Epidemiology of fatal and non-fatal firearm injuries in the US: 2001-2013

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Firearm injuries in the US increased throughout 1980s, reaching a peak around 1993[1], after which a declining trend was observed for more than a decade[2]. But today, we hear of mass shootings in this country every few weeks. Approximately 280 people are shot every day, of which 86 die of fatal firearm wounds[3]. Gun ownership survey shows that one in three Americans owns a gun[11]. Firearm injury burden in US remains one of the most important public health problems of this century.

Firearm fatalities have remained stable since 1990s, however non-fatal firearm injury rates have shown fluctuation since 2005[5]. Although majority of firearm victims survive (five survive for every two deaths) [10], non-fatal firearm injuries have been less extensively studied than the fatal. This research was undertaken to explore trends in fatal and non-fatal firearm injuries across 13 years, from 2001-2013. Injuries were classified by type as fatal, non-fatal injuries treated and released from emergency department (NF-ED) and non-fatal hospitalized (NF-HS); and examined for overall, age-, gender-, race/ethnicity- and intent-specific temporal trends from 2001- 2013.

Important results from our study

- **Figure. 1: Firearm injury burden with distribution by injury type** Between 2001-2013, total of 1,292,448 firearm injuries were recorded, of which, 406,496 (31.5 %) were fatal injuries, 400,600 (31.0%) NF-ED and 485,352 (37.5%) NF-HS (hospitalized)

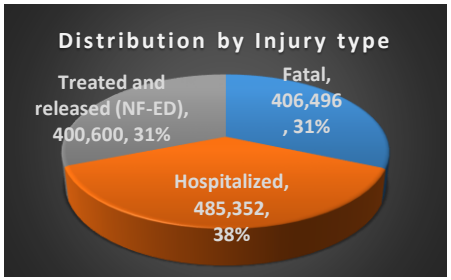
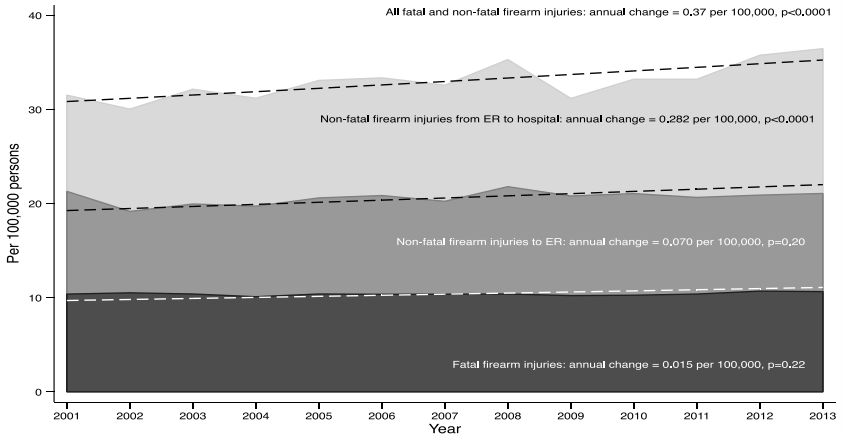


Figure 2 shows temporal trends in fatal, non-fatal ED and HS injuries

- From 2001-2013, firearm injury rates overall, increased (31.4 to 36.4 / 100,000)
- Rates of fatal [from 10.4 - 10.6 (*black*)] and NF-ED [from 10.9 to 10.4 (*dark gray*)] injuries per 100,000 showed no significant change
- Hospitalizations (NF-HS), increased significantly [11.4 to 13.2 /100,000 *(light gray*)]. **Figure 2**



- Greatest annual increase observed in 15-44yr adults driven by increase in NF-hospitalizations, despite decreasing fatalities
- 45+ adults also showed increasing trends but no change observed in 0-14year olds
- Increasing firearm injury trend greater in males than females

Category	Homicide	Suicide	Unintentional
White	↗	↑	↔
Black	↓	↔	↓
Hispanic	↗	↓	↔
Other-race	↓	↔	↔

Figure 3. Trends by injury intent and race/ethnicity
Horizontal / two sided arrows show no significant change

- Magnitude of burden remains highest in blacks, which is four fold greater than in whites and three times the rate in Hispanics
- However, firearm injury rates overall increased among white population mainly due to fatalities followed by hospitalizations; while black and Hispanic population showed declining trend not reaching significance (fig.3)
- Rates of all injury types decreased among Other-race
- Homicidal firearm injuries overall, significantly increased, driven by non-fatal hospitalizations despite a noticeable decline in homicide fatalities
- Greatest decline in firearm injuries with homicide intent seen in black and Other-race while white and Hispanic showed no change
- Firearm suicides overall increased, driven by fatal suicides in white despite significant decrease in Hispanics and non-significant decrease in blacks
- Unintentional firearm injuries declined overall, but most among blacks

CONCLUSION: In the 21st century, reversing the declining trend from 1990s, firearm injuries have increased with shift towards rapid rise in firearm hospitalizations. Although magnitude of firearm injuries remains high among blacks, there is an increasing shift of burden towards white population characterized by sharp increase in suicide fatalities and hospitalizations.

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