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At a Glance: Data on Firearm Injuries among Virginians

November 19, 2025
Virginia State Crime Commission
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Firearm injuries are a public health problem that impact the health and safety of Virginians.

- **Firearm injuries can affect anyone**, regardless of sex, age, race, ethnicity, or place of residence.
- **Health effects of firearm injuries** include physical disability, mental health consequences, and death.
- The Virginia Department of Health **monitors the burden of firearm injuries** using multiple data sources.

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Data Sources

Emergency department (ED) visits (Virginia ESSENCE)

- Patients from in- and out of state seeking care in Virginia EDs; geography based on patient residential zip code
- 100% of non-federal acute care hospitals and free-standing emergency care centers report ED visit data to VDH
- Near real-time data; chief complaint commonly free-text field (primary reason why patient sought care)
- Limitations: chief complaint variability, diagnosis coding delays, data volume and quality varies over time

Inpatient hospitalizations (Patient-Level Data File via Virginia Health Information)

- Virginia residents hospitalized in Virginia; geography based on patient residential zip code
- 100% of Virginia-licensed hospitals, no federal entities
- Discharge billing data on inpatients using ICD-10-CM diagnosis codes
- Limitations: delayed data, potential underreporting in bordering localities

Health behavior survey data (Virginia Adult Health Survey and Virginia Youth Survey)

- VAHS: Virginia's version of CDC BRFSS; respondents aged 18+ years; administered annually
- VYS: Virginia's version of the CDC YRBS; public school student respondents; administered every odd year
- Participants or schools are randomly selected, participation is optional, weighted for representativeness
- Limitations: Response bias, geographical limitations

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What about firearm injury **intent** for ED visits and inpatient hospitalizations?

Recent research and analysis suggests that firearm injury intent may be frequently misclassified in health care data.

- There are five injury intent types: unintentional, self-harm, assault, legal intervention or war, or undetermined.
- Default of firearm external cause of injury coding is **unintentional.**
- Miller et al. found that 28% of firearm ED visits with an intent of assault were misclassified as unintentional.[1]
- A recent VDH data analysis found that 50% of firearm injury ED visits and 42% of firearm injury hospitalizations were coded as unintentional; when matched to deaths, 2% were accurately classified as unintentional.[2]
- Misclassification of firearm injury intent may:
  - not tell the true picture of the firearm injury landscape; and
  - have impacts for appropriate prevention approaches based on intent.

1. Miller M, Azrael D, Yenduri R, et al. Assessment of the Accuracy of Firearm Injury Intent Coding at 3 US Hospitals. *JAMA Netw Open.* 2022;5(12):e2246429. doi:10.1001/jamanetworkopen.2022.46429
2. Yerkes, L., Austin, E., Davis, M., & Keen, T. (2024, June 10). Firearm Intent Classification Matters: Describing the Firearm Injury Continuum in Virginia [Conference presentation]. Council of State and Territorial Epidemiologists Annual Conference.

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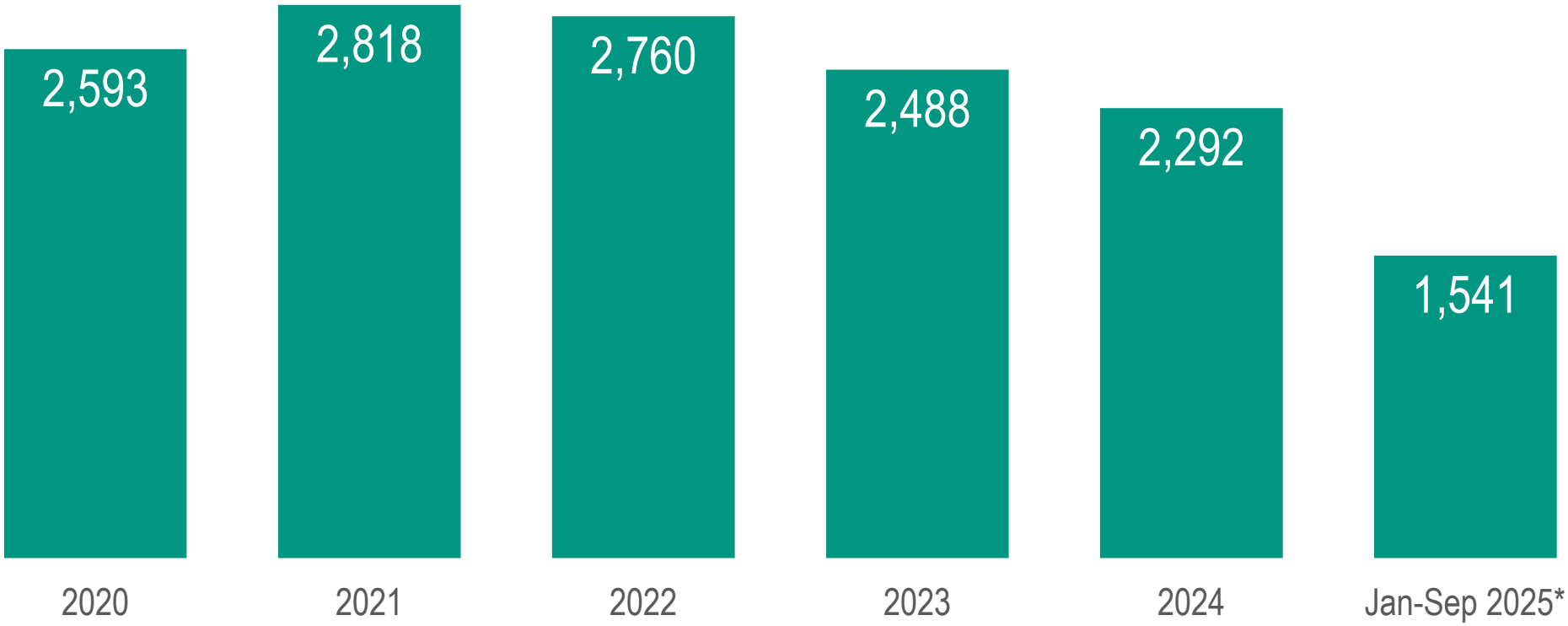
Source: Virginia ESSENCE, Virginia Department of Health

Firearm injury emergency department (ED) visits decreased **12%** from 2020 to 2024, peaking at 2,818 ED visits in 2021.



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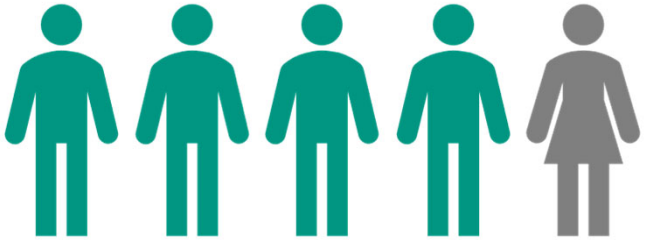
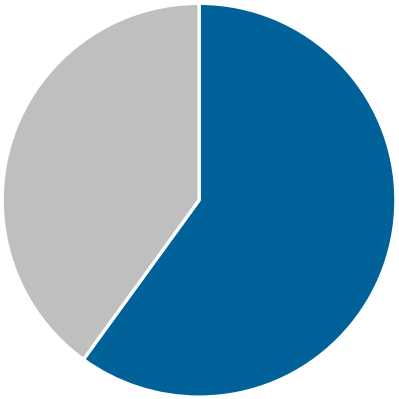
Source: Virginia ESSENCE, Virginia Department of Health

Firearm injury ED visits from 2019 to 2025* were highest among **males** and people **aged 15-34 years**.



Four in 5 were among **males**.



Six in 10 were among **people aged 15-34 years**.

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On average, **2** Virginians were hospitalized as inpatients for a firearm injury **every day** between 2020 and 2024.

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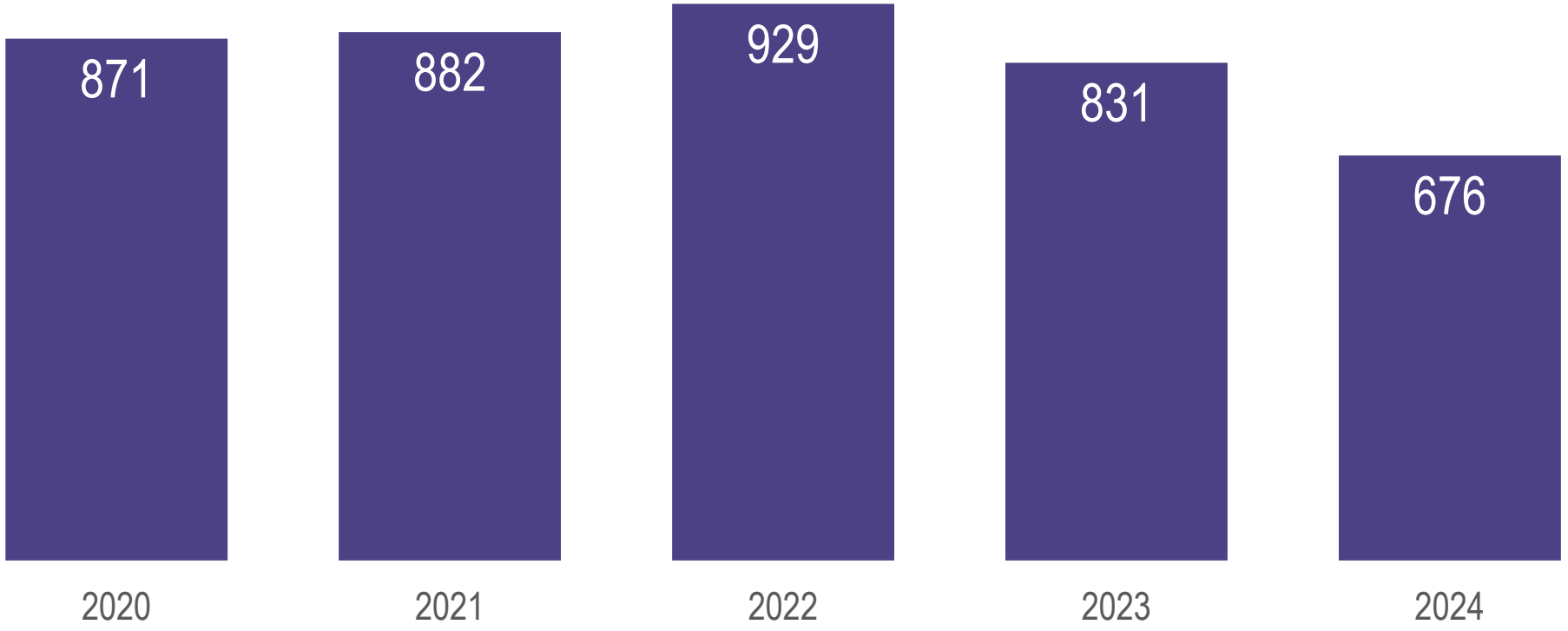
Source: Patient Level Data File via Virginia Health Information, Virginia Department of Health

Firearm injury hospitalizations among Virginians decreased **22%** from 2020 to 2024, peaking at 929 hospitalizations in 2022.



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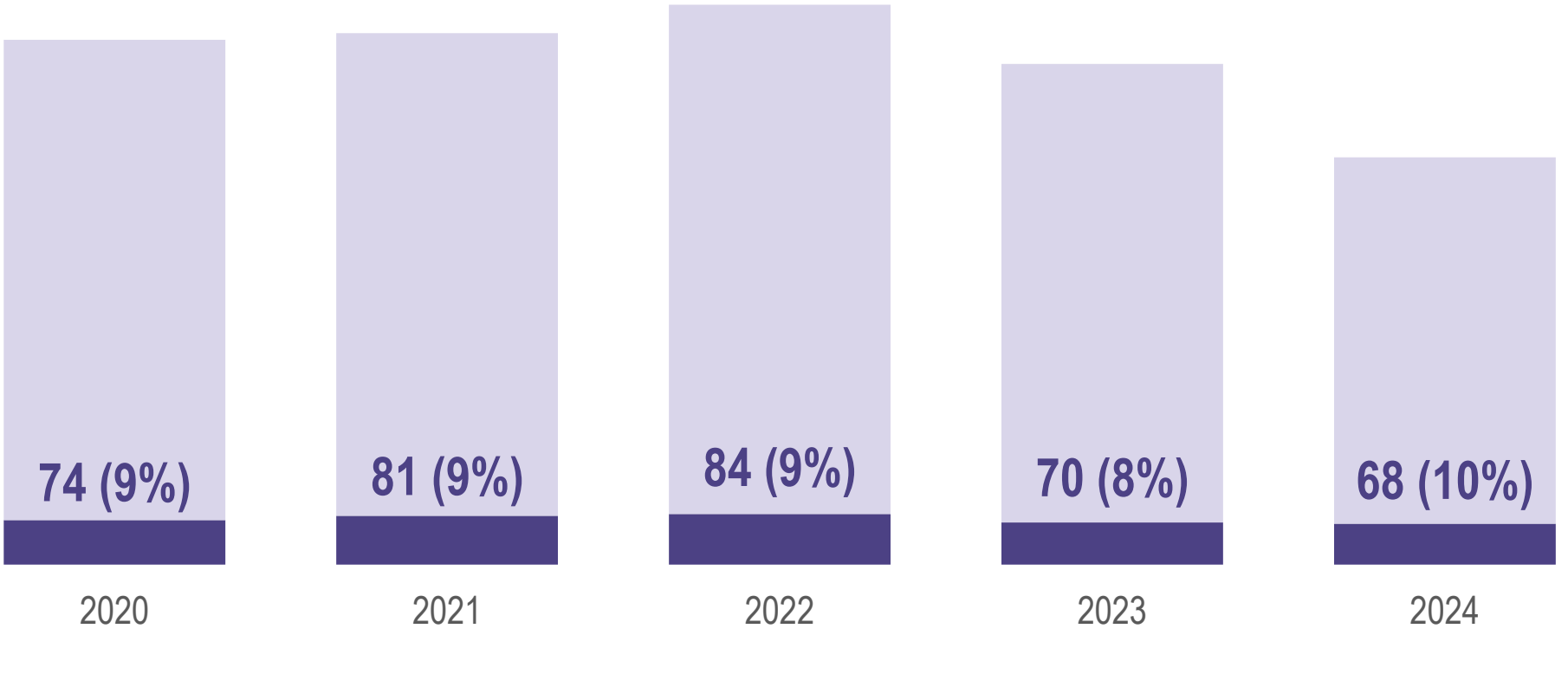
Source: Patient Level Data File via Virginia Health Information, Virginia Department of Health

On average, **9%** of firearm injury hospitalizations among Virginians from 2020 to 2024 were **fatal** each year.



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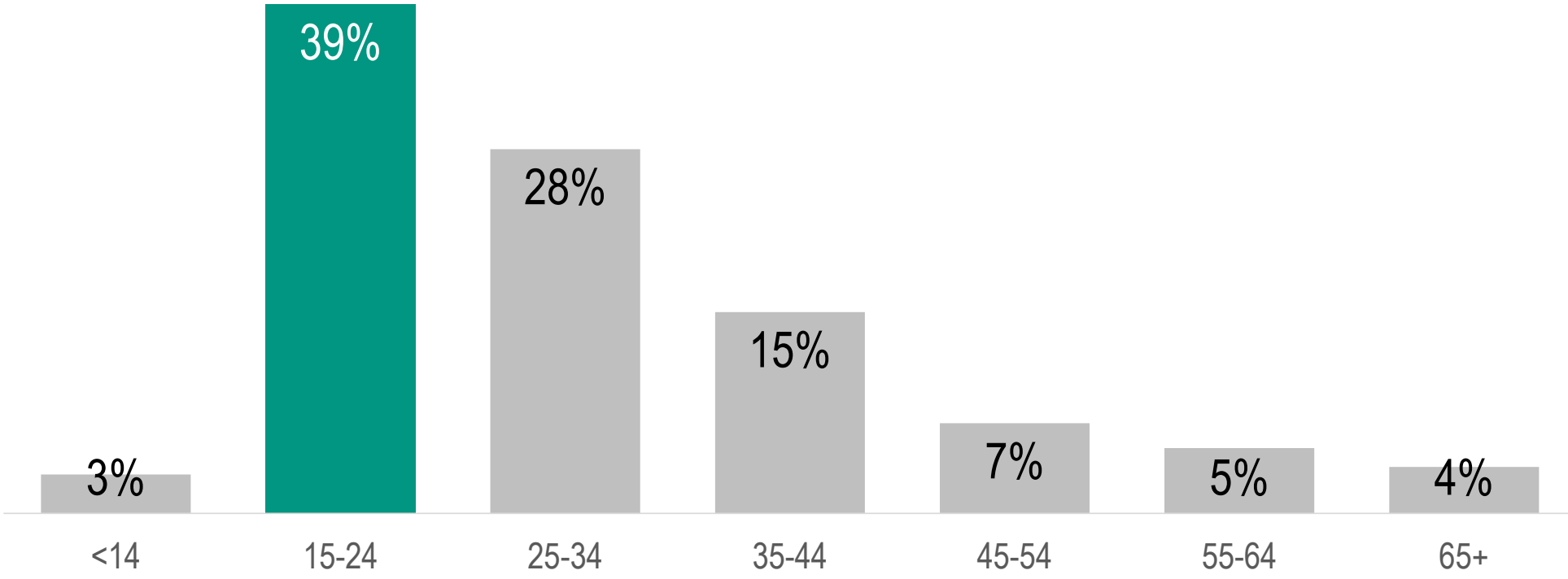
Thirty-nine percent of firearm injury hospitalizations were Virginians **aged 15-24 years** from 2020 to 2024.



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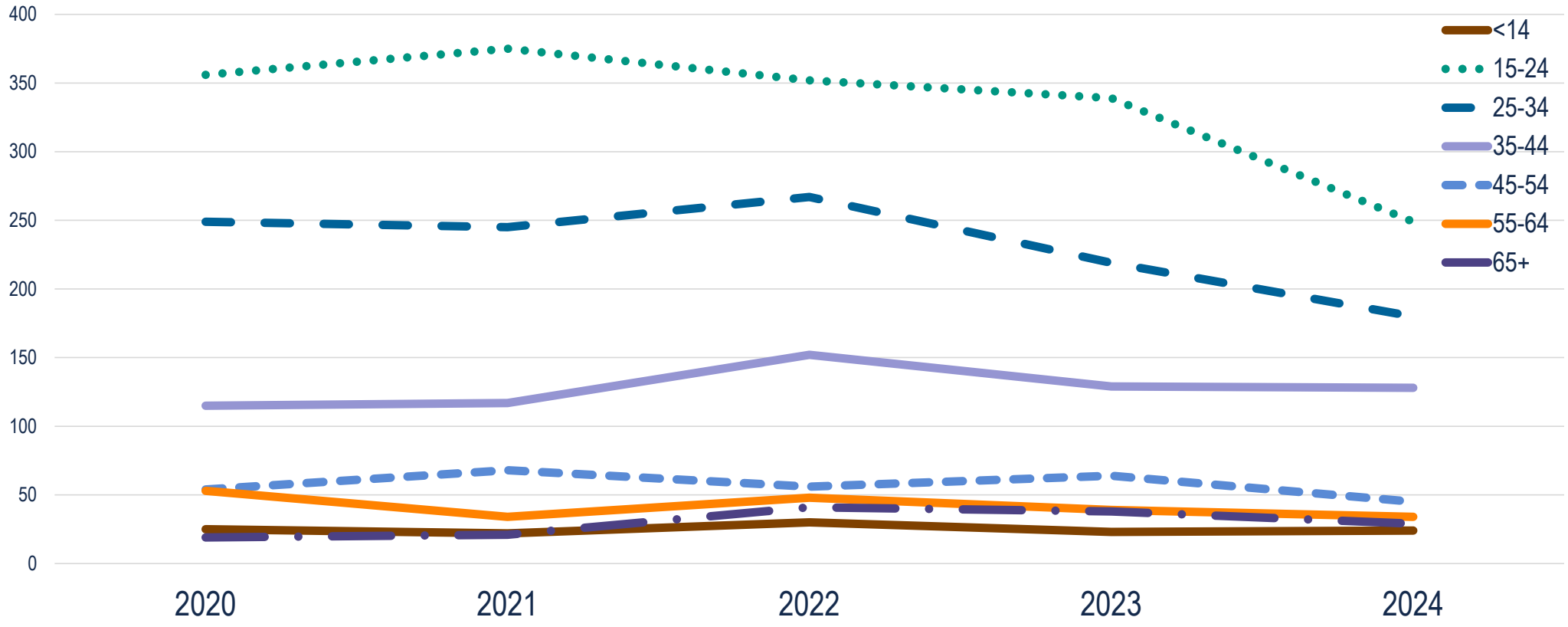
Source: Patient Level Data File via Virginia Health Information, Virginia Department of Health

Trends in firearm injury hospitalizations by age group from 2020 to 2024 show…



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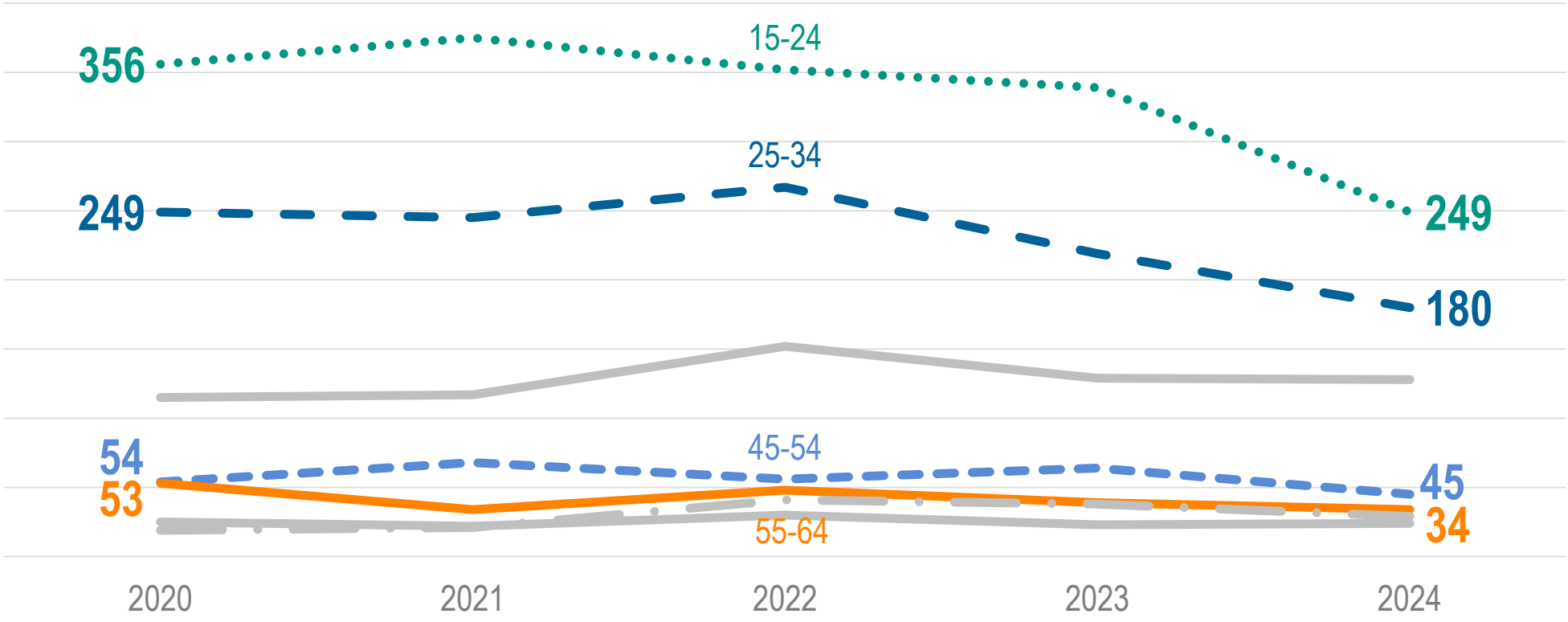
Source: Patient Level Data File via Virginia Health Information, Virginia Department of Health

From 2020 to 2024, firearm injury hospitalizations among Virginians **decreased** among four age groups, particularly those aged **55-64 years** at **36%** and **15-24 years** at **30%**.



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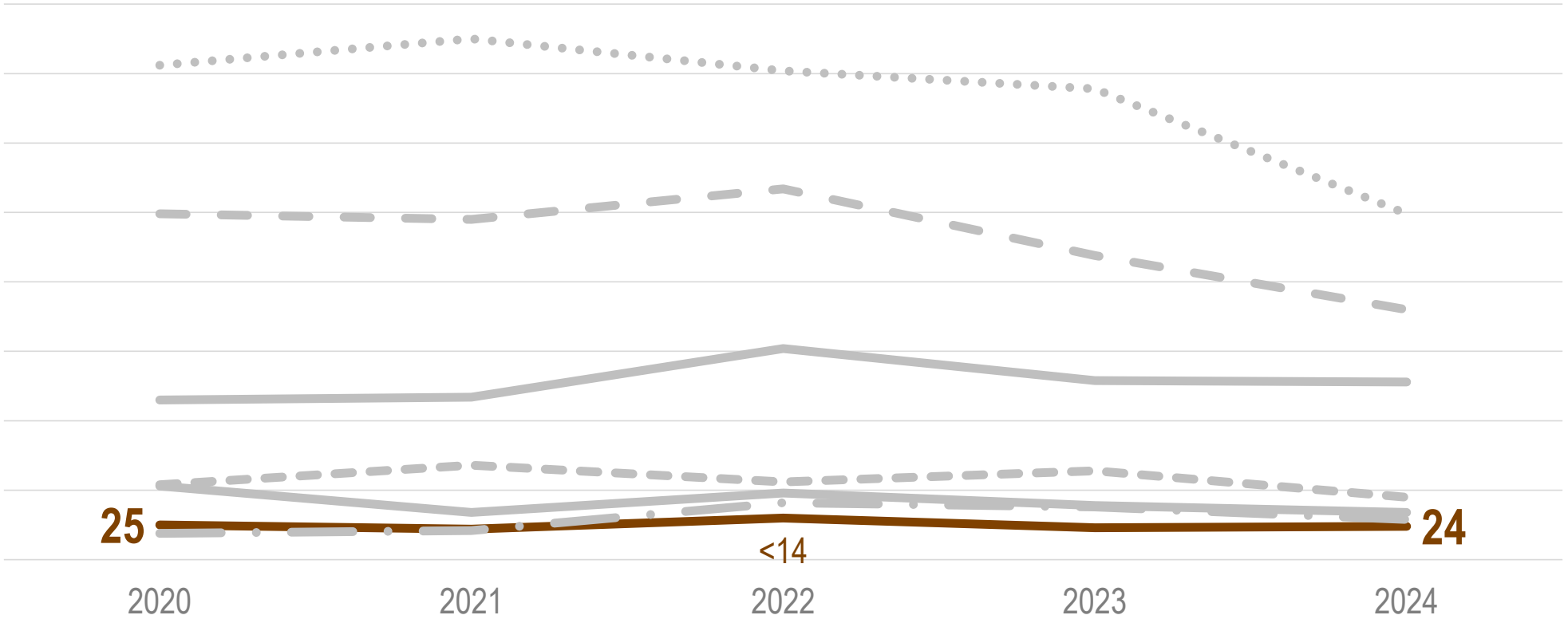
Source: Patient Level Data File via Virginia Health Information, Virginia Department of Health

Firearm injury hospitalizations among Virginians **younger than 14 years** **were stable** from 2020 to 2024, with an average of **25** hospitalizations annually.



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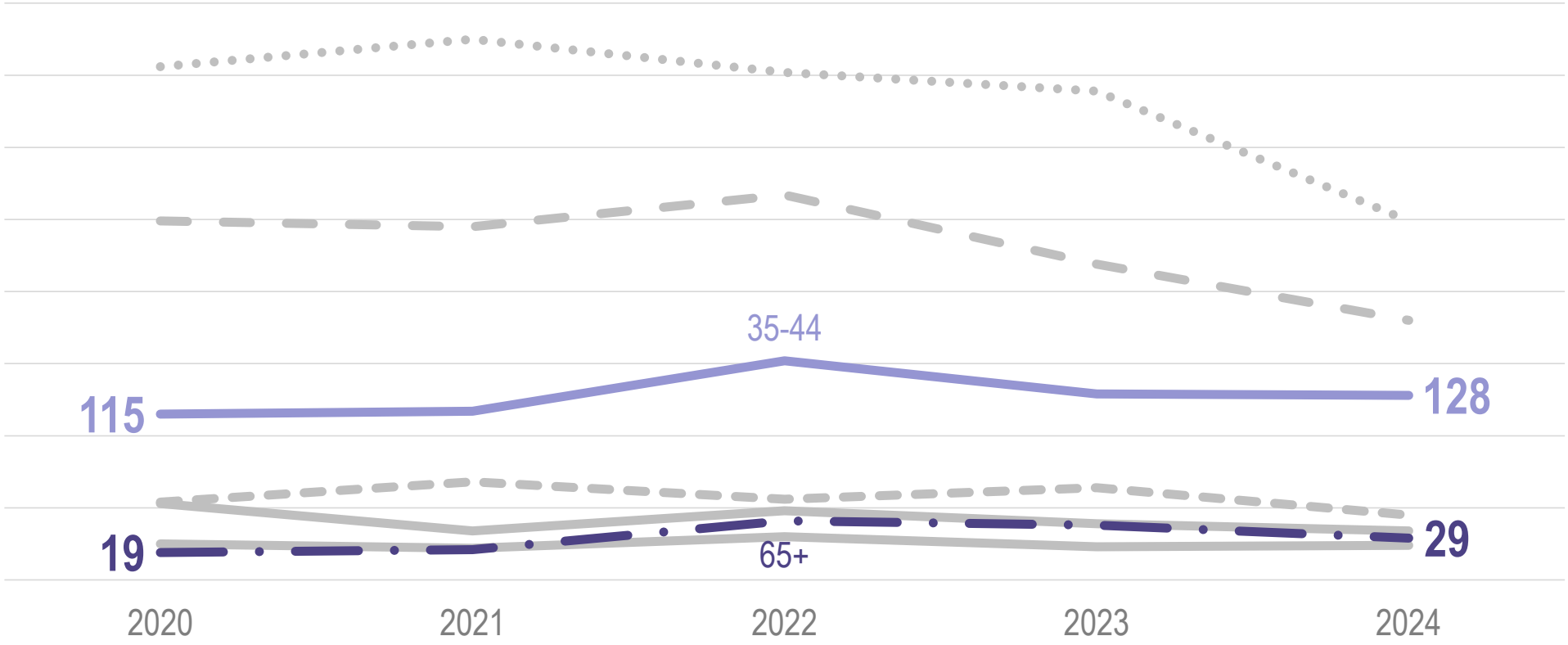
Source: Patient Level Data File via Virginia Health Information, Virginia Department of Health

From 2020 to 2024, firearm injury hospitalizations **increased** 11% among those aged **35-44 years** and **52%** among those aged **65+ years**, respectively.



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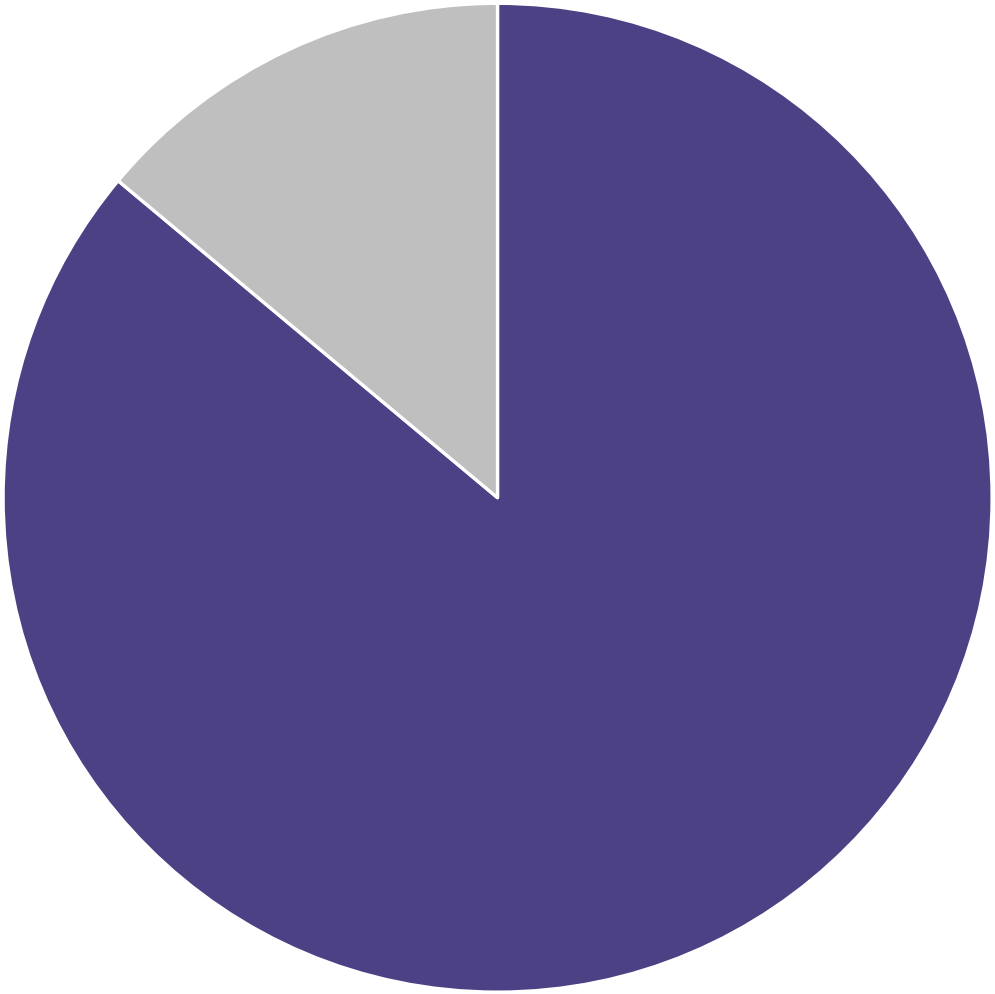
Source: Patient Level Data File via Virginia Health Information, Virginia Department of Health

From 2020 to 2024, **86%** of firearm injury hospitalizations were **male**.



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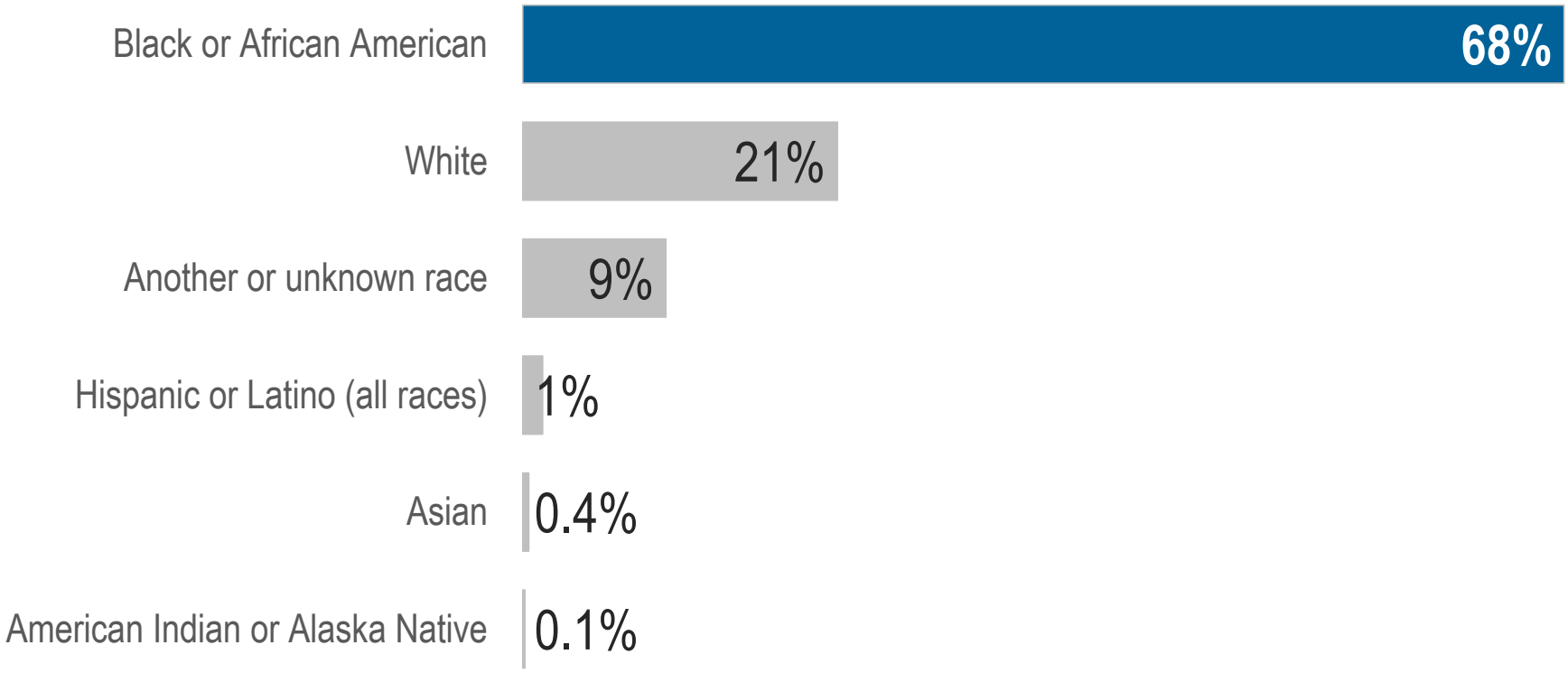
Source: Patient Level Data File via Virginia Health Information, Virginia Department of Health

Almost 7 in 10 firearm injury hospitalizations from 2020 to 2024 were among **Black or African American** Virginians.



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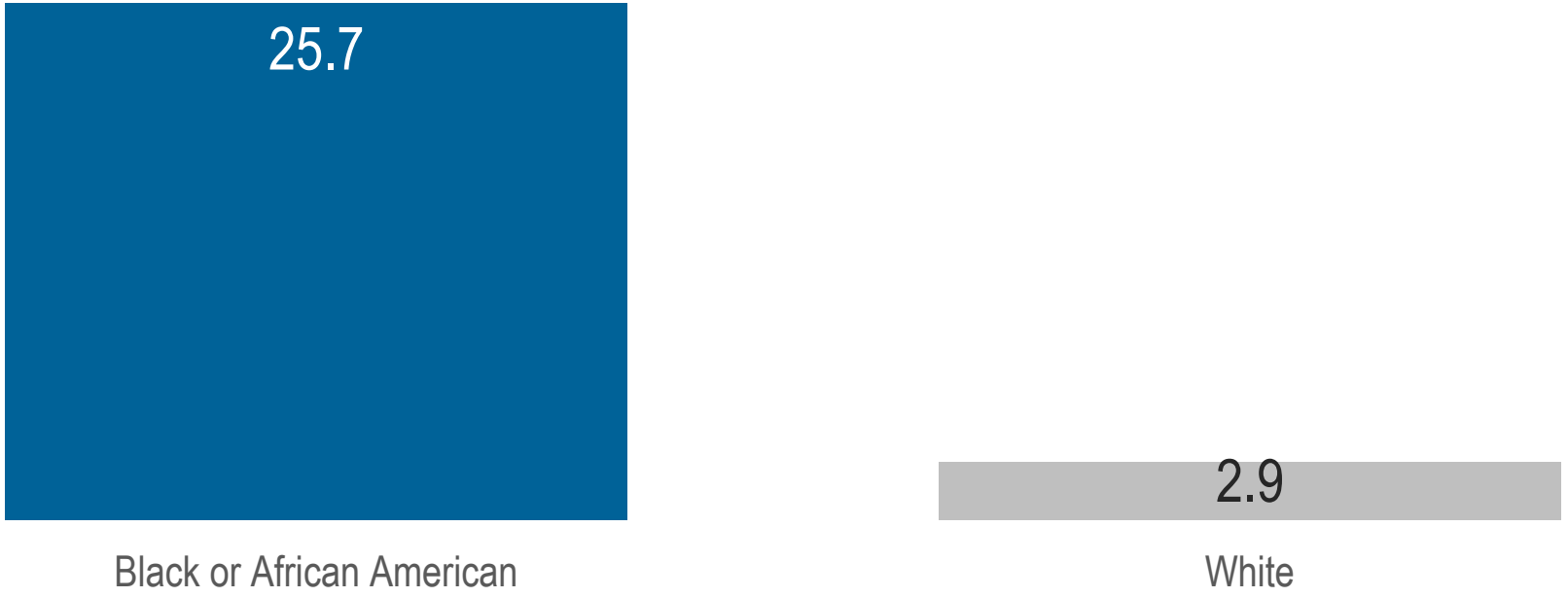
Source: Patient Level Data File via Virginia Health Information, Virginia Department of Health

In 2024, **Black or African American** Virginians were hospitalized for firearm injuries at **8.9 times the rate** of White Virginians.



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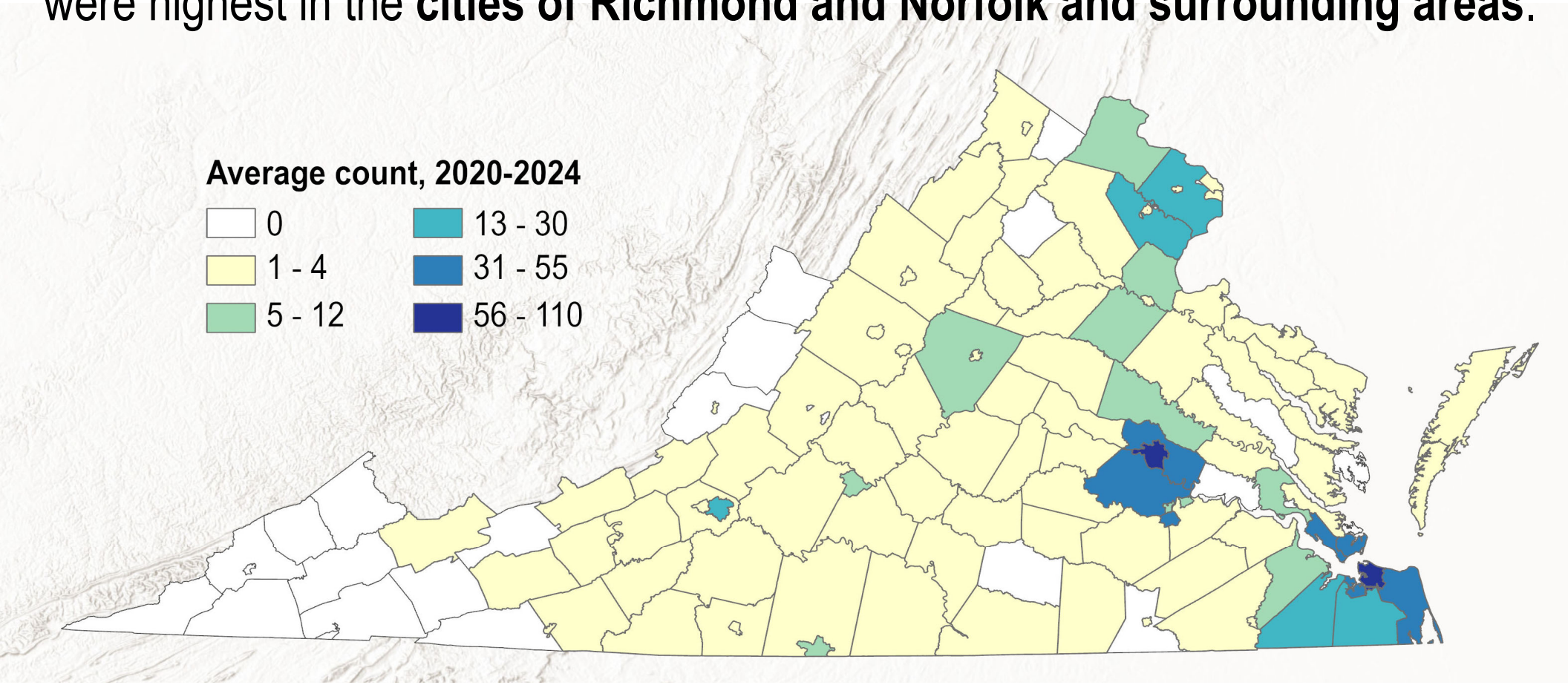
Source: Patient Level Data File via Virginia Health Information, Virginia Department of Health

Average annual counts of firearm injury hospitalizations from 2020 to 2024 were highest in the **cities of Richmond and Norfolk and surrounding areas**.



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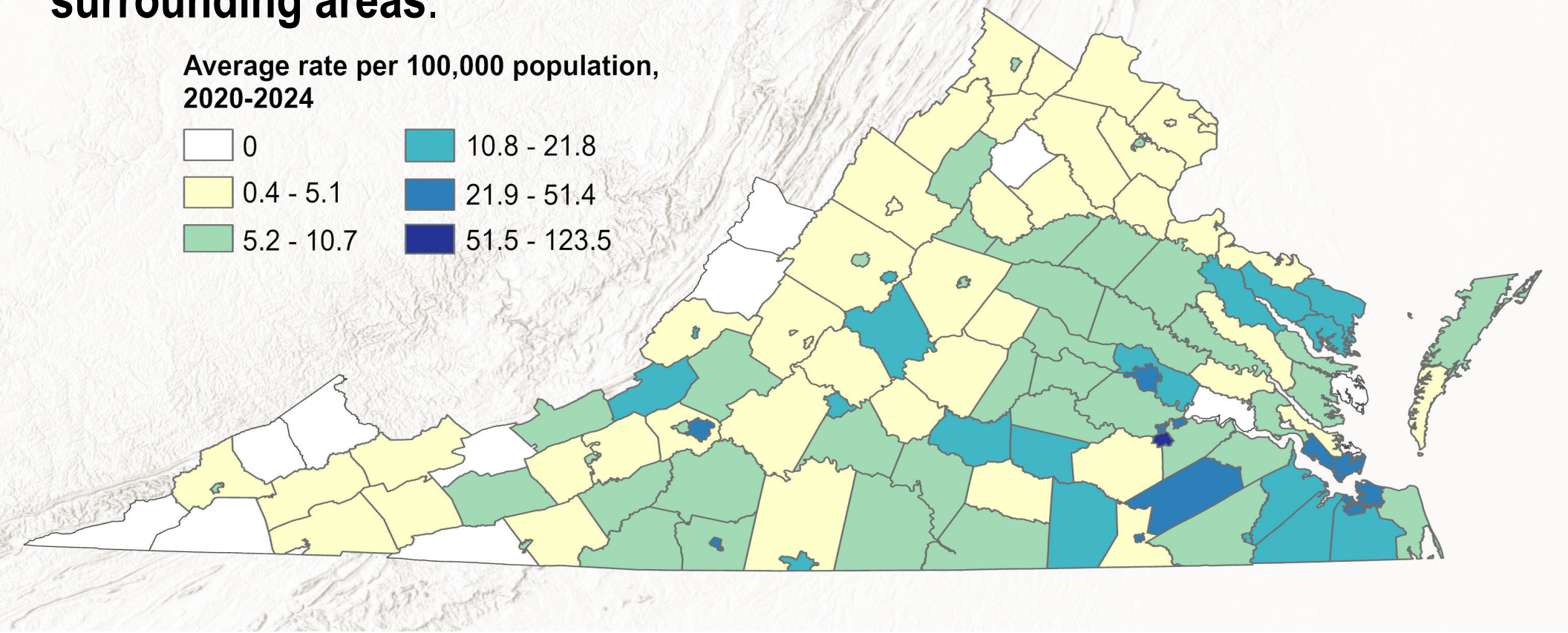
Average annual firearm injury hospitalization rates per 100,000 from 2020 to 2024 were highest for **the cities of Petersburg and Hopewell and surrounding areas**.



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From 2020 to 2024, the **top 10 Virginia localities** for average annual **count** and **rate** of firearm injury hospitalizations were:

Locality	Average annual count
Richmond City	110
Norfolk City	80
Newport News City	55
Portsmouth City	45
Henrico County	43
Petersburg City	41
Virginia Beach City	39
Chesterfield County	37
Hampton City	36
Roanoke City and Chesapeake City (tied)	30

Locality	Average annual rate
Petersburg City	123.5
Hopewell City	51.4
Richmond City	48.2
Portsmouth City	46.7
Emporia City	43.2
Norfolk City	34.2
Roanoke City	30.7
Newport News City and Sussex County (tied)	29.7
Colonial Heights City	28.4
Martinsville City	27.9

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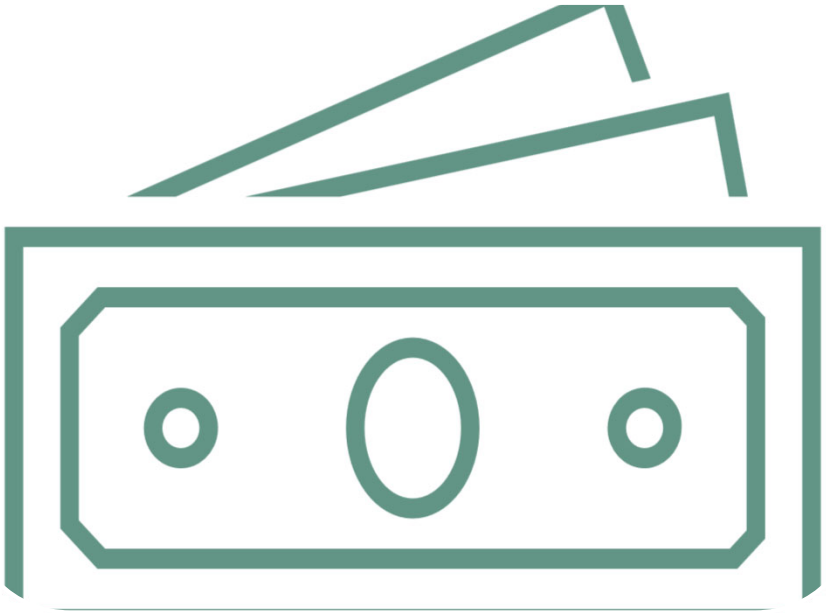
Source: Patient Level Data File via Virginia Health Information, Virginia Department of Health



Firearm injury hospitalizations cost over **$737 million** from 2020 to 2024.

Virginians spent a total of **34,214 days** in the hospital for firearm injuries from 2020 to 2024.

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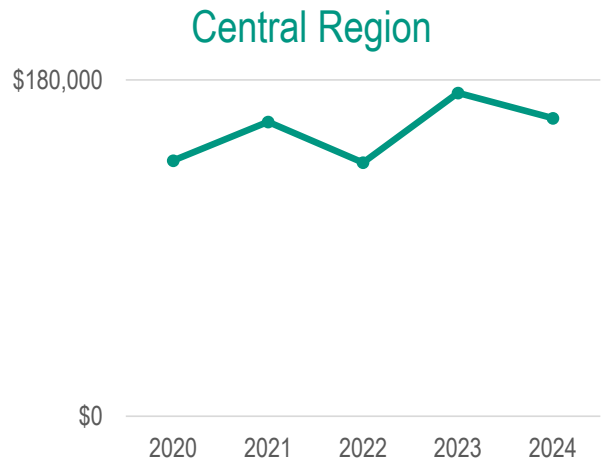
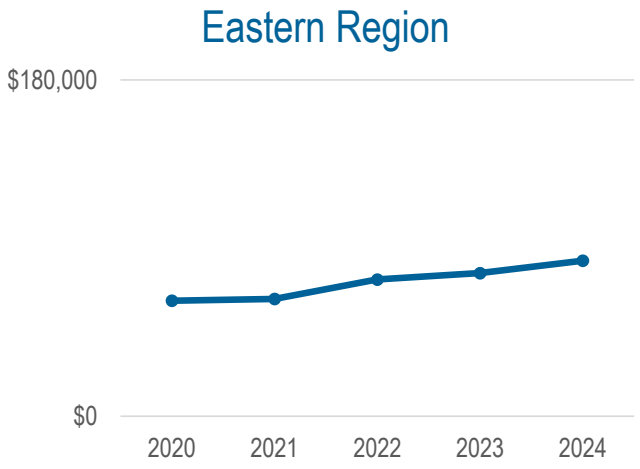
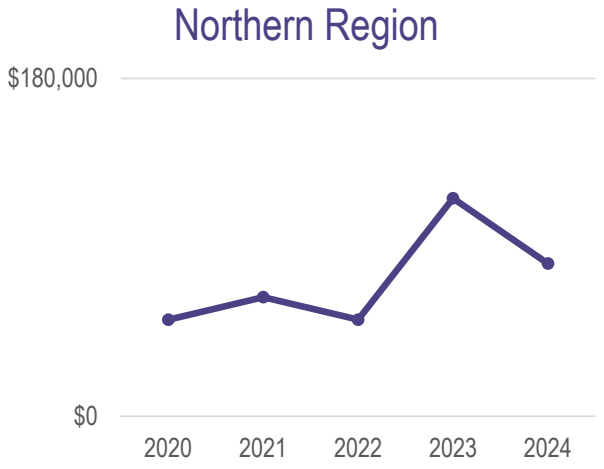
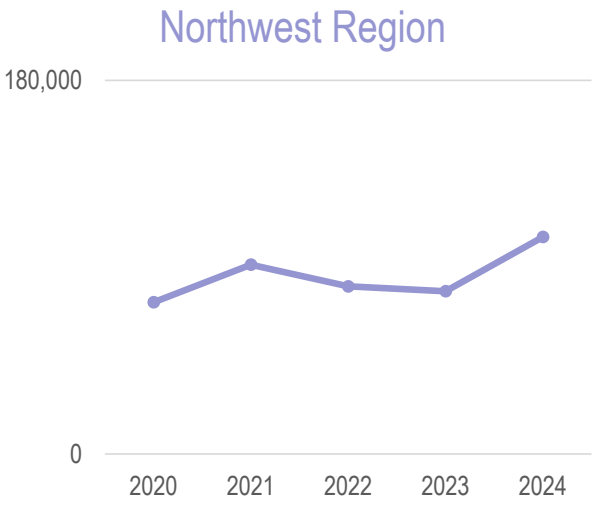
Source: Patient Level Data File via Virginia Health Information, Virginia Department of Health

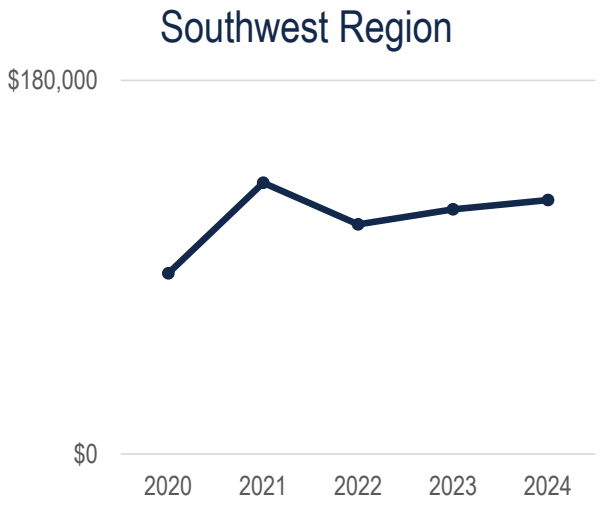
Median costs for firearm injury hospitalizations **increased** from 2020 to 2024 among residents across **all Virginia health regions**, with the highest median costs in the **Central Region**.











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Sources: Virginia Adult Health Survey and Virginia Youth Survey, Virginia Department of Health

In 2023,

49%

of **adult Virginians** with firearms at home reported at least one of their firearms was **unlocked and loaded**

15%

of Virginia **high school students** reported they could **access and use a loaded firearm without parental permission** in **less than 10 minutes**

3%

of Virginia **high school students** reported they **carried a firearm not used for hunting or sport** on at least one day in the past 12 months

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Main takeaways:

1. Firearm injury ED visits and hospitalizations **decreased** among Virginians in the past few years.

2. On average, **6 Virginians** visited the ED, and **2 Virginians** were hospitalized for a firearm injury every day.

3. Populations **most impacted** by firearm injury were male, 15-34 years, Black or African American, and living in the Central or Eastern health regions.

4. Firearm injury hospitalizations **cost** over **$737 million** from 2020 to 2024, an average of almost **$148 million** each year.

5. **15%** of Virginia high school youth reported they could access a loaded firearm without parental permission in <10 minutes; **3%** reported carrying a firearm not for sport or hunting.

6. **Continued monitoring** of firearm injury data trends **are key** to inform firearm injury and violence prevention efforts statewide.

Contact Information and Data Resources

View VDH Firearm Injury Dashboards

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OFHS Hospitalization, Population Health Survey, and Death Data Requests

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OEPI ED Visit Data Requests

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Extra Slides

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What about firearm injury **intent** for ED visits and inpatient hospitalizations?

Recent research suggests that firearm injury intent may be frequently misclassified.

- There are five injury intent types: unintentional, self-harm, assault, legal intervention or war, or undetermined.
- Default of firearm external cause of injury coding is **unintentional.**
- Miller et al. found that 28% of assault firearm ED visits were misclassified as unintentional.
- Misclassification of firearm injury intent may:
  - not tell the true picture of the firearm injury landscape; and
  - have impacts for appropriate prevention approaches based on intent.

Miller M, Azrael D, Yenduri R, et al. Assessment of the Accuracy of Firearm Injury Intent Coding at 3 US Hospitals. *JAMA Netw Open.* 2022;5(12):e2246429. doi:10.1001/jamanetworkopen.2022.46429

This study assessed firearm injury intent classification among Virginians by linking firearm injury deaths with:

ED visit match:

Firearm injury emergency department (ED) visits

Hospitalization match:

Firearm injury inpatient hospitalizations

Goals: To assess accuracy of intent in firearm injury ED visit and inpatient hospitalization data; and if intent is being misclassified, how much misclassification is occurring.

Methods

Three data sources were used to match firearm injury data from 2018 to 2022.

ED visits

- **11,776** firearm injury ED visits from 2018 to 2022
- ESSENCE (syndromic surveillance data system)

Inpatient hospitalizations

- **367** firearm injury inpatient hospitalizations from 2018 to 2022
- Person-Level Data (PLD) file via Virginia Health Information

Deaths (death certificates)

- **5,776** firearm injury deaths from 2018 to 2022
- Virginia Vital Events and Screening Tracking System (VVEST) via Electronic Death Reporting System

Some additional methods taken were:

- **Deterministic** matching approach
  - Lots of data cleaning to make sure every data point is the same format!
- **Death** intent considered the **accurate** intent (“gold standard”)
  - Firearm injury deaths are investigated by medical examiners
- Used only **fatal** hospitalizations
  - No personal health identifying information, like name or date of birth available
  - Discharge date of “expired”

The ED visit match used five match passes.

	Pass 1	Pass 2	Pass 3	Pass 4	Pass 5	
First Name	■					
Last Name	■	■				
Date of Birth	■	■	■	■		
Sex	■	■	■	■	■	
ED Date to Death Date			■		■	
ED Date +1 to Death Date				■		
Age					■	
Zip Code					■	
RECORDS MATCHED	192	14	263	29	23	**521**