Firearm injuries in the United States

Katherine Fowler, Ph.D.
Linda Dahlberg, Ph.D.
Tadesse Haileyesus, M.S.
Lee Annest, Ph.D.

American College of Epidemiology Annual Meeting
Atlanta, GA
September 29, 2015
Firearm violence is a public health problem

- 645 firearm deaths and 1,565 more injuries each week
- Firearm homicide: 2\textsuperscript{nd} leading cause of injury death ages 10-24
- Firearm suicide: 3\textsuperscript{rd} leading cause of injury death for all persons over 35
- Understanding the nature and extent of the problem is key first step to prevention
METHODS
Case definition

Firearm Injury
A gunshot wound or penetrating injury from a weapon that uses a powder charge to fire a projectile

Excludes: Gunshot wounds from air-powered, gas-powered, BB and pellet guns, as well as non-penetrating injuries associated with firearms (e.g., “pistol-whipping”)
Data source: Fatal injuries

- CDC’s National Vital Statistics System (NVSS)*
  - Death certificate data
  - Known intent (e.g., homicide, suicide, unintentional)
  - Demographics
  - Geographic region
  - Years: 1993-2012 (trends); 2010-2012 (descriptives)

* Accessed via Web based Injury Statistics Query and Reporting System (WISQARS)
Data source: Nonfatal injuries

- National Electronic Injury Surveillance System (NEISS)**
  - Probability sample of N=99 U.S. hospitals with emergency department
  - Injury intent (e.g., assault, self-harm, unintentional)
  - Select demographics
  - Disposition
  - Years: 1993-2012 (trends); 2010-2012 (descriptives)

**Accessible due to partnership between CDC and Consumer Products Safety Commission. Limited NEISS data available online via WISQARS.
Trend analyses

- Trends across years 1993-2012 were analyzed
  - SAS/Joinpoint regression analysis
- Analyzed separately for fatal and nonfatal injuries
- Analyzed by intent
  - Suicide/self-harm
  - Homicide/assault
  - Unintentional
RESULTS
Extent of firearm injuries and deaths

**Deaths**
- Average of $N=32,529$ firearm deaths per year
- Age-adjusted rate: 10.2 per 100,000

**Injuries**
- Average of $N=67,197$ firearm injuries per year
- Age-adjusted rate: 21.6 per 100,000

$^\dagger$Rates and counts represent annualized averages for years 2010-2012
Injury “tower”

- Unlike typical injury pyramid
- Proportion of deaths to hospitalizations to outpatient treatment fairly even
- Case fatality rates high, particularly for self-directed injuries
Who is most at risk for firearm injuries?

- Males
- Young people
- Non-Hispanic blacks
- Non-Hispanic whites
- American Indian/Alaska Natives
Who is most at risk for firearm injuries?

- **Males**
  - 86% of firearm deaths; 90% of firearm injuries
  - Rate of deaths 6.3 times female rate (18.1 vs. 2.8)
  - Rate of injuries 8.3 times female rate (38.4 vs. 4.6)
  - 7:1 rate ratio for firearm suicides
  - 5:1 rate ratio for firearm homicides

- **Young people**
- **Non-Hispanic blacks**
- **Non-Hispanic whites**
- **American Indian/Alaska Natives**
Who is most at risk for firearm injuries?

- Males
- Young people
  - Ages 25-34 have the highest rate of deaths (15.1)
  - Ages 15-24 have the highest rate of injuries (65.6)
  - Firearm homicide/assault and unintentional firearm deaths and injury rates highest among 15-24 year olds (range: 22.6-47.5)
  - However, rates of firearm suicide tend to increase with age, are highest for persons over 65 (10.3)
- Non-Hispanic blacks
- Non-Hispanic whites
- American Indian/Alaska Natives
Who is most at risk for firearm injuries?

- Males
- Young people
- Non-Hispanic blacks
  - Highest rate of firearm deaths overall (18.1)
  - Firearm homicide rates (14.8) 10-15 times higher than rates for non-Hispanic Asian/Pacific Islander and white groups
  - Black youth aged 15-24 had highest homicide rate (38.7), almost 20 times rate for white counterparts
- Non-Hispanic whites
- American Indian/Alaska Natives
Who is most at risk for firearm injuries?

- Males
- Young people
- Non-Hispanic blacks
- Non-Hispanic whites
  - Highest rates of firearm suicide (9.2), 2.9-6.3 times higher than non-Hispanic blacks, Asian/Pacific Islanders, Hispanics
- American Indian/Alaska Natives
Who is most at risk for firearm injuries?

- Males
- Young people
- Non-Hispanic blacks
- Non-Hispanic whites
- American Indian/Alaska Natives
  - Second highest rate of firearm suicide (7.8)
  - Highest rate of unintentional firearm deaths (0.3), but comparable to rates for non-Hispanic blacks and whites (both 0.2)
Where do most firearm deaths occur?

- South had highest % and rates (46%; rate: 12.6)
  - Firearm homicide rate: 4.5
  - Firearm suicide rate: 8.8
  - Unintentional firearm death: 0.3
- West had second-highest firearm suicide rate: 7.6
- Northeast had lowest % and rates (11%; rate: 6.4)

Figure 1
Census Regions and Divisions of the United States

Trends: Overall

- Nonfatal firearm injury rates declined 50% from 1993-1999
- Firearm death rates declined 31% from 1993-1999
Trends: Deaths

- Firearm homicide and unintentional rates declined 48% 1993-1999, and declined 12% 2006-2012
- Firearm suicide rates declined 20% 1993-1999, and declined 6% 1999-2006; increased 17% 2006-2012
Trends: Nonfatal injuries

- Assault-related firearm injuries declined 52% 1993-1999, but increased 52% 1999-2012
- Unintentional firearm injury rates declined 54% 1993-1999
DISCUSSION
Summary

- Findings highlight magnitude and importance of the problem of firearm injuries, which affect over 100,000 persons in U.S. per year.
- Over 60% of all firearm deaths are suicides.
- Nearly 70,000 people each year suffer firearm injuries, often with long term consequences.
- Disproportionately impact males, younger age groups, and racial/ethnic minorities.
- Rates of firearm injuries and deaths have generally declined, but firearm suicides and assaults have recently increased.
Limitations

- Limited information about context from data sources
- Potential misclassification of race/ethnicity in death certificate data
- Missing race/ethnicity data in NEISS precluded examination of firearm injury by race/ethnicity
- Nonfatal firearm injuries treated in settings other than emergency or inpatient clinics not included
Conclusion

- Firearm injuries contribute substantially each year to premature death, illness, and disability
- Human toll includes physical and mental health of victims and communities
- Understanding nature, magnitude and health impact is only the first step toward prevention
Thank you.

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333
Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
E-mail: cdcinfo@cdc.gov  Web: http://www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.