Firearm Deaths and Injuries among Youth in North Carolina

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Chronic Disease and Injury Section
Injury and Violence Prevention Branch
NC Resident Suicide Mortality Rates, Ages 10 to 17: 1999-2018

Source: NC State Center for Health Statistics
NC Resident Firearm-related Mortality Rates, Children Ages 0 to 17: 2009-2018

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate per 100,000 Children Ages 0-17</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>1.7</td>
</tr>
<tr>
<td>2010</td>
<td>1.6</td>
</tr>
<tr>
<td>2011</td>
<td>1.8</td>
</tr>
<tr>
<td>2012</td>
<td>1.5</td>
</tr>
<tr>
<td>2013</td>
<td>1.9</td>
</tr>
<tr>
<td>2014</td>
<td>2.1</td>
</tr>
<tr>
<td>2015</td>
<td>1.7</td>
</tr>
<tr>
<td>2016</td>
<td>2.2</td>
</tr>
<tr>
<td>2017</td>
<td>2.0</td>
</tr>
<tr>
<td>2018</td>
<td>2.7</td>
</tr>
</tbody>
</table>

2009-2018: 59% Increase

* Firearm deaths included the following ICD-codes: Unintentional W32-W34; Suicide X72-X74, Homicide X93-X95, U014

Source: NC State Center for Health Statistics
Firearm-related Violence in US & NC

**NC Firearm-related deaths in 2017**
- NC = 1,403
- NC ages 0-17 = 42

**NC Firearm-related deaths in 2018***
- NC = 1,345
- NC ages 0-17 = 61

*2018 data is provisional
Analysis by Injury Epidemiology and Surveillance Unit (as of Nov 2019)
Data and Surveillance

• Since 2004, abstract approximately 2,000 violent deaths per year (homicides, suicides, firearm deaths)

• Data Sources and Collaborators
  – Death certificate data- State Center for Health Statistics
  – NC Office of the Chief Medical Examiner (OCME)
  – NC-IBRS (SBI)
  – Decentralized law enforcement
    • More than 650 law enforcement agencies in NC
    • ~250 in a given year experience violent death

• Data can differ slightly due to case definition, data closeout dates, and other factors
Types of Information Gathered

• Demographics (victim and suspect)

• Circumstances of the event

• Alcohol/drug use by the victim

• Type of location where the event happened

• Type of weapon used

• Relationship between the victim and suspect
North Carolina Violent Death Reporting System

Death Certificates

LE Reports

C/ME Reports

600+ data fields

Injury characteristics

Demographics

Circumstances

Mental Health Diagnoses

Toxicology
Deaths by Manner/Intent: Resident and Occurrence Deaths

<table>
<thead>
<tr>
<th>Manner/Intent</th>
<th>Resident</th>
<th>Occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suicide</td>
<td>18,373</td>
<td>19,000</td>
</tr>
<tr>
<td>Homicide</td>
<td>8,871</td>
<td>9,281</td>
</tr>
<tr>
<td>Unintentional</td>
<td>219</td>
<td>235</td>
</tr>
<tr>
<td>Firearm</td>
<td>326</td>
<td>345</td>
</tr>
<tr>
<td>Legal Intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undetermined Intent</td>
<td>927</td>
<td>961</td>
</tr>
</tbody>
</table>

Total resident deaths = 29,966
Total occurrence deaths = 31,123

* 2018 data is provisional
Analysis by Injury Epidemiology and Surveillance Unit (as of Nov 2019)
Deaths by Manner/Intent: Resident and Occurrence Deaths
North Carolina Violent Death Reporting System, age 0-17, 2004-2018

Total resident deaths = 1,421
Total occurrence deaths = 1,453

* 2018 data is provisional
Analysis by Injury Epidemiology and Surveillance Unit (as of Nov 2019)
Firearm Death Rates by Sex, Age, and Race: NC-VDRS, 2017

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Hispanic</th>
<th>White**</th>
<th>Black**</th>
<th>AI/NA**</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>1.9</td>
<td>22.4</td>
<td>37.5</td>
<td>25.4</td>
</tr>
<tr>
<td>5-9</td>
<td>0</td>
<td>4.4</td>
<td>3.5</td>
<td>+</td>
</tr>
<tr>
<td>10-14</td>
<td>0</td>
<td>1.9</td>
<td>5.7</td>
<td>1.2</td>
</tr>
</tbody>
</table>

* Rate per 100,000 NC population; † <5 deaths; rate suppressed

** Non-Hispanic

*Technical Note:* 1,403 violent deaths caused by firearms in 2017- using May 2019 datafile

Data Source: North Carolina Violent Death Reporting System, 2017; Analysis conducted by Injury Epidemiology and Surveillance Unit
Firearm-Related Deaths by Manner and Firearm Type: NC-VDRS, 2017

**Manner by Percent**
- Suicide: 65.4%
- Homicide: 29.8%
- Legal Intervention: 2.1%
- Undetermined/Unintentional Firearm: 0.9%

**Firearm Type by Percent**
- Handgun: 76.6%
- Rifle: 10.2%
- Shotgun: 7.3%
- Other/Unknown: 5.9%

**Technical Note:** 1,403 violent deaths caused by firearms in 2017 - using May 2019 datafile

**Data Source:** North Carolina Violent Death Reporting System, 2017; Analysis conducted by Injury Epidemiology and Surveillance Unit
Firearm-Related Deaths by Manner and Firearm Type, ages 0-17: NC-VDRS, 2017

Manner by Percent
- Homicide: 42.86%
- Suicide: 7.14%
- Unintentional firearm: 50%

Technical Note: 42 violent deaths caused by firearms in 2017 for ages 0-17- using Dec 2019 datafile

Data Source: North Carolina Violent Death Reporting System, 2017; Analysis conducted by Injury Epidemiology and Surveillance Unit
Circumstances
Firearm-related Suicide Circumstances
Firearm Suicides: Percent of Circumstances:
NC-VDRS age 0-17, 2016-2017

N= 38: total number suicide firearm deaths 0-17
N= 34: At least 1 known circumstance (89%)

Analysis by Injury Epidemiology and Surveillance Unit- using Dec 2019 datafile
Firearm-related Homicide Circumstances
Firearm-related Homicide: Percent of Circumstances for age 0-17: NC-VDRS, 2016-2017

N= 47: total number homicide firearm deaths 0-17
N= 42: At least 1 known circumstance (89%)

Analysis by Injury Epidemiology and Surveillance Unit- using Dec 2019 datafile
Quick Note: ICD-10-CM Transition

  - Affects Hospital Discharge (HD), Emergency Department (ED), and outpatient diagnosis coding.

- ICD-10-CM captures more detail than ICD-9-CM:
  - Contains almost 5 times as many codes.
  - Number of relevant injury codes jumped from 2,600 (ICD-9-CM) to 43,000.
  - ICD-10-CM data is not comparable to ICD-9-CM data.

- Case definitions and external cause of injury categories are still being evaluated and are subject to change.

- Current nonfatal firearm-related injury case definition includes any mention of the following codes:
  - Accidental Discharge of Firearm: W32.0, W33.0, W34.00, W.34.09
  - Intentional Self-Harm by Firearm: X72, X73, X74.8, X74.9
  - Assault by Firearm: X93, X94, X95.8, X95.9
  - Terrorism Involving Firearms: Y38.4
  - Firearm Discharge of Undetermined Intent: Y22, Y23, Y24.8, Y24.9
  - Legal Intervention Involving Firearm Discharge: Y35.0

*With a 7th character of A or missing (Initial encounter/active treatment)
Firearm-Related Hospitalization Rates per 100,000 in North Carolina, all ages (2016-2018)

2016: 1,074 Firearm-Related Hospitalizations
2017: 1,100 Firearm-Related Hospitalizations
2018: 1,076 Firearm-Related Hospitalizations
Total: 3,250 Firearm-Related Hospitalizations

**Technical Note:** Analysis includes only NC Resident cases WITH a valid NC FIPS code using CDC/CSTE case definitions.

**Data Source:** State Center for Health Statistics: Hospitalization Discharge Data, 2016-2018; Analyses conducted by Injury and Epidemiology Surveillance Unit
Insurance Type by Percent Among Firearm-Related Hospitalizations, 2016-2018

<table>
<thead>
<tr>
<th>Insurance Type</th>
<th>Percent</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-pay</td>
<td>41.1</td>
<td>1,074</td>
<td>1,100</td>
<td>1,076</td>
<td>3,250</td>
</tr>
<tr>
<td>Medicaid</td>
<td>27.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other*</td>
<td>17.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Cross/Blue Shield</td>
<td>9.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicare Part A or B</td>
<td>5.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Technical Note: Analysis includes only NC Resident cases WITH a valid NC FIPS code using CDC/CSTE case definitions.

Data Source: State Center for Health Statistics: Hospitalization Discharge Data, 2016-2018; Analyses conducted by Injury and Epidemiology Surveillance Unit.
Firearm-Related Hospitalization (0-17) Rates, 2016-2018

Rate per 100,000

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Rate per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>5.9</td>
</tr>
<tr>
<td>Female</td>
<td>1.3</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1.4</td>
</tr>
<tr>
<td>White, NH</td>
<td>1.4</td>
</tr>
<tr>
<td>Black, NH</td>
<td>9.4</td>
</tr>
<tr>
<td>Al/NA, NH</td>
<td>7.8</td>
</tr>
<tr>
<td>Asian, NH</td>
<td>1.2</td>
</tr>
<tr>
<td>&lt; 1</td>
<td>*</td>
</tr>
<tr>
<td>1-4</td>
<td>1.2</td>
</tr>
<tr>
<td>5-9</td>
<td>0.7</td>
</tr>
<tr>
<td>10-14</td>
<td>2.5</td>
</tr>
<tr>
<td>15-17</td>
<td>13.8</td>
</tr>
</tbody>
</table>

*NC Residents, 2016-2018; NH: Non-Hispanic

Source: NC State Center for Health Statistics, Hospitalization Discharge Data (2016-2018) [Excludes Deaths]

Analysis by Injury Epidemiology and Surveillance Unit

N = 275 Hospitalizations
Primary Payer Information for Firearm-Related Hospitalizations (0-17), 2016-2018

*NC Residents, 2016-2018

Source: NC State Center for Health Statistics, Hospitalization Discharge Data (2016-2018) [Excludes Deaths]
Analysis by Injury Epidemiology and Surveillance Unit

<table>
<thead>
<tr>
<th>Payer</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicaid</td>
<td>82.4</td>
</tr>
<tr>
<td>Blue Cross &amp; Blue Shield</td>
<td>6.8</td>
</tr>
<tr>
<td>Private Insurance</td>
<td>2.8</td>
</tr>
<tr>
<td>Self-Pay</td>
<td>2.4</td>
</tr>
<tr>
<td>Other</td>
<td>5.6</td>
</tr>
</tbody>
</table>

N = 275 Hospitalizations
Firearm-Related Hospitalization (0-17) Charges, 2016-2018

- $96,239 average charge
- $3,477 minimum charge
- $1,479,954 maximum charge

*N = 275 Hospitalizations

*NC Residents, 2016-2018

Source: NC State Center for Health Statistics, Hospitalization Discharge Data (2016-2018) [Excludes Deaths]
Analysis by Injury Epidemiology and Surveillance Unit
Firearm-Related ED Visits
Firearm-Related ED Visit Rates per 100,000 in North Carolina, all ages (2016-2018)

Data Source: NC DETECT, Emergency Department Visits, 2016-2018; Analysis conducted by Injury Epidemiology and Surveillance Unit

* Rate per 100,000 NC population; † <5 deaths; rate suppressed  ** Non-Hispanic

Technical Note: Analysis includes only NC Resident cases WITH a valid NC county FIPS code using CDC/CSTE case definitions.

Data Source: NC DETECT, Emergency Department Visits, 2016-2018; Analysis conducted by Injury Epidemiology and Surveillance Unit
Insurance Type Among Firearm-Related ED Cases, 2016-2018

<table>
<thead>
<tr>
<th>Insurance Type</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-pay</td>
<td>23.1</td>
<td>23.1</td>
<td>23.1</td>
<td>23.1</td>
</tr>
<tr>
<td>Medicaid</td>
<td>16.3</td>
<td>16.3</td>
<td>16.3</td>
<td>16.3</td>
</tr>
<tr>
<td>Insurance</td>
<td>8.4</td>
<td>8.4</td>
<td>8.4</td>
<td>8.4</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>5.1</td>
<td>5.1</td>
<td>5.1</td>
<td>5.1</td>
</tr>
<tr>
<td>Medicare</td>
<td>2.1</td>
<td>2.1</td>
<td>2.1</td>
<td>2.1</td>
</tr>
<tr>
<td>Other Gov</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
</tr>
</tbody>
</table>

2016: 3,175 Firearm-Related ED Visits
2017: 3,218 Firearm-Related ED Visits
2018: 3,178 Firearm-Related ED Visits
Total: 9,571 Firearm-Related ED Visits

Technical Note: Analysis includes only NC Resident cases WITH a valid NC FIPS code using CDC/CSTE case definitions.

Data Source: NC DETECT, Emergency Department Visits, 2016-2018; Analysis conducted by Injury Epidemiology and Surveillance Unit
Firearm-Related ED Visit (0-17) Rates, 2016-2018

- Male: 20.5
- Female: 3.8
- Hispanic: 4.7
- White, NH: 4.5
- Black, NH: 20.3
- Al/NA, NH: 8.9
- Asian, NH: *

*NC Residents, 2016-2018; NH: Non-Hispanic

Source: NC State Center for Health Statistics, Hospitalization Discharge Data (2016-2018) [Excludes Deaths]
Analysis by Injury Epidemiology and Surveillance Unit

N = 855 ED Visits
Firearm-Related ED Visits Among NC Residents Ages 17 and Younger, 2016-2018

*N* = 855 ED Visits

*NC Residents, 2016-2018;

**Source:** NC State Center for Health Statistics, Hospitalization Discharge Data (2016-2018) [Excludes Deaths]

Analysis by Injury Epidemiology and Surveillance Unit
Prevention
Association of Increased Safe Household Firearm Storage With Firearm Suicide and Unintentional Death Among US Youths

Michael C. Monuteaux, ScD; Deborah Azrael, PhD; Matthew Miller, MD, MPH, ScD

Invited Commentary | Psychiatry

Limiting Access to Firearms as a Suicide Prevention Strategy Among Adults
What Should Clinicians Recommend?

Joseph A. Simonetti, MD, MPH; Ali Rowhani-Rahbar, MD, MPH, PhD

RESEARCH LETTER

Home Gun Safety Queries in Well-Child Visits

What Is Safe Household Firearm Storage to Prevent Deaths Among US Youths?

To the Editor In their article,¹ Monuteaux et al propose that “6%
4.6 MILLION CHILDREN LIVE IN HOMES WHERE GUNS ARE UNLOCKED AND LOADED

1,500 CHILDREN ARE KILLED WITH GUNS EVERY YEAR
Percent of NC Parents Firearm Practices
(Do you use a gun or chamber lock?)
NC CHAMP (ages 0-17), 2011

- 32.8% Have firearm in or around home
- 25.4% Keep firearms **loaded**
- 29.2% Keep firearms **unlocked**
- 17.3% Unlocked & loaded

Data Source: NC Child Health Assessment and Monitoring Program (NC CHAMP), 2011
Analysis by Injury Epidemiology and Surveillance Unit