bookentry_main.lasso?id=4070
- Foundations of Employment Discrimination Law, Foundation Press, 2003 (2d edition).
- Foundations of Employment Discrimination Law, Oxford University Press, 1997 (Initial edition).

Book Chapters:

- "Drug Prohibitions and Its Alternatives." Chapter 2 in Cook, Philip J., Stephen Machin, Olivier Marie, and Giovanni Mastrobuoni, eds, *Lessons from the Economics of Crime: What Reduces Offending?* MIT Press. 45-66 (2013).
- "The Death Penalty," Chapter in Encyclopedia of Law and Economics, Spring (2013).
- "Rethinking America's Illegal Drug Policy," in Philip J. Cook, Jens Ludwig, and Justin McCrary, eds, Controlling Crime: Strategies and Tradeoffs (2011), pp.215-289 (with Benjamin Ewing and David Peloquin).

Articles:

- "The Impact of Right to Carry Laws and the NRC Report: The Latest Lessons for the Empirical Evaluation of Law and Policy" NBER Working Paper. Revised January 2014 (with Abhay Aneja and Alexandria Zhang).
- "Reflections on the Newtown Shooting One Year Later," Stanford Lawyer, December 5, 2013. <http://stanfordlawyer.law.stanford.edu/2013/12/reflections-on-the-newtown-shooting-one-year-later/>
- "Gun lunacy rides high in America," Special to CNN, September 13, 2013. <http://www.cnn.com/2013/09/13/opinion/donohue-gun-control/index.html?iref=allsearch>

- “Why the NRA fights background checks,” Special to CNN, Wed April 10, 2013.
<http://www.cnn.com/2013/04/10/opinion/donohue-background-checks/index.html>
- “Substance vs. Sideshows in the More Guns, Less Crime Debate: A Comment on Moody, Lott, and Marvell” (with Abhay Aneja, and Alexandria Zhang) ECON JOURNAL WATCH 10(1) January 2013: 32-39
- “Do Police Reduce Crime? A Reexamination of a Natural Experiment,” in Empirical Legal Studies of Judicial Systems (Yun-chien Chang ed., forthcoming, 2013) (with Daniel E. Ho & Patrick Leahy).
- “Jury Nullification in Modified Comparative Negligence Regimes,” 79 The University of Chicago Law Review 945 (2012)(with Eli K. Best).
- “What Can Be Done to Stem Gun Violence?” San Francisco Chronicle, December 21, 2012. <http://www.sfgate.com/opinion/article/What-can-be-done-to-stem-gun-violence-4139575.php#ixzz2G4qlkJJ2>
- “When Will America Wake Up to Gun Violence?” CNN opinion, July 21, 2012. Posted to: <http://www.cnn.com/2012/07/20/opinion/donohue-gun-control/>.
- “Time To Kill The Death Penalty?” The California Progress Report, June 28, 2012.
- “Assessing Post-ADA Employment: Some Econometric Evidence and Policy Considerations.” Journal of Empirical Legal Studies Vol. 8: No. 3, September 2011, pp. 477-503 (with Michael Ashley Stein, Christopher L. Griffin, Jr. and Sascha Becker).
- “The Impact of Right-to-Carry Laws and the NRC Report: Lessons for the Empirical Evaluation of Law and Policy”, Am Law Econ Rev (Fall 2011) 13 (2): 565-631 (with Abhay Aneja and Alex Zhang). Revised in Donohue, John J., Aneja, Abhay and Zhang, Alexandria, “The Impact of Right to Carry Laws and the NRC Report: The Latest Lessons for the Empirical Evaluation of Law and Policy” (July 27, 2012). Available at SSRN: <http://ssrn.com/abstract=2118893>.
- “Punishment is a Cost, Not a Benefit,” Review of Mark A. R. Kleiman’s “When Brute Force Fails: How to Have Less Crime and Less Punishment,” XLVII Journal of Economic Literature (March 2010), 168-172.
- “The Politics of Judicial Opposition: Comment,” Journal of Institutional and Theoretical Economics, 166(1), 108—114 (2010).
- “Introduction to the Death Penalty Symposium,” 11 American Law and Economics Review, v (Fall 2009) (with Steve Shavell).
- “Estimating the Impact of the Death Penalty on Murder,” 11 American Law and Economics Review 249 (Fall 2009) (with Justin Wolfers).
- “The Impact of the Death Penalty on Murder,” Criminology & Public Policy (November 2009, Volume 8, Issue 4) at pp. 795-801.
- “The Impact of Legalized Abortion on Teen Childbearing,” 11 American Law and Economics Review 24 (2009) (with Jeff Grogger and Steven Levitt).

- “Assessing the Relative Benefits of Incarceration: The Overall Change Over the Previous Decades and the Benefits on the Margin,” in Steven Raphael and Michael Stoll, eds., “Do Prisons Make Us Safer? The Benefits and Costs of the Prison Boom,” pp. 269-341 (2009).
- “More Guns, Less Crime Fails Again: The Latest Evidence from 1977-2006,” 6 Econ Journal Watch 218-233 (May 2009)(with Ian Ayres).
- “Yet Another Refutation of the More Guns, Less Crime Hypothesis – With Some Help From Moody and Marvell,” 6 Econ Journal Watch 35-59 (January 2009)(with Ian Ayres).
- “AntiDiscrimination Law,” in Steven Durlauf and Lawrence Bloom, eds., The New Palgrave Dictionary of Economics, 2d Edition, 2008.
- “Murder in Decline in the 1990s: Why the U.S. and N.Y.C. Were Not That Special,” Punishment and Society 10: 333 (2008) at <http://pun.sagepub.com>
- “Understanding the 1990s Crime Drops in the U.S. and Canada,” Canadian Journal of Criminology and Criminal Justice, Vol 49, No. 4, p. 552 (October 2007) at <http://www.ccja-acjp.ca/en/cjcr200/cjcr278.html>
- “The Law and Economics of Antidiscrimination Law,” A. M. Polinsky and Steven Shavell, eds., Handbook of Law and Economics, Volume 2 (2007), Pages 1387-1472.
- “Economic Models of Crime and Punishment,” Social Research, Vol. 74: No. 2, Summer 2007, pp. 379-412.
- “Rethink the War on Drugs,” Yale Law Reports, Summer 2007, pp. 46-47.
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- “The Impact of Damage Caps on Malpractice Claims: Randomization Inference with Difference-in-Differences,” (with Daniel Ho), 4 Journal of Empirical Legal Studies 69 (2007).
- “The Discretion of Judges and Corporate Executives: An Insider’s View of the Disney Case,” The Economists’ Voice: Vol. 3: No. 8, Article 4. Available at: <http://www.bepress.com/ev/vol3/iss8/art4>
- “The Knicks Boldly Go Where Companies Have Not,” The New York Times, July 2, 2006 Sunday (with Ian Ayres).
- “The Death Penalty: No Evidence of Deterrence,” The Economists’ Voice, (with Justin Wolfers) (April 2006), [http://bpp.wharton.upenn.edu/jwolfers/Press/DeathPenalty\(BEPRESS\).pdf](http://bpp.wharton.upenn.edu/jwolfers/Press/DeathPenalty(BEPRESS).pdf).
- Reprinted in Stiglitz, Edlin, and DeLong (eds), The Economists’ Voice: Top Economists Take on Today’s Problems (2008).
- “The Costs of Wrongful-Discharge Laws,” 88 Review of Economics and Statistics (with David Autor and Stewart Schwab)(2006), pp. 211-31.
- “Security, Democracy, and Restraint,” 1 Opening Argument 4 (February 2006).
- Reprinted in Loch Johnson and James Wirtz, Intelligence and National Security: An Anthology 406-407 (2d ed. 2008).

- “Uses and Abuses of Empirical Evidence in the Death Penalty Debate,” 58 Stanford Law Review 791 (2005) (with Justin Wolfers).
 - Reprinted in Steven Levitt and Thomas Miles, eds., The Economics of Criminal Law, Edward Elgar Publishing (2008).
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- “Does Terrorism Increase Crime? A Cautionary Tale,” (with Daniel Ho), 2005.
- “The Evolution of Employment Discrimination Law in the 1990s: A Preliminary Empirical Evaluation” (with Peter Siegelman), in Laura Beth Nielsen and Robert L. Nelson, eds., Handbook of Employment Discrimination Research (2005).
- “Fighting Crime: An Economist’s View,” 7 The Milken Institute Review 46 (2005).
 - Reprinted in Kurt Finsterbusch, ed., Social Problems (McGraw-Hill, 2006).
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- “Guns, Crime, and the Impact of State Right-to-Carry Laws,” 73 Fordham Law Review 623 (2004).
- “Clinton and Bush’s Report Cards on Crime Reduction: The Data Show Bush Policies Are Undermining Clinton Gains”, The Economists’ Voice: Vol. 1: No. 1, Article 4. 2004, <http://www.bepress.com/ev/vol1/iss1/art4>
- “The Employment Consequences of Wrongful-Discharge Laws: Large, Small, or None at All?” American Economic Review: Papers and Proceedings May, 2004 (with David Autor and Stewart Schwab).
- “Further Evidence that Legalized Abortion Lowered Crime: A Reply To Joyce,” 39 Journal of Human Resources 29 (Winter 2004)(with Steven Levitt).
- “The Final Bullet in the Body of the More Guns, Less Crime Hypothesis,” Criminology & Public Policy (July 2003, Volume 2, Issue 3) at pp. 397-410.
- “Shooting Down the ‘More Guns, Less Crime’ Hypothesis,” 55 Stanford Law Review 1193 (2003)(with Ian Ayres).
- “The Latest Misfires in Support of the ‘More Guns, Less Crime’ Hypothesis,” 55 Stanford Law Review 1371 (2003)(with Ian Ayres).
- “Can Guns, Or Gun Violence, Be Controlled?” (Reviewing James Jacobs, Can Gun Control Work?), The American Prospect (December 16, 2002), p. 35.
- “Divining the Impact of Concealed Carry Laws,” in Jens Ludwig and Philip Cook, Evaluating Gun Policy: Effects on Crime and Violence (Washington D.C.: Brookings, 2003).
- “The Search for Truth: In Appreciation of James J. Heckman,” 27 Law and Social Inquiry 23 (2002).
- “The Schooling of Southern Blacks: The Roles of Social Activism and Private Philanthropy, 1910-1960,” Quarterly Journal of Economics (Feb. 2002), (with James Heckman and Petra Todd), pp. 225 – 268.
 - Reprinted in Legal Decisionmaking section of the American Bar Foundation Anthology, ABF Press (2007).

- Reprinted in American Bar Foundation, Analyzing Law's Reach: Empirical Research on Law and Society (2008)
- "The Impact of Race on Policing and Arrests," Journal of Law and Economics, vol. XLIV October 2001)(with Steven Levitt), pp. 367 – 394.
- "The Impact of Legalized Abortion on Crime," Quarterly Journal of Economics (Vol. CXVI, Issue 2, May 2001)(with Steven Levitt) pp. 379-420.
 - Reprinted in Steven Levitt and Thomas Miles, eds., The Economics of Criminal Law, Edward Elgar Publishing (2008).
 - Reprinted in Robert Cooter and Francesco Parisi, eds., Recent Developments In Law And Economics, Edward Elgar Publishing (2010).
- "Understanding the Reasons for and Impact of Legislatively Mandated Benefits for Selected Workers," 53 Stanford Law Review 897 (2001).
 - Reprinted in Michael Zimmer, Charles Sullivan et al, Cases and Materials on Employment Discrimination (6th edition)(2003).
- "Nondiscretionary Concealed Weapons Law: A Case Study of Statistics, Standards of Proof, and Public Policy," American Law and Economics Review 436 (1999)(with Ian Ayres).
 - Reprinted in Steven Levitt and Thomas Miles, eds., The Economics of Criminal Law, Edward Elgar Publishing (2008).
- "Why We Should Discount the Views of Those Who Discount Discounting," 108 Yale Law Journal 1901 (1999).
- "Understanding The Time Path of Crime," 88 Journal of Criminal Law and Criminology 1423 (1998).
- "Discrimination in Employment," The New Palgrave Dictionary of Law and Economics (1998).
 - Excerpted in Lynne Dallas, Law and Public Policy: A Socio-Economic Approach (2003).
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- "Allocating Resources Among Prisons and Social Programs In the Battle Against Crime," 27 Journal of Legal Studies 1 (1998) (with Peter Siegelman).
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- "Guns, Violence, and the Efficiency of Illegal Markets," 88 American Economic Review 463 (May 1998)(with Steve Levitt).
- "Did *Miranda* Diminish Police Effectiveness?" 50 Stanford Law Review 1147 (1998).
- "Some Thoughts on Affirmative Action," 75 Washington University Law Quarterly 1590 (1997).
- "Executive Compensation," 3 Stanford Journal of Law, Business & Finance 1 (1997).
- "Some Perspective on Crime and Criminal Justice Policy," Lawrence Friedman and George Fisher, eds., The Crime Conundrum: Essays on Criminal Justice 45 (1997).
- "The Selection of Employment Discrimination Disputes for Litigation: Using Business Cycle Effects to Test the Priest/Klein Hypothesis," 24 Journal of Legal Studies 427 (1995) (with Peter Siegelman).

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- "Liberal Law and Economics," (reviewing Rethinking the Progressive Agenda by Susan Rose-Ackerman), 13 Journal of Policy Analysis and Management 192 (1994).
- Review of Richard Epstein's Forbidden Grounds: The Case Against Employment Discrimination Laws, 31 Journal of Economic Literature 1477 (1994).
- "Law and Macroeconomics: Employment Discrimination Over the Business Cycle," 66 University of S. Calif. L. Rev. 709 (1993) (with Peter Siegelman).
- "Advocacy Versus Analysis In Assessing Employment Discrimination Law," 44 Stanford Law Review 1583 (1992).
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- "The Effects of Fee Shifting on the Settlement Rate: Theoretical Observations on Costs, Conflicts, and Contingency Fees," 54 Law and Contemporary Problems 195 (1991).
- "Re-Evaluating Federal Civil Rights Policy," 79 Georgetown Law Journal 1713 (1991) (with James Heckman).
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- "Continuous versus Episodic Change: The Impact of Civil Rights Policy on the Economic Status of Blacks," 29 Journal of Economic Literature 1603 (December 1991) (with James Heckman).
- Reprinted in Paul Burstein, ed., Equal Employment Opportunity, Aldine De Gruyter, New York (1994).
- "The Impact of Federal Civil Rights Policy on the Economic Status of Blacks," 14 Harvard Journal of Law and Public Policy 41 (1991).
- "Studying the Iceberg From Its Tip: A Comparison of Published and Unpublished Employment Discrimination Cases," 24 Law and Society Review 1133 (1990) (with Peter Siegelman).
- "Prohibiting Sex Discrimination in the Workplace: An Economic Perspective," 56 University of Chicago Law Review 1337 (1989).
- "The Law & Economics of Tort Law: The Profound Revolution," 102 Harvard Law Review 1047 (1989).
- "Using Market Incentives to Promote Auto Occupant Safety," 7 Yale Law and Policy Review 449 (1989).

- "Diverting the Coasean River: Incentive Schemes to Reduce Unemployment Spells," 99 Yale Law Journal 549 (1989).
- Winner of the 1989 Scholarly Paper Competition, Association of American Law Schools.
- "Reply to Professors Ellickson and Stigler," 99 Yale Law Journal 635 (1989).
- "Law and Economics: The Road Not Taken," 22 Law and Society Review 903 (1988).
- "Further Thoughts on Employment Discrimination Legislation: A Reply to Judge Posner," 136 U. Pa. L. Rev. 523 (1987).
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- "Posner's Third Symphony: Thinking about the Unthinkable," 39 Stanford Law Review 791 (1987)(with Ian Ayres).
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- "Godfrey v. Georgia: Creative Federalism, the Eighth Amendment, and the Evolving Law of Death," 30 Catholic University Law Review 13 (1980).
- "Criminal Code Revision--Contempt of Court and Related Offenses," Hearings before the Subcommittee on Criminal Justice of the House Judiciary Committee, July 18, 1979, at 1087.

Blog Posts:

- "When will America wake up to gun violence?" CNN.com, July 20, 2012,
<http://www.cnn.com/2012/07/20/opinion/donohue-gun-control/index.html>
- "It Takes Laws to Control the Bad Guys," The New York Times -- Room For Debate:
<http://www.nytimes.com/roomfordebate/2011/01/11/more-guns-less-crime> (January 11, 2011).
- "Have 'Woman-Protective' Studies Resolved the Abortion Debate? Don't Bet on It,"
<http://balkin.blogspot.com/2008/09/have-woman-protective-studies-resolved.html> (September 2008).
- "Dodging the Death Penalty Bullet On Child Rape," <http://balkin.blogspot.com/2008/07/dodging-death-penalty-bullet-on-child.html> (July 2008).

- “Why I’d Stick With Yale Clerks-- Some Econometric Ruminations,” <http://balkin.blogspot.com/2008/04/why-id-stick-with-yale-clerks-some.html> (April 2008).

WORKSHOPS AND ADDRESSES

- “Trial and Decision in the Connecticut Death Penalty Litigation,” Faculty Workshop, **Stanford Law School**, November 20, 2013.
- “Rethinking America’s Illegal Drug Policy,” Law and Economics Workshop, **Harvard Law School**, April 20, 2010; NBER Conference, “Economical Crime Control,” **Boalt Hall**, Berkeley, CA, January 16, 2010; **NBER Summer Institute** Pre-Conference “Economical Crime Control,” July 23, 2009; **Whitney Center** Lecture Series, Hamden, CT, October 5, 2009; Law and Economics Workshop, **University of Chicago Law School**, October 13, 2009; Seminar for Spanish Law Professors, **Harvard Law School**, October 23, 2009; The Criminal Law Society, **Stanford Law School**, March 31, 2011, **University of Denver Sturm College of Law**, April 21, 2011; Law and Economics Workshop, **Boalt Hall**, Berkeley, CA, October 17, 2011; Shaking the Foundations Conference, **Stanford Law School**, November 2, 2013.
- “The Challenge to the Connecticut Death Penalty,” **Yale Law School**, Death Penalty Clinic, November 5, 2007; Graduate Student Seminar, November 11, 2009; Stanford Program in International Legal Studies Seminar, **Stanford Law School**, Nov. 11, 2010; Faculty Workshop, **Stanford Law School**, June 8, 2011; Faculty workshop, **Duke Law School**, April 13, 2012; Program on Public Policy, **Stanford University**, May 2, 2012; Annual Meeting of the American Law and Economics Association, **Vanderbilt Law School**, Nashville, TN, May 18, 2013; Faculty Workshop, **University of Arizona Law School**, October 17, 2013; 8th Annual Conference on Empirical Legal Studies, **University of Pennsylvania Law School**, October 26, 2013.
- Commentator: “How to Lie with Rape Statistics” by Corey Rayburn Yung, 8th Annual Conference on Empirical Legal Studies, **University of Pennsylvania Law School**, October 2013.
- “An Empirical Look at Gun Violence in the U.S.” **University of Arizona Law School**, October 17, 2013
- Discussant, “Sex Offender Registration and Plea Bargaining,” **NBER Labor Summer Institute**, Cambridge, MA, July 25, 2013.
- “What Works in the War Against Crime?” **Renaissance Weekend**, Jackson Hole, Wyoming, July 5, 2013.
- Seminar Presentation, “Statistics and the Streets – Curbing Crime, Realities of the Death Penalty, and Successes in Public Safety,” **Renaissance Weekend**, Jackson Hole, Wyoming, July 5, 2013.
- Flashes of Genius (Glimpses of Extra-ordinarily Novel Thinking) -- “Stemming Gun Violence,” **Renaissance Weekend**, Jackson Hole, Wyoming, July 5, 2013.
- “Can Laws Reduce Crime?” Safe Oakland Speakers Series, Holy Names University, Oakland, CA, May 1, 2013, <http://www.ustream.tv/channel/safe-oakland-speaker-series>
- Presentation on “The Death Penalty in America” on a panel on “human rights and criminal justice systems in the world,” Science for Peace conference at Bocconi University in Milan, Italy, November 15, 2012. <http://www.fondazioneveronesi.it/scienceforpeace2012/>

- Seminar Presentation, "America's Criminal Justice System," **Renaissance Weekend**, Santa Monica, CA., Feb. 19, 2012.
- "Statistical Inference, Regression Analysis and Common Mistakes in Empirical Research," SPILLS Fellow's Workshop, **Stanford Law School**, February 2, 2012.
- "New Evidence in the 'More Guns, Less Crime' Debate: A Synthetic Controls Approach," Conference on Empirical Legal Studies, **Northwestern Law School**, November 4, 2011.
- "Drug Legalization and its Alternatives," *Lessons from the Economics of Crime: What Works in Reducing Offending?* **CESifo Venice Summer Institute Workshop**, July 22, 2011.
- "Incapacitating Addictions: Drug Policy and American Criminal Justice," in Rethinking the War on Drugs through the US-Mexico Prism," **Yale Center for the Study of Globalization**, May 12, 2011.
- Plenary Session: Flashes of Genius (Glimpses of Extra-ordinarily Novel Thinking) -- "Has Legalized Abortion Reduced Crime?" **Renaissance Weekend**, Liguna Niguel, CA., Feb. 18, 2011.
- "An Evidence-Based Look at the More Guns, Less Crime Theory (after Tucson)" The American Constitution Society for Law and Policy (ACS), **Stanford Law School**, January 25, 2011; **Renaissance Weekend**, Liguna Niguel, CA., Feb. 19, 2011; "Faculty Forum" at the External Relations Office, **Stanford Law School**, April 5, 2011.
- "Empirical Evaluation of Law: The Dream and the Nightmare," Legal Studies Workshop, **Stanford Law School**, Feb. 7, 2011; **Renaissance Weekend**, Liguna Niguel, CA., Feb. 20, 2011; **University of Denver Sturm College of Law**, April 22, 2011; Presidential Address, Annual Meeting of the American Law and Economics Association, **Columbia University**, May 20, 2011.
- Death Sentencing in Connecticut," **American Society of Criminology Annual Meeting**, San Francisco, Nov. 17, 2010.
- "The Impact of Right to Carry Laws and the NRC Report: Lessons for the Empirical Evaluation of Law and Policy," Conference on Empirical Legal Studies, **Yale Law School**, Nov. 6, 2010.
- Comment on Bushway and Gelbach, "Testing for Racial Discrimination in Bail Setting Using Nonparametric Estimation of a Parametric Model," Conference on Empirical Legal Studies, **Yale Law School**, Nov. 6, 2010.
- Commentator, "A Test of Racial Bias in Capital Sentencing," **NBER Political Economy Program Meeting**, April 23, 2010.
- "The (Lack of a) Deterrent Effect of Capital Punishment," Faculty Workshop, **University of Chicago Economics Department**, October 21, 2009.
- Keynote Address, "The Evolution of Econometric Evaluation of Crime and Deterrence," 1st Paris& Bonn Workshop on Law and Economics: The Empirics of Crime and Deterrence, **University of Paris Ouest Nanterre**, September 24, 2009.
- Comment on Cook, Ludwig, and Samaha, "Gun Control after *Heller*: Litigating Against Regulation," NBER Regulation and Litigation Conference, **The Boulders**, Carefree, Arizona, September 11, 2009.
- "Impact of the Death Penalty on Murder in the US," Faculty Workshop, Law School, **Universitat Pompeu Fabra (Barcelona)**, June 18, 2009.

- Comment on Joanna Shepherd's "The Politics of Judicial Opposition," Journal of Institutional and Theoretical Economics Conference, **Kloster Eberbach, Germany**, June 12, 2009.
- "The Great American Crime Drop of the '90s: Some Thoughts on Abortion Legalization, Guns, Prisons, and the Death Penalty," **Hamilton College**, Clinton, NY, June 5, 2009.
- "The Impact of the ADA on the Employment and Earnings of the Disabled," **American Law and Economics Association Meetings**, University of San Diego, May 15, 2009.
- "Crime and Punishment in the United States," **Eastern State Penitentiary, Yale Alumni Event**, Philadelphia, PA, April 26, 2009.
- "Measuring Culpability in Death Penalty Cases," Conference on Applications of Economic Analysis in Law, **Fuqua School of Business, Duke University**, April 18, 2009.
- "Autopsy of a Financial Crisis," Workshop on New International Rules and Bodies for Regulating Financial Markets, **State University of Milan**, March 23, 2009.
- "Yet Another Refutation of the More Guns, Less Crime Hypothesis – With Some Help From Moody and Marvell, Law and Economics Workshop, **NYU Law School**, March 10, 2009.
- Intelligence-Squared Debate: "Guns Reduce Crime," **Rockefeller University**, New York, October 28, 2008.
- "The D.C. Handgun Controls: Did the Supreme Court's Decision Make the City Safer?" Debate, **The Contemporary Club of Albemarle**, Charlottesville, VA, October 23, 2008.
- "Evaluating the Empirical Claims of the Woman-Protective Anti-Abortion Movement," Panel on The Facts of the Matter: Science, Public Health, and Counseling, Yale Conference on the Future of Sexual and Reproductive Rights, **Yale Law School**, October 11, 2008.
- "Can You Believe Econometric Evaluations of Law, Policy, and Medicine?" **Stanford Law School**, Legal Theory Workshop, March 1, 2007; Faculty Workshop, **Tel Aviv University School of Law**, May 14, 2007; Faculty Workshop, **University of Haifa Law School**, May 16, 2007; Law and Economics Workshop, **Georgetown Law School**, September 19, 2007; Law and Economics Workshop, **St. Gallen Law School**, Switzerland, November 29, 2007; and Yale Law School, February 25, 2008; Law and Economics Workshop, **Swiss Institute of Technology**, Zurich, Switzerland, May 21, 2008; Faculty Workshop, **University of Virginia Law School**, October 24, 2008; Plenary Session, Latin American and Caribbean Law and Economics Association, **Universitat Pompeu Fabra (Barcelona)**, June 15, 2009.
- "Empirical Evaluation of Gun Policy," **Harvard Law School**, October 9, 2008.
- "Assessing the Relative Benefits of Incarceration: The Overall Change Over the Previous Decades and the Benefits on the Margin," **Russell Sage Foundation**, New York, May 3, 2007; Law and Economics Workshop, **Tel Aviv University School of Law**, May 28, 2008.
- Death Penalty Debate with Orin Kerr, Bloggingheads, April 11, 2008.
- "Evaluating Connecticut's Death Penalty Regime," Faculty Public Interest Conversation, **Yale Law School**, April 9, 2008.
- "The Death Penalty in Connecticut and the United States," **The Whitney Center**, Hamden, CT, November 5, 2007; Seminar on Advanced Criminal Law: Criminal Sentencing and the Death Penalty, **Fordham Law School**, April 8, 2008; Law and Economics Workshop, **Swiss Institute of Technology**, Zurich, Switzerland, May 20, 2008.

- Radio Interview, "The Death of Capital Punishment?" Morning Edition: Where We Live. WNPR. Connecticut, March 10, 2008.
- Comment on Thomas Dee's "Born to Be Mild: Motorcycle Helmets and Traffic Safety," **American Economics Association Meetings**, New Orleans, Louisiana, January 4, 2008.
- "The Empirical Revolution in Law and Policy: Jubilation and Tribulation," **Keynote Address, Conference on Empirical Legal Studies, NYU Law School**, November 9, 2007.
- "The Optimal Rate of Incarceration," **Harvard Law School**, October 26, 2007.
- "Empirical Evaluation of Law: The Impact on U.S. Crime Rates of Incarceration, the Death Penalty, Guns, and Abortion," Law and Economics Workshop, **St. Gallen Law School, Switzerland**, June 25, 2007.
- Comment on Eric Baumer's "A Comprehensive Assessment of the Contemporary Crime Trends Puzzle," Committee on Law and Justice Workshop on Understanding Crime Trends, **National Academy of Sciences**, Washington, D.C., April 25, 2007.
- Comment on Bernard Harcourt, Third Annual Criminal Justice Roundtable Conference, **Yale Law School**, "Rethinking the Incarceration Revolution Part II: State Level Analysis," April 14, 2006.
- "Corporate Governance in America: The Disney Case," **Catholic University Law School**, Milan, Italy, March 19, 2007.
- "The U.S. Tort System," (Latin American) Linkages Program, **Yale Law School**, February 13, 2007.
- Panel Member, "Guns and Violence in the U.S.," **Yale University, International Center**, January 24, 2007.
- "Economic Models of Crime and Punishment," Punishment: The U.S. Record: A Social Research Conference at **The New School**, New York City, Nov. 30, 2006
- Comment on Baldus et al, "Equal Justice and the Death Penalty: The Experience of the United States Armed Forces, Conference on Empirical Legal Studies, **University of Texas Law School**, Austin, Texas, October 27, 2006.
- "Empirical Evaluation of Law: The Promise and the Peril," **Harvard Law School**, October 26, 2006.
- "Estimating the Impact of the Death Penalty on Murder," Law and Economics Workshop, **Harvard Law School**, September 12, 2006; Conference on Empirical Legal Studies, **University of Texas Law School**, October 28, 2006; Joint Workshop, Maryland Population Research Center and School of Public Policy, **University of Maryland**, March 9, 2007.
- "Why Are Auto Fatalities Dropping so Sharply?" **Faculty Workshop, Wharton**, Philadelphia, PA, April 19, 2006.
- "The Law of Racial Profiling," Law and Economic Perspectives on Profiling Workshop, **Northwestern University Department of Economics**, April 7, 2006.
- "Landmines and Goldmines: Why It's Hard to Find Truth and Easy To Peddle Falsehood in Empirical Evaluation of Law and Policy," **Rosenthal Lectures, Northwestern University School of Law**, April 4-6, 2006.
- "The Impact of Legalized Abortion on Crime," **American Enterprise Institute**, March 28, 2006.
- "The Impact of Damage Caps on Malpractice Claims: Randomization Inference with Difference-in-Differences," **Conference on Medical Malpractice, The Rand Corporation**, March 11, 2006.

- “Powerful Evidence the Death Penalty Deters?” **Leighton Homer Surbeck Chair Lecture, Yale Law School**, March 7, 2006.
- “Uses and Abuses of Empirical Evidence in the Death Penalty Debate,” Faculty Workshop, **University of Connecticut Law School**, October 18, 2005; Faculty Workshop, **UCLA Law School**, February 3, 2006; Law and Economics Workshop, **Stanford Law School**, February 16, 2006; ; Law Faculty, **University of Cambridge, Cambridge, England**, February 28, 2006; **University of Illinois College of Law**, Law and Economics Workshop, March 2, 2006; Faculty Workshop, **Florida State University Law School**, March 30, 2006; **ALEA**, Berkeley, CA May 6, 2006; **University of Chicago Law School**, Law and Economics Workshop, May 9, 2006.
- “Is Gun Control Illiberal?” Federalist Society Debate with Dan Kahan at Yale Law School, January 31, 2006.
- “Witness to Deception: An Insider’s Look at the Disney Trial,” **2005-2006 Distinguished Lecture, Boston University School of Law**, November 10, 2005; Center for the Study of Corporate Law, **Yale Law School**, November 3, 2005; **Law Offices of Herbert Smith, London, England**, February 23, 2006; Law Faculty, **University of Cambridge, Cambridge, England**, February 27, 2006.
- “Understanding the Surprising Fall in Crime in the 1990s,” **Rotary Club**, Orange, CT, August 5, 2005; Faculty Workshop, **Yale School of Management**, September 21, 2005.
- Panel Member, “The Board's Role in Corporate Strategy,” The Yale Global Governance Forum, **Yale School of Management**, September 8, 2005.
- “Crime and Abortion,” **Museo de la Ciudad de Mexico**, Mexico City, October 20, 2003.
- “Allocating Resources towards Social Problems and Away From Incarceration as a Means of Reducing Crime,” **MacArthur Foundation Research Network on Adolescent Development and Juvenile Justice**, San Francisco, CA, February 28, 2003.
- “Shooting Down the More Guns, Less Crime Hypothesis,” **Stanford Law School**, Law and Economics Seminar, January 28, 2003; Faculty Workshop, Center for the Study of Law and Society, **Boalt Hall**, University of California, Berkeley, Feb. 24, 2003; Development Workshop, **Stanford Law School**, April 25, 2003; Faculty Workshop, **Stanford Law School**, July 2, 2003; Law and Public Affairs Program Workshop, **Princeton University**, September 29, 2003; Stanford Alumni Weekend, **Stanford University**, October 17, 2003; Faculty Workshop, **CIDE**, Mexico City, October 20, 2003.
- “The Impact of Legalized Abortion on Teen Childbearing,” **NBER Labor Summer Institute**, Cambridge, MA, July 30, 2002.
- “Do Concealed Handgun Laws Reduce Crime?” Faculty Workshop, **Stanford Law School**, October 4, 2000; First-Year Orientation, **Stanford Law School**, September 5, 2001; Faculty Workshop, **Harvard Law School**, April 26, 2002; Faculty Workshop, **Columbia Law School**, April 29, 2002.
- “The Evolution of Employment Discrimination Law in the 1990s: An Empirical Investigation,” Fellows Workshop, American Bar Foundation, February 11, 2002.
- “The Role of Discounting in Evaluating Social Programs Impacting on Future Generations: Comment on Arrow and Revesz,” Colloquium on Distributive Justice, **Stanford Law School**, Oct. 18, 2001.
- “The Impact of Wrongful Discharge Laws,” **NBER Labor Summer Institute**, Cambridge, MA, July 30, 2001; Labor and Employment Seminar, **NYU Law School**, October 16, 2001; Faculty Workshop, **Stanford Law School**, September 18, 2002; **Yale Law School**, January, 2004.

- “Racial Profiling: Defining the Problem, Understanding the Cause, Finding the Solution,” **American Society of Criminology Conference**, San Francisco, CA, November 15, 2000.
- “Institutional Architecture for Building Private Markets,” Conference on “Latin America and The New Economy” at **Diego Portales University** in Santiago, Chile, October 26, 2000.
- “The History and Current Status of Employment Discrimination Law in the United States,” Unicapital School of Law, (Centro Universitario Capital), Sao Paulo, Brazil, March 10, 2000.
- “Corporate Governance in Developing Countries: Opportunities and Dangers,” Conference on Neoliberal Policies for Development: Analysis and Criticism,” University of Sao Paulo Law School, March 13, 2000
- “Legalized Abortion and Crime,” Law and Economics Workshop, **University of Pennsylvania Law School**, September 21, 1999; Faculty Workshop, **Yale Law School**, September 27, 1999; **John Jay College of Criminal Justice**, October 7, 1999; Faculty Workshop, **Quinnipiac Law School**, October 13, 1999; Faculty Workshop, **University of Connecticut Law School**, October 19, 1999; **University of Virginia Law School**, October 25, 1999; Faculty Workshop, **Baruch College**, November 9, 1999; MacArthur Foundation Social Interactions and Economic Inequality Network Meeting, **Brookings Institution**, December 4, 1999; Faculty Workshop, **NYU Law School**, January 21, 2000; Faculty Workshop, **University of San Diego Law School**, February 18, 2000; Public Economics Workshop, Department of Economics, **Stanford University**, April 28, 2000; Law and Economics Workshop, **University of California at Berkeley Law School**, September 18, 2000; Faculty Workshop, **Cornell Law School**, September 26, 2000; OB-GYN Grand Rounds, **Stanford Medical School**, October 2, 2000; **Center for Advanced Studies in the Behavioral Sciences**, October 11, 2000; Faculty Workshop, **Graduate School of Business**, February 5, 2002.
- Panel member, Session on Executive Compensation, Director's College, **Stanford Law School**, March 23, 1999.
- “Exploring the Link Between Legalization of Abortion in the 1970s and Falling Crime in the 1990s,” Law and Economics Workshop, **Harvard Law School**, March 16, 1999; Law and Economics Workshop, **University of Chicago Law School**, April 27, 1999; Faculty Workshop, **Stanford Law School**, June 30, 1999.
- “Is the Increasing Reliance on Incarceration a Cost-Effective Strategy of Fighting Crime?” Faculty Workshop, **University of Wisconsin School of Social Science**, February 19, 1999.
- “What Do We Know About Options Compensation?” Institutional Investors Forum, **Stanford Law School**, May 29, 1998.
- Commentator on Orlando Patterson’s presentation on “The Ordeal of Integration,” **Stanford Economics Department**, May 20, 1998.
- “Understanding The Time Path of Crime,” Presentation at Conference on Why is Crime Decreasing? **Northwestern University School of Law**, March 28, 1998; Faculty Workshop, **Stanford Law School**, September 16, 1998; Faculty Workshop, **University of Michigan Law School**, February 18, 1999.
- Commentator, Conference on Public and Private Penalties, the **University of Chicago Law School**, Dec. 13-14, 1997.
- “Some Thoughts on Affirmative Action,” Presentation at a conference on Rethinking Equality in the Global Society, **Washington University School of Law**, November 10, 1997.
- Commentator on Chris Jencks’ Presentation on Welfare Policy, **Stanford Economics Department**, October 8, 1997.

- “The Impact of Race on Policing, Arrest Patterns, and Crime,” Faculty Workshop, **Stanford Law School**, September 10, 1997; Law and Economics Workshop, **University of Southern California Law School**, October 23, 1997; Law and Economics Workshop, **Columbia University Law School**, November 24, 1997; Law and Economics Workshop, Haas School of Business, **University of California at Berkeley**, February 19, 1998; Annual Meeting of the American Law and Economics Association, **University of California at Berkeley**, May 8, 1998; Conference on the Economics of Law Enforcement, **Harvard Law School**, October 17, 1998.
- “Crime in America: Understanding Trends, Evaluating Policy,” **Stanford Sierra Camp**, August 1997.
- “Executive Compensation: What Do We Know?” TIAA-CREF Committees on Corporate Governance and Social Responsibility, Center for Economic Policy Research, **Stanford University**, June 27, 1997; NASDAQ Director’s Day, **Stanford University**, June 30, 1997.
- Panel Chair, Criminal Law (Theory), Criminal Law (Empirical), and Labor/Discrimination/Family Law, American Law and Economics Association, **University of Toronto Law School**, May 9-10, 1997.
- Commentator, “Diversity in Law School Hiring,” **Stanford Law School**, February 25, 1997.
- Keynote Speaker, “The Optimal Rate of Crime,” 11th Annual Conference, **The Oklahoma Academy for State Goals**, Tulsa, Oklahoma, May 7, 1996.
- Panel member, Session on Executive Compensation, Director's College, **Stanford Law School**, March 28-29, 1996.
- “The Power of Law: Can Law Make a Difference in Improving the Position of Women and Minorities in the Labor Market?” The Fellows of the **American Bar Foundation**, Baltimore, Maryland, February 3, 1996.
- “Public Action, Private Choice and Philanthropy: Understanding the Sources of Improvement in Black Schooling Quality in Georgia, 1911-1960,” **Stanford Faculty Workshop**, January 24, 1996; Faculty Workshop, **University of Virginia Law School**, January 22, 1997; **National Bureau of Economic Research**, Cambridge, Massachusetts, Labor Studies Conference, April 3, 1998.
- Commentator, “The Effect of Increased Incarceration on Crime,” Meetings of the **American Economics Association**, San Francisco, January 6, 1996.
- Commentator, Symposium on Labor Law, **University of Texas Law School**, November 10-11, 1995.
- Panel Member, Symposium on Criminal Justice, **Stanford Law School**, October 6-7, 1995.
- Commentator, “The Litigious Plaintiff Hypothesis,” Industrial and Labor Relations Conference, **Cornell University**, May 19, 1995.
- Commentator on Keith Hylton's, “Fee Shifting and Predictability of Law,” Faculty Workshop, **Northwestern University School of Law**, February 27, 1995.
- “The Selection of Employment Discrimination Disputes for Litigation: Using Business Cycle Effects to Test the Priest/Klein Hypothesis,” **Stanford University**, Law and Economics Seminars, October 31, 1994.
- “Is the United States at the Optimal Rate of Crime?” Faculty Workshop, **Indiana University School of Law**, Indianapolis, November 18, 1993; Faculty Workshop, **Northwestern University School of Law**, April 18, 1994; Law and Economics Workshop, **Stanford Law School**, April 28, 1994; Meetings of the American Law and Economics Association, **Stanford Law School**, May 13, 1994; **American Bar Foundation**, September 7, 1994; Faculty Workshop, **DePaul Law School**, September 21, 1994; Law and Economics Workshop, **University of**

Chicago Law School, October 11, 1994; Faculty Seminar, **Stanford Law School**, October 31, 1994; Law and Economics Luncheon, **Stanford Law School**, November 1, 1994; Faculty Seminar Workshop, **University of Illinois College of Law**, Champaign, November 22, 1994; Law and Economics Workshop, **Harvard Law School**, November 29, 1994; School Alumni Luncheon, Chicago Club, December 13, 1994; **Northwestern Law School**; Law and Economics Workshop, **Yale Law School**, February 1, 1996; Faculty Workshop, **Cornell Law School**, April 10, 1996; Faculty Workshop, **Tokyo University Law School**, June 4, 1996; Panel on "The Economics of Crime," **Western Economics Association** Meeting, San Francisco, July 1, 1996.

- "The Broad Path of Law and Economics," Chair Ceremony, **Northwestern University School of Law**, September 30, 1994.
- Commentator on Paul Robinson's "A Failure of Moral Conviction," **Northwestern University School of Law**, September 20, 1994.
- "The Do's of Diversity, The Don'ts of Discrimination," Kellogg School of Business, **Northwestern University**, May 17, 1994.
- "Does Law Matter in the Realm of Discrimination?" **Law and Society Summer Institute**, Pala Mesa Lodge, Fallbrook, California, June 25, 1993.
- Commentator, "The Double Minority: Race and Sex Interactions in the Job Market," Society for the Advancement of Socio-Economics, **New School for Social Research**, March 28, 1993.
- "The Effects of Joint and Several Liability on Settlement Rates: Mathematical Symmetries and Meta-Issues in the Analysis of Rational Litigant Behavior," Economic Analysis of Civil Procedure, **University of Virginia School of Law**, March 26, 1993.
- Debate with Richard Epstein on Employment Discrimination Law, **Chicago Federalist Society**, February 23, 1993.
- Panel Chair, "Optimal Sanctions and Legal Rules in Tort and Criminal Law," Meetings of Annual Association of Law and Economics, **Yale Law School**, May 15, 1992.
- Panel Member, "The Law and Economics of Employment at Will," **The Institute For Humane Studies**, Fairfax, Virginia, March 27, 1992.
- "The Efficacy of Title VII," Debate with Professor Richard Epstein, **University of Chicago Law School**, February 26, 1992.
- Moderator, "Using Testers to Demonstrate Racial Discrimination," **University of Chicago Law School**, February 13, 1992.
- "Law & Macroeconomics: The Effect of the Business Cycle on Employment Discrimination Litigation," Law and Society Workshop, **Indiana University**, November 6, 1991; Faculty Workshop, **University of North Carolina Law School**, Chapel Hill, November 8, 1991; Faculty Workshop, **Northwestern University School of Law**, December 11, 1991; Law and
- Economics Conference, **Duquesne Law School**, March 14, 1992; **University of Chicago Law School**, April 2, 1992.
- Panel Chair and Commentator, "New Perspectives on Law and Economics," **Society for the Advancement of Socioeconomics**, Stockholm, June 17, 1991; **Law and Society Meetings**, Amsterdam, June 29, 1991.

- Panel Chair, "Regulation of International Capital Markets," **Law and Society Meetings**, Amsterdam, June 27, 1991.
- Panel Chair, "The Law and Economics of Discrimination," American Association of Law and Economics, **University of Illinois Law School**, May 24, 1991.
- "The Economics of Employment Discrimination Law," **Industrial Relations Research Association**, Chicago, Illinois, March 4, 1991.
- "Does Current Employment Discrimination Law Help or Hinder Minority Economic Empowerment?" Debate with Professor Richard Epstein, The Federalist Society, **Northwestern Law School**, February 26, 1991.
- Panel Member, "The Law and Economics of Employment Discrimination," **AALS Annual Meeting**, Washington, D.C., January 6, 1991.
- "Re-Evaluating Federal Civil Rights Policy," Conference on the Law and Economics of Racial Discrimination in Employment, **Georgetown University Law Center**, November 30, 1990.
- "Opting for the British Rule," Faculty Seminar, **Northwestern Law School**, September 11, 1990; Faculty Seminar, **University of Virginia Law School**, September 14, 1990; Law and Economics Seminar, **University of Michigan Law School**, October 18, 1990; Faculty Workshop, **NYU Law School**, November 14, 1990; Faculty Workshop, **University of Florida Law School**, March 18, 1991.
- "The Effects of Fee Shifting on the Settlement Rate: Theoretical Observations on Costs, Conflicts, and Contingency Fees," at the **Yale Law School Conference "Modern Civil Procedure: Issues in Controversy,"** June 16, 1990.
- "Studying the Iceberg From Its Tip?: An Analysis of the Differences Between Published and Unpublished Employment Discrimination Cases," **Law and Society Meetings**, Berkeley, California, May 31, 1990.
- Panel Discussion on Tort Reform, **University of Pennsylvania Law School**, April 27, 1990.
- Panel Discussion of "The Role of Government in Closing the Socio-Economic Gap for Minorities," at the Federalist Society National Symposium on "The Future of Civil Rights Law," **Stanford Law School**, March 16, 1990.
- "Continuous versus Episodic Change: The Impact of Affirmative Action and Civil Rights Policy on the Economic Status of Blacks," **University of Virginia Economics Department**, February 15, 1990; **Princeton University Department of Economics**, February 21, 1990 (with James Heckman); Law & Economics Workshop, **University of Toronto Law School**, October 8, 1991.
- "Sex Discrimination in the Workplace: An Economic Perspective," Fellows Seminar, **American Bar Foundation**, October 16, 1989.
- "The Changing Nature of Employment Discrimination Litigation," Law and Economics Workshop, **Columbia Law School**, March 23, 1989; Faculty Seminar, **University of Virginia Law School**, March 24, 1989; Law and Economics Workshop, **University of Chicago**, April 25, 1989; **Law & Society Meeting**; Madison, Wisconsin, June 8, 1989; Labor Economics Workshop, **University of Illinois**, Chicago, November 1, 1989; Law & Economics Workshop, **University of Pennsylvania Law School**, November 9, 1989; Law and Economics Seminar, **University of California at Berkeley**, October 4, 1990; Law and Social Science Workshop, **Northwestern University**, February 3, 1991; Law and Economics Seminar, **Stanford Law School**, March 21, 1991; Faculty Workshop, **Cornell Law School**, April 3, 1991; Visiting Committee, **Northwestern Law School**, April 5, 1991.

- "Law & Economics: The Third Phase," The Association of General Counsel, **Northwestern University School of Law**, October 14, 1988.
- "Employment Discrimination Litigation," **Northwestern Law School** Alumni Monthly Loop Luncheon. **Chicago Bar Association**, May 31, 1988.
- "The Morality of the Death Penalty." A debate with Ernest Van Den Haag. **Northwestern University School of Law**, April 19, 1988.
- "Models of Deregulation of International Capital Markets." A presentation with David Van Zandt, Faculty Seminar, **Northwestern University School of Law**, April 1, 1988; Visiting Committee, May 5, 1988.
- "Is Title VII Efficient?" A debate with Judge Richard Posner, Faculty Seminar, **Northwestern University School of Law**, November 20, 1987.
- "The Senate's Role in Confirming Supreme Court Nominees: The Historical Record," **Northwestern University School of Law**, September 22, 1987.
- "Diverting the Coasean River: Incentive Schemes to Reduce Unemployment Spells," **Yale Law School** Civil Liability Workshop, March 30, 1987; Faculty Seminar, **Northwestern University School of Law**, March 18, 1987; **University of Southern California Law Center**, May 1, 1987; and Seminar in Law and Politics, Department of Political Science, **Northwestern University**, May 8, 1987; Labor Workshop, Department of Economics, **Northwestern University**, October 27, 1987; **AALS Annual Meeting**, New Orleans, January 7, 1989.
- "Women in the Labor Market--Are Things Getting Better or Worse?" **Hamilton College**, February 23, 1987.
- "The Changing Relative Quit Rates of Young Male and Female Workers," **Hamilton-Colgate Joint Faculty Economics Seminar**, February 23, 1987.
- "Living on Borrowed Money and Time--U.S. Fiscal Policy and the Prospect of Explosive Public Debt," **Orange Rotary Club**, February 22, 1985.
- "Capital Punishment in the Eighties," **Hamilton College**, April 6, 1981.
- "Terms and Conditions of Sale Under the Uniform Commercial Code," Executive Sales Conference, **National Machine Tool Builders' Association**, May 12, 1980.

PROFESSIONAL ACTIVITIES

- Co-Editor (with Steven Shavell), [American Law and Economics Review](#), May 2006 – August 2012.
- President, American Law and Economics Association, May 2011 – May 2012.
- Co-President, Society for Empirical Legal Studies, November 2011 - August 2012. Member, Board of Directors from November 2011 - November 2014.
- Member, Committee on Law and Justice, National Research Council, October 2011 – present.
- Testified before the Connecticut Legislature in Support of Senate Bill 1035 and House Bill 6425 (A Bill to Eliminate the Death Penalty)., March 7, 2011; Testified again before the Connecticut Judiciary Committee on March 14, 2012.
- Member of the Special Committee on ALI Young Scholars Medal, October 2009 – February 2011.

- Vice-President/President Elect, American Law and Economics Association, June 2010 – May 2011.
- Secretary-Treasurer, American Law and Economics Association, June 2009 – May 2010.
- Board of Advisors, Yale Law School Center for the Study of Corporate Law, July 2004 – August 2010.
- Evaluated the Connecticut death penalty system: “Capitol Punishment in Connecticut, 1973-2007: A Comprehensive Evaluation from 4600 murders to One Execution,”
http://works.bepress.com/john_donohue/55/
- Member, Panel on Methods for Assessing Discrimination, National Academy of Sciences, September 2001 – June 2004. Resulting Publication: National Research Council, Measuring Racial Discrimination (2004),
<http://www.nap.edu/catalog/10887.html>
- Member, National Science Foundation Review Panel, Law and Social Sciences, September, 1999 – April 2001.
- Editorial Board, Journal of Empirical Legal Studies, July 2003 – present.
- Editorial Board, International Review of Law and Economics, October 1999 – present.
- Editorial Board, Law and Social Inquiry, February 2000 – present.
- Board of Editors, American Law and Economics Review, August 1998 – April 2013.
- Consultant, Planning Meeting on Measuring the Crime Control Effectiveness of Criminal Justice Sanctions, National Academy of Sciences, Washington, D.C., June 11, 1998
- Member, Board of Directors, American Law and Economics Association, June 1994-May 1997. Member, ALEA Nominating Committee, July 1995-May 1996. Member, Program Committee, July 1996-May 1998 and July 2000 – May 2002.
- Statistical Consultant, 7th Circuit Court of Appeals Settlement Conference Project (December, 1994).
- Testified before U.S. Senate Labor Committee on evaluating the Job Corps, October 4, 1994.
- Assisted the American Bar Association Standing Committee on the Federal Judiciary in evaluating the qualifications of Ruth Bader Ginsburg (June 1993) and David Souter (June, 1990).
- Chair, AALS Section on Law and Economics, January 1990-January 1991.
- Economic Consultant to Federal Courts Study Committee. Analyzing the role of the federal courts and projected caseload for Judge Richard Posner's subcommittee. February 1989-March 1990.
- Member, 1990 AALS Scholarly Papers Committee.
- Member, Advisory Board, Corporate Counsel Center, Northwestern University School of Law. Since December 1987.
- Associate Editor, Law and Social Inquiry. Summer 1987-December 1989.
- Interviewed Administrative Law Judge candidates for U.S. Office of Personnel Management. Chicago, Illinois. May 23, 1988.
- Member, Congressman Bruce Morrison's Military Academy Selection Committee. Fall 1983.

- 1982 Candidate for Democratic Nomination, Connecticut State Senate, 14th District (Milford, Orange, West Haven).

PRO BONO LEGAL WORK

- Death Penalty case: Heath v. Alabama. Fall 1986-Fall 1989.
- Wrote brief opposing death sentence in Navy spy case. Court ruled in favor of defendant on September 13, 1985.
- Staff Attorney, Neighborhood Legal Services, January-July 1981.
- Appealed sentence of death for Georgia defendant to the United States Supreme Court. Sentence vacated on May 27, 1980. Baker v. Georgia.
- Court-appointed representation of indigent criminal defendant in District of Columbia Superior Court, February-July 1980.

RESEARCH GRANTS

- Stanford University Research Fund, January 1997 and January 1998.
- The National Science Foundation (project with James Heckman), December 1992; (project with Steve Levitt), July 1997.
- Fund for Labor Relations Studies, University of Michigan Law School, March 1988.

BAR ADMISSIONS

- Connecticut - October 1977; District of Columbia - March 1978 (Currently Inactive Status); United States Supreme Court - November 1980; U.S. District Court for the District of Connecticut – February 14, 1978.

PROFESSIONAL and HONORARY ASSOCIATIONS

- American Academy of Arts and Sciences (since April 2009).
- Research Associate, National Bureau of Economic Research (since October 1996) – in Law and Economics and Labor Studies.
- American Law Institute (since September 29, 2010).
- American Bar Association
- American Economic Association
- American Law and Economics Association

PERSONAL

- Born: January 30, 1953.

EXHIBIT B

To

**Declaration of John J. Donohue III in
Support of Sunnyvale's Opposition to
Plaintiffs' Motion for Preliminary
Injunction**

Reducing Gun Violence in America

Informing Policy with Evidence and Analysis

EDITED BY

Daniel W. Webster, ScD, MPH,
and Jon S. Vernick, JD, MPH

Center for Gun Policy and Research
Johns Hopkins Bloomberg School of Public Health

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Firearms and Violent Death in the United States

Matthew Miller, Deborah Azrael,
and David Hemenway

Firearm-Related Deaths in the United States

In 2010, there were more than 31,000 firearm deaths in the United States: 62% were suicides, 36% were homicides, and 2% were unintentional (2%) (CDC 2012a). Almost as many Americans die from gunfire as die from motor vehicle crashes (almost 34,000 in 2010). Americans under age 40 are more likely to die from gunfire than from any specific disease (CDC 2012a).

Homicide

The United States is not a more violent country than other high-income nations. Our rates of car theft, burglary, robbery, sexual assault, and aggravated assault are similar to those of other high-income countries (van Kesteren, Mayhew, and Nieuwbeerta 2001); our adolescent fighting rates are also similar (Pickett

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Table 1.1 Homicide, suicide, and unintentional gun deaths among 5-14 year olds: The United States versus 25 other high-income populous countries (early 2003)

	Mortality rate ratio
Homicides	
Gun homicides	13.2
Non-gun homicides	1.7
Total	3.4
Suicides	
Gun suicides	7.8
Non-gun suicides	1.3
Total	1.7
Unintentional firearm deaths	10.3

Source: Richardson and Hemenway 2011

et al. 2013). However, when Americans are violent, the injuries that result are more likely to prove fatal. For example, the U.S. rate of firearm homicide for children 5 to 14 years of age is thirteen times higher than the firearms homicide rate of other developed nations, and the rate of homicide overall is more than three times higher (Table 1.1).

U.S. homicide rates vary cyclically over time. Current rates are at a 30-year low, but as recently as 1991 rates were nearly twice as high (CDC 2012a). Changes in homicide rates over the past several decades are largely attributable to changes in firearm homicide rates, mostly driven by changes in firearm homicide rates among adolescent and young men in large cities (Hepburn and Hemenway 2004, Blumstein and Wallman 2000, Cork 1999, Cook and John 2002).¹

The U.S. homicide rate is much higher in urban than in rural areas, as are rates of all violent crime. Nine out of ten homicide offenders are male, and 75% of victims are male. African Americans are disproportionately represented among both perpetrators and victims.²

Suicide

Compared with other high-income countries, the U.S. adult suicide rate falls roughly in the middle. Among younger persons, however, our suicide mortality is relatively high: for children under 15 years of age, the overall suicide

rate in the United States is 1.6 times that of the average of other high-income countries, largely accounted for by a firearm suicide rate eight times that of the average of these countries (Richardson and Hemenway 2011).

Over the past several decades, suicide rates have been more stable than have rates of homicide (Miller, Azrael, and Barber 2012). Nevertheless, after declining from a peak of 12.9/100,000 in 1986 to 10.4 in 2000, driven largely by a decline in the rate of firearm suicide, the suicide rate has increased over the past decade to 12.4/100,000 in 2010, mostly due to an increase in suicide by hanging (Miller, Azrael, and Barber 2012, CDC 2012a).

Age, sex, race, and other demographic characteristics—including marital status, income, educational attainment, and employment status—all influence suicide mortality (Nock et al. 2008). Suicide rates are higher, for example, for white and Native Americans than for black, Hispanic, and Asian Americans (CDC 2007). A consistent finding across numerous studies is that the strongest individual-level risk factor for a fatal suicidal act is having previously attempted suicide; other strong risk factors include psychiatric and substance abuse disorders (Shaffer et al. 1996).

In contrast to homicide rates, suicide rates are higher in rural than in urban areas almost entirely due to higher rates of firearm suicide in rural areas.

Unintentional Firearm Deaths

Approximately 675 Americans per year were killed unintentionally with firearms between 2001 and 2010 (CDC 2007). Data from the National Violent Death Reporting System show that two-thirds of the accidental shooting deaths occurred in someone's home, about half of the victims were younger than 25 years, and half of all deaths were other-inflicted. In other-inflicted shootings, the victim was typically shot accidentally by a friend or family member—often an older brother (Hemenway, Barber, and Miller 2010).

Firearm Ownership in the United States

The United States has more private guns per capita (particularly more handguns) and higher levels of household gun ownership than other developed countries (Killias 1993, SAS 2007).

Most of what we know about gun ownership levels in the United States over the past several decades comes from the General Social Survey (GSS 2010),

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a relatively small biannual survey of U.S. adults. Data from the GSS show that the percentage of households with firearms has fallen from approximately 50% in the late 1970s to 33% today. Changing household demographics are believed to explain the decline in the household ownership of guns chiefly due to a fall in the number of households with an adult male (Smith 2000). Notably, however, the percentage of individuals owning firearms has remained relatively constant over the past several decades (GSS 2010).

The GSS does not speak to the number of guns in civilian hands or the distribution of guns within households. For this information, researchers have turned to data from two medium-sized national surveys conducted a decade apart. These surveys suggest that the number of guns in civilian hands grew from approximately 200 million in 1994 to 300 million in 2004—and that the average gun owner now owns more guns than previously (Hepburn et al. 2007, Cook and Ludwig 1997).

Compared with other Americans, gun owners are disproportionately male, married, older than 40, and more likely to live in nonurban areas. Their long guns (rifles, shotguns) are owned mainly for sport (hunting and target shooting). People who own only handguns typically own the guns for protection against crime (Hepburn et al. 2007, Cook 1979).

In 2001, 2002, and 2004, but not before or since, information on household gun ownership from the General Social Survey was supplemented by information from the National Behavioral Risk Factor Surveillance System (CDC 1997). The BRFSS is of sufficient size (more than 200,000 respondents annually) that household gun ownership could, for the first time, be determined at the state level for all 50 states and for some Metropolitan Statistical Areas.

Prior to these three iterations of the BRFSS, researchers generally used proxies to measure firearm ownership rates at the state and sub-state level. A validation study by Azrael, Philip, and Miller (2004) found that from among all proxies, the fraction of suicides that are committed with firearms (FS/S) correlates most strongly and consistently with cross-sectional survey-based measures of household firearm ownership at the county, state, and regional levels.

Household firearm ownership is probably a good measure of the accessibility of guns used in suicides, since most suicides involving firearms occur in the home (Kellermann et al. 1992, CDC 2012b) and involve a firearm owned by a member of the household (Kellermann et al. 1992). Household gun owner-

ship levels seem also to be the key exposure variable for firearm homicides that take place in the home, where women, children and older adults are particularly likely to be killed. The most common perpetrator in such instances is a family member (CDC 2012b). By contrast, older adolescent and young adult males are more often killed outside the home by guns owned by a non-family member.³

In this essay, we focus on studies that assess the relationship between gun prevalence and violent death. As such, the essay does not examine studies of gun carrying nor any literature on illegal gun markets. It also does not address research that investigates the relationship between firearm regulations and violent death. Note, however, that firearm prevalence and firearm regulation are highly collinear. Strong regulations may limit firearm ownership, and low levels of firearm ownership make it easier to pass stronger regulations.

This essay is also not an exhaustive review of the literature examining the association of firearm availability and violent death. (For more comprehensive reviews, see Hepburn and Hemenway 2004, Miller and Hemenway 1999, and Brent 2001.) Rather, it briefly summarizes (a) international ecologic studies comparing the United States to other countries, (b) ecologic studies of U.S. regions, states, and metropolitan areas, and (c) individual case-control and cohort studies.

Studies included in this brief review met a minimal threshold of attempting to control for important confounders: studies had to compare likes to likes. For case-control studies of homicide, that means—at a minimum—controlling for age, gender, and neighborhood; in suicide studies, for age, sex, and psychiatric risk factors for suicidal behavior. For international studies of homicide, it means comparing high-income countries to high-income countries. International comparisons of adult suicide rates are confounded by large differences in religion, culture and recording practices (i.e., the social meaning and cultural acceptance of adult suicide), as evidenced by tenfold differences in suicide rates across high-income nations. Thus, the only international studies of suicide included focus on the suicides of children—which all countries hold to be tragedies. For ecologic studies in the United States, making “like to like” comparisons means comparing states to states with similar levels of urbanization (or, for homicide, similar crime rates), cities to cities, and rural areas to rural areas.⁴

Firearms and Homicide

Ecologic Studies

Killias (1993) evaluated rates of violence in 14 developed countries: 11 in Europe, along with the United States, Canada, and Australia. He used data from the 1989 International Crime Survey, a telephone survey of 14 countries and 28,000 respondents, to measure firearm prevalence. Respondents were asked whether there were any firearms in their household and, if so, whether any were a handgun or a long gun. Military firearms were excluded. In this study, which did not include control variables, rates of firearm ownership and homicide were positively correlated, while rates of firearm ownership and non-firearm homicide were not.

A study by Hemenway and Miller (2000) included 26 high-income nations with populations greater than one million. To measure gun availability, the authors used two proxies, including FS/S. No control variables were included in the analysis. Firearm availability was strongly and significantly associated with homicide across the 26 countries.

A follow-up study (Hemenway, Shinoda-Tagawa, and Miller 2002) examined homicide rates among women across high-income countries. The validated proxy (FS/S, or the percentage of suicides committed with a firearm) was used to estimate firearm ownership in each country. Urbanization and income inequality were included as control variables. The United States accounted for 70% of all female homicide victims in the study and had the highest firearm ownership rates. The U.S. homicide rate for women was five times higher than that of all of the other countries combined; its female firearm homicide rate was eleven times higher.

U.S. Studies

Cook (1979) conducted a cross-sectional analysis of 50 large cities in the United States to explore the relationship between gun availability and robbery, including robbery-murder. Using data on the number of robberies in 1975, Cook examined how firearm availability (as proxied by Cook's index) was related to robbery and robbery-murder rates, controlling for measures of the effectiveness of the criminal justice system, population density, and other regional and state differences. Increased gun availability was not associated with overall robbery rates, but it was positively associated with the proportion of robber-

ies that involved a gun—and with the per capita robbery-murder rate, through an increased rate of gun robbery.

Miller et al. (2002) evaluated the relationship between levels of firearm ownership at the state and regional level and the incidence of homicide from 1988 to 1997 for 50 states and 9 regions. At the state level, they used the percentage of suicides with a firearm as a proxy for ownership and they measured gun availability at the regional level with data from the GSS. Five potential confounders were included: poverty, urbanization, unemployment, alcohol consumption, and (non-homicide) violent crime rates. In the multivariate analyses, a positive and significant association between gun ownership and homicide rates was found for the entire population and for every age group (except ages 0–4), primarily due to higher firearm homicide rates.

A similar study (Miller et al. 2007) used survey estimates of household gun ownership for each state from the Behavioral Risk Factor Surveillance System. It examined data from 2001 to 2003 and controlled for state-level rates of aggravated assault, robbery, unemployment, urbanization, alcohol consumption, poverty, income inequality, the percentage of the population that was black, and the percentage of families headed by a single female parent. Again, states with higher rates of household firearm ownership had significantly higher homicide victimization rates for men, for women, and for children. The association was driven by gun-related homicide victimization rates; non-gun-related victimization rates were not significantly associated with rates of firearm ownership.

Individual Level Studies

Ecologic studies provide evidence about whether more guns in the community are associated with more homicides in the community. Case-control and cohort studies provide data more germane to the question of whether a gun in the home increases or reduces the risk of homicide victimization for members of the household.

Kellermann et al. examined approximately 400 homicide victims from three metropolitan areas who were killed in their homes (Kellermann et al. 1993). All died from gunshot wounds. In 83% of the homicides, the perpetrator was identified; among these cases, 95% of the time, the perpetrator was not a stranger. In only 14% of all the cases was there evidence of forced entry. After controlling for illicit drug use, fights, arrests, living alone, and whether the home was rented,

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Table 1.2 NVDRS 2005–2010

	Firearm			Non-firearm		
	N	Occurred in a house/apt	Occurred at victim's residence	N	Occurred in a house/apt	Occurred at victim's residence
Homicides by age group						
0–4 yrs	81	75%	67%	1,025	90%	77%
5–14 yrs	257	72%	51%	205	78%	67%
15–24 yrs	5,679	37%	16%	1,385	47%	27%
25–34 yrs	4,906	44%	24%	1,479	56%	39%
35–64 yrs	5,003	56%	41%	3,716	62%	50%
65+ yrs	470	74%	69%	719	79%	76%
Suicides by age group						
0–4 yrs	—			—		
5–14 yrs	105	97%	88%	301	91%	88%
15–24 yrs	3,332	75%	64%	3,769	69%	65%
25–34 yrs	4,034	76%	67%	4,743	70%	65%
35–64 yrs	15,634	78%	74%	16,568	72%	70%
65+ yrs	6,019	89%	88%	2,168	80%	83%

Note: Unknowns for age (0.7%), house/apt (1.4%), home (3.6%) were set aside.

the presence of a gun in the home remained strongly associated with an increased risk for homicide in the home. Gun ownership was most strongly associated with an increased risk of homicide by a family member or intimate acquaintance.⁵

Whereas most men are murdered away from home, most children, older adults, and women are murdered at home (Table 1.2). A gun in the home is a particularly strong risk factor for female homicide victimization—with the greatest danger for women coming from their intimate partners.

The heightened risk of femicide is illustrated in a subgroup analysis of female homicide victimization from Kellermann's 1993 case-control study of homicide in the home. A spouse, a lover, or a close relative murdered most of the women decedents, and the increased risk for homicide from having a gun in the home was attributable to these homicides (Bailey, Flewelling, and Rosenbaum 1997). A case-control study by Wiebe et al. (2003) also found that the risk of homicide associated with living in a home with guns was particularly high for women (who were almost three times more likely to become homicide victims compared with women living in homes without guns). Here too, a gun in the home was a risk factor for homicide by firearm but not for homicide by other means.

Other case-control studies have also found that a gun in the home is a risk for homicide in the home, with especially heightened risk for women (Cummings et al. 1997, Dahlberg, Ikeda, and Kresnow 2004). Results from perpetrator-based case-control homicide studies also find that gun ownership is a risk for homicide perpetration. For example, a study of women murdered by intimate partners found that compared with a control group of living battered women, a gun in the house was present for 65% of perpetrators of murder versus 24% of perpetrators of nonfatal abuse. Access to a firearm by the battered woman had no protective effect (Campbell et al. 2003).

Cohort Studies

There are no studies that follow a large cohort of individuals with known characteristics, comparing homicide victimization rates of those with a gun in the home and those without.

Firearm Prevalence and Suicide

Firearm suicide rates and overall suicide rates in the United States are higher where guns are more prevalent (Miller, Hemenway, and Azrael 2007, Kubrin and Wadsworth 2009). By contrast, rates of suicide by methods other than firearms are not significantly correlated with rates of household firearm ownership (Miller, Hemenway, and Azrael 2007). This pattern has been reported in ecologic studies that have adjusted for several potential confounders, including measures of psychological distress, alcohol and illicit drug use and abuse, poverty, education, and unemployment (Miller, Azrael, and Barber 2012, Miller, Hemenway, and Azrael 2007).

Household firearm ownership has also been consistently found to be a strong predictor of suicide risk in studies that examined individual-level data. U.S. case-control studies find that the presence of a gun in the home or purchase from a licensed dealer is a risk factor for suicide (Bailey et al. 1997, Brent et al. 1993, Brent et al. 1994, Brent et al. 1991, Brent et al. 1988, Conwell et al. 2002, Cummings et al. 1997, Kellermann et al. 1992, Grassel et al. 2003, Kung, Pearson, and Lui 2003, Wiebe 2003). The relative risk is large (two- to tenfold), depending on the age group and, for younger persons, how firearms in the home are stored (Miller and Hemenway 1999, Brent et al. 1991, Kellermann et al. 1992).

The only large U.S. cohort study to examine the firearm-suicide connection found that suicide rates among California residents who purchased handguns

from licensed dealers were more than twice as likely to die by suicide as were age/sex matched members of the general population, not only immediately after the purchase but throughout the six-year study period (Wintemute et al. 1999). Here, too, the increase in suicide risk was attributable entirely to an excess risk of suicide with a firearm (Wintemute et al. 1999).

Drawing causal inferences about the relation between firearm availability and the risk of suicide from existing case-control and ecologic studies has been questioned on the grounds that these studies may not adequately control for the possibility that members of households with firearms are inherently more suicidal than members of households without firearms (NRC 2005). Additional cited limitations include the possibility of differential recall (by cases compared with controls) of firearm ownership and comorbid conditions, and reverse causation (whereby suicidal persons purchase firearms with the idea of committing suicide).

It is very unlikely, however, that the strong association between firearms and suicide reported consistently in U.S. studies is either spurious or substantially overstated. First, individual-level studies have often controlled for measures of psychopathology (Bailey et al. 1997, Brent et al. 1994, Brent et al. 1993, Brent et al. 1988, Conwell et al. 2002, Cummings et al. 1997, Kellermann et al. 1992, Wiebe 2003).

Second, directly answering the reverse causation critique, the risk of suicide associated with a household firearm pertains not only to gun owners but to *all* household members (Cummings et al. 1997, Kellermann et al. 1992, Wintemute et al. 1999); the relative risk is larger for adolescents than for the gun owner; and for the gun owner the risk persists for years after firearms are purchased (Cummings et al. 1997, Kellermann et al. 1992, Wintemute et al. 1999).

Third, studies that have examined whether people who live in homes with guns have higher rates of psychiatric illness, substance abuse, or other known suicide risk factors generally fail to find any indication of heightened risk (Oslin et al. 2004, Kolla, O' Connor, and Lineberry 2011). For example, four case-control studies found comparable rates of psychiatric illness and psychosocial distress among households with versus without firearms (Kellermann et al. 1992, Ilgen et al. 2008, Miller et al. 2009, Sorenson and Vitti 2008, Betz, Barber, and Miller 2011).

Fourth, there appears to be a hierarchy of suicide risk among children and young adults, depending on how securely household firearms are stored, suggesting a dose-response relationship (Grossman et al. 2005).

Finally, the consistency in magnitude, direction, and specificity of method-related risk observed in both the many individual-level and ecologic studies (the latter not being subject to recall bias or the reverse causation criticism) leads to only one conclusion: a gun in the home increases the likelihood that a family member will die from suicide.

Unintentional Firearm Deaths

Not surprisingly, ecologic and case-control studies find that where there are more guns and more guns poorly stored, there are more unintentional firearm deaths (Miller, Azrael, and Hemenway 2001, Wiebe 2003, Grossman et al. 2005). U.S. children aged 5 to 14 have eleven times the likelihood of being killed accidentally with a gun compared with similarly aged children in other developed countries (Table 1.2) (Richardson and Hemenway 2011).

Conclusion

The United States, with its many guns and highly permissive gun laws, faces a far more serious problem of lethal firearms violence than other high-income nations. The relative magnitude of our problem is illustrated in Table 1.1. This table, which compares U.S. children aged 5–14 with children of other developed countries, illustrates the stark fact that U.S. children are *thirteen* times more likely to die from a firearm homicide and *eight* times more likely to die of a firearm suicide than children in comparable developed nations. There is no evidence that U.S. children are more careless, suicidal, or violent than children in other high-income nations. Rather, what distinguishes children in the United States from children in the rest of the developed world is the simple, devastating fact that they die—mostly by firearms—at far higher rates.

Within the United States itself, the evidence is similarly compelling: where there are more guns, there are more violent deaths—indeed, many more. The magnitude of this relationship is illustrated in Table 1.3, which compares the number of lives lost between 2001 and 2007 to homicide, suicide, and unintentional firearm accidents by sex and age groups in states with the highest compared with the lowest gun ownership rates. The consistency of findings across different populations, using different study designs, and by different researchers is striking. No credible evidence suggests otherwise.

Table 13 Violent deaths in states with the highest versus lowest gun ownership levels
(BRFSS 2004); Mortality Data WISQARS 1999–2007

	High-gun states ^a	Low-gun states ^b	Ratio
Aggregate population of adults, 2001–2007	356 million	358 million	1.0
Proportion of households with firearms	50%	15%	3.3
Percentage of adult population reporting depression, past 12 months (NSDUH 2008–2009)	3.7%	3.7%	1.0
Percentage of adult population reporting suicidal ideation, past 12 months (NSDUH 2008–2009)	6.6%	6.5%	1.0
Number of nonlethal violent crimes in 2010 (UCR 2010)	165,739	148,287	1.1
Suicide			
Women			
Firearm suicide	4,148	563	7.4
Non-firearm suicide	4,633	4,575	1.0
Total suicide	8,781	5,138	1.7
Men			
Firearm suicide	26,314	7,163	3.7
Non-firearm suicide	11,592	12,377	0.9
Total suicide	37,906	19,540	1.9
Men ages 15–29			
Firearm suicide	5,803	1,308	4.4
Non-firearm suicide	3,192	2,671	1.2
Total suicide	8,995	3,979	2.2
5–14 year olds			
Firearm suicide	166	15	11.1
Non-firearm suicide	225	154	1.5
Total suicide	391	169	2.3
Adults 65+ years old			
Firearm suicide	6,374	1,714	3.7
Non-firearm suicide	1,182	2,270	0.5
Total suicide	7,556	3,984	1.9
Homicide			
Men			
Firearm homicide	13,755	7,799	1.8
Non-firearm homicide	5,031	3,963	1.3
Total homicide	18,786	11,762	1.6
Women			
Firearm homicide	3,165	998	3.2
Non-firearm homicide	2,855	2,132	1.3
Total homicide	6,020	3,130	1.9

Table 1.3 (Continued)

	High-gun states ^a	Low-gun states ^b	Ratio
5–14 year olds			
Firearm homicide	259	100	2.6
Non-firearm homicide	212	169	1.3
Total homicide	471	269	1.8
Men 15–29			
Firearm homicide	6,971	4,900	1.4
Non-firearm homicide	1,187	1,334	0.9
Total homicide	8,158	6,234	1.3
Adults 65+ years old			
Firearm homicide	620	139	4.5
Non-firearm homicide	794	534	1.5
Total homicide	1,414	673	2.1
Unintentional firearm deaths	109	677	6.2

Note: All data are from 1999–2007 because cell counts were suppressed beginning in 2008; terrorism-related homicides are not counted.

^aLouisiana, Utah, Oklahoma, Iowa, Tennessee, Kentucky, Alabama, Mississippi, Idaho, North Dakota, West Virginia, Arkansas, Alaska, South Dakota, Montana, Wyoming

^bHawaii, New Jersey, Massachusetts, Rhode Island, Connecticut, New York

Firearm policy is often focused on guns used in crime. What is notable about the studies reviewed here, however, is the consistency of the story they tell about *all* firearms—not just those used in crime. In the United States, there are more firearm suicides than firearm homicides, and women, children, and older adults are more likely to die by gunfire from a household gun (typically, legally acquired and possessed) than from illegal guns.

The first step in ameliorating a public health problem is to identify what the problem is. For the purposes of this essay, the problem is that, year after year, many more Americans are dying by gunfire than people in any other high-income nation. Good firearm policy has the potential to reduce the toll of lethal firearm violence in the United States. Efforts to reduce this uniquely American problem will, however, be less effective than they could be if good policy is not accompanied by a shift in the kind of discussions politicians, academicians, and citizens engage in about firearms. Science can provide the content—and better science based on better data, better content. The best chance for durable and large-scale reductions in lethal violence in the United States is for all of us to commit to keeping the conversation about the costs and benefits of guns in American society civil, ongoing, and factually grounded.

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ACKNOWLEDGMENTS

The text, but not the figures reported, in this essay draw in part on prior reviews written previously by the authors, often supported by the Joyce Foundation.

NOTES

1. Researchers attribute the decline in the 1990s to different causes, including reduced unemployment, increased policing, and a decline in and stabilization of illegal drug markets (Wintemute 2000). Declines in the last decade have not yet been well explained.
2. Homicide rates have been consistently higher in the southern and western regions of the United States. This is especially true for firearm homicides (CDC 2012a).
3. Measuring the availability of guns in the context of these homicides is more problematic, not least because researchers (Webster, Vernick, and Hepburn 2001, MAIG 2008) have shown that guns involved in these deaths often move across state lines from states with permissive gun laws to states with fewer guns and stronger laws.
4. Studies included in this review were those previously included in review articles by two of the authors, updated to include new articles meeting the criteria specified in these reviews which have appeared in the research literature since the time those review papers were published.
5. The study did not provide evidence about whether a gun from the home was used in any of the homicides. However, the idea that a gun in the home increased the risk of death was supported by several observations. First, the link between gun ownership and homicide was due entirely to a strong association between gun ownership and homicide by firearm; homicide by other means was not significantly linked to having a gun in the home. Second, gun ownership was most strongly associated with homicide at the hands of a family member or intimate acquaintance (i.e., guns were not significantly linked to an increased risk of homicide by non-intimate friends, unidentified persons, or strangers). Third, there was no evidence of a protective effect of keeping a gun in the home—even in the small subgroup of cases that involved forced entry.

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EXHIBIT C
To
Declaration of John J. Donohue III in
Support of Sunnyvale's Opposition to
Plaintiffs' Motion for Preliminary
Injunction



National Institute of Justice

Research in Brief

Jeremy Travis, Director

May 1997

Issues and Findings

Discussed in this Brief: Results of a nationally representative telephone survey (1994) on private ownership and use of firearms by American adults. The survey provides the most complete data available on the private stock of firearms in the United States.

Key issues: With nearly 200 million guns in private hands, firearms have an important impact on the quality of life in America. What is the size and composition of the Nation's private gun inventory? What are the methods of, and reasons for, acquiring firearms? How are firearms stored? How frequently are guns used against criminal attackers?

Key findings: The survey data and analysis yielded the following results:

- In 1994, 44 million Americans owned 192 million firearms, 65 million of which were handguns. Although there were enough guns to have provided every U.S. adult with one, only 25 percent of adults actually owned firearms; 74 percent of gun owners possessed two or more.
- The proportion of American households that keep firearms appears to be declining.
- Sixty-eight percent of handgun owners also possessed at least one rifle or shotgun.

continued...

Guns in America: National Survey on Private Ownership and Use of Firearms

by Philip J. Cook and Jens Ludwig

The United States is unique among wealthy nations in its vast private inventory of firearms. The nearly 200 million guns in private hands are used in part for recreation, mostly hunting and target shooting. But what engenders the most public controversy over firearms is their use against people during either the commission of or defense against crime.

Gun advocates regard firearms as an important crime deterrent and source of protection, while control advocates denounce guns for the damage they do in the hands of criminals. What both groups can agree on is that widespread ownership of firearms has an important impact on the quality of life in America.

To learn more about the role of firearms, the National Institute of Justice (NIJ) sponsored—through a grant to the Police Foundation—a nationally representative telephone survey in 1994 on private ownership and use of firearms by American adults (see "Firearms Survey Methodology"). This Research in Brief reports some of the survey's more important findings, including the following:

- Size, composition, and ownership of the Nation's private gun inventory.

- Methods of, and reasons for, firearms acquisition.
- Storage and carrying of guns.
- Defensive use of firearms against criminal attackers.

Gun ownership

Prevalence. According to conventional wisdom, about half of American households own guns, a belief affirmed by a long series of national polls dating back to 1959.¹ Yet data from the 1994 telephone survey (National Survey of Private Ownership of Firearms—NSPOF) indicate that just 35 percent (plus or minus 1.3 percent) of households own guns. This estimate may be somewhat off the mark but not by much. Conventional wisdom appears out of date.

The best available survey series on gun ownership is the General Social Survey (GSS), conducted by the National Opinion Research Center. Its estimates have been lower than some others, in the range of 40 to 43 percent during the 1990s. In particular, the GSS estimate for 1994 was just 41 percent. Another telephone survey in 1994 produced a still lower estimate for gun ownership, 38 percent of households.²

Research in Brief

Issues and Findings

continued...

- Gun ownership was highest among middle-aged, college-educated people of rural small-town America. Whites were substantially more likely to own guns than blacks, and blacks more likely than Hispanics.
- The most common motivation for owning firearms was recreation. Forty-six percent possessed a gun primarily for protection against crime.
- There were 13.7 million firearm transactions in 1993–1994, including 6.5 million handguns. About 60 percent of gun acquisitions involved federally licensed dealers.
- About 211,000 handguns and 382,000 long guns were stolen in noncommercial thefts in 1994.
- Slightly more than half of all privately owned firearms were stored unlocked; 16 percent of firearms were stored unlocked and loaded.
- In 1994, about 14 million adults (approximately one-third of gun owners) at least once carried a firearm in their vehicles or on their person for protection.
- Evidence suggests that this survey and others like it overestimate the frequency with which firearms were used by private citizens to defend against criminal attack.

Target audience: Criminal justice and public health researchers and practitioners. Legislators and policymakers at all levels of government.

Concentration. Despite enough guns in private hands to provide every adult in America with one, only one-quarter of adults actually own firearms. Those who have one gun usually have several: 74 percent possessed two or more in 1994.

Gun ownership is quite concentrated but not more so than for other durable goods. In marketing circles, the "80/20 rule" suggests that the top fifth of all consumers of a product typically account for four-fifths of all purchases by value. NSPOF data indicate that the top 20 percent of firearm owners possessed 55 percent of privately owned firearms.³ Of gun owners in 1994, 10 million individuals owned 105 million guns, while the remaining 87 million guns were dispersed among 34 million other owners.

Persons owning several guns tended to have varied collections, including rifles, shotguns, and handguns.⁴ We find that 68 percent of handgun owners also owned at least one rifle or shotgun, suggesting some experience and interest in the sporting uses of guns. Exhibit 1 provides additional data on the composition of private gun collections.

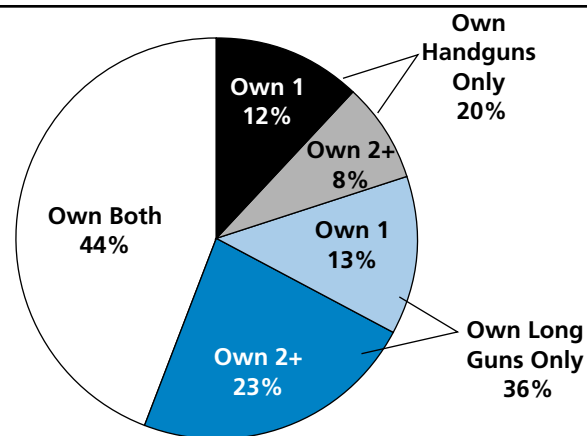
Demographic patterns. In 1994 gun ownership was far from uniformly distrib-

uted across the population, as is evident from exhibit 2. Most striking is the gender gap: 42 percent of men but just 9 percent of women owned guns at the time of NSPOF. (The gap is even wider when the focus is on whether the respondent ever owned a gun.) With respect to race, whites were substantially more likely to own guns than blacks (27 versus 16 percent), and blacks more likely than Hispanics (16 versus 11 percent). But for handguns alone, the ownership rates among blacks and whites were nearly equal (13.1 versus 16.5 percent).

Gun ownership (and handgun ownership) was highest among middle-aged,⁵ college-educated people of rural and small-town America. But one of the best predictors of gun ownership was the presence of firearms in the respondent's childhood home. People whose parents possessed guns were three times as likely as others to own one themselves. In fact, 80 percent of all current gun owners reported that their parents kept a firearm in the home.

Motivations. The most common motivation for owning firearms was recreation. As shown in exhibit 3, about 35 percent of gun owners (15 million people, 8 percent of the adult public) hunted in 1994, and about an equal percentage engaged

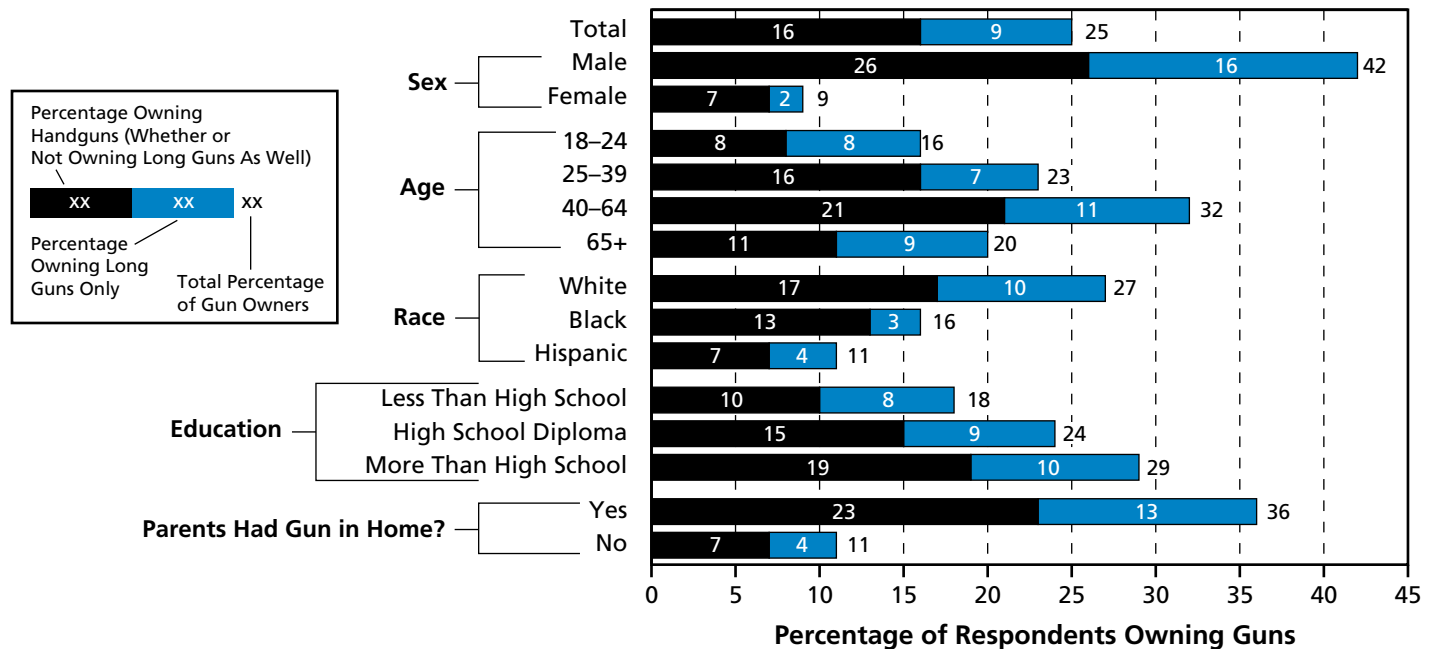
Exhibit 1. Composition of Gun Ownership (1994)^a



a. There were 44 million gun owners in 1994.

Research in Brief

Exhibit 2. Gun Ownership Patterns (NSPOF Estimates, 1994)



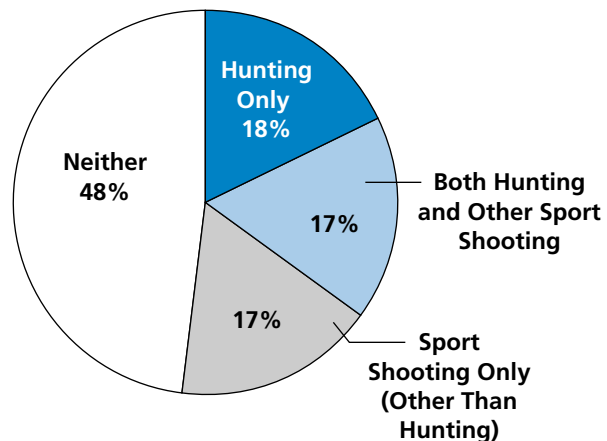
in sport shooting other than hunting. Given the substantial overlap between the two groups, about half (23 million) of the Nation's 44 million gun owners participated in a gun sport during 1994. Of those who owned only handguns in 1994, 40 percent used them recreationally, almost entirely for sport shooting other than hunting.

Another reason cited for firearm ownership was self-protection. Overall, 46 percent of gun owners possessed firearms (usually handguns) primarily for protection against crime (41 percent for males; 67 percent for females). Almost three-quarters of those who owned only handguns kept them primarily for self-protection. Of course, some people seek the protection of a gun because they may be disproportionately likely to lead risky lives or associate with violent people.⁶ Those who had been arrested for nontraffic offenses were more likely to own firearms (37 percent compared to 25 percent in the general population).

But most persons do not own guns, and the NSPOF included several items to find out why. In 1994, about two-thirds of gunless adults were actively opposed to having guns in their homes because they viewed guns as dangerous, "im-

moral," or otherwise objectionable. The remaining one-third were at least open to the possibility of obtaining firearms and might do so if their financial condition or motivation became stronger. For many, the needed moti-

Exhibit 3. Recreational Use of Firearms—Percentage of Gun Owners Who Hunt, Do Other Sport Shooting, Do Neither



Note: The average number of days hunters said they spent hunting in 1994 was 16.4 days. The average number of days sport shooters said they spent sport shooting in 1994 was 18.6 days.

T Firearms Survey Methodology

The NIJ-sponsored National Survey of Private Ownership of Firearms (NSPOF) was conducted by Chilton Research Services of Drexel Hill, Pennsylvania, during November and December 1994. Data collected by the survey were analyzed by the authors of this Research in Brief.

The telephone survey employed a list-assisted random-digit-dial sampling method, in which every residential telephone number had the same likelihood of being selected. Each household selected in this fashion was scheduled for as many calls as needed (up to a maximum of six) to make contact with the appropriate person and complete the interview. When a household was first contacted, the interviewer asked to speak with the adult in the household who had the most recent birthday. Because this method randomizes the selection of respondents from among the adults living in the household, the NSPOF was a probability sample of adults in the United States.*

Minimums were established for the number of completed interviews with racial minorities and gun-owning households. Such households were more likely than others to be included in the final sample. Sampling weights were calculated to adjust for this design feature and for other sociodemographic differences between the sample and the U.S. adult population.

Although these adjustments improved the quality of population estimates based on the NSPOF, some types of estimates may still be biased. As in every survey, some sample members refused to cooperate and others were never home when the interviewer called. The concern is that these nonrespondents may tend to differ from the general population (and the completed sample) in relevant ways. The scope of that potential problem is usually indicated by the response rate.

In the absence of a single accepted definition of "response rate," two reasonable

definitions yield figures of 44 and 59 percent for the NSPOF. Thus, nonresponse bias in our estimates is a real possibility. Nonetheless, the response rate for this survey is no lower than for other well-executed telephone surveys, and there is no reason to believe that this survey used a less representative sample than others.**

Most of the estimates contained in this Research in Brief rely on the responses of those who personally owned firearms. The estimates do not rely on the reports of those who did not personally own a gun but lived in a gun-owning household because our analysis of the NSPOF data suggests that the survey respondents were often unwilling or unable to report on guns owned by other adults in the household. For example, we find that in households headed by married couples, women were much less likely to report a gun in the house (which in most cases would belong to their husbands) than were men.

* For details about the GENESYS method employed by Chilton or other survey issues, see Brick, J.M., J. Waksberg, D. Kulp, and A. Starer, "Bias in List-Assisted Telephone Samples," *Public Opinion Quarterly*, 59:218–235. Also: Waksberg, J., "Sampling Methods for Random Digit Dialing," *Journal of the American Statistical Association*, 73:40–46, 1978.

** Kleck, G., and M. Gertz, "Armed Resistance to Crime: The Prevalence and Nature of Self-Defense With a Gun," *Journal of Criminal Law and Criminology*, 86(1):150–187, Fall 1995. They reported a response rate of 61 percent for their national telephone survey of gun ownership and defensive gun use. In calculating this response rate, they excluded all sample members whom they were unable to contact. By their definition, the NSPOF response rate would be higher than 61 percent.

1994 National Survey of Private Ownership of Firearms (NSPOF)

Objectives: Provide national estimates for:

- Adult ownership of guns, by gun type.
- Sources and motivations for gun acquisition.
- Firearm safety and storage.
- Defensive use of firearms.
- Attitudes toward gun control.

Sample: Probability sample of 2,568 noninstitutionalized adults aged 18 and over who are fluent in English or Spanish and live in households with a telephone.

Method: Telephone interview with one randomly selected adult from each household.

Population estimates: Weighted averages of relevant responses. Standard errors for estimates of population-prevalence rates range up to 1.4 percentage points, somewhat higher for prevalence estimates within subpopulations.

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vation may have come from an increased concern about crime: nearly 5 percent of respondents reported that they planned to obtain a gun for protection against crime within a year.

The stock of guns in private hands

The NSPOF-based estimate for the total number of privately owned firearms is 192 million: 65 million handguns, 70 million rifles, 49 million shotguns, and 8 million other long guns (exhibit 4). Of the handguns, 48 percent were revolvers, 40 percent semiautomatics, and 12 percent were reported as "some other type of handgun" by respondents.

The millions of guns in private hands included everything from cheap .22-caliber "snubbies" to finely made high-powered rifles worth thousands of dollars. The variety of firearm designs reflects the multiplicity of uses for which they are intended and also influences the weapons' capacities for harm. Firearm regulations place special restrictions on commerce in short-barreled guns (because they are easily concealed and disproportionately used in crime) and on large-capacity magazines.

From our analysis, we find that the magazine capacity of one-fifth of all handguns was 10 or more rounds (exhibit 4B). The barrel of about one in six handguns was 3 inches or shorter (exhibit 4C).⁷ Comparing handguns acquired in 1993 or 1994 with those acquired prior to 1993 permitted examination of changes in the demand for different kinds of handguns over time. Handguns acquired more recently were more likely to have large magazine capacities (37.8 versus 14.1 percent held 10 or more rounds) and were less likely to be of small caliber, defined as .32 or under (28.6 versus 38 percent). (See exhibit 4D.)

Transactions

Acquisitions. To date, little information has been available about gun flows in the United States. The potential importance of this information is its use in evaluating regulation of firearms commerce. For example, the Gun Control Act of 1968 restricts interstate shipments to federally licensed firearm dealers (FFLs), who in turn are required to follow laws regulating retail transfers. Transactions not involving FFLs, known as the "secondary market," typically do not require recordkeeping and are exempt from the Federal requirement (for handguns) of a waiting period and criminal record check.⁸ Moreover, secondary market transactions are not subject to regulatory oversight. Thus, knowing the volume of informal transfers that do or do not involve FFLs would be useful.

The average firearm in circulation in 1994 was acquired by its present owner in 1981, with the average handgun having been acquired in 1983. Persons owning handguns in 1994 acquired about 28 percent of them in 1993–1994, compared with 20 percent of long guns. An estimated 13.7 million transactions occurred during 1993–1994, including 6.5 million involving handguns. Sixty percent of long guns and 68 percent of handguns were new at the time of acquisition by their 1994 owners during the 1993–1994 period.

How do people typically acquire firearms? As shown in exhibit 5, almost all guns acquired during 1993 and 1994 were either purchased by the respondent (73 percent) or received as a gift (19 percent). The remaining 8 percent were obtained through inheritance, a swap of some kind, or other means.

Exhibit 4. Gun Stock Characteristics (1994)

4A. Estimates of Number of Guns

	Number in millions
Handguns	
Revolvers	31
Semiautomatics	26
Other	8
Total	65
Rifles	
Semiautomatics	28
Other	42
Total	70
Shotguns	49
Other long guns	8
Total All Guns	192

4B. Magazine Capacity of Handgun Stock^a

Number of Rounds	Percentage of Handgun Stock
1–9 rounds	79%
10 or more rounds	21%

a. The average number of rounds is 8.1.

4C. Length of Barrel

	Percentage of All Handgun Stock	Percentage of Handguns With Caliber .32 or Under ^b
1–3 inches	17%	37% ^c
4–5 inches	38%	31% ^c
6 or more inches	45%	38% ^c

b. The percentage of all handgun stock having a caliber .32 or under is 34 percent.

c. These percentages are not of all guns but only of those identified in the middle column.

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Exhibit 4. Gun Stock Characteristics (1994) (continued)

4D. Magazine Capacity and Barrel Length by Time of Acquisition

Magazine Capacity ^d	Handguns Acquired Prior to 1993 (N=234) Percentage of All Handguns		Handguns Acquired in 1993 or 1994 (N=91) Percentage of All Handguns	
1–9 rounds	85.9%		62.2%	
10 or more rounds	14.1%		37.8%	
Length of Barrel ^e	Percentage of Handgun Stock	Percentage With Caliber .32 or Under	Percentage of Handgun Stock	Percentage With Caliber .32 or Under
1–3 inches	17.6%	40.8%	17.4%	33.7%
4–5 inches	35.9%	30.5%	41.6%	31.1%
6 or more inches	46.5%	43.4%	41.0%	22.6%

d. The average number of rounds for guns acquired before 1993 is 7.6. For guns acquired in 1993 or 1994 it is 9.5.

e. The percentage of all handguns acquired prior to 1993 having a caliber .32 or under is 38 percent. The percentage of all handguns acquired in 1993 or 1994 having a caliber .32 or under is 28.6 percent.

The predominant sources of guns, unsurprisingly, were stores (60 percent). Other important sources included family members and acquaintances. The 3 percent of respondents who indicated that they obtained guns "through the mail" (which is illegal for all but FFLs) may have misremembered or may have referred to a mail-order purchase arranged through an FFL.

The average gun obtained in 1993 and 1994 was worth \$392 at the time of transfer, with little difference between handguns and long guns. Fewer than 1 in 20 guns acquired during those 2 years were valued at less than \$100.

Fifty-seven percent of firearms were obtained from stores, pawnshops, or other sources that the respondents were certain to have been federally licensed firearm dealers. Some respondents

were not sure about whether the source was an FFL. Others indicated that the source was an FFL but then reported that the transaction was a trade rather than a cash sale or that the source was an acquaintance or family member. If those cases are included, the proportion increases to 64 percent.

We conclude that approximately 60 percent of gun acquisitions involved an FFL and hence were subject to

Exhibit 5. Methods and Sources for Gun Acquisition in 1993 and 1994 (NSPOF Estimates)

	Percentage for Long Guns (N=121)	Percentage for Handguns (N=128)	Percentage for All Guns (N=251)
What Best Describes How You Obtained Your Gun?			
Bought it	69	77	73
Received it as a gift	22	16	19
Traded something for it	3	2	3
Inherited it	5	4	5
From What Source Did You Obtain This Gun?			
Gun store	33	55	43
Pawnshop	5	8	6
Other store	18	3	11
Gun show or flea market	4	4	4
Through the mail	3	3	3
Member of the family	22	12	17
Friend or acquaintance	12	13	12
Other	5	3	4

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Federal regulations on such matters as out-of-State sales, criminal history checks, and recordkeeping. A somewhat higher percentage of handgun acquisitions than long gun acquisitions involved FFLs. The remaining acquisitions, amounting to about 2 million per year, were off-the-books transfers in the secondary market.

Thefts. A major theme highlighted in a 1986 survey of incarcerated felons was that theft was an important means of obtaining firearms for those with criminal intentions: 32 percent of surveyed felons had stolen their most recently acquired handgun.⁹

Based on the NSPOF, an estimated 0.9 percent of all gun-owning households (269,000) experienced the theft of one or more firearms during 1994. About 211,000 handguns and 382,000 long guns were stolen in noncommercial thefts that year, for a total of 593,000 stolen firearms. Those estimates are subject to considerable sampling error but are consistent with earlier estimates of about half a million guns stolen annually.¹⁰

Gun safety

Gun storage. Of 1,356 accidental deaths by gunshot in 1994, 185 involved children 14 years old and

younger.¹¹ For each such fatality, there are several accidental shootings that cause serious injury. Guns were also the means of destruction in 19,590 suicides, 210 involving children 14 or younger. For these reasons, safe handling and storage of firearms have attracted the attention of the public health community.

We found that 20 percent of all gun-owning households had an unlocked, loaded gun in the home at the time of the survey. This figure was substantially higher among handgun-owning households than among households with long guns only—30 percent versus 7 percent.

Slightly more than half of firearms of either type were stored unlocked, but handguns were much more likely to be loaded. Reflecting their predominant use in self-defense, handguns were likely to be stored in bedrooms or vehicles of owners or even on their person, while most long guns were kept in gun closets or other out-of-the-way places (exhibit 6).

Although training programs usually include suggestions on how to store guns safely, it does not appear that trainees are paying attention. More than half (56 percent) of owners had received some form of "formal" training from the military, law enforcement, National

Rifle Association, National Safety Council, or other source. As a group, owners who received such training were no less likely than others to keep guns loaded and unlocked. This surprising result is consistent with other recent studies.¹²

However, a more detailed analysis of NSPOF data that examined the effects of different formal training programs separately indicated one exception: training programs such as those offered by local affiliates of the National Safety Council were associated with a significant reduction in the likelihood of keeping a gun unlocked and loaded. This result speaks well of that training, the trainees, or both.

Carrying

Carrying a gun outside the home, especially in an urban area, is problematic because the public is at risk if the carrier is reckless or inclined to violence. For that reason, carrying a firearm in a vehicle or on the person is subject to a variety of State and local regulations. In most States, carrying a concealed gun is prohibited or restricted to those who have obtained a special license. At the same time, many States have reacted to public concerns about crime by enacting laws under which most citizens can usually obtain a

Exhibit 6. Storage Method and Location of Firearms (NSPOF Estimates)

	Percentage for Long Guns (N=437)	Percentage for Handguns (N=352)	Percentage for All Guns (N=789)
Storage Method/Location			
Gun loaded	11	55	26
Gun loaded and unlocked	7	34	16
Where Gun Kept			
Bedroom	17	37	24
Gun closet	53	26	44
Other closet	19	11	17
In vehicle or on person	1	16	6
Other	10	8	10

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concealed-carry permit. Currently, 31 States have passed such laws.

About 14 million adults (approximately one-third of gun owners) carried firearms for protection at least once during the 12 months preceding NSPOF. Four million of them indicated that they carried guns for protection "in connection with work." Two-thirds who carried guns kept them in their vehicles, while the others sometimes carried them on their person.

The occupations of respondents who report carrying guns in connection with work are quite diverse. Somewhat surprisingly, only a quarter of this group were employed in the protective service field. The questionnaire does not distinguish between those who are required by their employers to carry firearms as part of their occupational duties and those who do so on their own initiative. In any event, an estimated 3 million adults who were not in law enforcement or security carried firearms for protection on the job in 1994.

The majority (56 percent) of those who carried firearms outside of work did so fewer than 30 days per year, but a substantial minority (22 percent) rarely left home without a gun. On any given day, 1.1 million people were carrying guns on their person outside the workplace, while another 2.1 million stored guns in their cars or trucks.

Some correlates of gun carrying are worth noting. Males who carried guns in 1994 were about 2½ times as likely to have been arrested for a nontraffic offense as other men (15 percent versus 6 percent). And a disproportionate share of gun carriers resided in the South, where the prevalence of carrying guns was almost double that of the rest of the Nation.

Defensive gun uses

NSPOF estimates. Private citizens sometimes use their guns to scare off trespassers and fend off assaults. Such defensive gun uses (DGUs) are sometimes invoked as a measure of the public benefits of private gun ownership. On the basis of National Crime Victimization Survey (NCVS) data, one would conclude that defensive uses are rare indeed, about 108,000 per year. But other surveys yield far higher estimates of the number of DGUs. Most notable has been a much publicized estimate of 2.5 million DGUs, based on data from a 1994 telephone survey conducted by Florida State University professors Gary Kleck and Mark Gertz.¹³ The 2.5 million figure has been picked up by the press and now appears regularly in newspaper articles, letters to the editor, editorials, and even Congressional Research Service briefs for public policymakers.

The NSPOF survey is quite similar to the Kleck and Gertz instrument and provides a basis for replicating their estimate. Each of the respondents in the NSPOF was asked the question, "Within the past 12 months, have you yourself used a gun, even if it was not fired, to protect yourself or someone else, or for the protection of property at

home, work, or elsewhere?" Answers in the affirmative were followed with "How many different times did you use a gun, even if it was not fired, to protect yourself or property in the past 12 months?" Negative answers to the first DGU question were followed by "Have you *ever* used a gun to defend yourself or someone else?" (emphasis in original). Each respondent who answered yes to either of these DGU questions was asked a sequence of 30 additional questions concerning the most recent defensive gun use in which the respondent was involved, including the respondent's actions with the gun, the location and other circumstances of the incident, and the respondent's relationship to the perpetrator.

Forty-five respondents reported a defensive gun use in 1994 against a person (exhibit 7). Given the sampling weights, these respondents constitute 1.6 percent of the sample and represent 3.1 million adults. Almost half of these respondents reported multiple DGUs during 1994, which provides the basis for estimating the 1994 DGU incidence at 23 million. This surprising figure is caused in part by a few respondents reporting large numbers of defensive gun uses during the year; for example, one woman reported 52!

Exhibit 7. Defensive Gun Use (DGU) Estimates for 1-Year Recall Period (1994)—Comparison of NSPOF with Kleck and Gertz Estimates

	NSPOF Estimates		Kleck and Gertz
	<i>All DGUs Against Persons (N=45)</i>	<i>DGUs Meeting Kleck and Gertz Criteria* (N=19)</i>	
1 Year			(N=66)
Estimated number of defenders (in millions)	3.1	1.5	2.5
Estimated number of DGUs (in millions)	23.0	4.7	n/a

* In their 1995 DGU study, Kleck and Gertz presented estimates based on only the DGU reports that met certain criteria (see text).

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A somewhat more conservative NSPOF estimate is shown in the column of exhibit 7 that reflects the application of the criteria used by Kleck and Gertz to identify "genuine" defensive gun uses. Respondents were excluded on the basis of the most recent DGU description for any of the following reasons: the respondent did not see a perpetrator; the respondent could not state a specific crime that was involved in the incident; or the respondent did not actually display the gun or mention it to the perpetrator.

Applying those restrictions leaves 19 NSPOF respondents (0.8 percent of the sample), representing 1.5 million defensive users. This estimate is directly comparable to the well-known estimate of Kleck and Gertz, shown in the last column of exhibit 7. While the NSPOF estimate is smaller, it is statistically plausible that the difference is due to sampling error. Inclusion of multiple DGUs reported by half of the 19 NSPOF respondents increases the estimate to 4.7 million DGUs.

Some troubling comparisons. If the DGU numbers are in the right ballpark, millions of attempted assaults, thefts, and break-ins were foiled by armed citizens during the 12-month period. According to these results, guns are used far more often to defend against crime than to perpetrate crime. (Firearms were used by perpetrators in 1.07 million incidents of violent crime in 1994, according to NCVS data.)

Thus, it is of considerable interest and importance to check the reasonableness of the NSPOF estimates before embracing them. Because respondents were asked to describe only their most recent defensive gun use, our compar-

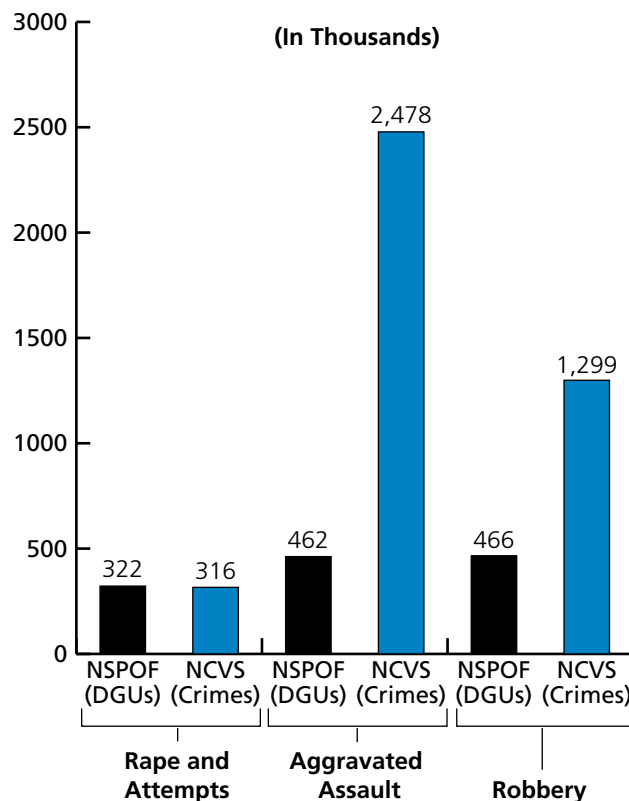
isons are conservative, as they assume only one defensive gun use per defender. The results still suggest that DGU estimates are far too high.

For example, in only a small fraction of rape and robbery attempts do victims use guns in self-defense. It does not make sense, then, that the NSPOF estimate of the number of rapes in which a woman defended herself with a gun was more than the total number of rapes estimated from NCVS (exhibit 8). For other crimes listed in exhibit 8, the results are almost as absurd: the NSPOF estimate of DGU robberies is 36 percent of all NCVS-estimated robberies, while the NSPOF estimate of DGU assaults is 19 percent of all aggravated assaults. If those percentages were close to accurate, crime would be a risky business indeed!

NSPOF estimates also suggest that 130,000 criminals are wounded or killed by civilian gun defenders. That number also appears completely out of line with other, more reliable statistics on the number of gunshot cases.¹⁴

The evidence of bias in the DGU estimates is even stronger when one recalls that the DGU estimates are calculated using only the most recently reported DGU incidents of NSPOF respondents; as noted, about half of the respondents who reported a DGU indicated two or more in the preceding year. Although there are no details on the circumstances of those additional DGUs, presumably they are similar to the most recent case and provide evidence for additional millions of violent crimes foiled and perpetrators shot.

Exhibit 8. Defensive Gun Uses Compared to Total Crime Counts (1994)



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False positives. Regardless of which estimates one believes, only a small fraction of adults have used guns defensively in 1994. The only question is whether that fraction is 1 in 1,800 (as one would conclude from the NCVS) or 1 in 100 (as indicated by the NSPOF estimate based on Kleck and Gertz's criteria).

Any estimate of the incidence of a rare event based on screening the general population is likely to have a positive bias. The reason can best be explained by use of an epidemiological framework.¹⁵ Screening tests are always subject to error, whether the "test" is a medical examination for cancer or an interview question for DGUs. The errors are either "false negatives" or "false positives." If the latter tend to outnumber the former, the population prevalence will be exaggerated.

The reason this sort of bias can be expected in the case of rare events boils down to a matter of arithmetic. Suppose the true prevalence is 1 in 1,000. Then out of every 1,000 respondents, only 1 can possibly supply a "false negative," whereas any of the 999 may provide a "false positive." If even 2 of the 999 provide a false positive, the result will be a positive bias—regardless of whether the one true positive tells the truth.

Respondents might falsely provide a positive response to the DGU question for any of a number of reasons:

- They may want to impress the interviewer by their heroism and hence exaggerate a trivial event.
- They may be genuinely confused due to substance abuse, mental illness, or simply less-than-accurate memories.
- They may actually have used a gun defensively within the last couple of

years but falsely report it as occurring in the previous year—a phenomenon known as "telescoping."

Of course, it is easy to imagine the reasons why that rare respondent who actually did use a gun defensively within the time frame may have decided not to report it to the interviewer. But again, the arithmetic dictates that the false positives will likely predominate.

In line with the theory that many DGU reports are exaggerated or falsified, we note that in some of these reports, the respondents' answers to the followup items are not consistent with respondents' reported DGUs. For example, of the 19 NSPOF respondents meeting the more restrictive Kleck and Gertz DGU criteria (exhibit 7), 6 indicated that the circumstance of the DGU was rape, robbery, or attack—but then responded "no" to a subsequent question: "Did the perpetrator threaten, attack, or injure you?"

The key explanation for the difference between the 108,000 NCVS estimate for the annual number of DGUs and the several million from the surveys discussed earlier is that NCVS avoids the false-positive problem by limiting DGU questions to persons who first reported that they were crime victims. Most NCVS respondents never have a chance to answer the DGU question, falsely or otherwise.

Unclear benefits and costs from gun uses. Even if one were clever enough to design a questionnaire that would weed out error, a problem in interpreting the result would remain. Should the number of DGUs serve as a measure of the public benefit of private gun possession, even in principle? When it comes to DGUs, is

more better? That is doubtful, for two kinds of reasons:

- First, people who draw their guns to defend themselves against perceived threats are not necessarily innocent victims; they may have started fights themselves or they may simply be mistaken about whether the other persons really intended to harm them. Survey interviewers must take the respondent's word for what happened and why; a competent police investigation of the same incident would interview all parties before reaching a conclusion.
- Second and more generally, the number of DGUs tells us little about the most important effects on crime of widespread gun ownership. When a high percentage of homes, vehicles, and even purses contain guns, that presumably has an important effect on the behavior of predatory criminals. Some may be deterred or diverted to other types of crime. Others may change tactics, acquiring a gun themselves or in some other way seeking to preempt gun use by the intended victim.¹⁶ Such consequences presumably have an important effect on criminal victimization rates but are in no way reflected in the DGU count.

Conclusions

The NSPOF provides the most complete data available on the private stock of firearms in the United States, including the kinds of guns owned, by whom they are owned, and for what purpose they were acquired. When asked, handgun owners usually gave self-protection as their primary motive for owning guns, while long-gun owners mentioned hunting or target shooting. Other findings support the conclusion that handguns are much more likely than long guns to be kept

unlocked and ready for use in the home and to be carried in public; they are much less likely to be used in sporting activities. Despite those differences, demographic and socioeconomic patterns of firearm ownership in 1994 were similar for handguns and long guns; in fact, most handgun owners also owned one or more long guns.

A fair conclusion is that the more fundamental divide is not between handgun and long-gun owners but between those who own guns and those who do not. Those who like guns, have some experience with them, and have the means to obtain them tend to keep several for various purposes. But most of the adult public turns elsewhere for recreation and protection against crime.

Over time, the relative importance of self-protection and sport as motivations for gun acquisition and use has changed. Perhaps as a result of the increasing urbanization of America, the overall prevalence of gun ownership appears to be declining, as is participation in hunting. Proportionately fewer households owned firearms in 1994 than was true in the 1960s and 1970s, and the younger cohorts are entering into gun ownership at slower rates than previous ones. When people do acquire guns now, the motivation is more likely self-defense than in the past: The mix of new firearms sold in 1994 was equally divided between handguns and long guns, whereas 25 years earlier twice as many long guns were sold.¹⁷

The NSPOF does not provide much evidence on whether consumers who buy guns for protection against crime get their money's worth. The NSPOF-based estimate of millions of DGUs each year greatly exaggerates the true number, as do other estimates based

on similar surveys. Much debated is whether the widespread ownership of firearms deters crime or makes it more deadly—or perhaps both—but the DGU estimates are not informative in this regard.

For other purposes, the NSPOF is a reliable reference. Such information is vital to the evaluation of the ongoing debate over government regulation of gun transactions, possession, and use.

Notes

1. For example, the December 1993 Gallup Poll estimated that 49 percent of households possessed a gun.

2. Kleck, G., and M. Gertz, "Armed Resistance to Crime: The Prevalence and Nature of Self-Defense With a Gun," *Journal of Criminal Law and Criminology*, 86(1):150–187, Fall 1995.

3. For a discussion of the "80/20" rule, see Clotfelter, C.T., and P.J. Cook, *Selling Hope: State Lotteries in America*, Cambridge, Massachusetts: Harvard University Press, 1989. It is possible that if one could adjust for the value of guns, the degree of concentration would be still greater and better fit the rule.

4. Fifty-five percent of all individuals who owned four or more guns had at least one in each of these three categories.

5. The NSPOF offers evidence that gun ownership is declining. Not only were middle-aged people more likely to own a gun in 1994 than those under age 40, but they were also more likely to have acquired a gun by age 21.

6. Surveys of juvenile delinquents and adult felons confirm the importance of self-defense as a motive for gun possession by active criminals. For juvenile de-

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linquents, see Sheley, J.F., and J.D. Wright, *Gun Acquisition and Possession in Selected Juvenile Samples*, Research in Brief, Washington, D.C.: U.S. Department of Justice, National Institute of Justice, December 1993. For adult felons, see Wright, J.D., and P. Rossi, *Armed and Considered Dangerous*, Hawthorne, New York: Aldine, 1986.

7. Of some interest, given the controversy over the "Saturday Night Special," is that most short-barreled handguns were not .22 caliber; two-thirds were in excess of .32 caliber, the same as for longer barreled handguns.

8. Cook, P.J., S. Molliconi, and T.B. Cole, "Regulating Gun Markets," *Journal of Criminal Law and Criminology*, 86(1):59–92, Fall 1995.

9. Wright and Rossi, 1986, 183.

10. The standard error for this point estimate is about four-tenths of a percentage point. Thus, the 95-percent confidence interval ranges from around 0.1 percent to 1.7 percent of gun-owning households. Cook,

Molliconi, and Cole, 1995, use data from the National Crime Victimization Survey for the period 1987–1992 to estimate 511,000 stolen guns per year.

11. Monthly Vital Statistics Report, Department of Health and Human Services, 45(3S), September 30, 1996. Table 16.

12. Hemenway, D., S.J. Solnick, and D. Azrael, "Firearm Training and Storage," *Journal of the American Medical Association*, 273(1):46–50, 1995.

13. Kleck and Gertz, 1995.

14. In 1994 about 17,000 people were shot dead in criminal assaults and justifiable homicides. Given what we know about the case fatality rate, fewer than 100,000 nonfatal gunshot woundings were known to the police. (See Cook, P.J., "The Case of the Missing Victims," *Journal of Quantitative Criminology*, 1985). Presumably, the true number of justifiable shootings was just a fraction of this total.

15. Hemenway, D., "Survey Research and Self-defense Gun Use: An Explanation of Extreme Overestimates," Harvard Injury Control Center Discussion Paper, 1996.

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This Research in Brief is available online at the Justice Information Center home page (<http://www.ncjrs.org>) and available through fax-on-demand (800–851–3420 or 301–251–5518; ask for document number 1026). The full-

length report, as submitted to NIJ by the authors and on which this Research in Brief is based, may be obtained through interlibrary loan or, for a fee, as a photocopy from the National Criminal Justice Reference Service (call 800–851–3420 for cost and other information).

The Police Foundation has published *Guns in America: Results of a Comprehensive National Survey on Firearms Ownership and Use*, which is based on the full-length report submitted to NIJ by the authors. For ordering information, call 202–833–1460 or write to the Police Foundation, Attn: Publications, 1001 22nd Street N.W., Washington, D.C. 20037.

16. Cook, P.J., "The Technology of Personal Violence." In M. Tonry (ed.), *Crime and Justice: A Review of Research* (Vol. 14), Chicago: University of Chicago Press, 1–71, 1991.

17. Cook, P.J., "Notes on the Availability and Prevalence of Firearms," *American Journal of Preventive Medicine*, 9 Supp:33–38, May/June 1993.

Findings and conclusions of the research reported here are those of the authors and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

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To
Declaration of John J. Donohue III in
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Plaintiffs' Motion for Preliminary
Injunction

ORIGINAL ARTICLE

The US gun stock: results from the 2004 national firearms survey

L Hepburn, M Miller, D Azrael, D Hemenway

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Objectives: To examine the size and composition of the privately held firearm stock in the US; and to describe demographic patterns of firearm ownership and motivations for ownership.

Design, setting and participants: A nationally representative household telephone survey of 2770 adults aged ≥ 18 years living in the US, conducted in the spring of 2004.

Main outcome measure: Responses to questions regarding firearm ownership, the number and types of guns owned, and motivations for ownership.

Results: 38% of households and 26% of individuals reported owning at least one firearm. This corresponds to 42 million US households with firearms, and 57 million adult gun owners. 64% of gun owners or 16% of American adults reported owning at least one handgun. Long guns represent 60% of the privately held gun stock. Almost half (48%) of all individual gun owners reported owning ≥ 4 firearms. Men more often reported firearm ownership, with 45% stating that they personally owned at least one firearm, compared with 11% for women.

Conclusions: The US population continues to contain at least one firearm for every adult, and ownership is becoming increasingly concentrated. Long guns are the most prevalent type of gun in the US but handgun ownership is widespread. Ownership demographic patterns support findings of previous studies.

The General Social Survey, a biannual survey of the US civilian population, has tracked household and personal firearm ownership over the past two and a half decades.¹ This survey reports the percentage of households with firearms and personal firearm ownership for the nation as a whole and for the nine major census regions. Over the past 4 years, information from the General Social Survey has been supplemented by information on household gun ownership at the state level from the National Behavioral Risk Factor Surveillance System.² A clear pattern that has emerged over the past several decades from these surveys is a persistent decline in household gun ownership. Although these surveys describe the demographic patterns of gun ownership in the US, they provide almost no information about the characteristics of or changes in the nation's gun stock.

We conducted a nationally representative household telephone survey in 2004 to explore the characteristics of privately owned firearms in the US. The last study to examine detailed questions like these, such as the types and numbers of working firearms in private homes, was conducted in 1994 by Cook and Ludwig.³ In their comprehensive report, they found that 35% of households and 25% of individuals owned firearms, and estimated that there were 192 million working firearms in the US in private hands. In addition to describing demographic characteristics of firearm owners, they were able to determine that the ownership of private firearms was highly concentrated among a small percentage of owners. They also clearly identified a difference in the number of household firearms reported by married men and women, who, in theory, should report similar rates of household firearm ownership. Their findings, however, that married men reported a rate of 49% household firearm ownership compared with 36% reported by married women suggested that women were either unaware of their spouse's firearm ownership or were reluctant to report it. These results led the authors to believe that more complete survey responses would come from individuals who personally owned a firearm rather than the household responses.

All of these findings helped identify patterns of private firearm ownership in the US and provided health professionals, researchers and policy makers with information about the private gun stock that was previously unknown. Through our survey, we wished to investigate possible changes in the privately owned gun stock between 1994 and 2004 and provide additional information about firearm ownership patterns in the US.

METHODS

The institutional review board at the Harvard School of Public Health approved this study in 2004. The random-digit-dial telephone sample (conducted by the survey research firm Fact Finders, St Louis, Missouri, USA) comprised 2770 randomly selected adults aged ≥ 18 years living in the 50 states and including the District of Columbia. The number of interviews designated for each of the states was proportional to that state's population relative to the total population of the US as given by the 2000 census. The methods used in composing this sample assured that each household with a telephone had an equal probability of being selected for inclusion in the sampling frame. One adult from each household was randomly selected to participate.

Interviews were completed between 17 March and 28 June 2004. Once a telephone number had been randomly selected for inclusion in the survey sample, as many as 10 repeat phone calls were made until a final disposition was assigned. Of the 31 302 telephone numbers called, 13 117 (42%) were non-responses, 11 065 (35%) were not eligible and eligibility was unknown for 4338 (14%). In total, 41% of the numbers were not residential, not in service or were for households in states where the interview quota had been reached. In addition, 39% of interviews could not be completed because the maximum number of calls had been made without an eligible respondent answering the phone. Only 19% (5421) of the non-interviews were refusals. According to calculations based on formulas from the American Association for Public Opinion Research,⁴

our minimum response rate was 14%, assuming that all unknowns were eligible and counting partial interviews as respondents; and our maximum response rate was 18%, assuming that all unknowns were ineligible.

Demographic characteristics including age, sex, education, marital status, race, presence of children in the home, whether the area was urban or rural, and household size of our sample were compared with those from the 2000 census.⁵ Although the demographic characteristics of our sample seemed similar overall to that of the census, our respondents had slightly higher educational levels (92% *v* total US 85% had at least a high-school diploma) and single-family households were fewer (19% *v* total US 26%). Our sample also under-represented adult men aged 18–34 years. For that reason, post-stratification weightings were applied to the data to reflect the age and sex distribution of the US population. Adjustments for the likelihood of selection on the basis of the number of adults in the household were also included in the weightings.

Our study included 40 active duty military personnel, who represented 1.4% of the total study population. Eleven reported owning firearms; however, only one reported owning the firearm primarily for work. We therefore chose to keep all of the respondents in the sample.

Respondents were asked several questions regarding firearm ownership and use. In particular, they were asked, “Do you or anyone you live with currently have any guns in your home or motor vehicles? Not including toys, models, air guns or starter pistols.” If the response was affirmative, the respondent was then asked, “In total, how many guns do you and anyone you live with currently have in your home or motor vehicle?” All respondents who replied that there were guns in their household were asked how many of each type of firearm was in their home (ie, revolvers, shotguns) and if they were in working order. To determine the proportion of adults who personally owned firearms, we asked those respondents who had replied that there were guns in their home, “Do any guns in your home belong to you personally?”

Statistical analyses

Descriptive and bivariate analyses were used to explore the relationships between firearm ownership, demographics, concentration and motivations for ownership. As previously mentioned, research suggests that individuals who personally own firearms report firearm ownership more accurately than non-owners who live in households with firearms.^{6–8} All of our reported analyses are therefore based on responses from individual gun owners rather than respondents living in households with guns, unless specifically noted that the calculation was performed using household responses.

To produce national estimates of the number of firearms in the US, we used population figures from the US census⁹ to determine the number of adults aged ≥ 18 years and the number of households in the US. We then calculated the percentage of respondents in our survey who reported personally owning a firearm. This number was applied to the US population to create national estimates of the number of adults who owned firearms. To estimate the number of firearms in private hands, we multiplied the number of firearm owners by the average number of firearms reported by respondents in our survey. As firearm ownership is not normally distributed and our survey included some extreme outliers in terms of the number of firearms owned, we performed calculations excluding the outliers. As a sensitivity analysis, similar calculations were performed using household reports of firearm ownership. We also conducted comparative analyses among men and women, and among respondents who lived alone and those living in multi-person households.

RESULTS

Firearm owners reported that 60% of the firearms owned in the US in 2004 were long guns, primarily rifles and shotguns (fig 1); the remaining 40% were handguns. Among all firearms, rifles were the most common, representing 33% of the gun stock. Revolvers were the most common type of handgun. A small percentage of respondents (5%) reported owning other handguns, including derringers and antique handguns. Other long guns, which include muzzle loaders and antique long guns, represented 6%.

According to our survey, 38% of households reported at least one firearm in the home and 26% of adults reported owning at least one gun. This corresponds to 42 million households with firearms and 57 million adult gun owners. We found that 64% of gun owners or 16% of adults reported owning at least one handgun; 80% of gun owners or 20% of all adults owned a long gun (results not shown).

Ownership demographics

Firearm ownership was more prevalent among middle-aged and older adults than among young adults aged 18–24 years (table 1). Ownership of any firearm was more common among men, those who were married or living with a partner, and respondents living in rural areas or the South. Ownership was strongly associated with whether the respondent grew up with guns in the home. Among gun-owning households in our survey, 46% had ≥ 1 adult gun owner.

Reasons for ownership

When respondents were asked, “What is the one most important reason that you own a handgun/long gun?” the most common response among those who owned a handgun was for self-defense (46%), followed by sport shooting (hunting or target shooting) or collecting (25%). Owners of long guns overwhelmingly reported sport shooting as the “most important” reason to own a long gun (77%; data not shown).

Concentration of ownership

Almost half (48%) of all individual gun owners, corresponding to 13% of the US adult population, reported owning ≥ 4 firearms. Household ownership followed a similar pattern, with 41% of firearm-owning households reporting ownership of ≥ 4 firearms (table 2). The 20% of gun owners who owned the most guns possessed about 65% of the nation’s guns.

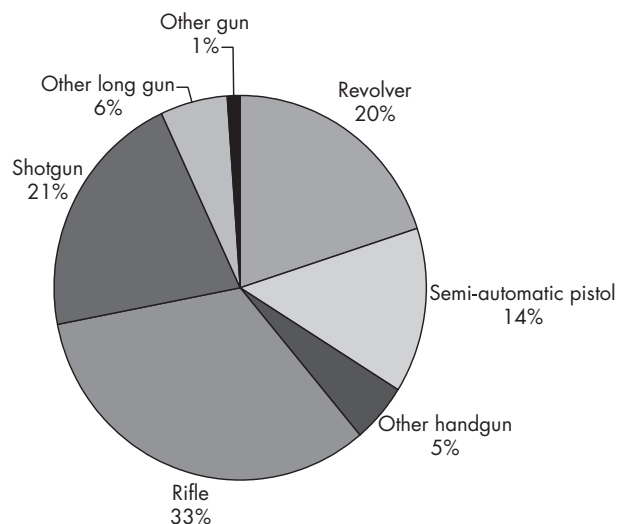


Figure 1 Types of firearms owned in the US.

Table 1 Demographic characteristics of firearm owners

	n	Owns any firearm, n = 726 (%)	Owns both handguns and long guns, n = 322 (%)	Owns handguns only, n = 127 (%)	Owns long guns only, n = 215 (%)
Total	2770	26	12	5	8
Age (years)					
<25	216	16	6	3	7
25-44	903	26	11	5	8
45-64	1058	30	15	5	8
≥65	545	27	12	5	7
Sex					
Male	1363	42	20	5	13
Female	1407	11	3	4	3
Race					
White	2178	30	14	4	9
Non-white	592	15	5	5	3
Marital status					
Single	953	18	7	4	6
Married or living with partner	1786	30	14	5	8
Community					
Urban	687	18	8	5	5
Suburban	1161	23	10	5	7
Rural	872	37	18	4	11
Education					
High school or less	920	26	10	3	10
Some college/associated degree	930	29	12	6	8
Bachelors or higher	904	23	12	4	5
Annual income					
<US\$40000	1120	21	8	4	8
>US\$40000	1282	30	15	6	8
Military service					
Veteran	404	53	27	8	12
Current military	40	31	14	4	8
No	2316	22	9	4	7
Political views					
Liberal	594	16	7	4	4
Moderate	861	26	11	5	9
Conservative	1019	32	16	6	8
Region					
Northeast	530	17	7	2	7
Midwest	635	27	12	3	10
South	986	32	14	7	8
West	619	24	10	5	6
Child aged <18 years					
Yes	1016	27	12	4	9
No	1749	26	12	5	7
Parents had a gun at home					
Yes	1647	40	18	6	12
No	1103	7	3	2	2

Number of guns

The actual number of guns reported in our survey varied depending on how the question was asked and who answered the question. Individual firearm owners (n = 702) reported owning an average of 6.6 (95% confidence interval (CI) 5.2 to 7.9, median 3) working firearms. On further examination, it seemed that individuals who owned ≥4 firearms (with an average of 12 firearms per person) were greatly affecting the mean. When outliers representing the top 3% of gun owners (those owning >25 guns) were removed, the average number of working firearms per owner was 5.0 (95% CI 4.6 to 5.4). On the basis of estimates of 26% of adults in the US owning at least one firearm, we estimated that 57 million adults owned 283 million firearms (95% CI 260 to 305 million).

Estimates based on the number of household firearms were lower. We estimated that 42 million households in the US possessed at least one firearm in 2004, with an average of 5.2 (95% CI 4.9 to 5.6) guns per household, with outliers of >25 guns removed. The number of privately owned firearms in the US based on these estimates would be 218 million (95% CI 206 to 235 million).

Reporting differences

Overall, men and women reported different rates of household firearm ownership. Among married respondents who lived in two-adult households, married men reported a household firearm ownership rate of 54% and an average of 8 firearms per household compared with a 40% ownership rate and an average of 4.6 guns as reported by married women (table 3).

DISCUSSION

In general, our survey results are consistent with previous reports of firearm ownership demographics.^{1-3,10} Firearms are most likely to be owned by white men who live in a rural areas, those who are middle-aged or older, with a middle to higher income, who grew up with guns in the home and who live in the southern or mid-western regions of the country. Long guns continue to be the most prevalent type of gun in the US. Our survey, however, reports a slightly higher percentage of firearms that are handguns than that reported in 1994³ (40% v 34%). This shift to a greater proportion of handguns may be reflective of the decline in hunting and indicate a change in motivations and use of firearm ownership.¹⁰ Similar to previous

Table 2 Distribution of firearm ownership in the US population

Firearms owned	Percentage of US population	
	Individuals*	Households*
1	6	8
2	4	6
3	3	4
≥4	13	16
Any firearm	26†	39†

*Calculations based on the number of individuals who reported an actual number of firearms; 5% of households that reported owning a firearm did not report the number of firearms present in their home.

†These numbers are calculated using the affirmative response to owning a firearm.

surveys,³⁻¹⁰ handgun owners were most likely to report owning their handguns for self-protection, whereas owners of long guns reported owning their guns for sporting purposes. Individuals who own only handguns are just as likely to live in an urban environment as a rural one and are demographically more diverse compared with owners of only long guns who are more likely to be men and live in a rural area.

Our findings diverge from those of previous studies on firearm ownership regarding the increase in the average number of guns per gun owner. Although the rate of individual (26%) and household (38%) ownership is similar to that in other recent surveys,^{1-3, 11} the number of guns reported per person is higher. When including outliers, gun owners reported an average of 6.9 guns per owner compared with 4.1 reported in 1994 (J Ludwig, personal communication, 12 January 2005). The higher average number of guns in our survey is attributable to the higher number of guns owned by those who owned ≥4 guns, as the percentage of gun owners in each category of gun ownership (those owning 1–3 or ≥4 guns) has stayed almost the same.

Cook and Ludwig³ reported an estimate of 192 million working firearms in circulation in 1994. Although the population increased 11% between 1994 and 2004, population growth alone does not explain the differences in the number of guns reported. A recent report by the National Research Council, using national data on firearms manufactured, imported and exported, estimated that 258 million firearms were available in the US as of 1999.¹² This estimate does not account for firearm loss, breakage or those destroyed. When we calculated the number of guns in the same manner as in the National Research Council report, adding all available years, we calculated that about 275 million guns were manufactured or imported for private sale in the US by the end of 2003. As the US does not require firearms to be registered (although some individual states do), it is impossible to determine the exact number of privately owned firearms in this country.

Our estimates of 283 million firearms in the US may be higher than those that Cook and Ludwig established in 1994, even with the population growth kept in context, for many possible reasons. Our sample may have, by chance, captured more affluent firearm owners who own many guns. We adjusted for age and sex, but were unable to adjust for income because our income-related questions were not comparable with a standard such as the US census. Alternatively, respondents may have overestimated the number of guns they owned. Given that we are extrapolating from a survey of 2770 respondents to millions of Americans, small changes in the number of reported firearms results in a large difference in the national estimates.

Table 3 Rates of household firearm ownership, median and average number of guns per household for men and women

	Ownership rate	Average number of guns	Median
Men	49	7.9	5
Women	30	4.1	3
Married men	54	8.0	4
Married women	40	4.6	3
Men who live alone	39	6.8	3
Women who live alone	12	2.5	2

The General Social Survey indicates that household gun ownership has been declining over time, from about 50% in the early 1970s to current estimates of 34%.¹ Although the exact number of firearms in the US may be debatable as a result of inclusion or exclusion of outliers, or whether individual or household responses are used, it seems that although the proportion of households with firearms is declining, the number of working firearms in the US is increasing, not decreasing, and increasing most among those who already own firearms.

We also found evidence to support earlier research showing that women report lower levels of household firearm ownership, and in particular report fewer guns per household than men.⁶⁻⁸ Married women in our study reported an average of 3.4 fewer household guns than married men and a difference in ownership of 14% (54% in men v 40% in women). These findings reinforce earlier recommendations for surveys of firearm ownership and behavior,⁶ to seek information from individual firearm owners rather than any person living in a household with a firearm.

Limitations

We have considered some of the challenges faced when conducting telephone surveys, in particular those related to asking household members to respond to questions about topics, in this case firearm ownership, which may pertain to other members of the household. This self-reported data may also be subject to potential inaccuracies due to recall bias or the tendency to report socially desirable responses.¹³ For example, when we asked respondents two different questions to determine how many firearms were in their households, one asking for the total number of guns in the home and one asking specifically how many of each type of gun were owned, we often received two different numbers. Given that this was a telephone survey, we were limited to adults with access to a working telephone. If households without telephones were more or less likely to own a firearm, then our findings could be biased in the respective directions. Finally, non-response can

Key points

- Firearm ownership in the US is very common, with about one third of all households owning at least one firearm.
- Long guns are the most prevalent type of gun in the US, but 40% of the gun stock is handguns.
- Firearm ownership is highly concentrated, with a small number of adults owning a large proportion of the nation's firearms.
- Married men and women report different rates of household firearm ownership, supporting the proposal that researchers should seek information about firearm ownership from individual firearm owners.

affect the validity of our findings if those choosing not to answer a question differed systematically from those who did.¹⁴ The low response rate in this survey is similar to other random-digit-dial telephone surveys¹⁵; however, it still allows for potential bias if those who participated in the survey differed in terms of firearm ownership from those who did not.

CONCLUSIONS

Implications for prevention

In the US, about one in four adults owns at least one firearm. Although some other developed countries have similar rates of personal firearm ownership, what is unique in the US is the number of firearms privately owned. Researchers have estimated about 25 guns per 100 people in countries such as Canada, New Zealand, Germany, France and Sweden.¹⁶ On the basis of current estimates from our survey, the US has 93 guns per 100 people.

The National Academy of Sciences recently issued a report on firearms and violence in which they called for improved data on firearm ownership and use to advance the empirical evaluations of programs and policies to reduce gun violence.¹² Our findings describe the current motivations for firearm ownership and also provide information on the similarities and differences among owners of different types of guns. This information can assist in designing a more appropriate firearm injury policy as well as understanding the denominator of exposure when evaluating injury prevention interventions.

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