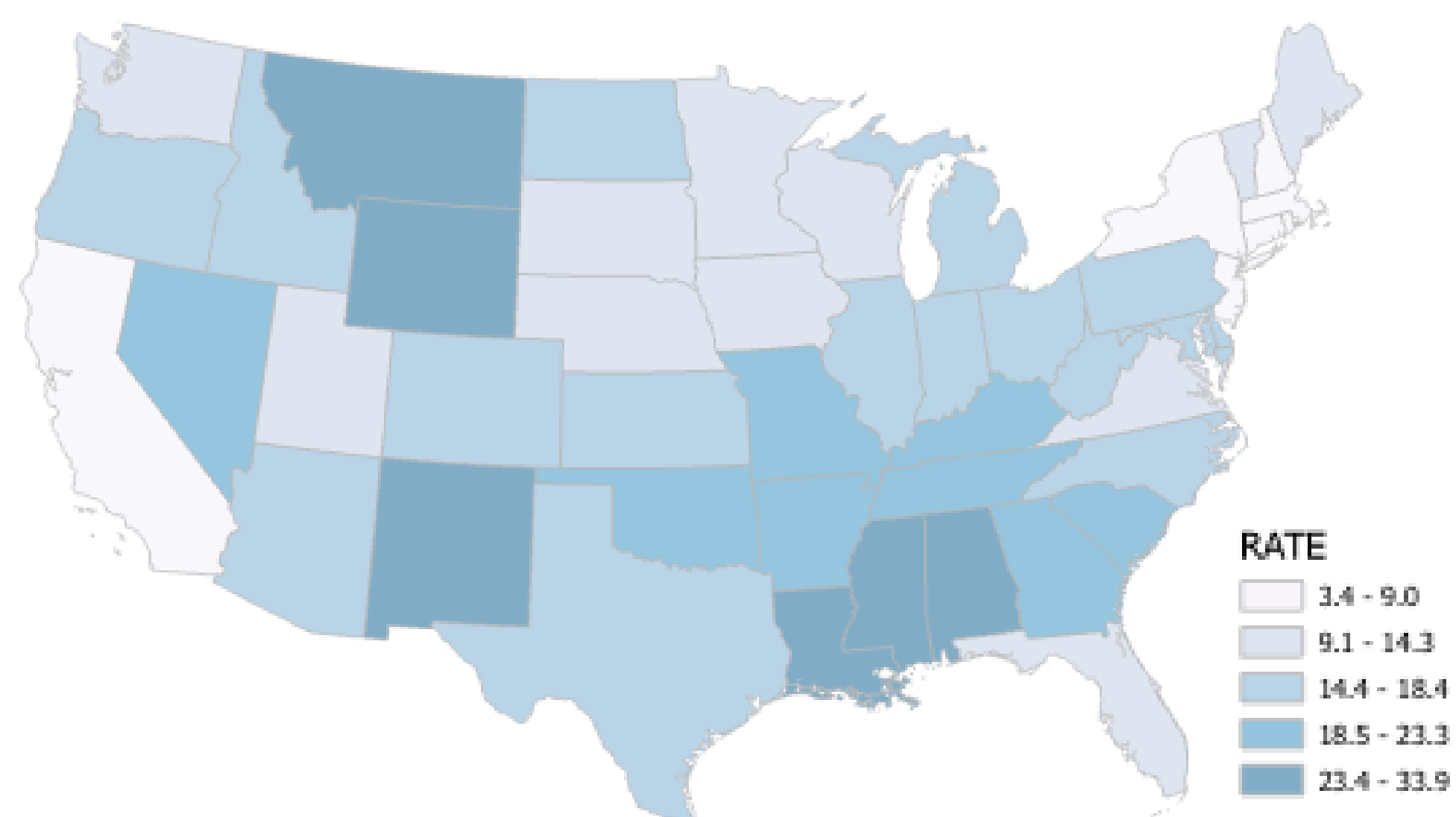


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## Introduction

- The NC firearm death rate is consistently above the National average.
- EMS encounters have the potential to serve as a rich source of data for understanding the landscape of non-fatal and fatal firearm injuries.
- We examined EMS records in NC to evaluate a broad firearm injury definition and understand demographic trends at the state level.

Figure 1. Firearms-related death rates in the US in 2021



Source (CDC). Rates are per 100,000 persons. The National average was 14.6 in 2021; NC rate was 17.3.

## Methods

- We used NC EMS data from 01/01/2021-12/31/2022, with a data use agreement from the NC Office of EMS.
- We categorized firearm injury EMS encounters (Table 1) by shooter and intent using complaint, narrative and injury cause code fields.

Table 1: EMS Firearm Definition V1

<b>Complaint Terms</b>	GSW or gunshot or "gun shot" or "shot myself" or "shot self*" or firearm or "I got shot" or "been shot" or "shot gun" or shotgun.
<b>Injury cause codes</b>	W34, W34.0, W34.09, W34.00, W34.00XA, W33.02, W33.03, W33.09, W33.01, W32.0, W32, W34.1, W33.0, W33, X94.0XXA, X95.9, X95.9XXA, Y22, Y22.XXXA, Y23.1, X72.XXXA, X74.9, Y35.0, Y35.02, Y35.023, Y35.03, Y35.092, Y35.093, Y35.003, Y23.3, Y22.0, Y24.8, Y23.8, Y23, Y23.0, Y23.0XXA, Y38.4X, Y24.9, Y24.9XXA, Y23.9
<b>Dispatch complaint AND narrative</b>	Dispatch complaint is Stab/Gunshot Wound/Penetrating Trauma AND narrative keywords of GSW or gun shot or gunshot
<b>Patient disposition exclusions</b>	Assist, Agency; Assist, Public, Assist; Unit, Canceled (Prior to Arrival At Scene); Canceled on Scene (No Patient Contact); Canceled on Scene (No Patient Found); Standby-No Services or Support Provided; Standby-Public Safety, Fire, or EMS Operational Support Provided; Transport Non-Patient, Organs, etc.

## Shooter, Intent and Demographic Analysis

Figure 2: Shooter and intent analysis for EMS firearms injuries meeting the v1 definition.

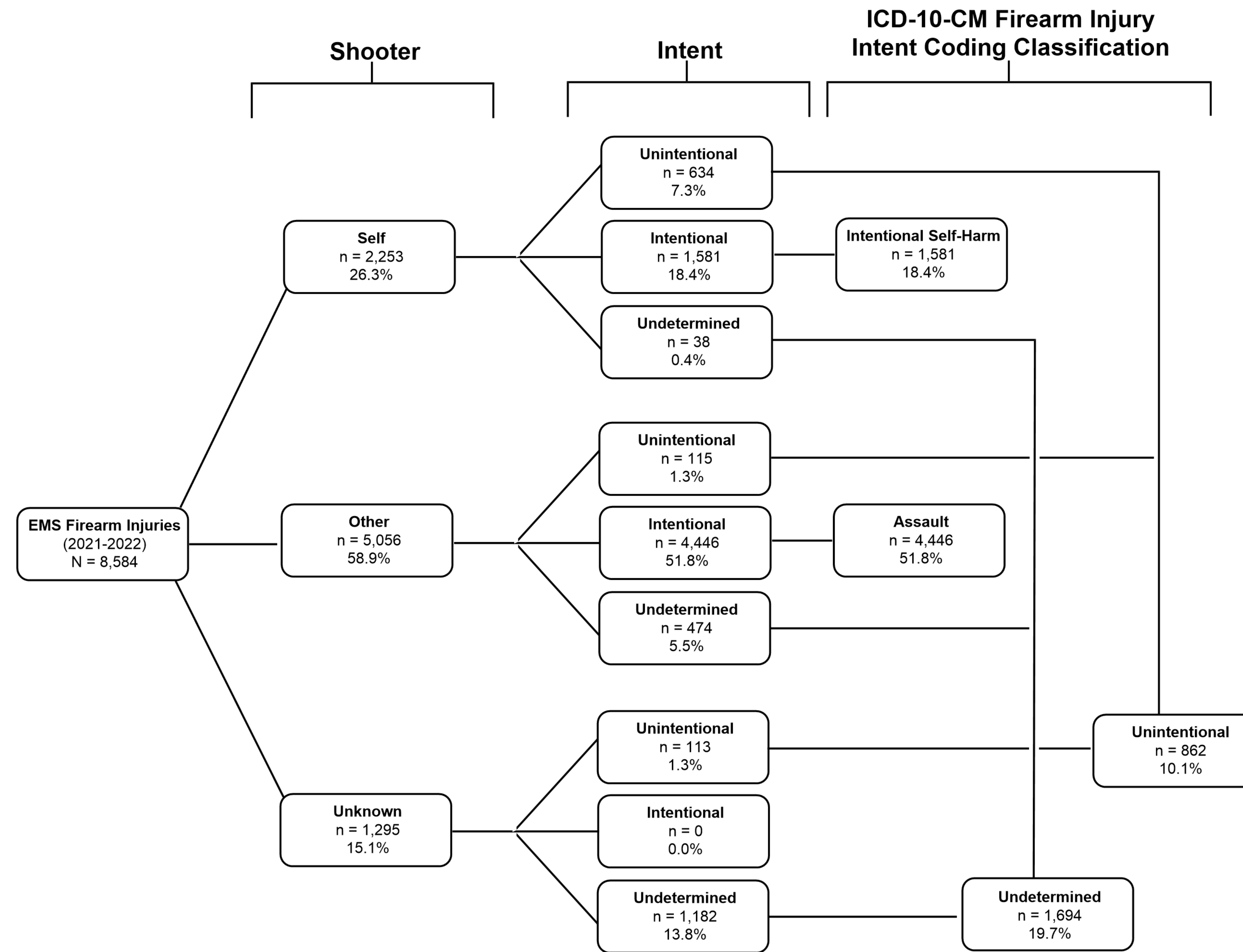


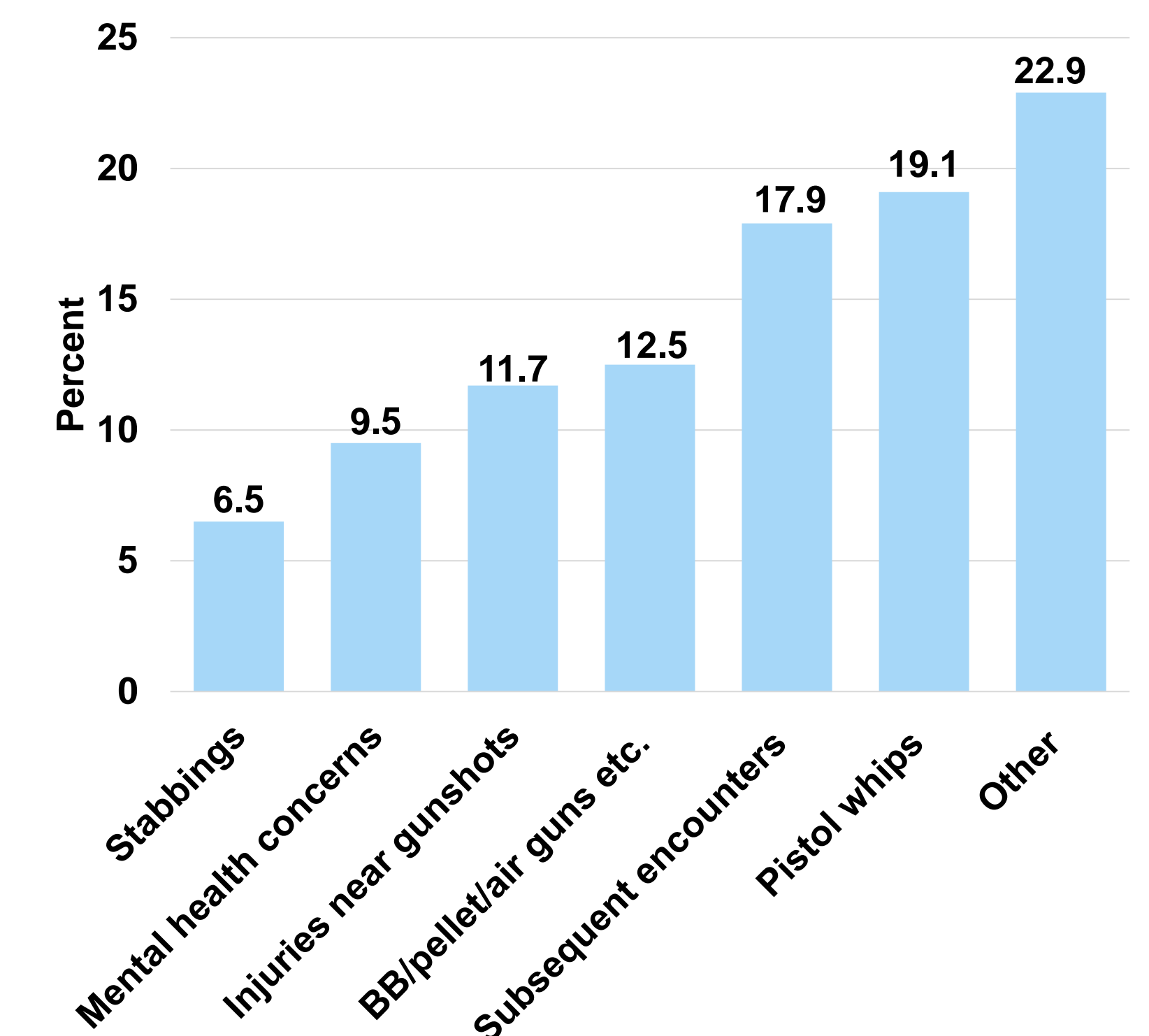
Table 2: EMS firearm injury demographics in NC (2021-2022)\*

Demographic	Assault	Intentional Self-Harm	Undetermined	Unintentional	All Intents
<b>Total</b>	<b>4446 (39.17)</b>	1581 (13.93)	1694 (14.93)	863 (7.60)	8584 (75.64)
<b>Sex</b>					
Male	3621 (70.34)	1342 (26.07)	1403 (27.25)	743 (14.43)	7109 (138.09)
Female	808 (14.77)	230 (4.21)	270 (4.90)	112 (2.05)	1420 (25.99)
Unknown/Missing	17	9	21	8	55
<b>Age Group</b>					
Infant/Preschool (0-4)	19 (3.20)	0 (0.00)	20 (3.37)	26 (4.37)	65 (10.93)
Elem. School (5-9)	23 (3.80)	0 (0.00)	19 (3.14)	14 (2.31)	56 (9.25)
Middle School (10-14)	86 (13.23)	22 (3.38)	36 (5.54)	32 (4.92)	176 (27.07)
High School (15-18)	515 (92.90)	66 (11.91)	199 (35.90)	53 (9.56)	833 (150.26)
College (19-24)	<b>1012 (112.77)</b>	173 (19.28)	354 (39.45)	175 (19.50)	1714 (190.99)
Young Adult (25-44)	2074 (75.25)	434 (15.75)	751 (27.25)	311 (11.28)	3579 (129.54)
Middle Aged (45-64)	580 (21.41)	443 (16.35)	229 (8.45)	155 (5.72)	1407 (51.93)
Senior (65+)	91 (4.93)	<b>430 (23.31)</b>	51 (2.76)	90 (4.88)	662 (35.88)
Unknown/Missing	46	13	35	7	101
<b>Race/Ethnicity</b>					
American Indian	74 (41.3)	6 (3.36)	61 (34.15)	12 (6.72)	153 (65.67)
Asian/Pacific Islander	22 (5.63)	17 (4.35)	7 (1.79)	11 (2.82)	57 (14.59)
Black/African American	<b>3103 (139.28)</b>	211 (9.47)	1020 (45.78)	266 (11.94)	4600 (206.47)
Hispanic or Latino	281 (24.24)	56 (4.83)	89 (7.68)	45 (3.88)	471 (40.63)
White	801 (10.83)	<b>1246 (16.85)</b>	351 (4.75)	485 (6.56)	2883 (38.99)
Unknown/Missing	165	45	166	44	420

\*Data are reported as count followed by rates per 100,000 persons within a given demographic in NC.

## False Positive Analysis

Figure 3: False positive categories



## Key Findings

- EMS data are an important source of information for examining nonfatal firearm injury intent.
- Assaults accounted for 51.8% of the total encounters reviewed (n=4446) followed by undetermined (19.7%, n=1694), intentional self-harm/suicide (18.4%, n=1,581), and unintentional (10.1%, n=862) encounters.
- Firearm-related assaults were highest among males (70.34), those aged 19 to 24 (112.77), and Black/African Americans (139.28)
- Intentional self-harm/suicide was highest among males (26.07), those aged 65+ (23.31), and Whites (16.85).
- Injury cause codes were missing in 27.5% of EMS firearm injury encounters reviewed and, when present, also contributed to false positives.
- Narratives revealed that a significant number of unintentional firearms-related injuries were due to the improper handling or storage of firearms.
- On the scene accounts of EMS personnel are helpful in providing context for encounters that can be used to provide tailored interventions.

## Acknowledgements

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