NC Department of Health and Human Services

Traumatic Brain Injuries in North Carolina

2019

NC Division of Public Health

Data updated July 22, 2021

Traumatic Brain Injury Technical Notes

Surveillance methods have been updated to identify any mention of an injury in our morbidity data sources. Individual records with multiple injuries listed will be included in the total for each of those injuries, but only counted once for overall total injury count. Previously, only the first listed injury was counted, which has resulted in an increase in the number of specific injuries identified.

For questions or for more information see technical notes document available at https://www.injuryfreenc.ncdhhs.gov/DataSurveillance/

Case definitions used:

- **Deaths** – ICD-10 codes listed as cause of death for traumatic brain injury (TBI): S01.0-S01.9, S02.2, S02.1, S02.3, S02.7-S02.9, S04.0, S06.0-S06.9, S07.0, S07.1, S07.8, S07.9, S09.7-S09.9, T01.0, T02.0, T04.0, T06.0, T90.2, T90.4, T90.5, T90.8, T90.9

***See technical notes document for a full list of ICD-10 codes used for TBI deaths**

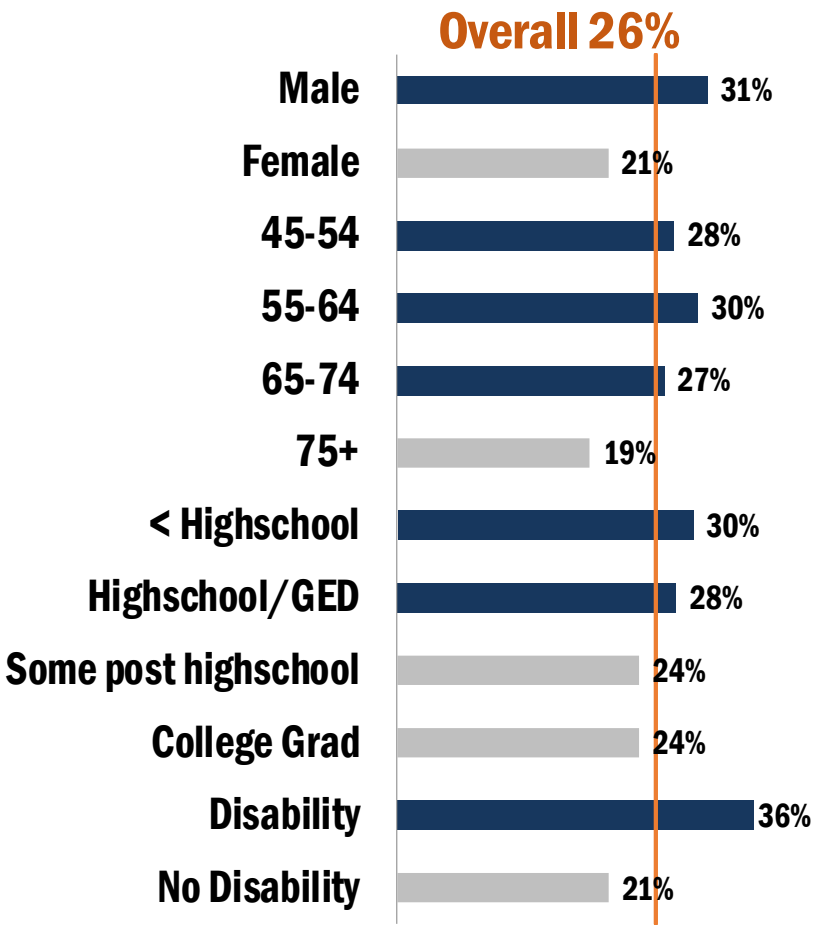
Technical Notes, Continued

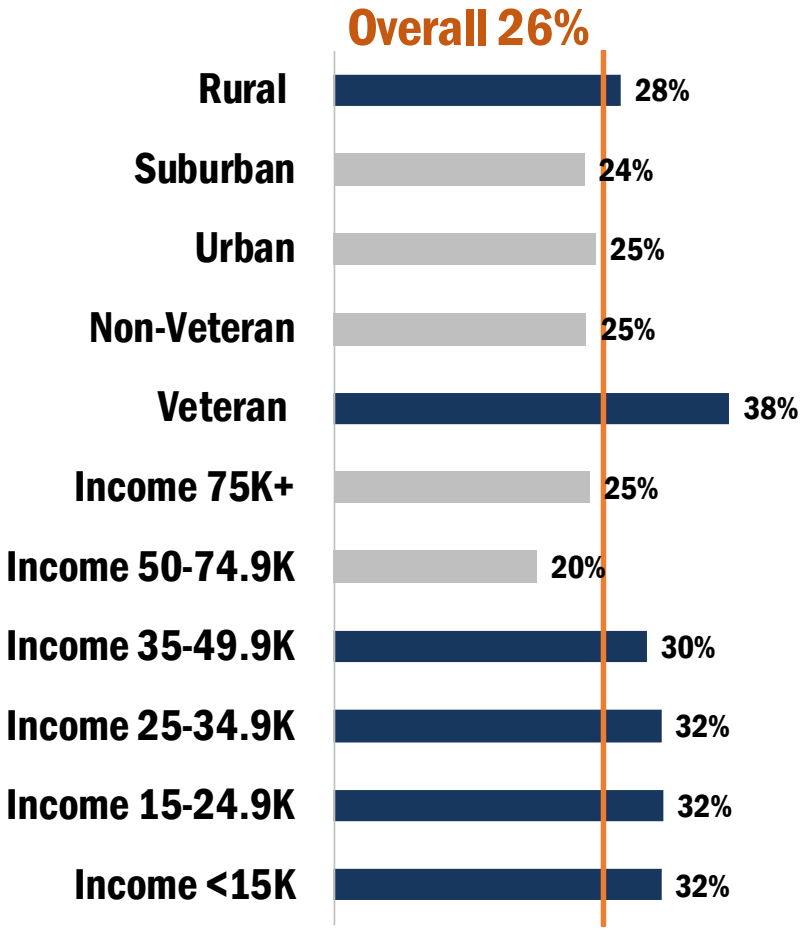
- **Hospitalizations** – Among records with an ICD-10-CM injury code*, any mention of the following ICD-10-CM codes (includes records resulting in death)
- **Emergency Department Visits** – Any mention of the following ICD-10-CM codes (includes records resulting in hospitalization or death)

S02.0, S02.1	Fracture of skull
S02.8, S02.91	Fracture of other specified skull and facial bones; unspecified fracture
S04.02, S04.03, S04.04	Injury of optic chiasm; injury of optic tract and pathways; injuries of visual cortex
S06	Intracranial injury
S07.1	Crushing injury of skull
T74.4	Shaken infant syndrome
*7th character of A, B, or missing (reflects initial encounter, active treatment)	

***See technical notes document for a full list of ICD-10-CM injury diagnosis codes**

Proportion of demographic groups reporting having ever experienced loss of consciousness, 2019 BRFSS

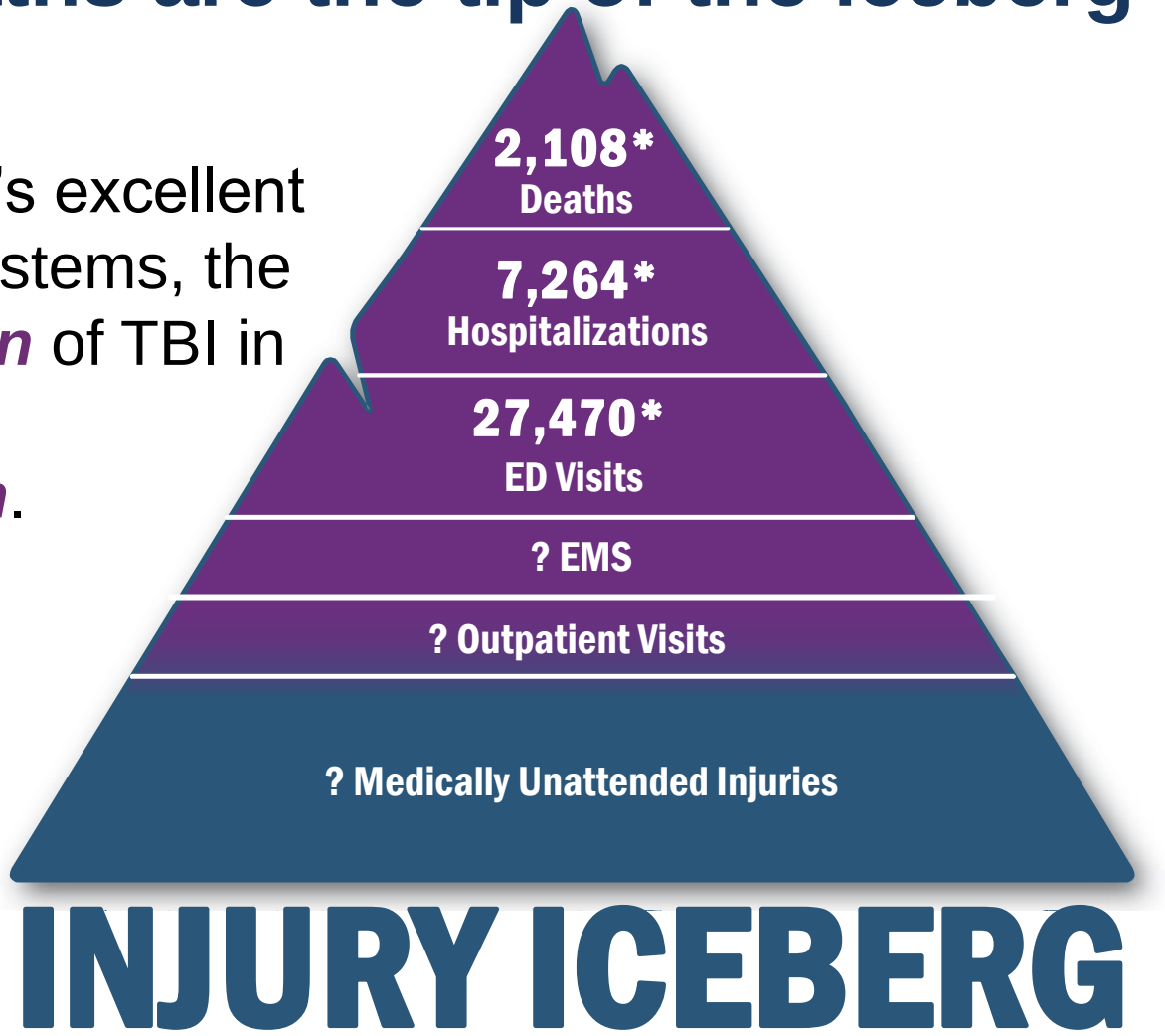




Source: NC State Center of Health Statistics, 2019 Behavioral Risk Factor Surveillance System (BRFSS) Survey Results

TBI deaths are the tip of the iceberg

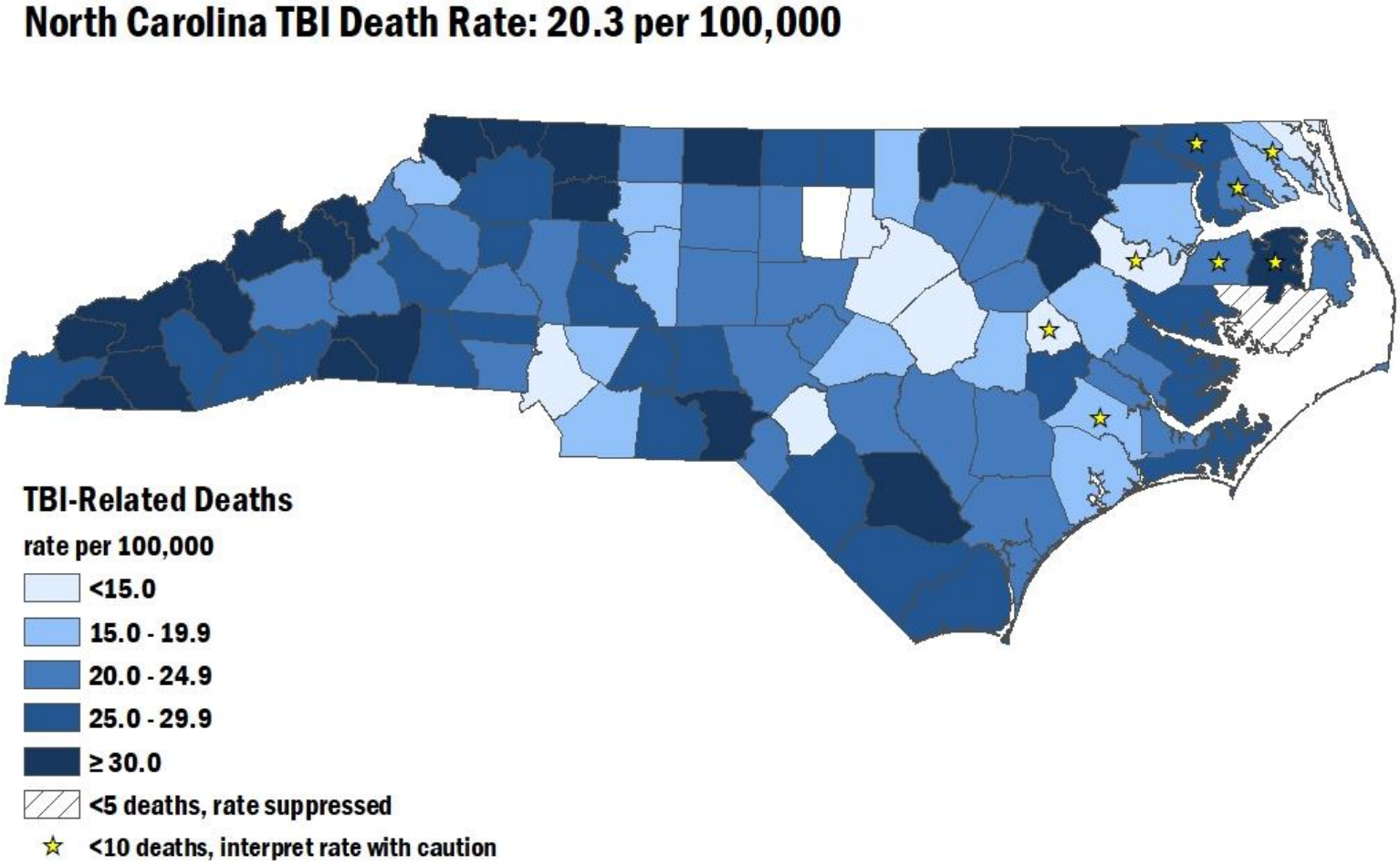
Despite NC's excellent reporting systems, the ***total burden*** of TBI in the state is ***unknown***.



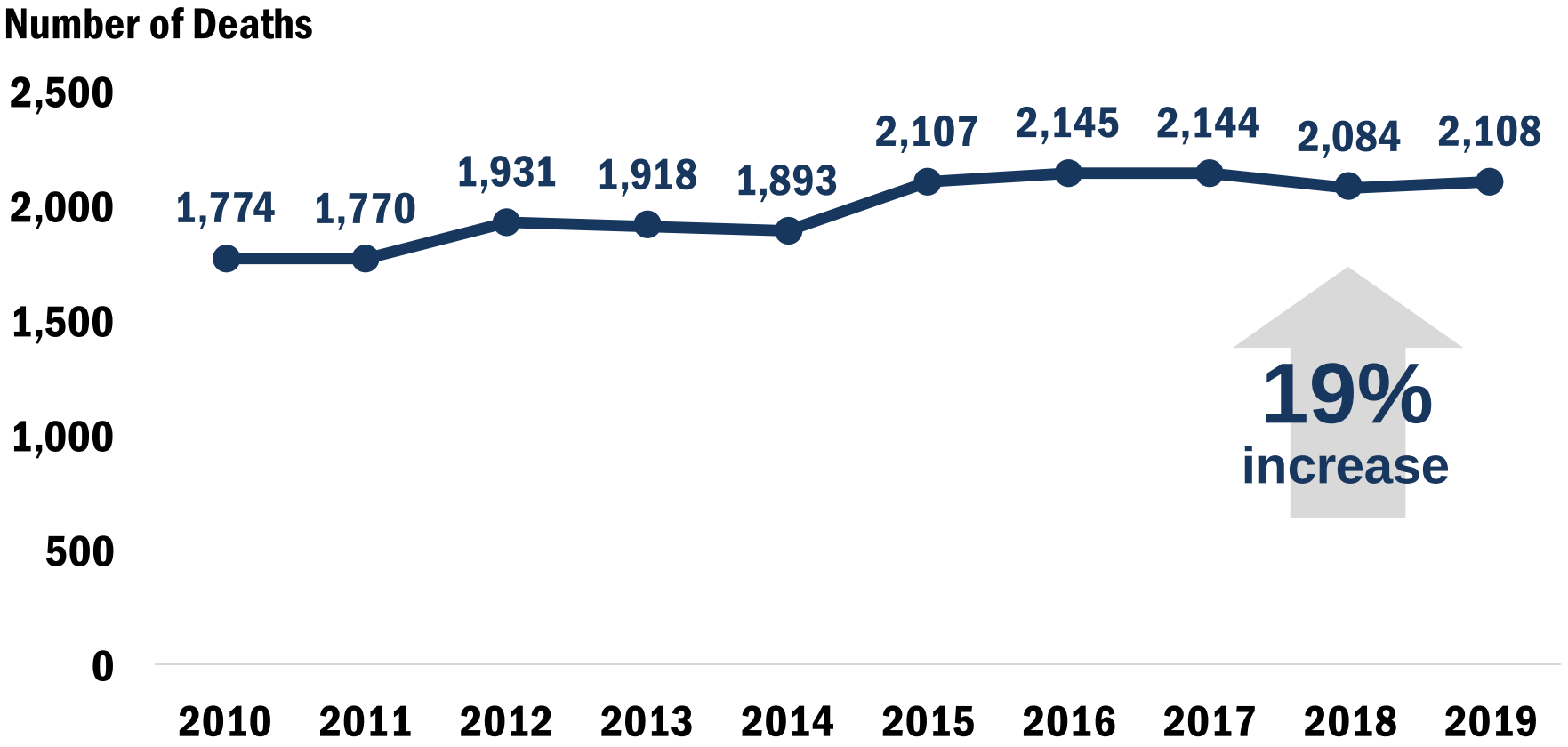
Limted to NC Residents, 2019
Source: NC State Center for Health Statistics, Vital Statistics-Deaths (2019) and Hospitalization Discharge Data (2019); NC DETECT (2019)
Analysis by Injury Epidemiology and Surveillance Unit

Traumatic Brain Injury Deaths

TBI-Related Deaths among North Carolina Residents, 2017-2019



TBI deaths have continued to increase over the last 10 years

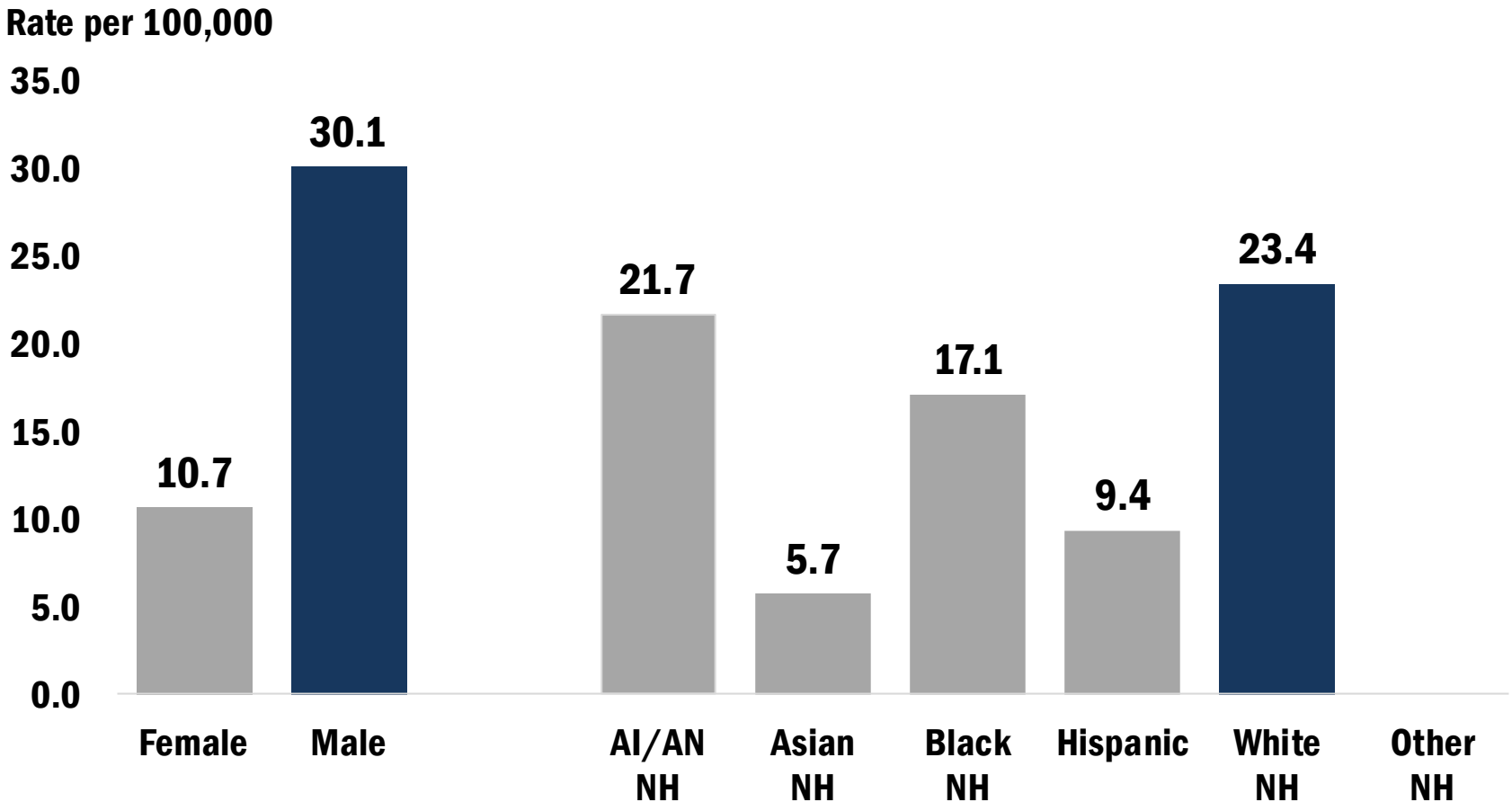


Limted to NC Residents, 2019

Source: NC State Center for Health Statistics, Vital Statistics-Deaths (2019)

Analysis by Injury Epidemiology and Surveillance Unit

Rates of TBI-related deaths were highest among men and non-Hispanic whites

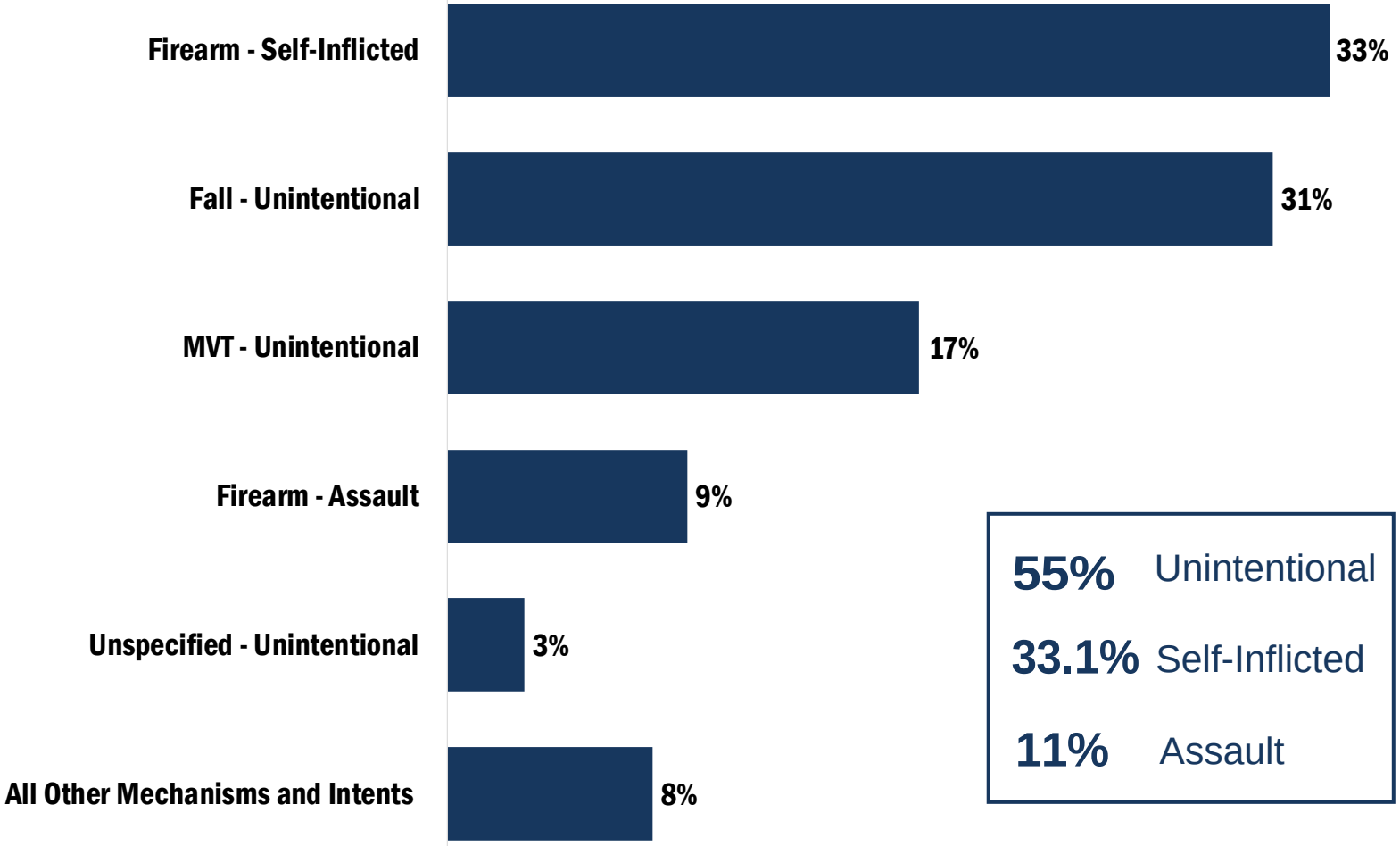


Limted to NC Residents, 2019 , N=2,108

Source: NC State Center for Health Statistics, Vital Statistics-Deaths (2019)

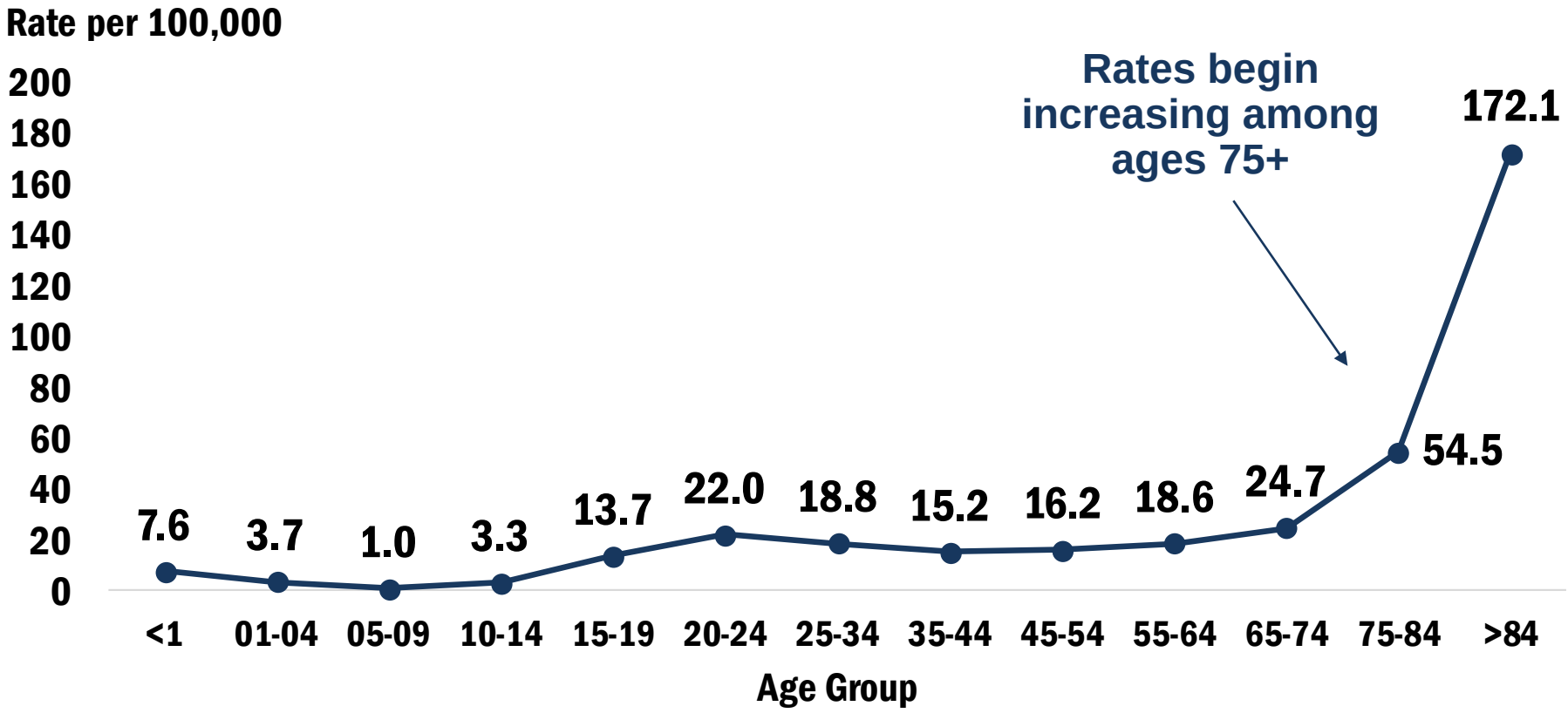
Analysis by Injury Epidemiology and Surveillance Unit

Self-inflicted firearm injury was the leading mechanism-intent category for all TBI deaths



*Included in other specified are Unspecified – Unintentional (3%), Motor Vehicle-Nontraffic – Unintentional (2%) and Other Land Transport – Unintentional (1%), as well as other mechanisms/intents.

TBI death rates are highest among those 85 and older

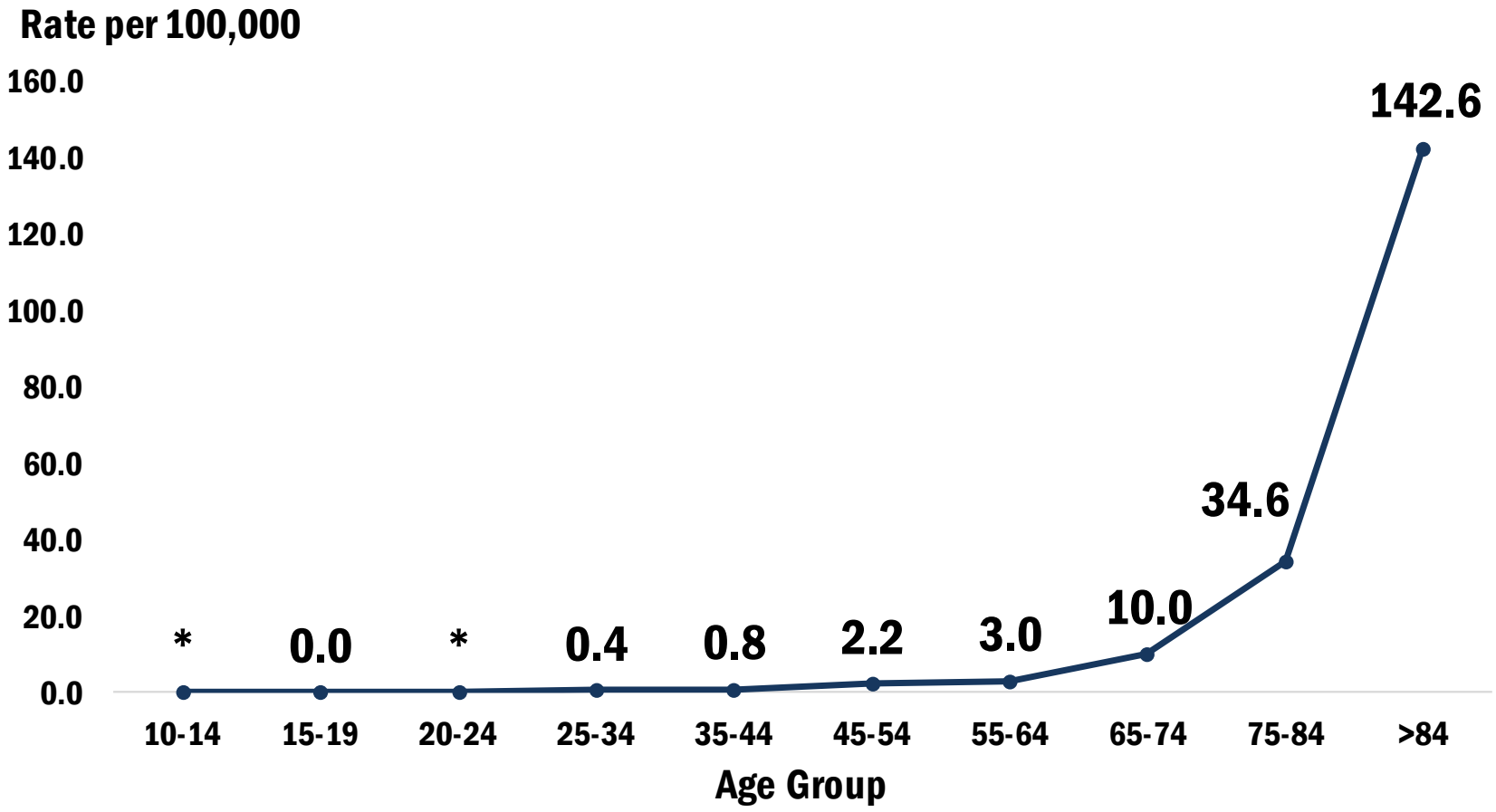


Limted to NC Residents, 2019 , N=2,108

Source: NC State Center for Health Statistics, Vital Statistics-Deaths (2019)

Analysis by Injury Epidemiology and Surveillance Unit

Fall-Related TBI death rates were highest among adults 85 and older



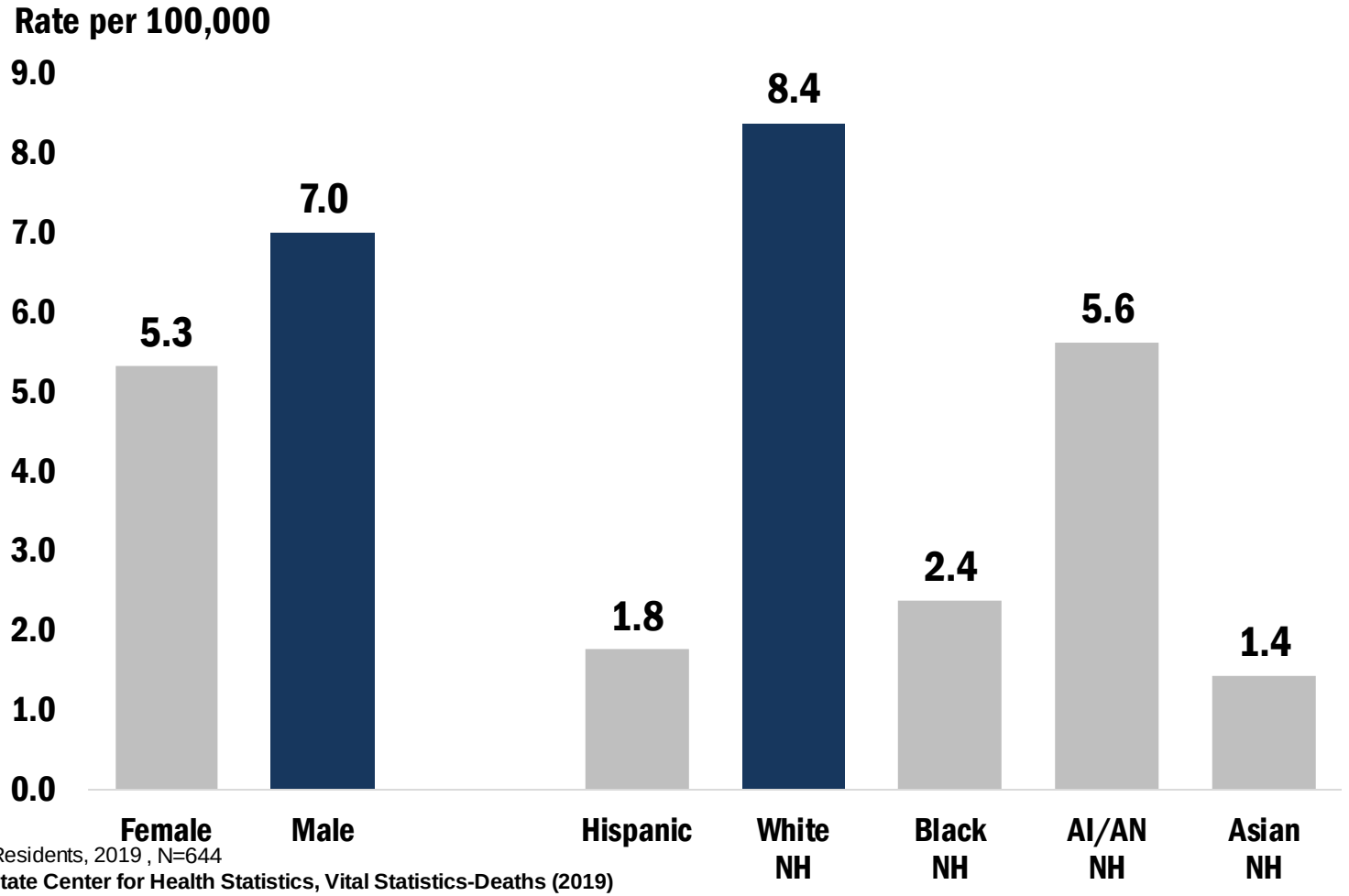
Limted to NC Residents, 2019, N=644

*Rate suppressed due to count being less than 5

Source: NC State Center for Health Statistics, Vital Statistics-Deaths (2019)

Analysis by Injury Epidemiology and Surveillance Unit

Fall-related TBI death rates were highest among men and non-Hispanic whites



Limted to NC Residents, 2019 , N=644

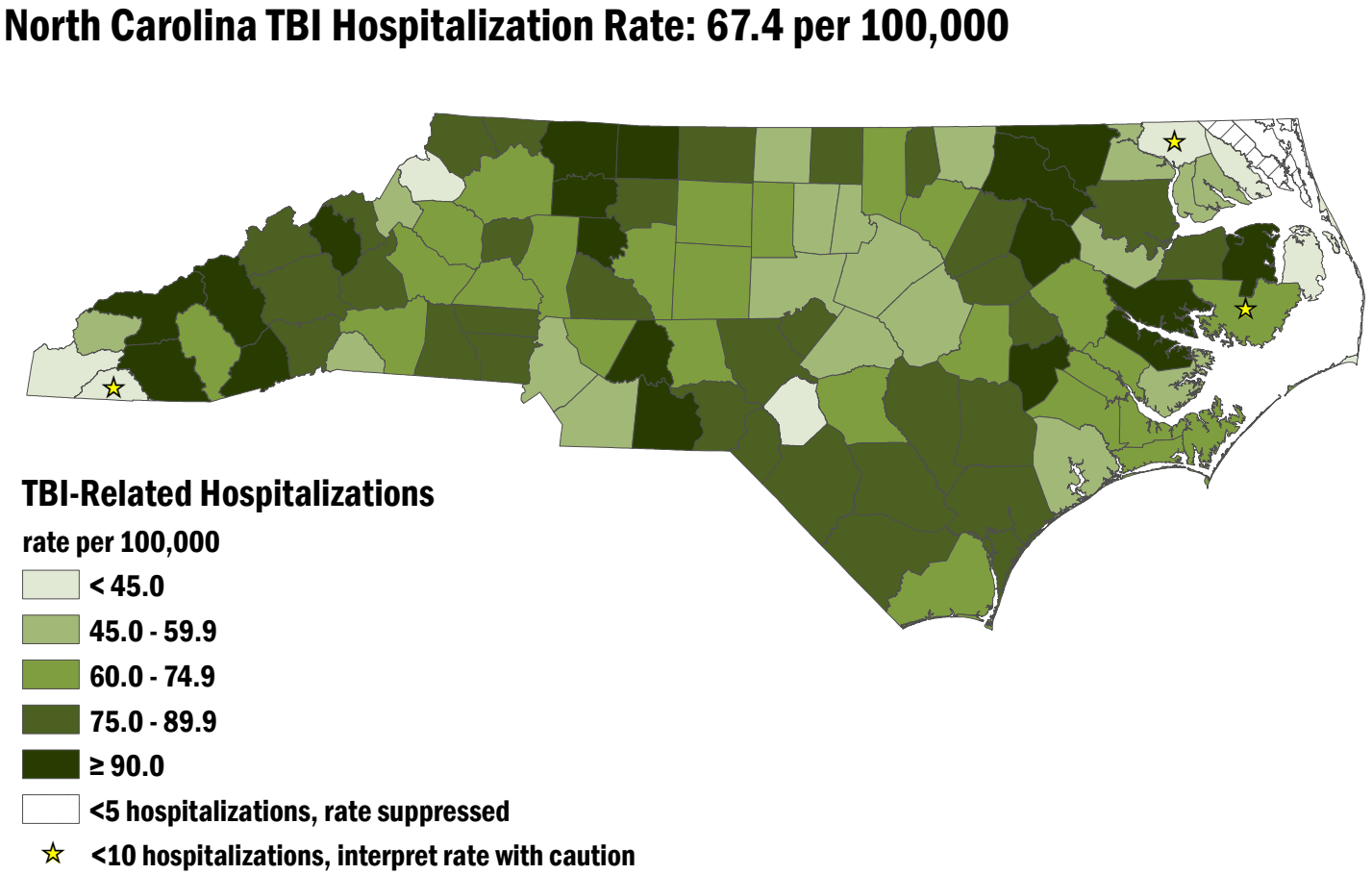
Source: NC State Center for Health Statistics, Vital Statistics-Deaths (2019)

Analysis by Injury Epidemiology and Surveillance Unit

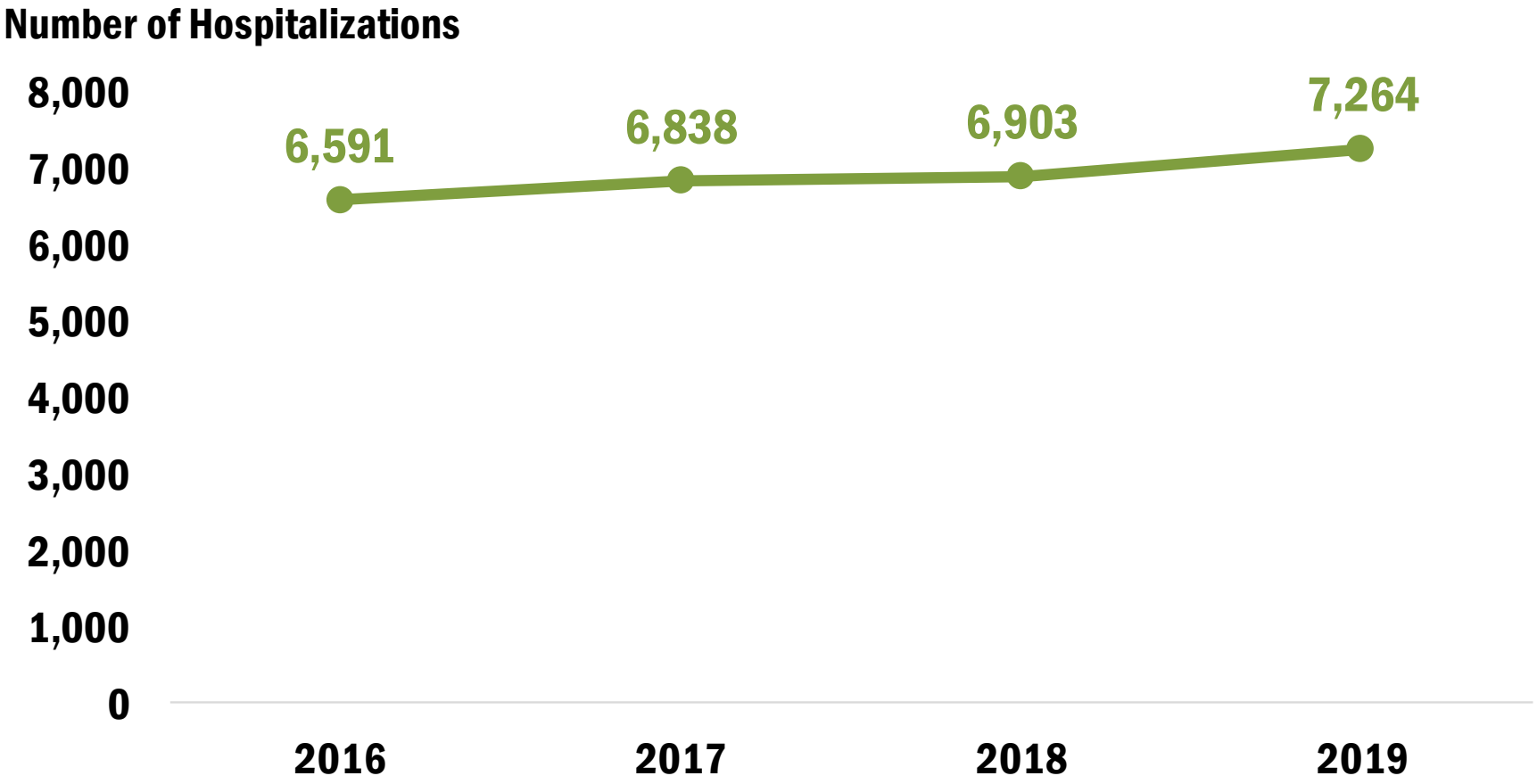
*Rate suppressed due to count being less than 5

Traumatic Brain Injury Hospitalizations

TBI-Related Hospitalizations among North Carolina Residents, 2017-2019



TBI-related hospitalizations increased by 11% over the last four years

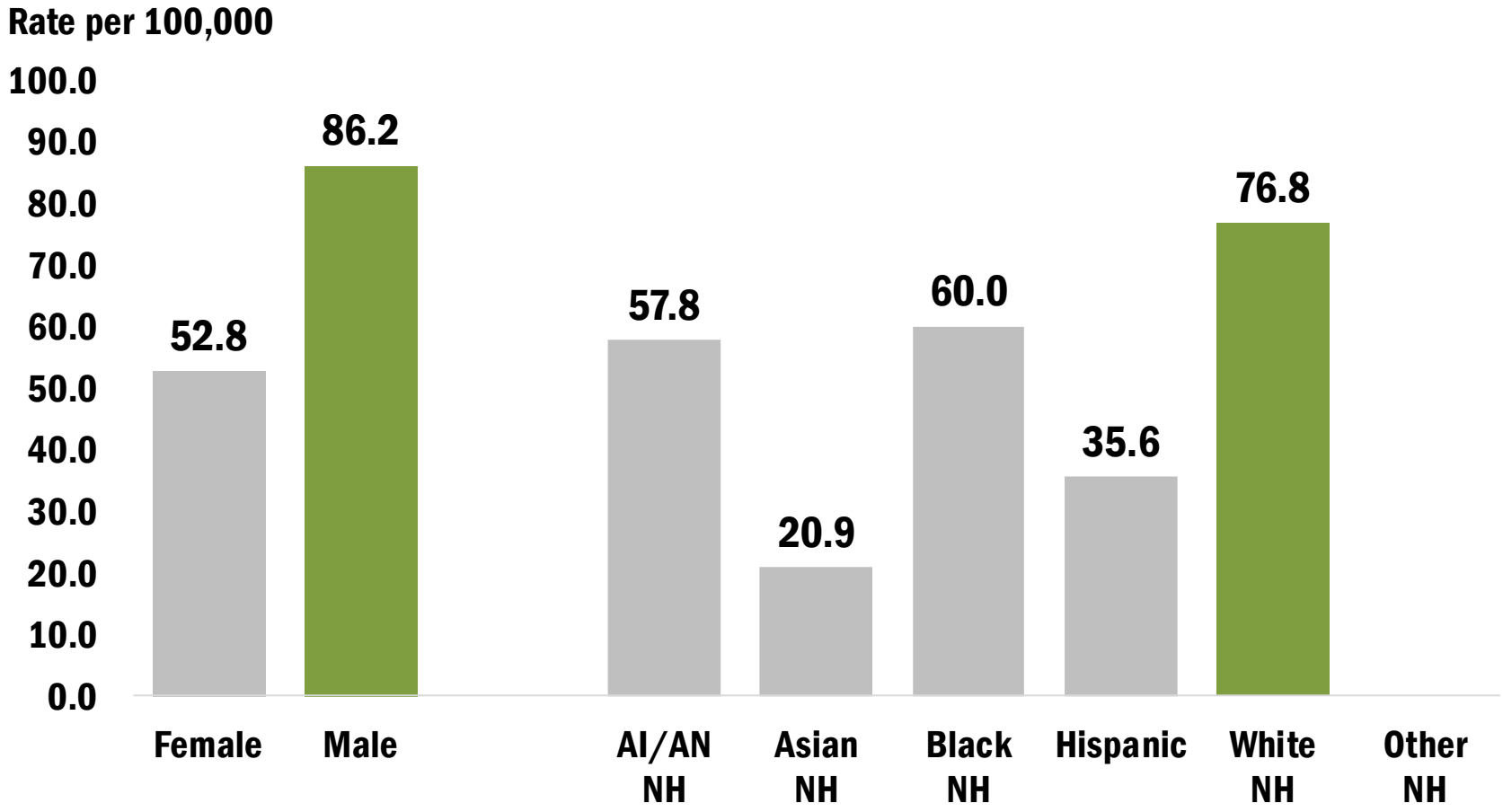


Limted to NC Residents, 2019

Source: NC State Center for Health Statistics, Hospitalization Discharge Data (2019)

Analysis by Injury Epidemiology and Surveillance Unit

TBI-related hospitalization rates were highest among men and non-Hispanic whites

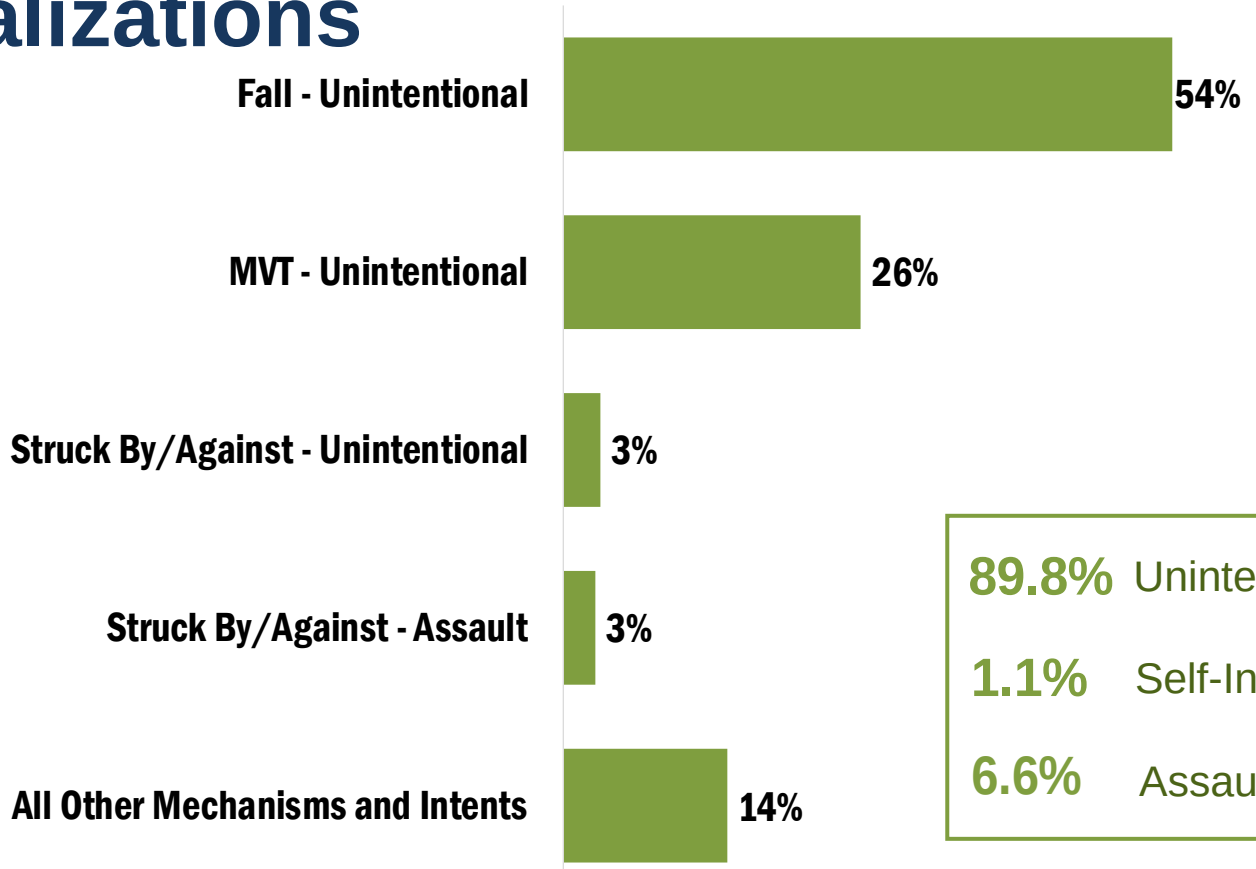


Limted to NC Residents, 2019 , N=7,264; NH – non-Hispanic; Rate not calculated for Other, NH

Source: NC State Center for Health Statistics, Hospitalization Discharge Data (2019)

Analysis by Injury Epidemiology and Surveillance Unit

Unintentional Falls were the leading mechanism-intent category for all TBI hospitalizations



89.8%	Unintentional
1.1%	Self-Inflicted
6.6%	Assault

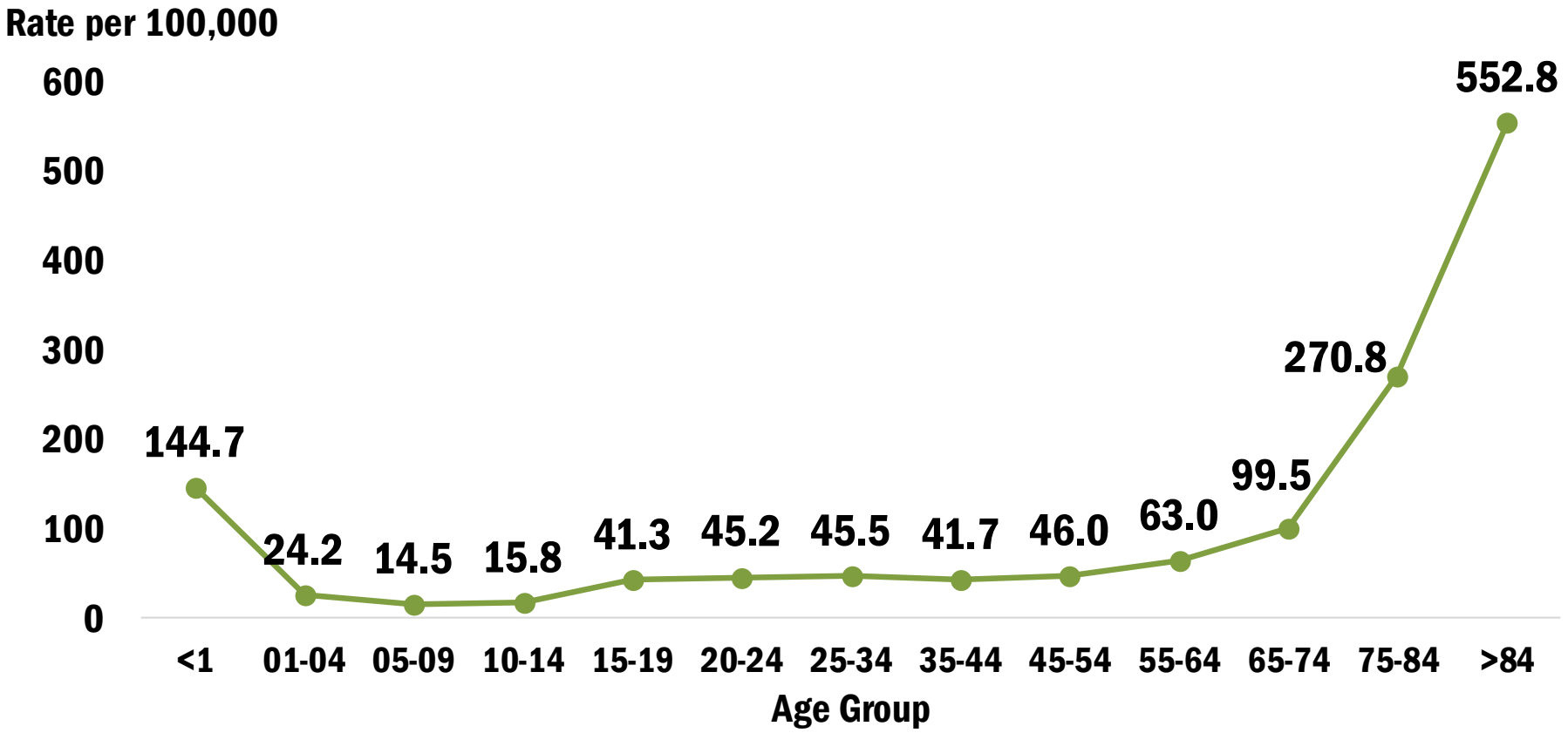
* Included in other specified are Unspecified - Unintentional (2%), Motor Vehicle-Nontraffic - Unintentional (2%), and Other Specified/Classifiable - Assault (1%), as well as other mechanism/intents.

Limted to NC Residents, 2019

Source: NC State Center for Health Statistics, Hospitalization Discharge Data (2019)

Analysis by Injury Epidemiology and Surveillance Unit

Adults 75 and older have the highest rates of TBI-related hospitalizations

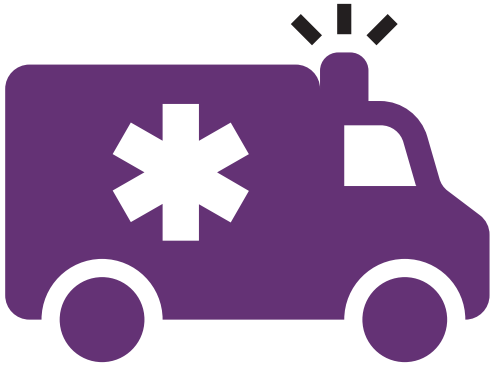


Age was unknown for 20 hospitalizations

Limted to NC Residents, 2019 , N=7,264

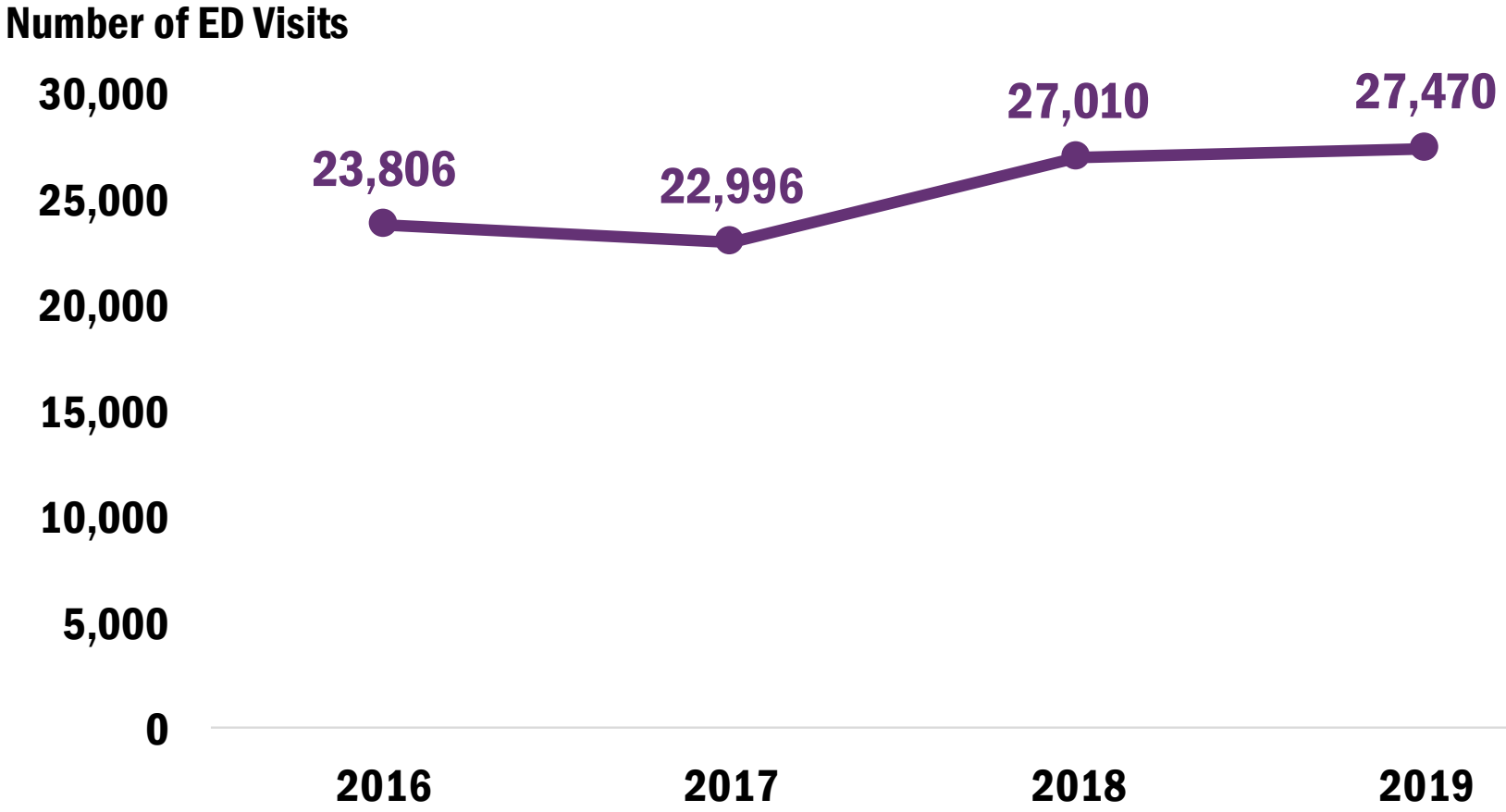
Source: NC State Center for Health Statistics, Hospitalization Discharge Data (2019)

Analysis by Injury Epidemiology and Surveillance Unit



Traumatic Brain Injury Emergency Department Visits

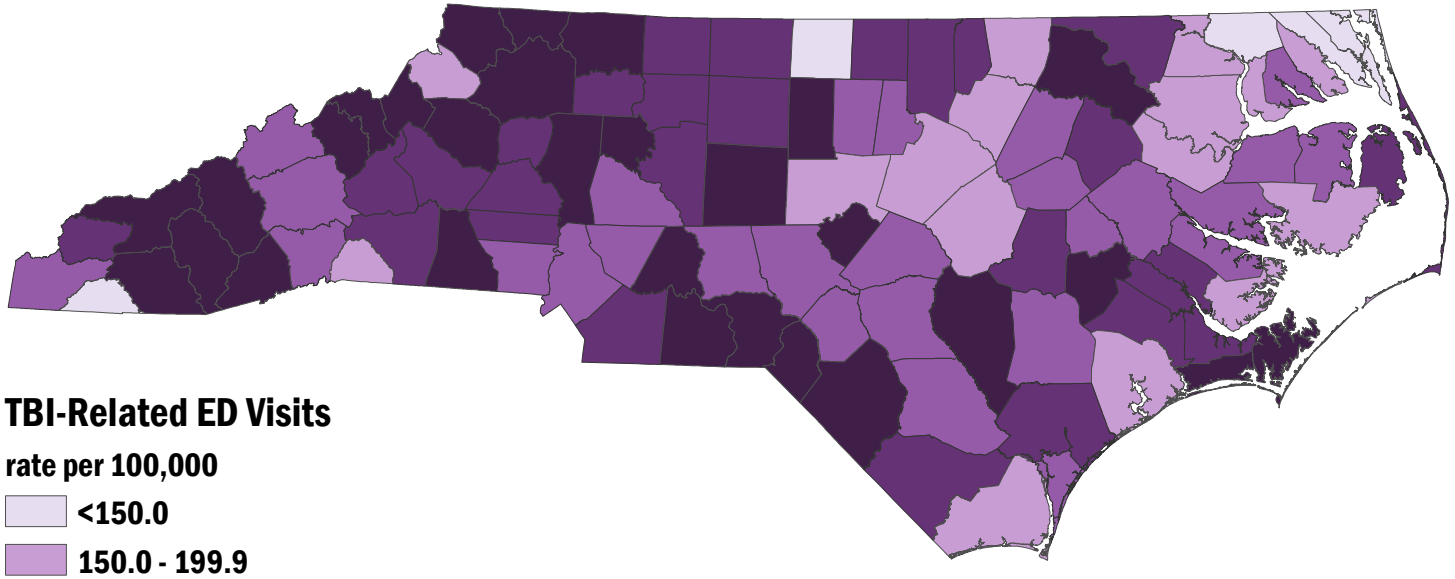
TBI-related ED visits increased by 15% over the last four years



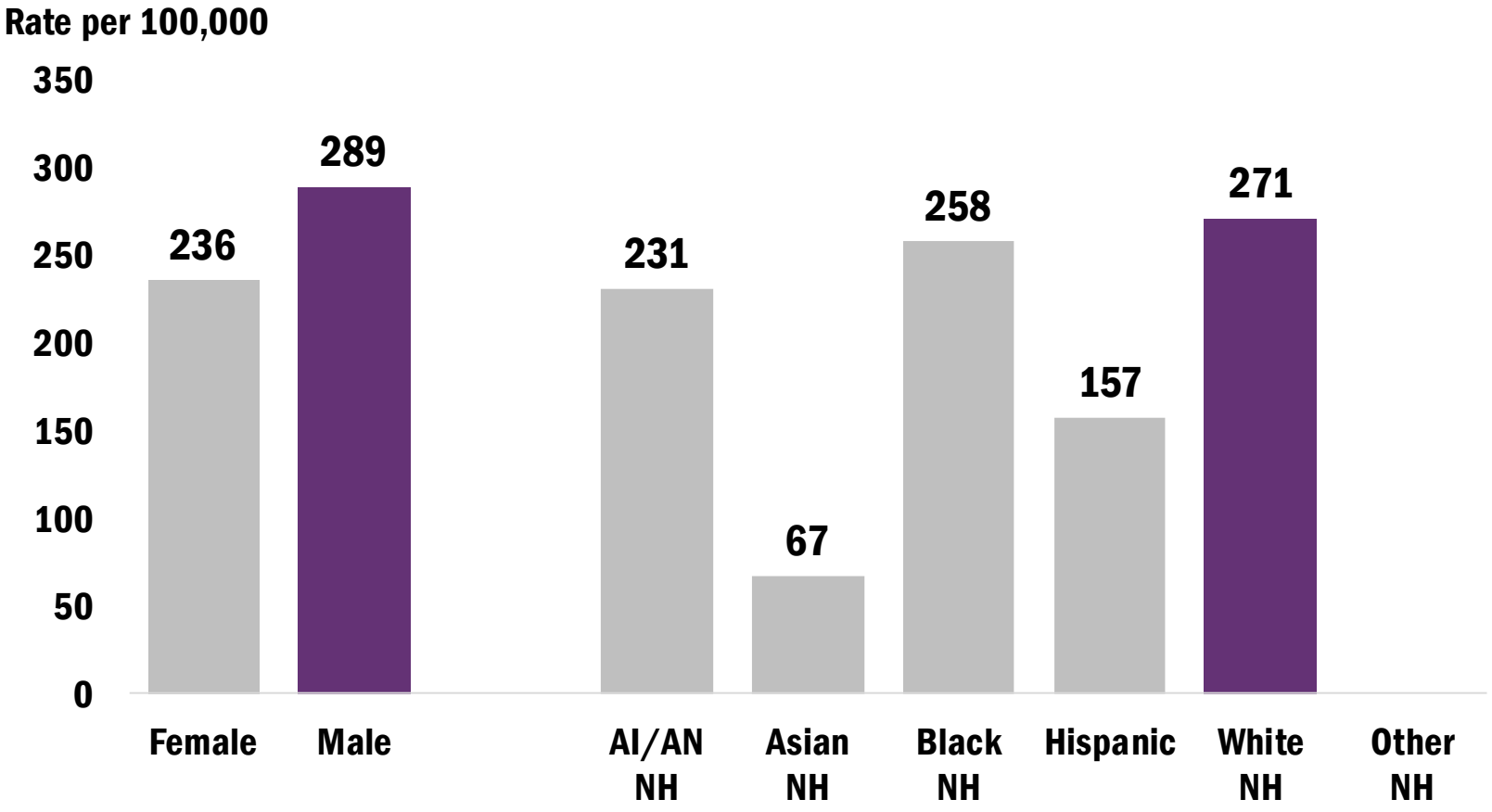
Limted to NC Residents, 2019
Source: NC DETECT (2019)
Analysis by Injury Epidemiology and Surveillance Unit

TBI-Related Emergency Department Visits (ED) Among North Carolina Residents, 2017-2019

North Carolina TBI ED Visit Rate: 248.8 per 100,000

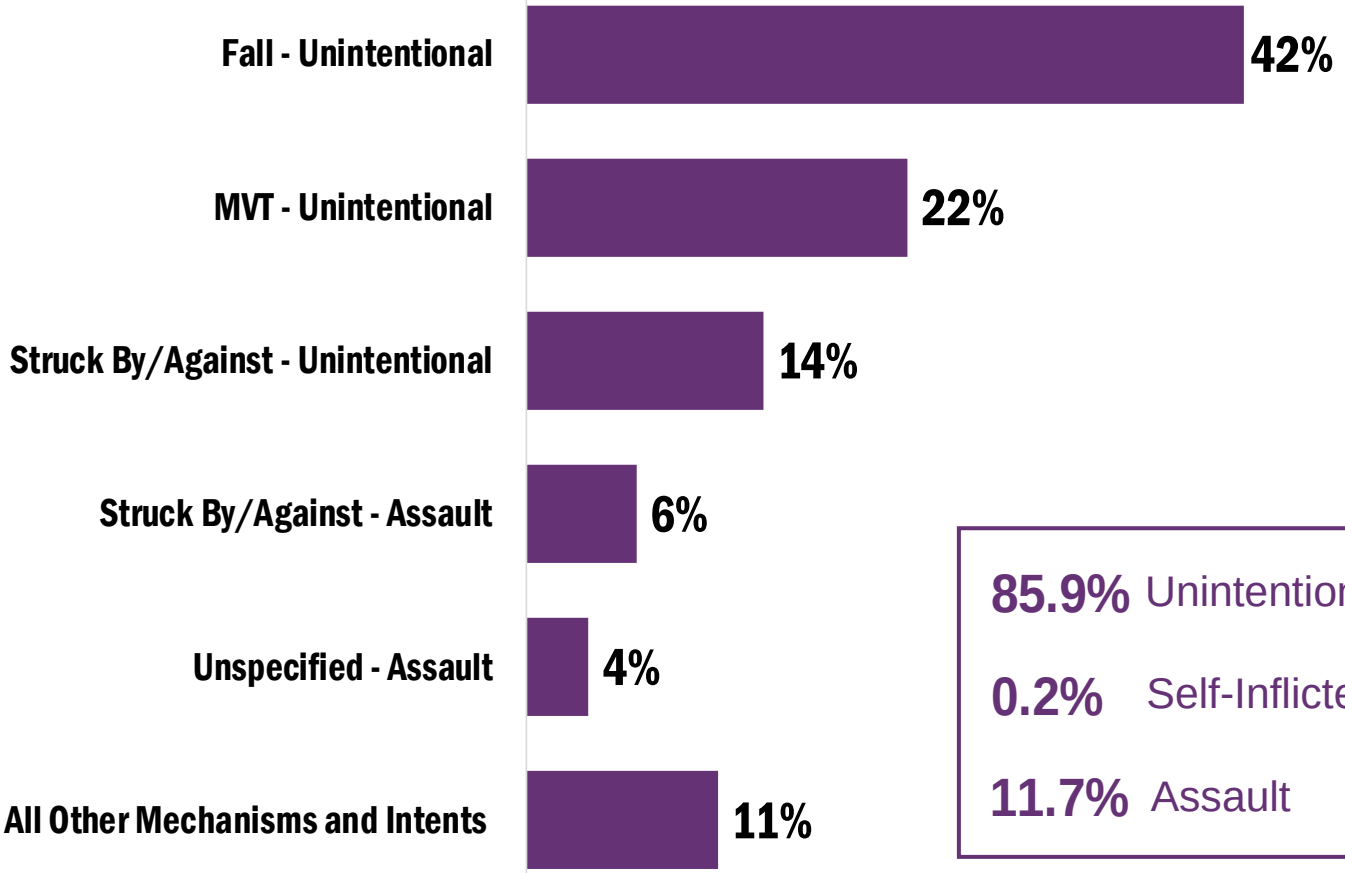


Rates of TBI-related ED visits were highest among men and non-Hispanic whites



NH - non-Hispanic; sex was unknown for 26(<0.1%) injury ED visits and race/ethnicity was unknown for 0,411(<0.1%) injury ED visits
Limted to NC Residents, 2019, N=27,470 ; Rate not calculated for Other
Source: NC DETECT (2019)
Analysis by Injury Epidemiology and Surveillance Unit

Falls were the leading specified cause of TBI-related ED visits



85.9% Unintentional

0.2% Self-Inflicted

11.7% Assault

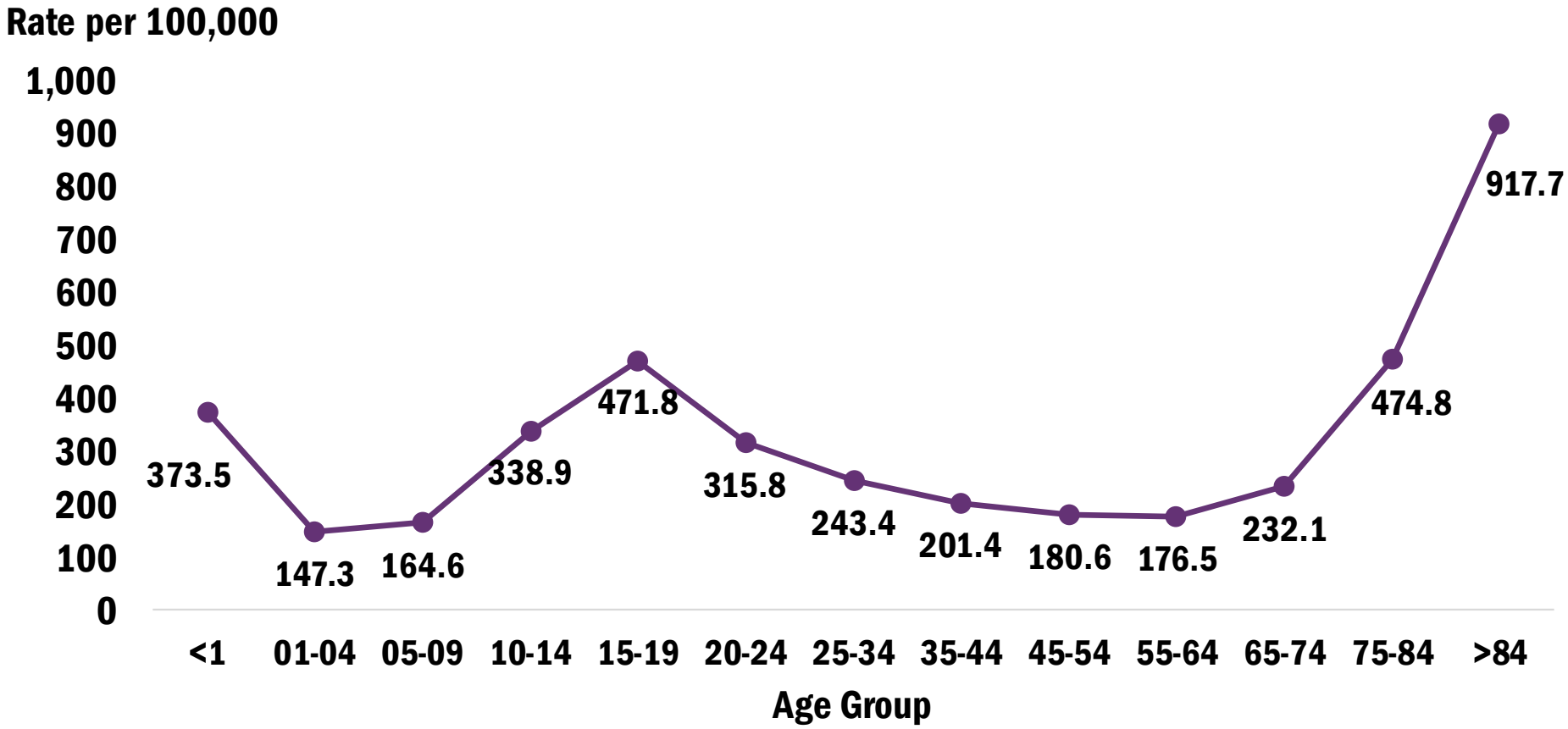
* Included in other specified are Unspecified - Unintentional (3%), Motor Vehicle-Nontraffic - Unintentional (2%), and Other Land Transport - Unintentional (1%), as well as other mechanism/intents.

Limted to NC Residents, 2019

Source: NC DETECT (2019)

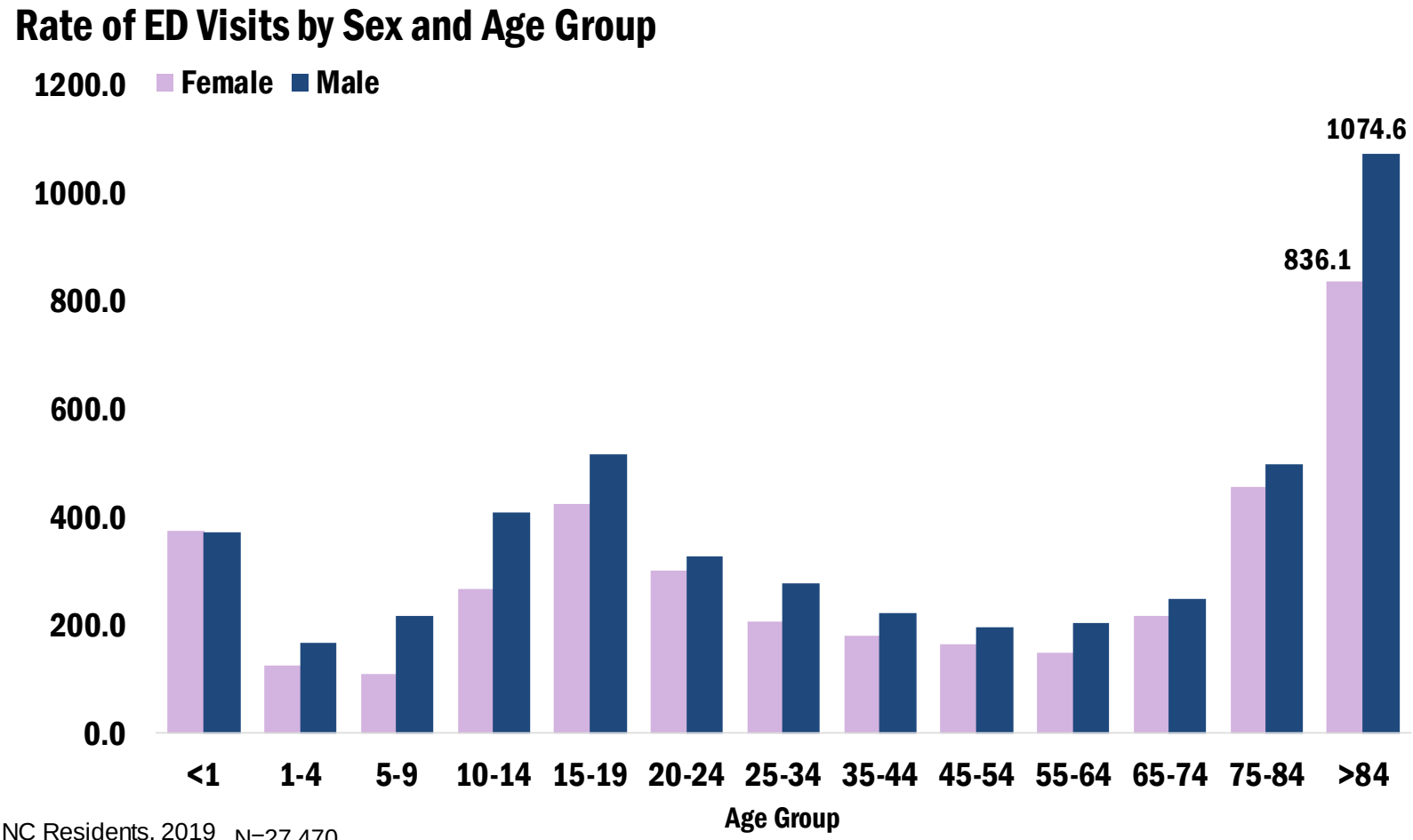
Analysis by Injury Epidemiology and Surveillance Unit

Adults 85 and older have the highest rates of TBI-related ED Visits



Limted to NC Residents, 2019, N=27,470
Source: NC DETECT (2019)
Analysis by Injury Epidemiology and Surveillance Unit

TBI-related ED visit rates were highest among men ages 85 and older



Limted to NC Residents, 2019 , N=27,470
Source: NC DETECT (2019)
Analysis by Injury Epidemiology and Surveillance Unit

Summary of Traumatic Brain Injury in North Carolina

- In 2019, traumatic brain injuries resulted in:
  - Over **2,000** deaths
  - Over **7,000** hospitalizations
  - Over **27,000** emergency department visits
- Most TBI-related injuries and deaths occur among **males and non-Hispanic whites**
- Rates of TBI are highest in the **75-84 and 85 and older age groups**
- Most traumatic brain injuries are related to **unintentional falls**