

Behind the Bullets

An Epidemiologic Review of Firearm Injury and Death in the U.S. and a Public Health Approach to Reducing The Epidemic of Firearm Violence



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Objectives

1. Review the epidemiology and risk factors for firearm injury and death
2. Review the data for public-health approaches of firearm injury reduction including strategies at the legislative, community, health care and personal levels
3. Define future research priorities, advocacy and clinical practice approaches for firearm injury prevention



Firearm Injury Research – Yes, We Have Data! Who does the Research?

- Centers for Disease Control (CDC)
 - National Violent Death Reporting System (NVDRS)
 - WISQARS (Web-based Injury Statistics Query and Reporting System)
- National Institutes of Health
- The Justice Department
- ATF (Bureau of Alcohol, Tobacco, Firearms and Explosives)

Violence Prevention

CDC > Injury Center > Violence Prevention > Funded Programs and Initiatives > National Violent Death Reporting System (NVDRS) > State Profiles

Violence Prevention

Our Approach +

Child Abuse & Neglect +

Elder Abuse +

Global Violence +

Intimate Partner Violence +

Publications +

Sexual Violence +

Suicide +

Youth Violence +

Funded Programs and Initiatives -

Dating Matters®

Advances Research on Preventing Dating, Intimate Partner, and Sexual Violence

Domestic Violence Prevention Enhancements and Leadership Through Alliances, Focusing on Outcomes for Communities United with States (DELTA Focus)

National Violent Death Reporting System

[f](#) [t](#) [+](#)

In 2002 the Centers for Disease Control and Prevention (CDC) began implementing the National Violent Death Reporting System (NVDRS). NVDRS is a state-based surveillance system that links data from law enforcement, coroners and medical examiners, vital statistics, and crime laboratories to assist each participating state in designing and implementing tailored prevention and intervention efforts. NVDRS provides data on violence trends at national and regional levels; each state can access all of these important data elements from one central database.

States that are funded for NVDRS operate under a cooperative agreement with CDC to whom all violent deaths are voluntarily reported. NVDRS funded six states initially. In 2016 CDC received funding to expand the system to a total of 42 states. The goal is to include eventually all 50 states, all U.S. territories, and the District of Columbia in the system.



The map shows the following states highlighted in purple: WA, OR, CA, NV, AZ, NM, CO, UT, WY, ID, MT, ND, SD, NE, KS, MN, IA, MO, OK, AR, TX, LA, MS, AL, GA, SC, NC, VA, WV, PA, NY, NJ, DE, MD, DC, VT, NH, ME, CT, RI, MA, HI, AK, and PR.



Firearm Injury Research – Yes, We Have Data! Who does the Research?

- Non-profits
 - The Trace
 - The Gun Violence Archive
 - The Brady Center
 - Everytown for Gun Safety
- CA appropriated 5 million for firearm research institute (2017)
- Prominent academic centers
 - Johns Hopkins
 - UC Davis
 - Harvard
 - University of Washington

GUN VIOLENCE Archive 2017

Total Number of Incidents	42,140
Number of Deaths ¹	10,491
Number of Injuries ¹	21,065
Number of Children (age 0-11) Killed or Injured ¹	493
Number of Teens (age 12-17) Killed or Injured ²	2,191

MISSION
Gun Violence Archive (GVA) is a not for profit corporation formed in 2013 to provide free online public access to accurate information about gun-related violence in the United States. GVA will collect and check for accuracy, comprehensive information about gun-related violence in the U.S. and then post and disseminate it online.

CHARTS AND MAPS

GUN VIOLENCE Archive INCIDENTS IN 2017

HARBORVIEW INJURY PREVENTION & RESEARCH CENTER

August 9, 2017

Helping Individuals with Firearm Injuries (HiFi)

HiFi
Helping Individuals with Firearm Injuries

A Violence Prevention study is testing community-based intervention to support gunshot wound victims

COMMUNITY RESOURCES

STOP THE BLEED WASHINGTON

#EndSuicideWA
The Pacific Northwest Suicide Prevention Resource Center

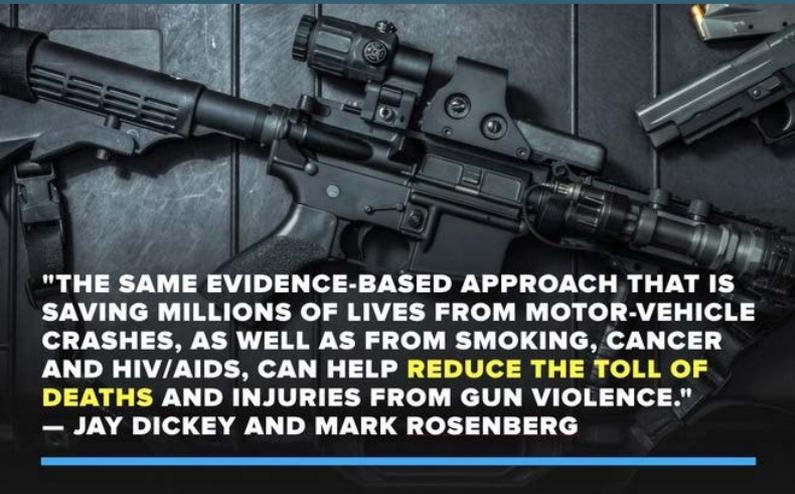
UPCOMING EVENTS

HIPRC Faculty Meeting
September 6 @ 1:00 pm - 2:00 pm





- Response to the 1993 CDC funded Kellerman et al. NEJM article, *Gun Ownership as a Risk Factor for Homicide in the Home*
- 1996 Congress passed an appropriations bill with the Dickey Amendment stating that CDC funding for injury prevention could not be used to “advocate or promote gun control” & removed \$2.6 million from budget
- Representative Dickey later reversed his views publicly
- 2013 President Obama released an executive order for the CDC to conduct research on causes and prevention of gun violence, and the role of firearms in deaths but no funding allocated by Congress since then
- NIH has small, threatened budget for firearm violence



"THE SAME EVIDENCE-BASED APPROACH THAT IS SAVING MILLIONS OF LIVES FROM MOTOR-VEHICLE CRASHES, AS WELL AS FROM SMOKING, CANCER AND HIV/AIDS, CAN HELP REDUCE THE TOLL OF DEATHS AND INJURIES FROM GUN VIOLENCE."

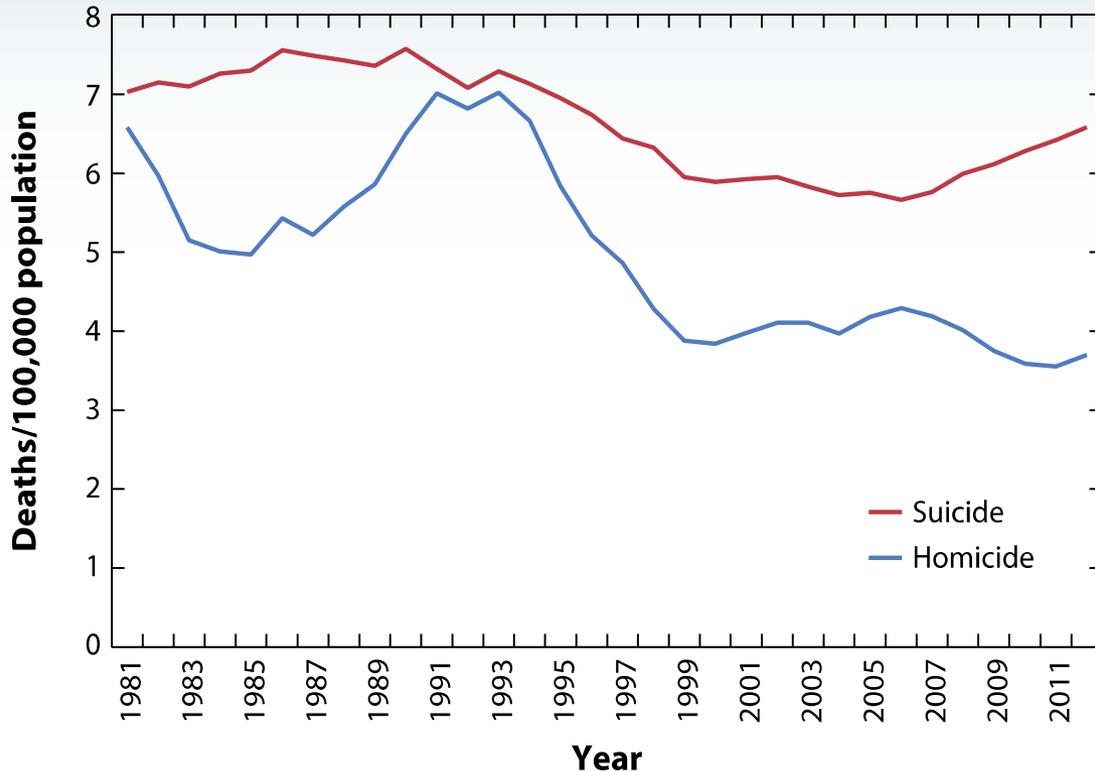
— JAY DICKEY AND MARK ROSENBERG

The Dickey Amendment

Yes, the CDC Can Do Research - What About Funding?



Firearm Mortality in the US

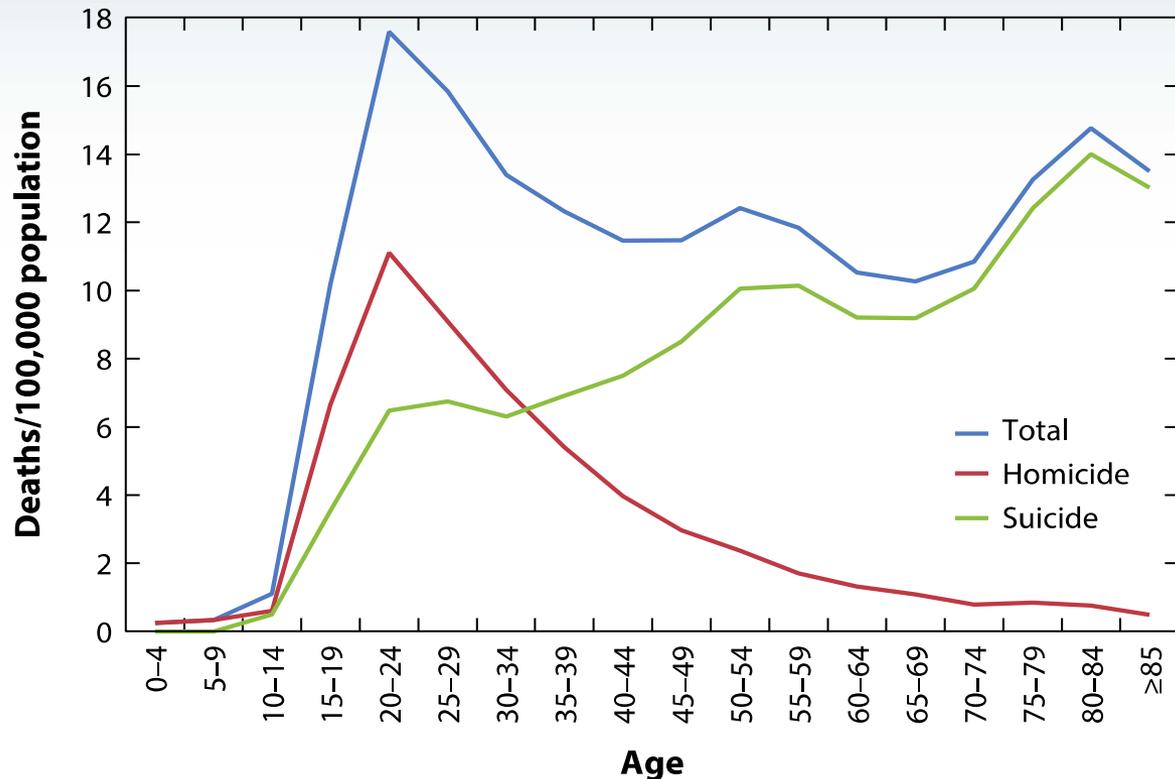


Mortality rates for firearm deaths 1981-2012

- 32,529 firearm deaths per year 2010-2012 (CDC WISQARS)
 - 62% suicide
 - 35% homicide
 - 2% accidental
- 10.2 firearm deaths per 100k
- Case fatality rate:
 - 85% suicide
 - 19% homicide
 - 5% accidental



Firearm Mortality and Age

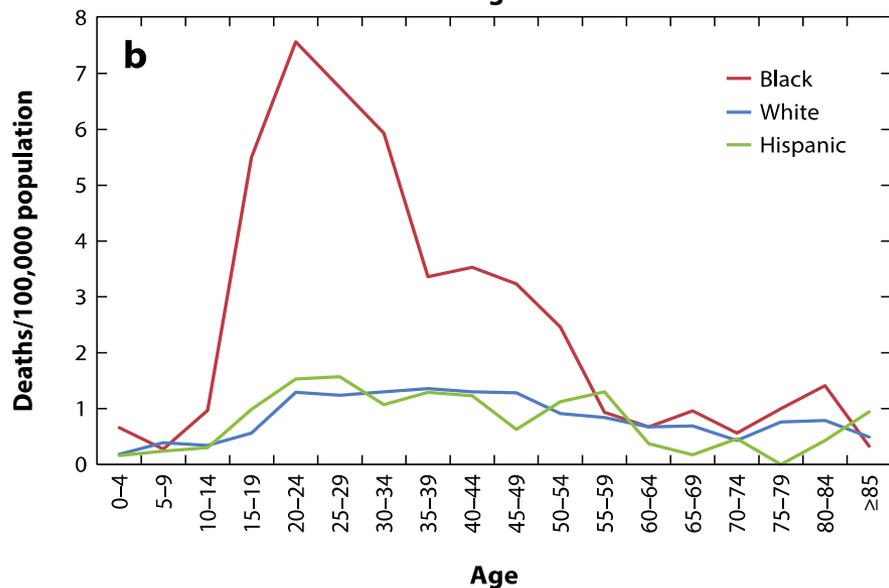
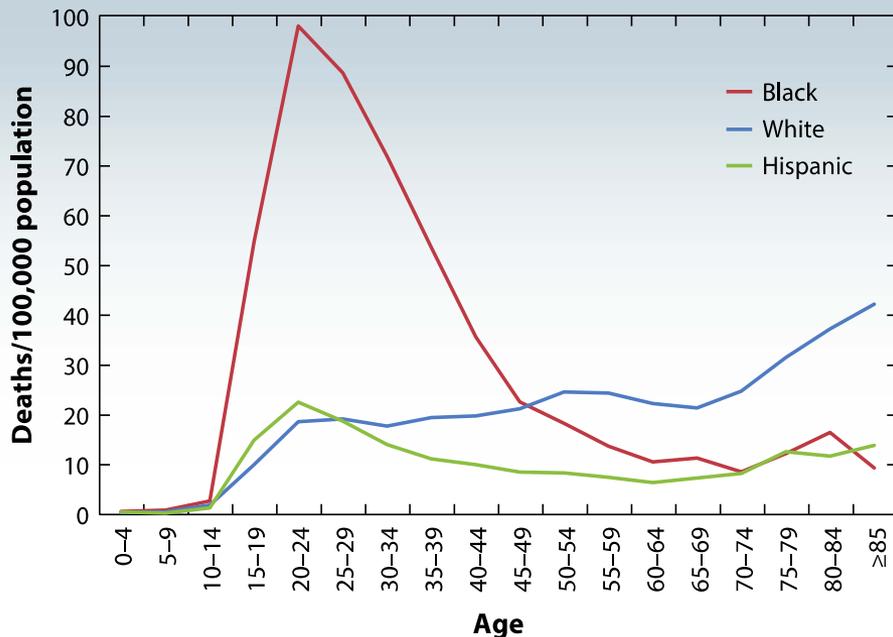


- Homicide rate highest between 15-24: 8.9
- Suicide rate highest over 65: 10.9 (bimodal)
- Accidental rate highest 15-24: 0.3

Mortality rates for firearm homicide and suicide by age groups, 2012



Homicide Firearm Mortality, Sex and Race



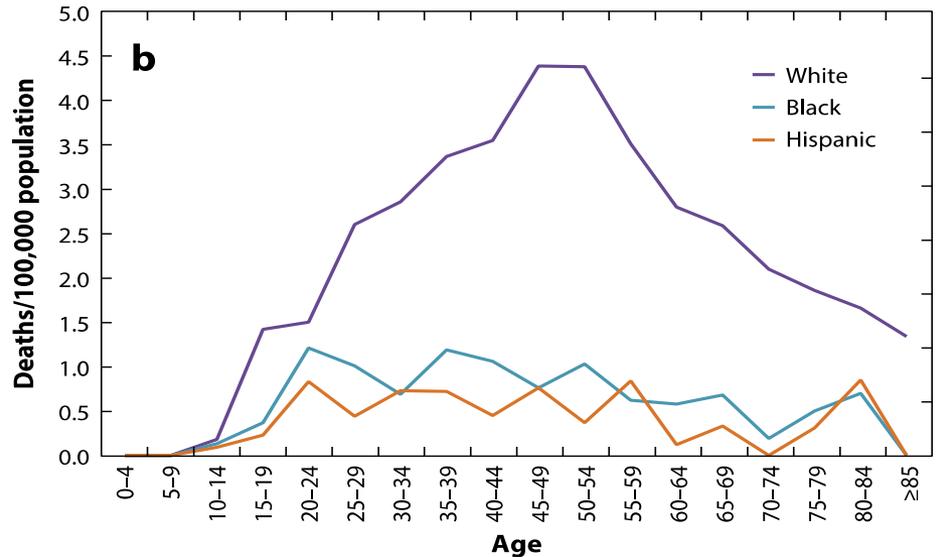
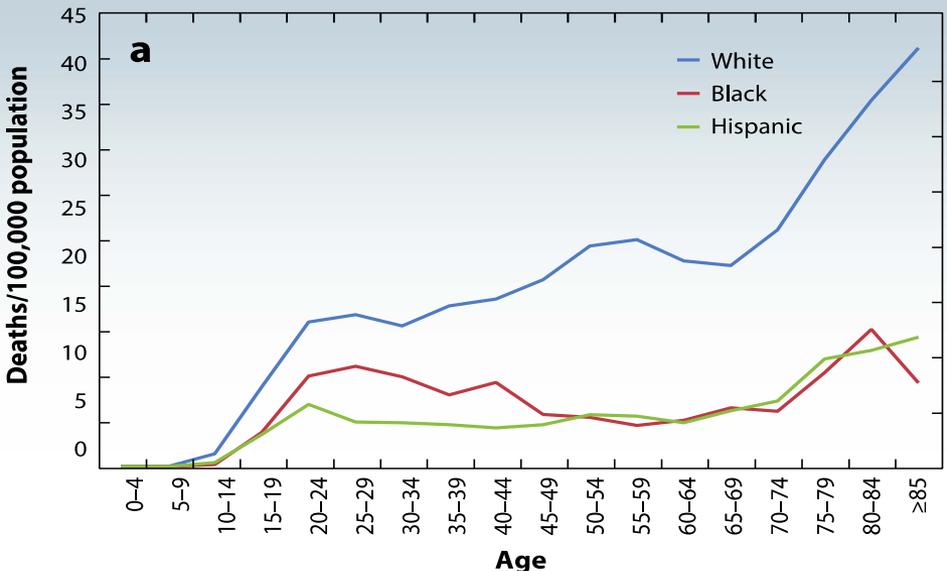
- Males account for 86% of firearm deaths
- African Americans have the highest overall rate of firearm death: 18.1
 - Homicide: 14.8
- Disproportionate burden of *homicide* on young AA men
 - Ages 20-29: rate 20x higher than whites
 - Ages 15-44: 5900 deaths, 89% homicide

Mortality rates for firearm homicide among males (top) and females by race and age, 2012.



Suicide Firearm Mortality, Sex and Race

- White males: highest suicide rate at 9.24
- 9,063 firearm deaths annually among white men, 89% suicide
- White females highest risk for firearm suicide

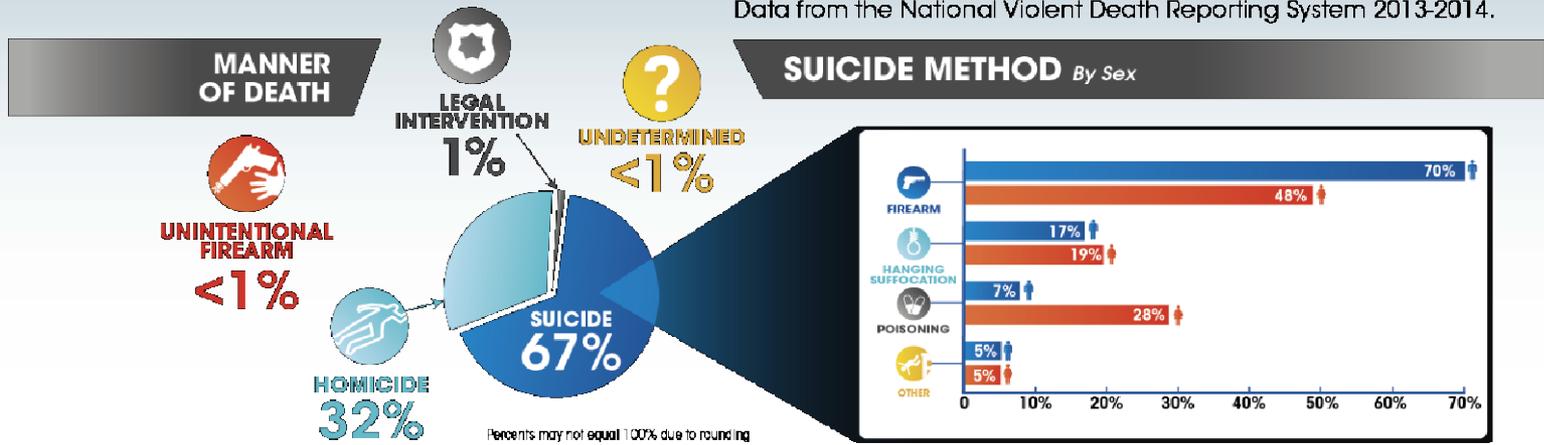


Mortality rates for firearm suicides among males (top) and females by race and age, 2012.

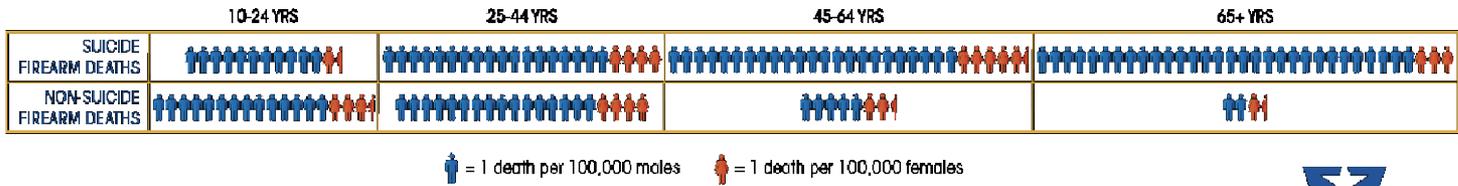


A LOOK AT SUICIDE IN SOUTH CAROLINA

Data from the National Violent Death Reporting System 2013-2014.



SUICIDE AND NON-SUICIDE* FIREARM DEATH RATES By Age and Sex



* Non-suicide deaths include homicides, legal interventions, unintentional firearm deaths, and undetermined manner (intent) deaths that may have resulted from violence.

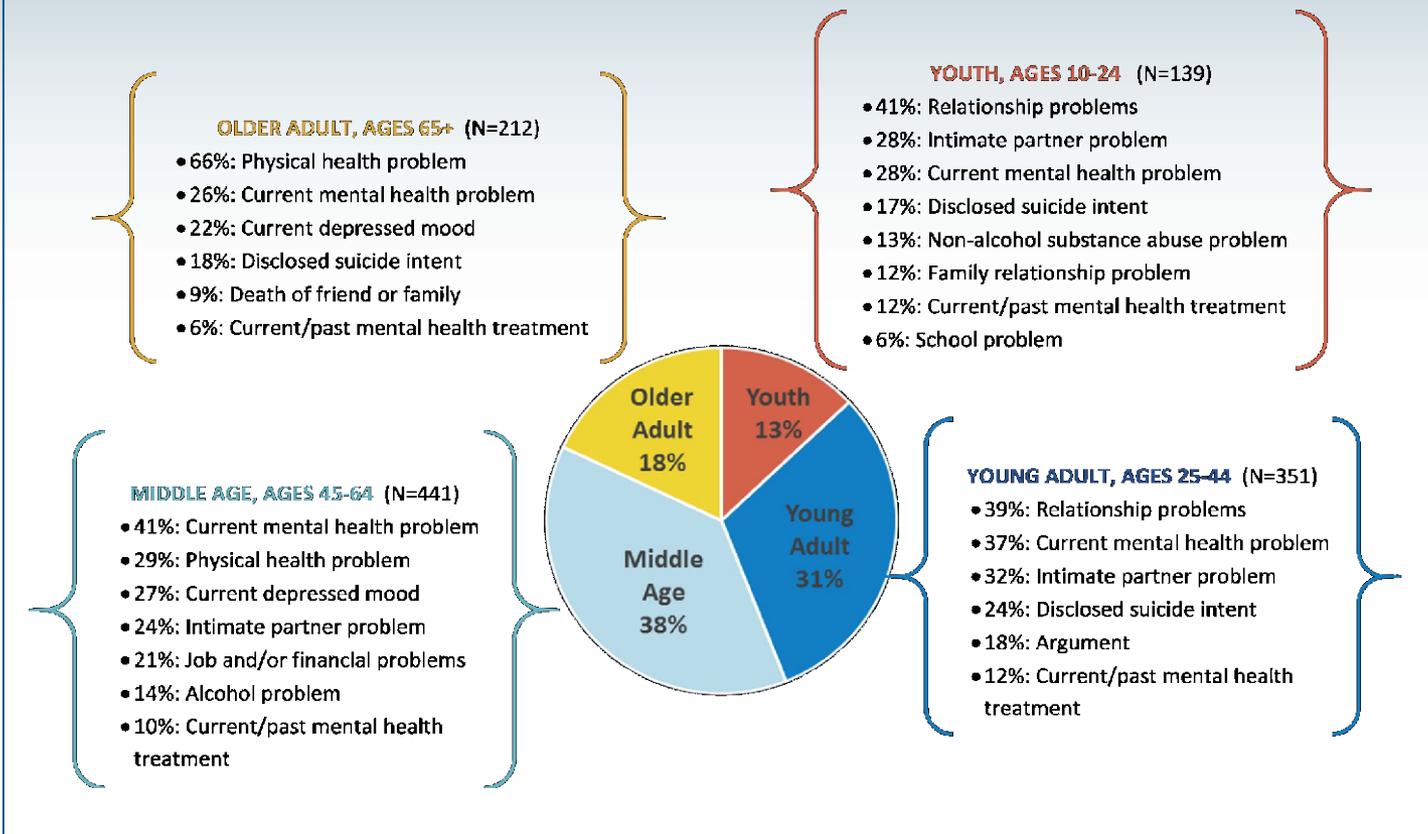


Suicide in SC...

- Suicide rate was 16% higher in SC than the US and had a **28% increase from 2004 – 2014 (rate 12 to 15.3 per 100k)**
- Firearms were used in 65% of suicides



SUICIDE CIRCUMSTANCES BY LIFE STAGE, SOUTH CAROLINA, 2013-2014



Suicide in SC...

- Most commonly cited circumstance was current mental health problem (36%), relationship problem (27%), intimate partner “problem” (24%), current depressed mood (23%)

10 Leading Causes of Death by Age Group, United States – 2015

Rank	Age Groups										Total
	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	
1	Congenital Anomalies 4,825	Unintentional Injury 1,236	Unintentional Injury 756	Unintentional Injury 763	Unintentional Injury 12,514	Unintentional Injury 19,795	Unintentional Injury 17,818	Malignant Neoplasms 43,054	Malignant Neoplasms 116,122	Heart Disease 507,138	Heart Disease 633,842
2	Short Gestation 4,084	Congenital Anomalies 435	Malignant Neoplasms 437	Malignant Neoplasms 428	Suicide 5,491	Suicide 6,947	Malignant Neoplasms 10,909	Heart Disease 34,248	Heart Disease 76,872	Malignant Neoplasms 419,389	Malignant Neoplasms 595,930
3	SIDS 1,568	Homicide 369	Congenital Anomalies 181	Suicide 409	Homicide 4,733	Homicide 4,863	Heart Disease 10,387	Unintentional Injury 21,499	Unintentional Injury 19,488	Chronic Low Respiratory Disease 131,804	Chronic Low Respiratory Disease 155,041
4	Maternal Pregnancy Comp. 1,522	Malignant Neoplasms 354	Homicide 140	Homicide 158	Malignant Neoplasms 1,469	Malignant Neoplasms 3,704	Suicide 6,936	Liver Disease 8,874	Chronic Low Respiratory Disease 17,457	Cerebro-vascular 120,156	Unintentional Injury 146,571
5	Unintentional Injury 1,291	Heart Disease 147	Heart Disease 85	Congenital Anomalies 156	Heart Disease 997	Heart Disease 3,522	Homicide 2,895	Suicide 8,751	Diabetes Mellitus 14,166	Alzheimer's Disease 109,495	Cerebro-vascular 140,323
6	Placenta Cord. Membranes 910	Influenza & Pneumonia 88	Chronic Low Respiratory Disease 80	Heart Disease 125	Congenital Anomalies 386	Liver Disease 844	Liver Disease 2,861	Diabetes Mellitus 6,212	Liver Disease 13,278	Diabetes Mellitus 56,142	Alzheimer's Disease 110,561
7	Bacterial Sepsis 599	Septicemia 54	Influenza & Pneumonia 44	Chronic Low Respiratory Disease 93	Chronic Low Respiratory Disease 202	Diabetes Mellitus 798	Diabetes Mellitus 1,986	Cerebro-vascular 5,307	Cerebro-vascular 12,116	Unintentional Injury 51,395	Diabetes Mellitus 79,535
8	Respiratory Distress 462	Perinatal Period 50	Cerebro-vascular 42	Cerebro-vascular 42	Diabetes Mellitus 196	Cerebro-vascular 567	Cerebro-vascular 1,788	Chronic Low Respiratory Disease 4,345	Suicide 7,739	Influenza & Pneumonia 48,774	Influenza & Pneumonia 57,062
9	Circulatory System Disease 428	Cerebro-vascular 42	Benign Neoplasms 39	Influenza & Pneumonia 39	Influenza & Pneumonia 184	HIV 529	HIV 1,055	Septicemia 2,542	Septicemia 5,774	Nephritis 41,258	Nephritis 49,959
10	Neonatal Hemorrhage 406	Chronic Low Respiratory Disease 40	Septicemia 31	Two Tied: Benign Neo./Septicemia 33	Cerebro-vascular 166	Congenital Anomalies 443	Septicemia 829	Nephritis 2,124	Nephritis 5,452	Septicemia 30,817	Suicide 44,193

Data Source: National Vital Statistics System, National Center for Health Statistics, CDC.
Produced by: National Center for Injury Prevention and Control, CDC using WISQARS™.



Homicide & Suicide – How they Fit in the Overall Burden of Disease...

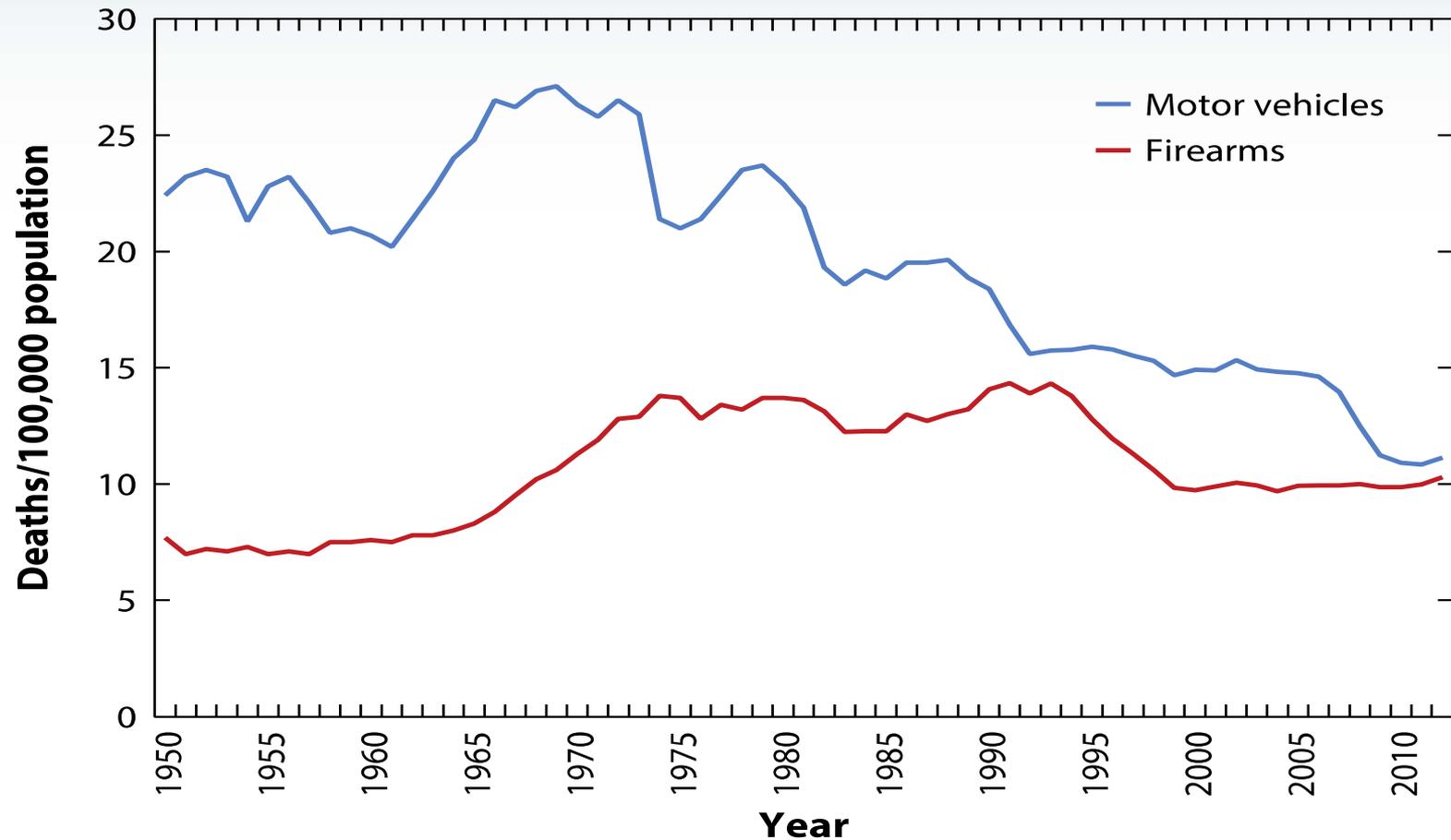
Deaths per 100,000 population,¹ age-adjusted

Table 17

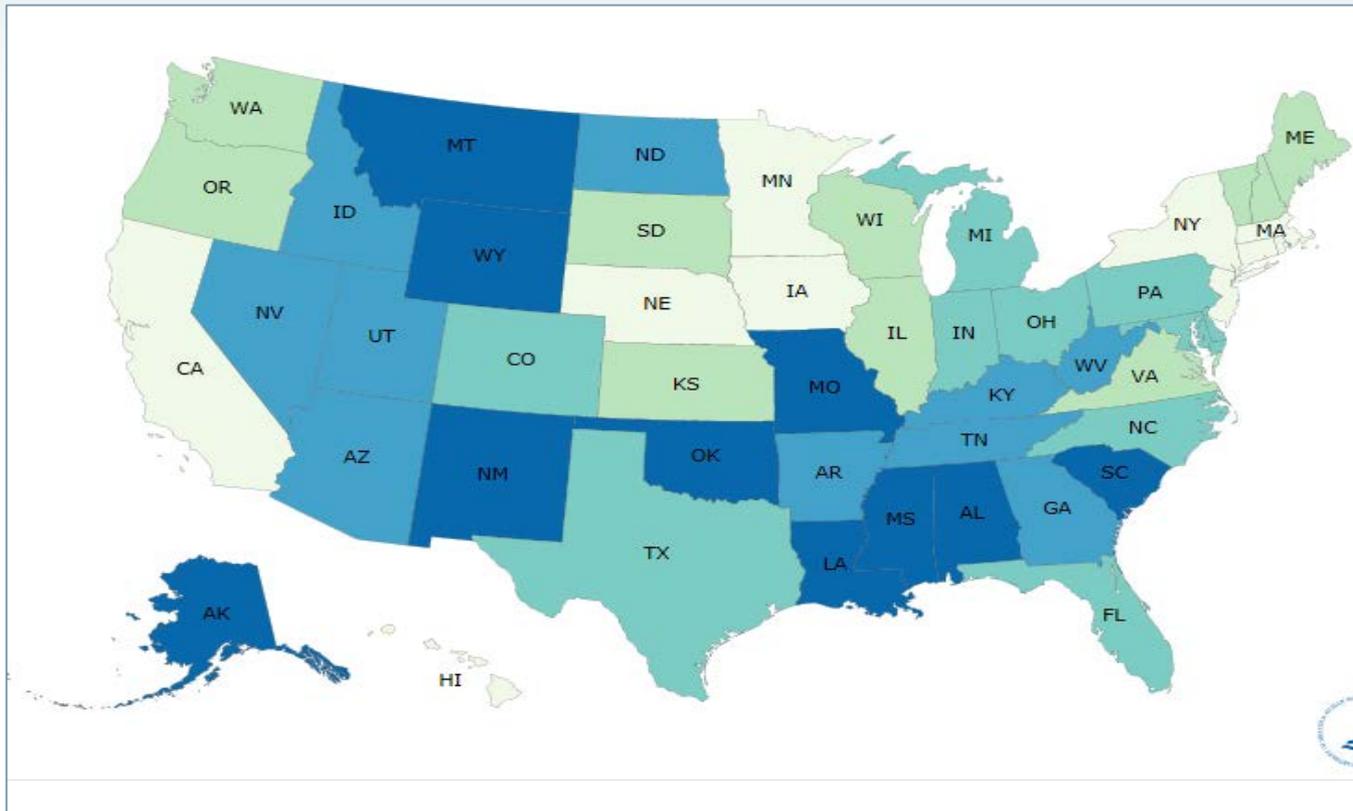
All causes	869.0 (2000)	724.6 (2014)	733.1 (2015)
Heart disease	257.6 (2000)	167.0 (2014)	168.5 (2015)
Cancer	199.6 (2000)	161.2 (2014)	158.5 (2015)
Chronic lower respiratory diseases	44.2 (2000)	40.5 (2014)	41.6 (2015)
Unintentional injuries	34.9 (2000)	40.5 (2014)	43.2 (2015)
Stroke	60.9 (2000)	36.5 (2014)	37.6 (2015)
Alzheimer's disease	18.1 (2000)	25.4 (2014)	29.4 (2015)
Diabetes	25.0 (2000)	20.9 (2014)	21.3 (2015)
Influenza and pneumonia	23.7 (2000)	15.1 (2014)	15.2 (2015)
Nephritis, nephrotic syndrome, and nephrosis	13.5 (2000)	13.2 (2014)	13.4 (2015)
Suicide	10.4 (2000)	13.0 (2014)	13.3 (2015)



Motor Vehicle Deaths vs. Firearm Deaths



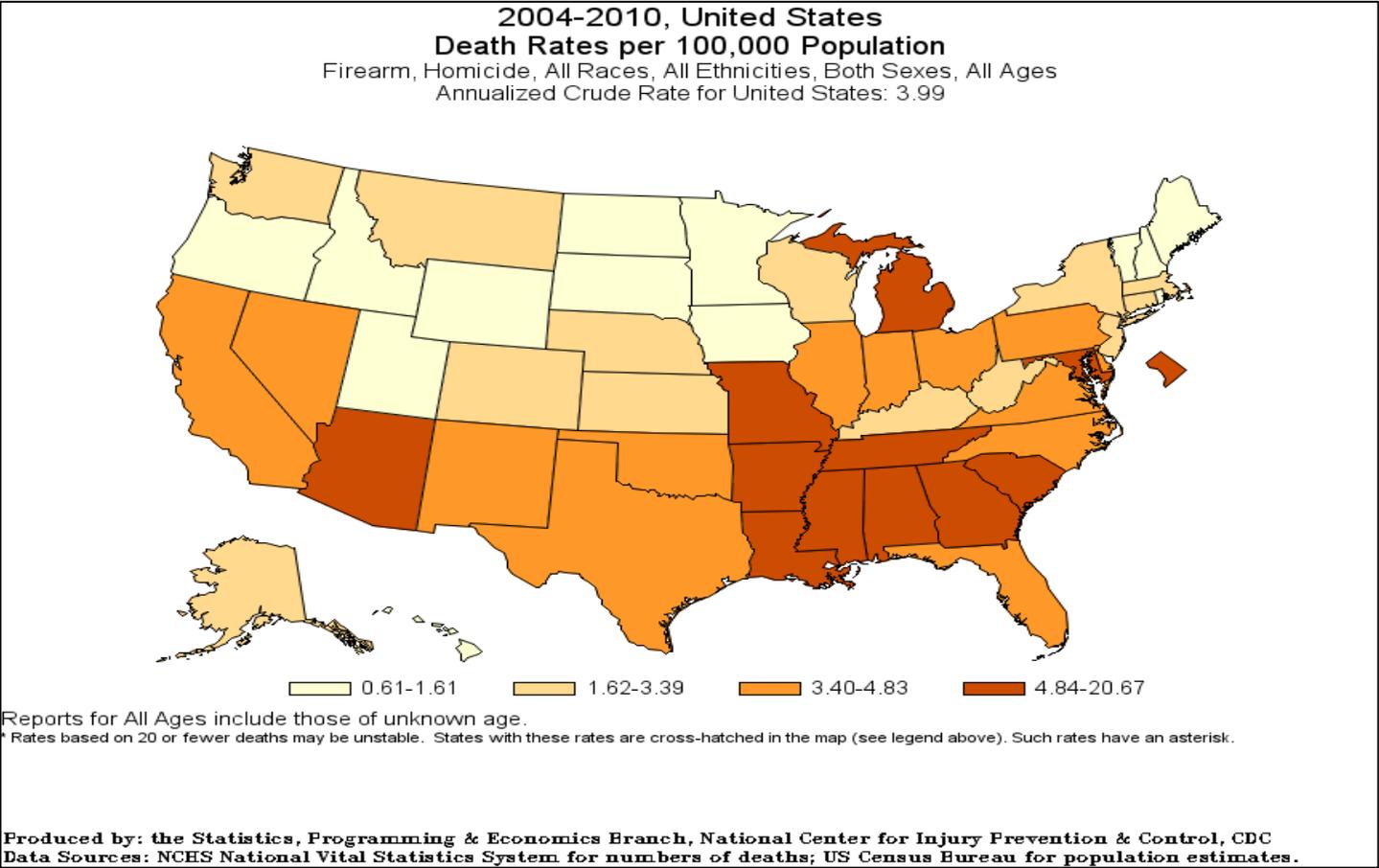
Firearm Fatalities – Geographic Distribution



2015 Firearm Mortality by State
CDC NCHS

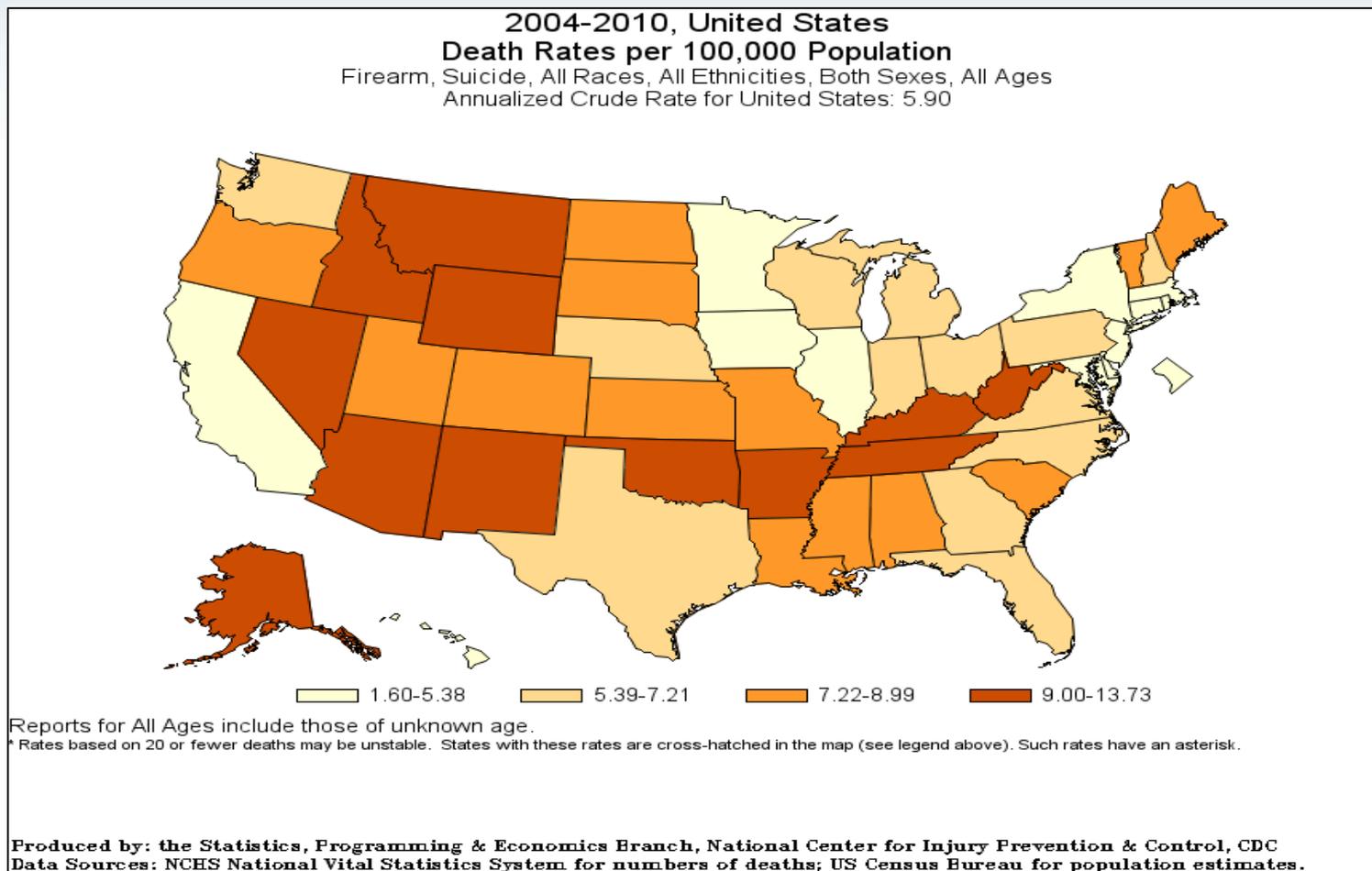


Firearm Fatalities - Homicide





Firearm Fatalities - Suicide





It's About More than the Mortality...

- 70,000 non-fatal firearm injuries annually
 - 21.6 per 100k
 - 54% result in hospitalization
 - Non-fatal injuries decreased in 1990s, **but increased 52% 1990-2012**
- Costs of firearm injuries and death?
 - Medical and work annual costs: \$48 billion
 - 6.6 billion from initial hospitalization alone
 - 40% Medicaid and Medicare
 - 24% self-pay
 - Total societal annual costs: **\$174 billion**
- Profound impact on victims, families, witnesses and communities
 - PTSD, loss of income, disability, fear, substance abuse





GSW Neck

- Trachea injury
- Carotid injury
- Stroke
- Esophageal injury
- Spinal cord injury
- Respiratory failure
- Prolonged vent wean
- Pneumonia
- ARDS



GSW Leg

- Soft tissue injury
- Infection
- Long bone fracture
- SFA injury
- Compartment syndrome
- AKI
- Loss of limb



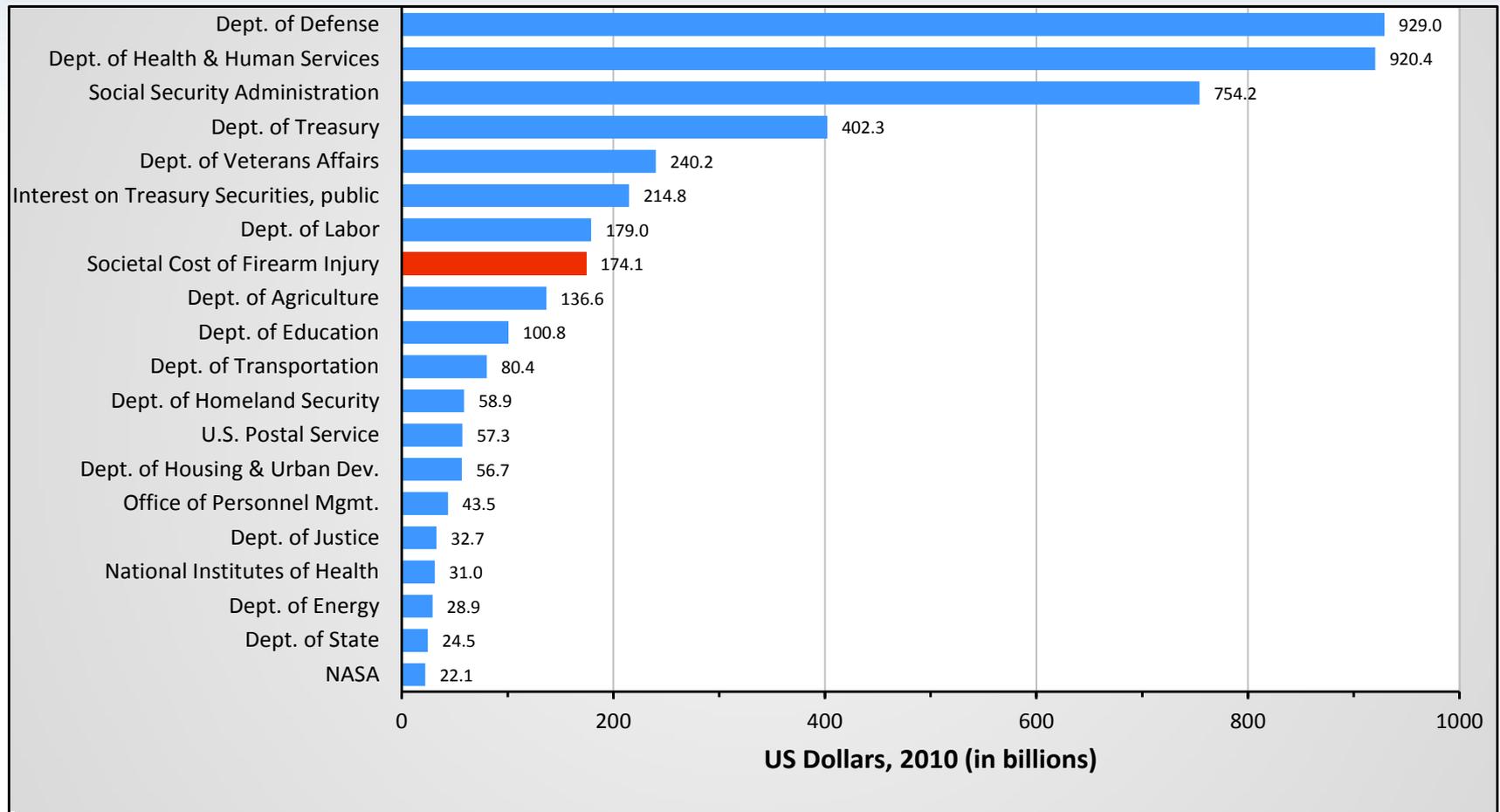
GSW Abdomen

- Solid organ injury (spleen, liver)
- Bowel injury
- Diaphragm injury
- Pelvic Abscess
- Sepsis
- ARDS
- Respiratory failure

How is a GSW so Devastating?



Societal Cost of Firearm Injury and Death



How do You *Really* Measure This?



How Does the US Compare?

Firearm mortality data 973 million in 23 high-income countries compiled by the WHO, 2010

	US*	Other Countries*
<i>Homicide rate</i>	5.3	0.8
<i><u>Firearm</u> homicide rate</i>	3.6	0.1
<i>Suicide rate</i>	12.4	15
<i><u>Firearm</u> suicide rate</i>	6.3	0.8

*Mortality rates per 100k

- Firearm homicide rate **25.2x** higher
 - Ages 15-24 **49x** higher
 - ✧ Non-firearm homicide rate only 2.7x higher
- Firearm suicide rate **8x** higher
 - Overall suicide rate lower
- Unintentional firearm deaths **6.2x** higher



How Does the US Compare?

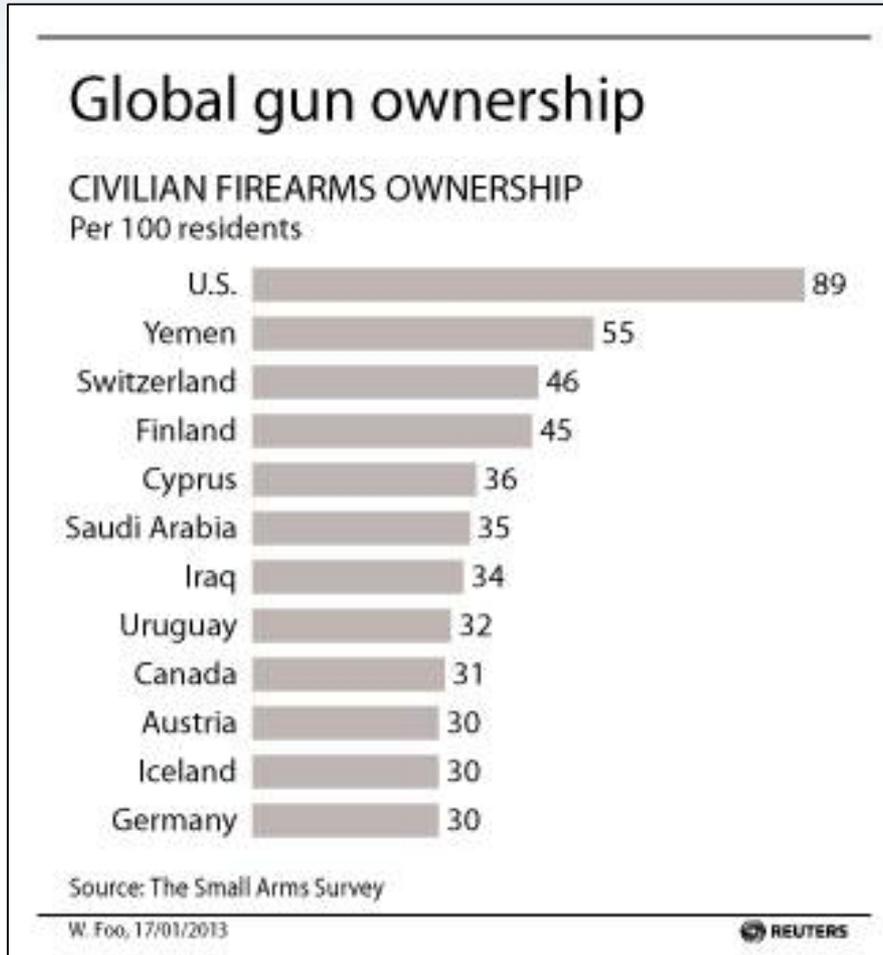
Out of *all* countries included in the analysis...

- › 90% of all women killed by firearms...
- › 91% of children 0-14 killed by firearms...
- › 92% of youth/young adults 15-24 killed by firearms...

Were in the



Firearm Ownership in the US



- Estimated 270 million civilian firearms in the US (ATF estimate >300 million)
- 89-100 firearms per 100 people
- 33% of US households have firearms
- 65% own more than 1 gun

Reasons People Own Guns

- Household ownership decreasing, but overall number of guns in population *increasing*
- Why do people own firearms?
 - Protection (67%)
 - Hunting (38%)
 - Sport/target (30%)
 - Collecting (13%)
 - Job (8%)
- 60% of US adults surveyed thinks a firearm increases self-protection
- Types of firearms:
 - Handgun, pistol (72%)
 - Rifle (62%)
 - Shotgun (52%)





Sources of US Civilian Firearms

- 60-80% purchased from federally licensed dealers
- 20-40% are purchased from “private parties” – *not legally* subject to background checks in most states (loopholes)
 - Equivalent to 6.6 million in 2008
 - Online sales
 - Non licensed gun show dealers
 - Friends/family
- 85% recovered crime guns sold at least once by private parties
 - Many *enter market legally* then *enter unregulated markets*
- 80% of inmates imprisoned for firearm-related crimes obtain firearms from family, friends, or underground markets

Wintemute GJ, Braga A, Kennedy DM. Private-Party Gun Sales, Regulation, and Public Policy. *NEJM*. 2010;363(6): 508-511.

US Bureau of Alcohol, Tobacco, Firearms. 2000. *Commerce in Firearms in the United States*. Washington, DC US Department of Treasury.

Wintemute GJ, Cook PJ, Wright MA. Risk factors among handgun retailers for frequent and disproportionate sales of guns used in violent and firearm-related crimes. *Inj Prev*. 2005;11:357-63

Vittes KA, Vernick JS, Webster DW. Legal status and source of offender's firearms in states with the least stringent criteria for gun ownership. *Injury Prevention*. 2013;19:26-31.



Where do Crime Guns Come From?

Highest Export Rates
Lowest Export Rates



Firearm Access Matters

Annals of Internal Medicine

REVIEW

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

A Systematic Review and Meta-analysis

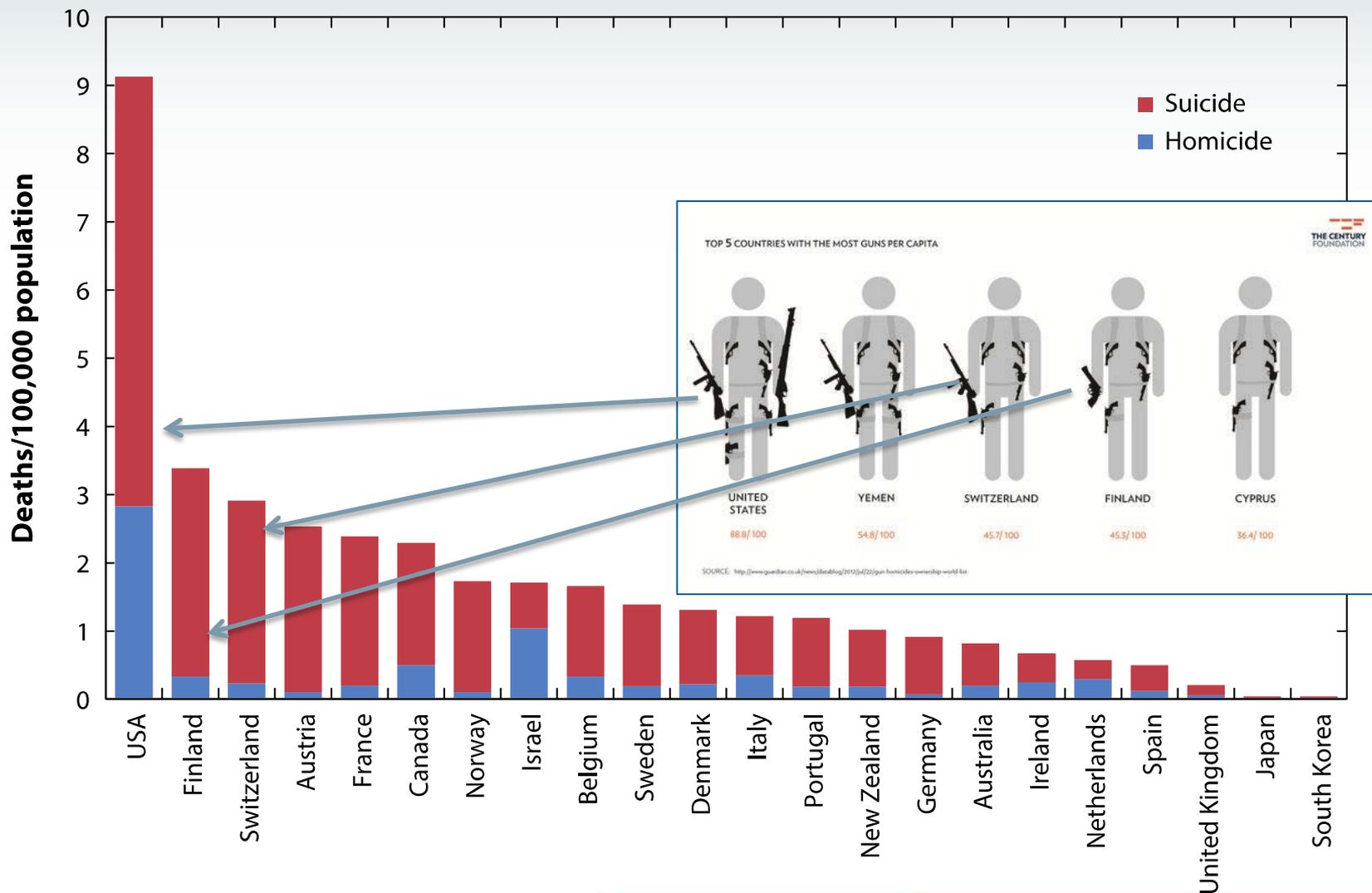
Andrew Anglemyer, PhD, MPH; Tara Horvath, MA; and George Rutherford, MD

- Methodologically strong meta-analysis of 16 studies
 - ✧ Firearm access *increased the odds of suicide by 3.24* (CI 2.4-4.4)
 - ✧ Firearm access *increased the odds of homicide by 2* (CI 1.56-4)
- Siegel et al. For every 1% increase in firearm ownership, homicide rates increased 0.9%





Burden of Firearm Deaths Relative to Ownership



Grinshteyn E, Hemenway D. Violent Death Rates: The US Compared to Other High-Income OECD Countries, 2010. *The American J of Med.* 2015. *Small Arms Survey, 2007*



Violence Prevention = Understanding its Causes

The Social-Ecologic Model



Personal & Community Risk Factors Associated With Firearm Homicide

- History of committing violent crimes
- History of alcohol abuse and DUI
- Intimate partner violence
- Experiencing prior assaults or receiving threats (community violence)
- African American
- Gang involvement
- Firearm access
- Male sex
- Economically depressed areas
- High unemployment
- Urban communities



Personal & Community Risk Factors for Use of Firearm for Suicide

- Firearm access
- Mental illness – depression
- Substance abuse, primarily alcohol
- Prior suicide attempts
- Relationship stressors
- Financial stressors
- Male sex
- Advanced age
- Medical illness
- White
- Rural Areas
- High unemployment areas
- Media coverage and knowledge of other suicides
- Poor access to mental health care
- Military background



Background Checks

- **Brady Handgun Violence Prevention Act (1994)**
 - › Firearms sold by *federally licensed dealers* are mandated to undergo background checks
 - › Penalties for dealers that forgo
 - › National Instant Criminal Background Check System (NICS)
 - › 2 million potential firearm sales blocked (1.5%) from 1994-2009
- **Some states have mandatory universal background checks for all firearm purchases**

Criteria for Denial

Convicted felons or under indictment, fugitives

Criminal conviction with >1 year prison sentence

Illegal immigrants and legal immigrants granted temporary visas

Unlawful drug users, convicted addict or dealers

Misdemeanor conviction for domestic violence

Prior commitment for mental illness, mentally incompetent



Prevention of firearm-related injuries with restrictive licensing and concealed carry laws: An Eastern Association for the Surgery of Trauma systematic review

Marie Crandall, MD, MPH, Alexander Eastman, MD, Pina Violano, PhD, MSPH, RN-BC, Wendy Greene, MD, Steven Allen, MD, Ernest Block, MD, Ashley Britton Christmas, MD, Andrew Dennis, DO, Thomas Duncan, DO, Shannon Foster, MD, Stephanie Goldberg, MD, Michael Hirsh, MD, D'Andrea Joseph, MD, Karen Lommel, DO, MHA, MS, Peter Pappas, MD, and William Shillinglaw, DO, Jacksonville, Florida

Epidemiologic Reviews

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Vol. 38, 2016

DOI: 10.1093/epirev/mxv012

Advance Access publication:

February 10, 2016

What Do We Know About the Association Between Firearm Legislation and Firearm-Related Injuries?

Julian Santaella-Tenorio*, Magdalena Cerdá, Andrés Villaveces, and Sandro Galea

Clinical Review & Education

JAMA Internal Medicine | Review | FIREARM VIOLENCE

Firearm Laws and Firearm Homicides A Systematic Review

Lois K. Lee, MD, MPH; Eric W. Fleegler, MD, MPH; Caitlin Farrell, MD; Elorm Avakame, BS; Saranya Srinivasan, MD; David Hemenway, PhD; Michael C. Monuteaux, ScD

Firearm legislation and firearm mortality in the USA: a cross-sectional, state-level study

Bindu Kalesan, Matthew E Mobily, Olivia Keiser, Jeffrey A Fagan, Sandro Galea



12 out of 14 studies showed significant reductions in firearm injuries (7-40%) secondary to restricted licensing (background checks)

Analysis of 130 studies in 10 different countries found laws restricting ownership associated with decreased homicides

Review of 12 studies found that laws strengthening background checks and requiring permit to purchase decrease homicides

Assessment of all states and firearm laws – background checks most strongly associated with reduced mortality

Mandatory Waiting Periods

- Individuals must wait a period of time after applying to get firearm (permit to purchase)
 - › Variable amongst states, usually 30 days
- Multiple studies show decreased rates of firearm homicide and suicide
 - › 2013-2014, states with mandatory waiting periods had decrease of 0.38 suicides per 100k, states without had increase of 0.71
 - › Repeal in Missouri resulted in significant increase in homicides (30%) and suicides, institution in Connecticut demonstrated homicide reduction 10 years after law (40%)



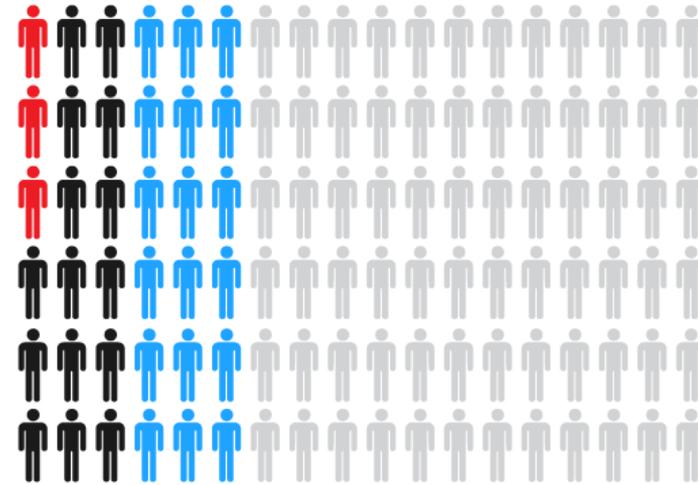
Child Access Laws

- Child Access Prevention (CAP) Laws
 - › Hold adults legally accountable for unsafe storage of firearms
 - › 27 states have CAP laws with wide variability of definition and prosecution
- CAP laws associated with lower risk of child accidental shootings and suicides, *not homicides*
 - › Accidental shooting (OR 0.74), suicide (0.23) injuries among children <12 (p<0.001)

GUNS IN HOMES WITH CHILDREN

Guns are present in about one-third of homes with children in the U.S.:

● In home ● Unlocked ● Loaded and unlocked



SOURCE 2008 study in Health Education Research
Jim Sergent, USA TODAY

AP | USA TODAY



Stand-Your-Ground Laws

- Laws that allow for individuals to use deadly force with a firearm against another person if under perceived threat of harm

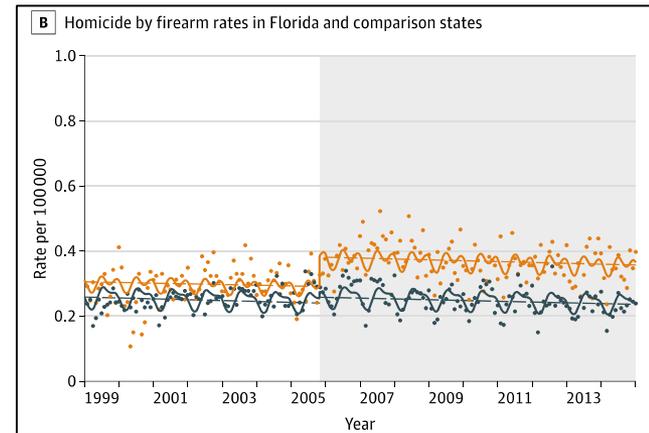
- Associated with *increased* youth firearm deaths

Lee et al – states with SYG had significantly increased firearm injuries from all-causes (accidental, assault and suicide)

JAMA Internal Medicine | Original Investigation | FIREARM VIOLENCE

Evaluating the Impact of Florida's "Stand Your Ground" Self-defense Law on Homicide and Suicide by Firearm An Interrupted Time Series Study

David K. Humphreys, PhD; Antonio Gasparrini, PhD; Douglas J. Wiebe, PhD



What Policies Demonstrate Mixed or Inconclusive Evidence?

- Concealed carry laws
- Firearm trafficking
- Minimum and mandatory sentencing laws
- Military or assault weapons ban
- Minimum age requirements (18 vs. 21)
- Methodologically weak studies
- Poor or inconsistent law enforcement
- Data isn't robust or accurate (i.e. trafficking data)
- Just doesn't work?



Assessment of Cumulative Policies – Do Some States Do Better?

- Multiple studies assessing the relationship of firearm laws and firearm mortality by state have found that stronger laws collectively are associated with lower firearm mortalities and injuries
 - › Typically ecological studies
 - › Use scoring system developed by Brady Campaign to score states on safety policies
 - › Systematic Reviews

The effect of gun control laws on hospital admissions for children in the United States

Children are safer in states with strict firearm laws: A National Inpatient Sample study

Arash Safavi
Hassan

AJPH RESEARCH

Handgun Legislation and Changes in Statewide Overall Suicide Rates

BACKGROUND:

METHODS:

Michael D. Anes

RESULTS:

CONCLUSION:

LEVEL OF EVIDENCE
KEY WORDS:

Objectives. To

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Methods. To

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Results. We f

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AJPH.2016.303



Firearm legislation and firearm mortality in the USA: a cross-sectional, state-level study



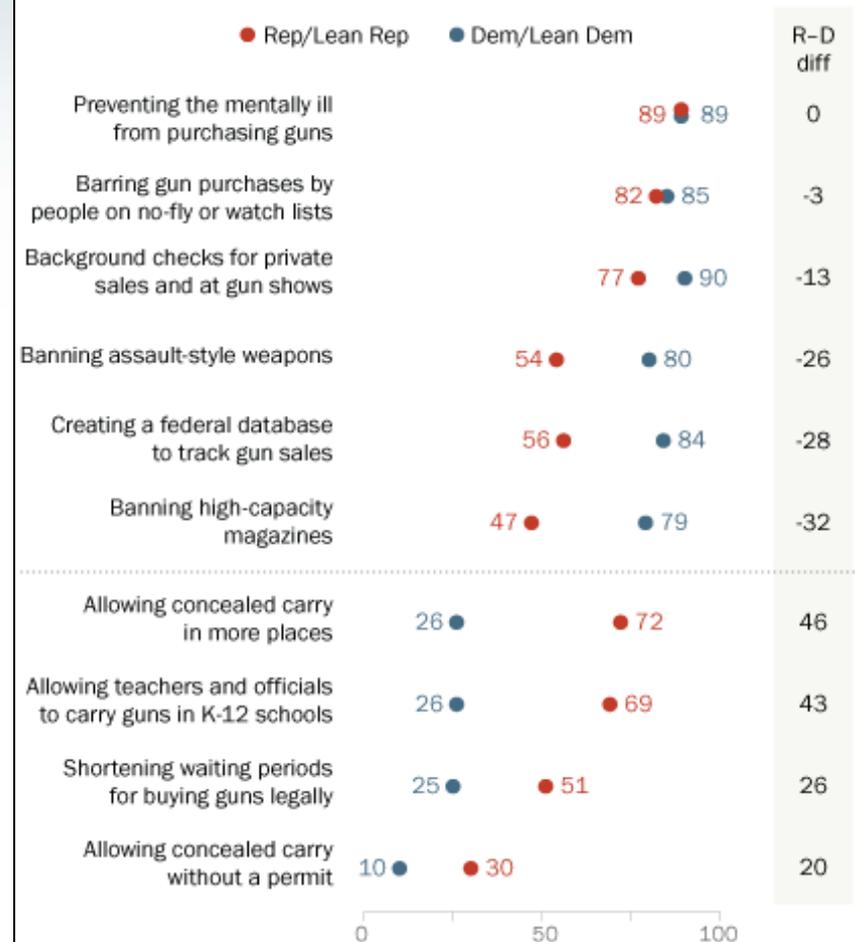
Bindu Kalesan, Matthew E Mobily, Olivia Keiser, Jeffrey A Fagan, Sandro Galea

Is There Support?

- Significant support among public for a number of public policy measures
 - Background checks
 - Banning purchase for those on no-fly lists
 - Blocking certain individuals with mental illness*

Partisan gap in views of concealed carry is among widest on gun policy proposals

% who strongly or somewhat favor ...



Source: Survey of U.S. adults conducted March 13-27 and April 4-18, 2017.

PEW RESEARCH CENTER



Asking Patients About Firearms... It's OK!

- Providers are legally able to inquire and provide counseling about firearms
- Majority of patients and parents don't oppose
 - › 66% of 3914 adults indicated it was sometimes to always appropriate (similar support for smoking and alcohol inquiry at 68%!)
 - › 75% of parents agreed pediatricians should ask and educate about firearm safety

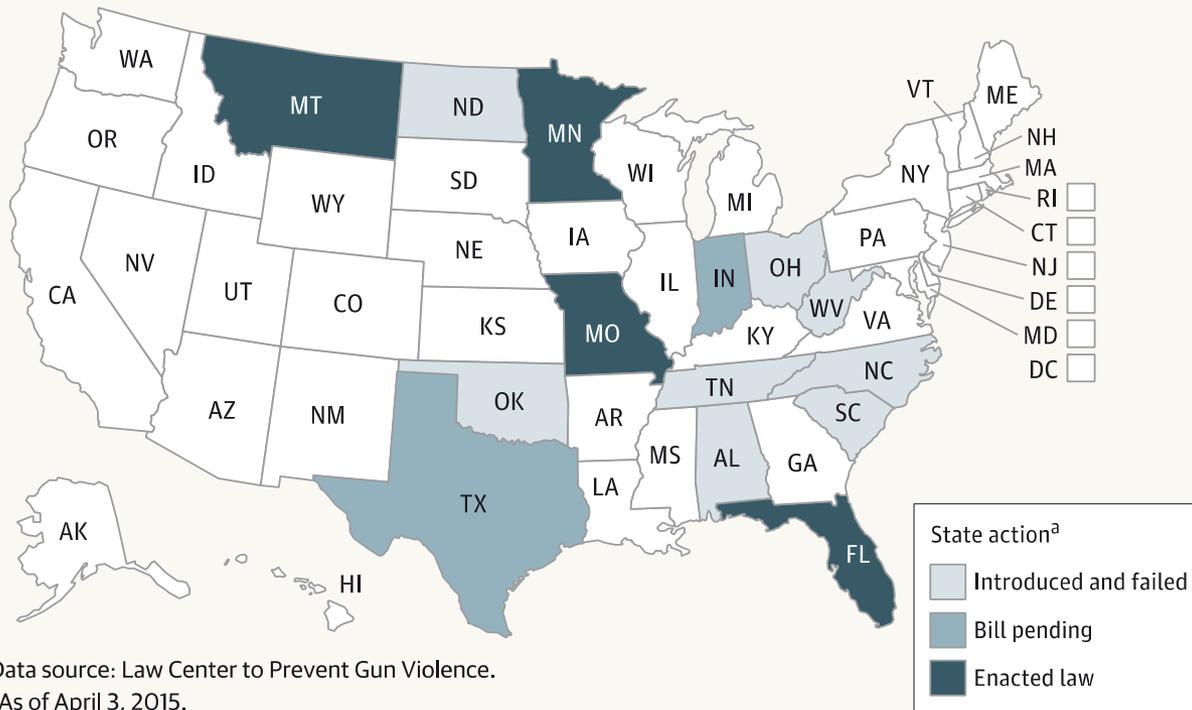
Betz ME, Azrael D, Barber C, Miller M. Public Opinion Regarding Whether Speaking With Patients About Firearms Is Appropriate. *Ann Intern Med.* 2016;165:543-555.

Garbutt JM, Bobenhouse N, Dodd S, Sterkel R, Strunk RC. What are parents willing to discuss with their pediatricians about firearm safety? A parental survey. *J Pediatr.* 2016;179:166-71.



Attempts to Limit Physician Inquiry

States That Have Considered or Enacted Some Form of Firearm-Related Medical Gag Law



- Many attempts to pass “gag” laws
- Physicians allowed to ask about firearms in ALL states
 - Florida “gag” law overturned
- Some restrict specific firearm data being recorded in state databases



Inquiry and Education on Firearm Ownership Safe Storage – Why Does it Matter?

Firearm Theft

- Approximately 380,000 firearms stolen per year in 250,000 incidents (crime guns)
- South accounts for 37% US households, *66% of gun thefts*

Accidental Shootings

- 33% of homes with children have firearms, 40% are unlocked
- 75% of child accidental shootings are at home
 - 60-70% owned by a family member

Suicide

- Majority with firearms and in the home
- Typically owned by family member or victim
- Higher risk when acutely suicidal, intoxicated, under the influence
- High ownership among veterans

Intimate Partner Violence

- A firearm increases the risk of IPV homicide 5x
- Usually occurs in the home

Unlocked Firearms – Higher Risk Of Child Death

- 2005 JAMA case-control study assessing the association of pediatric firearm suicide and unintentional deaths with storage practices
- Case guns more likely to be stored...
 - Loaded
 - Unlocked
 - With ammunition that was unlocked
- **Guns stored locked and unloaded were less likely to be involved in a shooting (OR 0.16)**
 - Using a safe or lock box was associated with an OR of 0.26 (CI 0.08-0.84) – the only extrinsic device shown to be significant



Inquiry Can Help Assess Lethality & Promote Patient Education

- Intimate Partner Violence
 - › Education about increased risk to patient and family
 - › Create safety plan
- Depression and Suicidal Ideation
 - › Best practice and standard to inquire about firearms
 - › Recommend removal from home and safe storage
 - › Create safety plan
- Accidental Shootings
 - › Recommended inquiry for pediatricians by AAP as a part of safety screening
 - › Allows for anticipatory guidance



Does Education on Safe Storage Work?

Epidemiologic Reviews

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Vol. 38, 2016

DOI: 10.1093/epirev/mxv006
Advance Access publication:
January 13, 2016

Effectiveness of Interventions to Promote Safe Firearm Storage

Ali Rowhani-Rahbar*, Joseph A. Simonetti, and Frederick P. Rivara

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Accepted for publication July 27, 2015.

- Systematic review of randomized and quasi-experimental controlled studies of safe firearm storage interventions
 - 7 Clinic and community based interventions
- The studies that demonstrated improvement in firearm storage practices included *firearm counseling and a safety storage device (lock or lock box)* rather than counseling alone.



How Do I Ask & Find Resources?

Annals of Internal Medicine

MEDICINE AND PUBLIC ISSUES

Yes, You Can: Physicians, Patients, and Firearms

Garen J. Wintemute, MD, MPH; Marian E. Betz, MD, MPH; and Megan L. Ranney, MD, MPH

See This... High Yield for Guidance

Table 2. Conditions When Firearm Information Might Be Particularly Relevant to the Health of a Patient and Potentially to Others

Condition	Examples	How to Respond When Patients Have Firearm Access
Acute risk for violence to self or others (based on information or behavior)	Suicidal ideation or intent Homicidal ideation or intent	This is an emergency Act promptly to ensure safe storage, in cooperation with patient if possible If necessary, disclose to others who are able to reduce risk (family, caregivers, psychiatric services, law enforcement)
Individual-level risk factors for violence to self or others or unintentional firearm injury	History of violence Alcohol or drug abuse Serious mental illness, especially: In combination with substance abuse or violence During acute exacerbations After violent victimization Conditions impairing cognition and judgment	Counsel on safe storage (5 Ls* or similar) Counsel on risk reduction When capacity is diminished, consider disclosure to others who are able to reduce risk
Member of demographic group at increased risk for violence to self or others or unintentional firearm injury	Middle-aged and older white men Young African American men Children and adolescents	Counsel on safe storage (5 Ls* or similar) Counsel on risk reduction For minors, involve parents



How Do I Ask & Find Resources?

ASK
ASKINGSAVESKIDS

[ABOUT ASK](#) [PLEDGE](#) [GET INVOLVED](#) [RESOURCES](#) [A MOTHER'S STORY](#) [CONTACT](#) [DONATE](#)

ONE QUESTION COULD SAVE YOUR CHILD'S LIFE.

[WATCH THE VIDEO](#) [MAKE THE PLEDGE](#)

ASK

The ASK (Asking Saves Kids) Campaign promotes a simple idea with the potential to help keep kids safe. ASK, “**Is there an unlocked gun in your house?**” before sending your child over to play.

ASK

- AskingSavesLives
- American Academy of Pediatrics
- Charleston Police Department:
 - Free gun locks
 - SC Chapter Moms Demand Action



Hospital and Community Intervention Programs

- Rationale – identify individuals at risk for violence and provide intensive case management in and out of hospital for primary and secondary prevention
 - › Capitalize on a “teachable moment”
 - › Identify high risk patients for violence or re-injury
 - › Perform needs assessment
 - › Match patients with what resources they need
 - › Long-term follow-up in community
- Most are ED and Trauma Center based





My Patient Population at Risk

- **What and Who Do I Care For?**
 - Intentional injury
 - › *20-40% recidivism rate after assault*
 - Youth and young adult community violence
 - › *20% homicide victims have a violent injury treated in past 5 years*
 - Firearm injury
 - Mental illness and suicidal ideation
 - Intimate partner violence (IPV)
 - Substance abuse
 - Child abuse



Can We Help This High Risk Group?

Operation Peaceworks, Ventura, CA
Violence Intervention Program (VIP), Baltimore, MD
Wraparound Project, San Francisco, CA
Project Ujima, Milwaukee/Madison, WI
Violence Intervention Program, Richmond, VA

Hospital + Community-based Intervention Programs

- Victims of violence, risk factors for violence
- Case management, social work -> link to resources
- Community resources: mental health, SA, employment, education, gang outreach, family support

Findings

- Decreased firearm assaults
- Decreased violence and injury recidivism
- Decreased arrests, incarceration
- Increased receipt of community resources



Noteworthy Programs: Wraparound Project – San Francisco, CA

- Hospital case management, community resources
- Participants:
 - › Ages 10-30 “high-risk” patients identified by social workers
- Outcomes
 - › Recidivism from violent injury
- Funding: AAST grant, CDC, San Francisco Mayor’s office (budget \$320k annually)
- N=254, recidivism significantly lower compared to historical controls (16% vs. 4.5%)
- Most associated with success
 - › Mental health support
 - › Employment

TABLE 2. WAP Needs and Cases, 2005–2011

Need	Met, N (% Total Identified)	Total Identified, N
Education	54 (65)	83
Housing	54 (62)	86
Mental health	86 (80)	111
Family counseling	20 (66)	30
Court advocacy	53 (85)	62
Vocational/professional training	36 (72)	50
Employment	54 (59)	91
Driver’s license	19 (46)	41
Substance abuse	2 (40)	5
Other	52 (89)	58



Successful & Cost Effective *IF* Integrated with Community Programs

- Systematic review of trauma center based youth violence programs (Ages 10-24)
 - › 90% demonstrated improved outcomes
 - › >50% showed lower recidivism
 - › Individual + intensive community-based case management are most successful

Hospital-centered violence intervention programs: a cost-effectiveness analysis

Vincent E. Chong, M.D., M.S.^a, Randi Smith, M.D., M.P.H.^a, Arturo Garcia, M.D.^a, Wayne S. Lee, M.D.^a, Linnea Ashley, M.P.H.^b, Anne Marks, M.P.P.^b, Terrence H. Liu, M.D., M.P.H.^a, Gregory P. Victorino, M.D.^{a,*}

^aDepartment of Surgery, Highland Hospital, University of California, San Francisco-East Bay, 1411 East 31st Street, QIC 22134, ^bYouth ALIVE!, 3300 Elm Street, Oakland, CA, USA

AAST 2014 PLENARY PAPER

Saving lives and saving money: Hospital-based violence intervention is cost-effective

Catherine Juillard, MD, MPH, Randi Smith, MD, MPH, Nancy Anaya, MD, MS, Arturo Garcia, MD, James G. Kahn, MD, MPH, and Rochelle A. Dicker, MD, San Francisco, California

CURRENT OPINION

Hospital-based violence intervention programs save lives and money

Jonathan Purtle, MPH, MSC, Rochelle Dicker, MD, Carnell Cooper, MD, Theodore Corbin, MD, MPP, Michael B. Greene, PhD, Anne Marks, MPP, Diana Creaser, MS, RN, Deric Topp, MPH, and Dawn Moreland, RN, BSN



What is *Your* population at risk?

- VA: Veterans with PTSD, depression, substance abuse, disability, access to service weapons?
- Geriatrics: Elderly men with multiple co-morbid illnesses, poor social support, depression, declining functional status?
- Women's health: Females with abusive partners? Depression and substance abuse?
- Adolescent medicine: Unstable home environment, exposure to violence, fights at school? Depressed teenager with access to a firearm?
- Pediatrics: Easy firearm access in the home – unlocked, loaded? Intimate partner violence?
- Psychiatry: Depression, suicidal ideation?

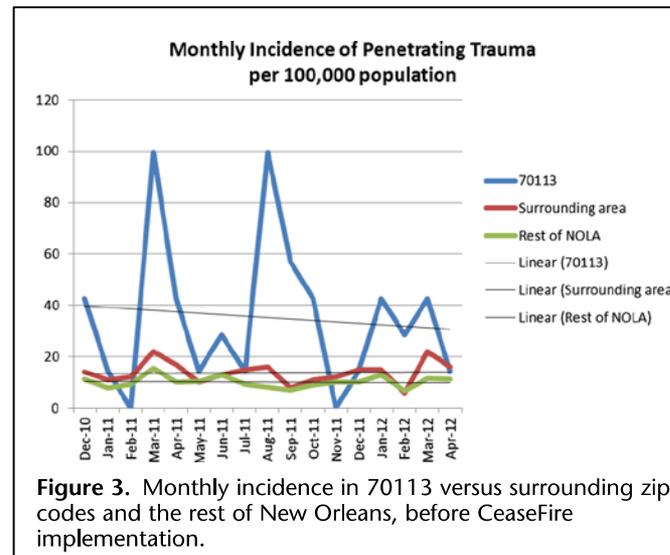


Other Community-Based Programs

- Community violence de-escalation
 - › Increased policing, arrests, charges
 - › Increased community awareness
 - › Gang deterrence
 - › Lay community member involvement

Operation CeaseFire–New Orleans: An infectious disease model for addressing community recidivism from penetrating trauma

Erin McVey, MD, Juan C. Duchesne, MD, Siavash Sarlati, MD, Michael O’Neal, MD, Kelly Johnson, MD, and Jennifer Avegno, MD, *New Orleans, Louisiana*



Other Community-Based Programs

- Firearm buy-back programs
 - › Limited ability to assess impact
 - › Need \$\$\$
- Evidence from Australia that large-scale buy-back of *banned* firearms reduced suicide

ORIGINAL ARTICLE

Goods for Guns—The Use of a Gun Buyback as an Injury Prevention/Community Education Tool

Margaret McGuire, MD, Mariann Manno, MD, Allison Rook, EdM, Louise Maranda, MVZ, MSc, PhD, Elizabeth Renaud, MD, Anthony DeRoss, MD, and Michael Hirsh, MD

ORIGINAL ARTICLE

Gun buyback programs: A venue to eliminate unwanted guns in the community

Pina Violano, MSPH, RN-BC, CCRN, CPS-T, Cassandra Driscoll, MPH, CPS-T, Neil K. Chaudhary, PhD, Kevin M. Schuster, MD, Kimberly A. Davis, MD, MBA, Esther Borer, CPS-T, Jane K. Winters, RN, BSN, and Michael P. Hirsh, MD, New Haven, Connecticut

143

ORIGINAL ARTICLE

Missing the target: a comparison of buyback and fatality related guns

E M Kuhn, C L Nie, M E O'Brien, R L Withers, G J Wintemute, S W Hargarten

Injury Prevention 2002;8:143-146



Significant Support from Medical Community

Annals of Internal Medicine

MEDICINE AND PUBLIC ISSUES

Firearm-Related Injury and Death in the United States: A Call to Action From 8 Health Professional Organizations and the American Bar Association

Steven E. Weinberger, MD; David B. Hoyt, MD; Hal C. Lawrence III, MD; Saul Levin, MD, MPA; Douglas E. Henley, MD; Errol R. Alden, MD; Dean Wilkerson, JD, MBA; Georges C. Benjamin, MD; and William C. Hubbard, JD

Deaths and injuries related to firearms constitute a major public health problem in the United States. In response to firearm violence and other firearm-related injuries and deaths, an interdisciplinary, interprofessional group of leaders of 8 national health professional organizations and the American Bar Association, representing the official policy positions of their organizations, advocate a series of measures aimed at reducing the health and public health consequences of firearms. The specific recommendations include universal background checks of gun purchasers, elimination of physician "gag laws," restricting the manufacture and sale of military-style assault weapons and large-capacity magazines for civilian use, and research to support strategies for

reducing firearm-related injuries and deaths. The health professional organizations also advocate for improved access to mental health services and avoidance of stigmatization of persons with mental and substance use disorders through blanket reporting laws. The American Bar Association, acting through its Standing Committee on Gun Violence, confirms that none of these recommendations conflict with the Second Amendment or previous rulings of the U.S. Supreme Court.

Ann Intern Med. 2015;162:513-516. doi:10.7326/M15-0337 www.annals.org

For author affiliations, see end of text.

This article was published online first at www.annals.org on 24 February 2015.



National professional organization	Expanded background checks	Restrictions on assault weapons	Mental health services	Increased research funding	Expanded gun storage laws	Physician counseling allowance
American Academy of Family Physicians ^{15,39}	Recommend	Recommend	Recommend	Recommend	Recommend	Recommend
American Academy of Pediatrics ^{14,15}	Recommend	Recommend	Recommend	Recommend	Recommend	Recommend
American Bar Association ^{15,40}	Recommend	Recommend	Recommend	Recommend	Recommend	Recommend
American College of Emergency Physicians ^{15,41}	Recommend	Recommend	Recommend	Recommend	Not addressed	Recommend
American College of Physicians ^{11,15}	Recommend	Recommend	Recommend	Recommend	Recommend	Recommend
American College of Surgeons ^{15,42}	Recommend	Recommend	Recommend	Recommend	Recommend	Recommend
American Congress of Obstetricians and Gynecologists ^{15,43}	Recommend	Recommend	Recommend	Recommend	Not addressed	Recommend
American Pediatric Surgical Association ⁴⁴	Recommend	Recommend	Recommend	Recommend	Recommend	Recommend
American Psychological Association ^{15,23}	Recommend	Recommend	Recommend	Recommend	Recommend	Recommend
American Public Health Academy ^{15,45}	Recommend	Recommend	Recommend	Recommend	Not addressed	Recommend
Association of State and Territorial Health Officials ⁴⁶	Not addressed	Not addressed	Recommend	Recommend	Recommend	Recommend
National Physicians Alliance ^{16,47}	Recommend	Recommend	Recommend	Recommend	Recommend	Recommend



In Summary...

- We do have data about firearm injury and death, but more is needed... especially suicide
 - Research & funding for *prevention and intervention*
 - We know a lot more about the victims of firearm injury than the source of guns they use
- There are multiple mechanisms to decrease firearm injury at the policy, community, health care and personal level
- *YOU may advocate for firearm safety, education, research, evidence-based policies, and identify your patient population at risk & provide interventions for them*



Questions?

The CNN logo is displayed in white text on a red rectangular background in the top left corner of the image.

“Thinking of this epidemic of preventable deaths as an infection that can be diagnosed, treated and perhaps cured, I feel more hopeful than I have been in a long time.”

– Dr. Sanjay Gupta, CNN chief medical correspondent



SHUTTERSTOCK

