New evidence on the relationship between handgun ownership & suicide risk

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Handgun Ownership and Suicide in California

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Lea Prince, Ph.D., Jonathan A. Rodden, Ph.D., Erin E. Holsinger, M.D.,
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ABSTRACT

BACKGROUND
Research has consistently identified firearm availability as a risk factor for suicide. However, existing studies are relatively small in scale, estimates vary widely, and no study appears to have tracked risks from commencement of firearm ownership.

METHODS
We identified handgun acquisitions and deaths in a cohort of 26.3 million male and female residents of California, 21 years old or older, who had not previously acquired handguns. Cohort members were followed for up to 12 years 2 months (from October 18, 2004, to December 31, 2016). We used survival analysis to esti-....
What we now about the relationship between firearm access and suicide, and how we know it

The LongSHOT project

LongSHOT study of suicide among firearm owners
Prevalence of firearms in the US

• ~55 million individuals own ≥1 guns
• ≥1 guns in 1/3 (~40 million) US households

National Firearm Survey 2015
Firearm-related deaths per 100,000 residents per year

- United States
- Switzerland
- France
- Austria
- Canada
- Israel
- OECD average
- Belgium
- Norway
- Sweden
- Denmark
- Italy
- New Zealand
- Australia
- Germany
- Ireland
- Netherlands
- Spain
- South Korea
- United Kingdom
- Japan

Firearm suicides
Does ready access to firearms increase risks suicide?
4 key facts re epidemiology of suicide

1. Suicide attempts are often impulsive acts
2. Most attempts are not fatal and most attempters (including repeat attempters) do not go on to die in a future suicide
3. Lethality of a suicide attempt depends heavily on lethality of method used
4. Firearms are an extremely lethal method

= means matter
Firearm ownership/access associated with triple the risk of suicide
Where does the existing evidence come from?

1. Ecologic studies

2. Case-control studies

3. Only 1 cohort study (Wintemute et al 1999)
The Dealer Record of Sale (DROS) system

CALIFORNIA DEPARTMENT OF JUSTICE
BUREAU OF FIREARMS
Dealer's Record of Sale (DROS) Worksheet

Transaction Information

- CFD No.: [space]
- SROS No.: [space]
- Transmission Date:
- Transmission Time:
- Delivery Date:
- Delivery Time:
- Gun Show Transaction: [Yes/No]
- Firearm Type (Long gun transaction, enter the number of firearms):
  - Handgun
  - Long Gun
- Transaction: [Dealer Sale/Private Party Transfer/Other Exempt]
- Gun show transaction exempt from 1 handgun per 30-day limit.

Waiting Period Exemptions

- Peace Officer Status: [Space]
- CA Firearms Dealer: [Special Weapons Permit]
- Permit Number: [Enter Permit Number]
- Collector Status: [Yes/No]
- Firearm Type: [Enter Firearm Type]

Revolver/Pistol Information

- Make (Colt, S&W, etc.):
- Model (1911, Kimber, etc.):
- Caliber:
- Barrel Length:
- Serial Number:
- Other Number (if different):
- Handgun Color:
  - Blue Steel
  - Silver/Nickel/Stainless
- Handgun Origin:

Purchaser Information

- First Name:
- Middle Name:
- Last Name:
- Suffix:
- Alias First Name:
- Alias Middle Name:
- Alias Last Name:
- Alias Suffix:
- Street Address:
- City:
- Zip Code:

One of the following forms of identification is required to legally purchase firearms in California: California driver license (DL), California ID (ID) card issued by the DMY, or Military ID (MO) for active-duty military accompanied by permanent duty station orders indicating that the purchaser is stationed in California.

Typical fields include:
- ID Type: [DL, CA, MIL, ML]
- ID Number:
- US Citizen: [Yes/No]
- Alien, Alien Registration Number and Country of Citizenship:
- Alien Registration Number:
- Citizenship:
- Date of Birth:
- Place of Birth:
- Sex:
- Height:
- Weight:
- Hair Color:
- Eye Color:
- HSC Number or Exemption Code (handgun only):

For the purchase of a handgun, the applicant must also provide:
- DCI/MR/PD:
- FOE:
- Dors:
- Other:

There is a statutory waiting period of three days from the date of the transaction. After the waiting period, the firearm may be picked up at the dealer's place of business. The dealer is required to conduct a background check on the buyer and provide a copy of the report to the buyer. The firearm must be returned to the seller if the buyer fails the background check. The seller is also required to report any sale of a firearm to the California Department of Justice within 24 hours of the sale.
Roadmap

What we now about the relationship between firearm access and suicide, and how we know it

The LongSHOT project

LongSHOT study of suicide among firearm owners
LongSHOT team

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Matt Spittal
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Garen Wintemute
Northeastern
Stanford
U of Melbourne
Erasmus
UC Davis
Assembly of LongSHOT cohort

LongSHOT cohort


Zhang et al Injury Prevention 2019
Temporal nature of data linkage approach

Oct 18 2004

May 23 2005
The LongSHOT cohort

• 28,866,022 adults (≥21 yrs) followed for up to 12.2 years

• 1,196,382 cohort members purchased ≥1 handguns during follow-up

• 1,655,639 cohort members died
  - 13,868 from gunshot wounds

Information on cohort members:

- Age, sex, race
- Geocoded place of residence *(time varying)*
- Dates of all lawful handgun (+ some long gun) acquisitions during study period *(running tally)*
- Prior handgun acquisitions (back to 1985)
- Area level measures of SES and crime *(time varying)*
# Firearm deaths

<table>
<thead>
<tr>
<th>Category</th>
<th>$n$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suicide</td>
<td>9,231</td>
</tr>
<tr>
<td>Homicide</td>
<td>4,264</td>
</tr>
<tr>
<td>Accidental</td>
<td>181</td>
</tr>
<tr>
<td>Legal intervention</td>
<td>64</td>
</tr>
<tr>
<td>Undetermined intent</td>
<td>128</td>
</tr>
</tbody>
</table>
What we now about the relationship between firearm access and suicide, and how we know it

The LongSHOT project

LongSHOT study of suicide among firearm owners
**Frequency and crude rate of death, by ownership status**

<table>
<thead>
<tr>
<th></th>
<th>Deaths among h/gun owners</th>
<th>Deaths among non-owners</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All cause</strong></td>
<td>21,680</td>
<td>1,540,069</td>
</tr>
<tr>
<td><strong>Suicide</strong></td>
<td>2,095</td>
<td>19,973</td>
</tr>
<tr>
<td><strong>Firearm suicide</strong></td>
<td>1,853</td>
<td>7,946</td>
</tr>
<tr>
<td><strong>Non-firearm suicide</strong></td>
<td>242</td>
<td>12,027</td>
</tr>
</tbody>
</table>

Studdert et al, *NEJM* 2020
Frequency and crude rate of death, by ownership status

<table>
<thead>
<tr>
<th>Cause</th>
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<th>Deaths among non-owners</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Rate per 100,000 per year</td>
</tr>
<tr>
<td>All cause</td>
<td>21,680</td>
<td>467</td>
</tr>
<tr>
<td>Suicide</td>
<td>2,095</td>
<td>45</td>
</tr>
<tr>
<td>Firearm suicide</td>
<td>1,853</td>
<td>40</td>
</tr>
<tr>
<td>Non-firearm suicide</td>
<td>242</td>
<td>6</td>
</tr>
</tbody>
</table>

Studdert et al, *NEJM* 2020
**Adjusted hazard ratio for suicide, owners vs non-owners** *

<table>
<thead>
<tr>
<th></th>
<th>Men (hazard ratios)</th>
<th>Women (hazard ratios)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suicide</td>
<td>3.34</td>
<td>7.16</td>
</tr>
</tbody>
</table>

* Adjusted for neighborhood, race/ethnicity, age, long gun ownership

Studdert et al, *NEJM* 2020
Relative risk over time

52% of all firearm suicides among owners

Studdert et al, NEJM 2020
Key findings

• Handgun owners 4 times more likely to die from suicide than nonowners of same age, sex, and race, living in the same neighborhood

• Elevated risk driven entirely by higher rates of suicide by firearm (rates of suicide by other methods are similar)

• Owners’ suicide risk highest in period immediately after purchase of first handgun, but…. majority of suicides occur more than a year later

• Handgun ownership involves a substantial and enduring risk of suicide
Next steps

• Examine suicide risk within subgroups of handgun owners (by race, age, sex)

• Create households within cohort, in order to examine “secondhand” risks of firearm ownership – *ie, risks to people who live with handgun owners but are not themselves owners:*
  - suicide?
  - homicide?
  - accidental firearm death?