IMPROVING IDENTIFICATION OF FIREARM INJURY INTENT IN NORTH CAROLINA

MARISSA LEFF, DANIELLE BRATHWAITE BA, CATHERINE WOLFF MS, & ANNA WALLER SCD

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DISCLAIMER

NC DETECT is a statewide public health syndromic surveillance system, funded by the NC Division of Public Health (NC DPH) Federal Public Health Emergency Preparedness Grant and managed through collaboration between NC DPH and UNC-CH Department of Emergency Medicine’s Carolina Center for Health Informatics. The NC DETECT Data Oversight Committee does not take responsibility for the scientific validity or accuracy of methodology, results, statistical analyses, or conclusions presented.

The authors have no conflicts of interest.
THE PROBLEM

• In 2019, injuries were the 3rd leading cause of death.\(^1\)

• Nationally, there were approximately 40,000 firearm injury deaths in 2019.\(^1\)

• North Carolina alone accounted for 1389 deaths.\(^2\)

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1. WISQARS, 2019
2. NC-VDRS, 2018
SYNDROMIC SURVEILLANCE

• Used to monitor specific health conditions or outcomes (like firearm injuries) in real or near-real time

• North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT): NC’s public health syndromic surveillance system that collects near real-time information about ED visits across the state
FIREARM SURVEILLANCE IN NC

CDC-Funded Statewide Surveillance Programs:

The North Carolina Violent Death Reporting System (NC-VDRS) includes data from death certificates, medical examiner and law enforcement reports.

- Firearm deaths include homicides, suicides, unintentional firearm death, death by legal intervention and deaths of undetermined intent

The North Carolina Firearm Injury Surveillance Through Emergency Rooms (NC-FASTER) includes all emergency department visits related to firearm injury.

- Firearm injury related ED visits included unintentional, suicidal, and assaultive, firearm injury, as well as those of undetermined intent.
CDC developed definitions for use in FASTER program to identify firearm injuries overall and firearm injuries by specific intent (assault, intentional self-harm, and unintentional/undetermined)

• CDC firearm injury SyS definitions utilize:
  • Key text words in the chief complaint
  • ICD-10-CM discharge diagnosis codes
<table>
<thead>
<tr>
<th>TIME PERIOD</th>
<th>HOST (Injured Person)</th>
<th>AGENT (Firearm)</th>
<th>ENVIRONMENT (Physical and Social)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Injury (Primary Prevention)</td>
<td>Domestic Violence Screening, Depression Screening (identify people at increased risk)</td>
<td>Background Checks, Red Flag Laws, Smart Gun Technology</td>
<td>Metal Detectors, Access to Mental Healthcare, Bullying Prevention Programs</td>
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<td>Injury (Secondary Prevention)</td>
<td>Stop the Bleed Training (bystander intervention)</td>
<td>Small Caliber Ammunition, Small Capacity Magazines</td>
<td>Community gunshot monitoring systems (activate 911)</td>
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<tr>
<td>Post-Injury (Tertiary Prevention)</td>
<td>Hospital-Based Violence Intervention Programs (reduce risk of another injury)</td>
<td>Legal Penalties, Prohibition of Future Firearm Possession</td>
<td>Trauma System Development, Decrease Media Coverage of Suicides</td>
</tr>
</tbody>
</table>

Adapted from Bulger et al, 2019
PURPOSE

• Firearm injury is a pressing public health issue. Accurate and timely data is essential to guide successful firearm injury prevention and response efforts.

• Firearm injury prevention & response also require accurate information about intent

• **Goal of this project:** Evaluate accuracy of intent coding based on available text fields in NC DETECT
SAMPLE

• N=1475 ED visits were pulled from NC DETECT.
  • Randomly selected 2 weeks from each quarter of 2019-2020 (16 weeks).
  • Accounts for seasonality and includes weekends.

• Pilot study used 10% sub-sample (N=151 ED visits)
  • Qualitatively assess available intent information and identify themes for use in the full sample.
METHODS

• Application of CDC SyS intent definition within full NC DETECT sample (N=1475). Complete.

• Retrospective review of pilot sample (N=151) to establish novel qualitative intent codes. Complete.

• Complete review of full sample (N=1475) by two independent, clinically-trained reviewers using new intent codes. In process.
RESULTS

CDC SyS Intent Categories (N=1475):
• 214 visits (14.5%) assault
• 20 (1.4%) intentional self-harm
• 1,019 (69.1%) unintentional
• 263 (17.8%) undetermined
• 41 (2.8%) multiple intent
  - 38 (92.7%) assault and unintentional
  - 3 (7.3%) intentional self-harm and unintentional
RESULTS

Qualitative Themes – Pilot Sample

1. Frequent “undetermined” firearm visits
2. Difficulty accurately identifying “unintentional” observations
3. Challenges separating the shooter from the intention
4. Commonly conflicting information
RESULTS: NOVEL INTENT CODING

1. Shooter
   - Self
     - Unintentional
     - Intentional
     - Undetermined Intent
   - Other
     - Unintentional
     - Intentional
     - Undetermined Intent
   - Not specified
     - Unintentional
     - Intentional
     - Undetermined Intent

2. Intent
   - Cleaning weapon
   - Suicide attempt
   - Stray bullet
   - IPV
     - Law Enforcement?

3. Example
CONCLUSION

• Chief complaint & triage notes often lack specifics
• When intent information is included, it is often contradictory
• Improved intent identification methods needed
REFERENCES

1. National Center for Injury Prevention and Control, CDC


QUESTIONS?