Life Saving Rural Trauma Tips:

How Targeted Education Improves Outcomes

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OBJECTIVES

- Identify and describe the characteristics of a rural area.
- Explain the concept of rural trauma and its distinguishing features.
- Evaluate the barriers that limit effective emergency and trauma management within rural communities
- Demonstrate how targeted education improves patient outcomes in rural trauma patients

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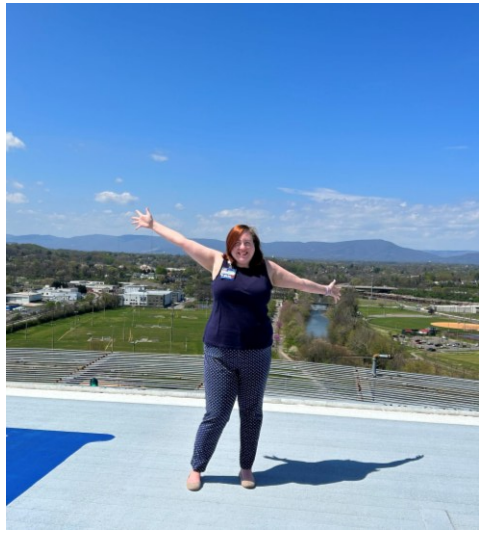

INTRODUCTION

- I graduated with my Bachelors of Science in Nursing (BSN) in 2016.
  - Spent almost 8 years on the inpatient Neuro-Trauma Unit at Carilion Roanoke Memorial Hospital (CRMH).
  - Became a Trauma Certified Registered Nurse (TCRN) in 2019.
  - Assumed the role of Trauma Outreach and Injury Prevention Coordinator in 2022.

- CRMH, part of the Carilion Clinic Health System, is a Level 1 Adult and Pediatric Trauma Center located in Roanoke, Virginia covering more than 20 counties of central and southwest Virginia, as well as parts of West Virginia, Tennessee, and North Carolina.

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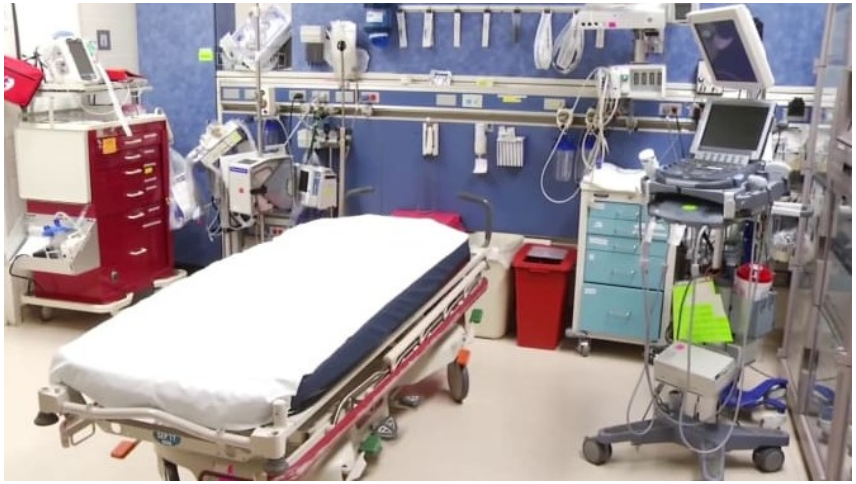
Global Trauma Facts

- Trauma is a major cause of morbidity and mortality for people of all ages [3]
- The most common causes of traumatic death are blunt trauma (i.e., motor vehicle collisions and falls)
- Road traffic crashes kill 1.2 million people annually around the world
  - 90% of these deaths are in low- or middle-income countries
  - One of the contributing factors to morbidity and mortality form traumatic injury is economic circumstances of both the patient and environment.
- Estimated cost: $518 billion globally
- Predicted to become the third largest contributor to the global burden of disease [11]



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Rural Trauma Facts

- **Higher Mortality**: Rural residents are more likely to die from a traumatic injury than nonrural residents, after controlling for factors like age, sex, and injury severity
  - Many of these injuries can be less severe or highly treatable
- Specific injury risks
  - **Occupational injuries**: Occupations common in rural areas, such as mining and agriculture, have higher fatality and disabling injury rates compared to the national average.
  - **Fires**: Fire death rates are 36% higher in rural areas, partly due to older housing and a greater reliance on risky heating sources. Many rural homes also lack functional smoke detectors.
  - **Firearm injuries**: Children in rural areas injured by firearms are more likely to be hospitalized and die than their urban counterparts.
  - **Motor Vehicles**: higher incidence of motor vehicle crashes and a lower incidence of seat belt usage
  - **Unintentional injuries**: Rural children have higher mortality rates from unintentional injuries, including drowning in natural bodies of water and ATV crashes.

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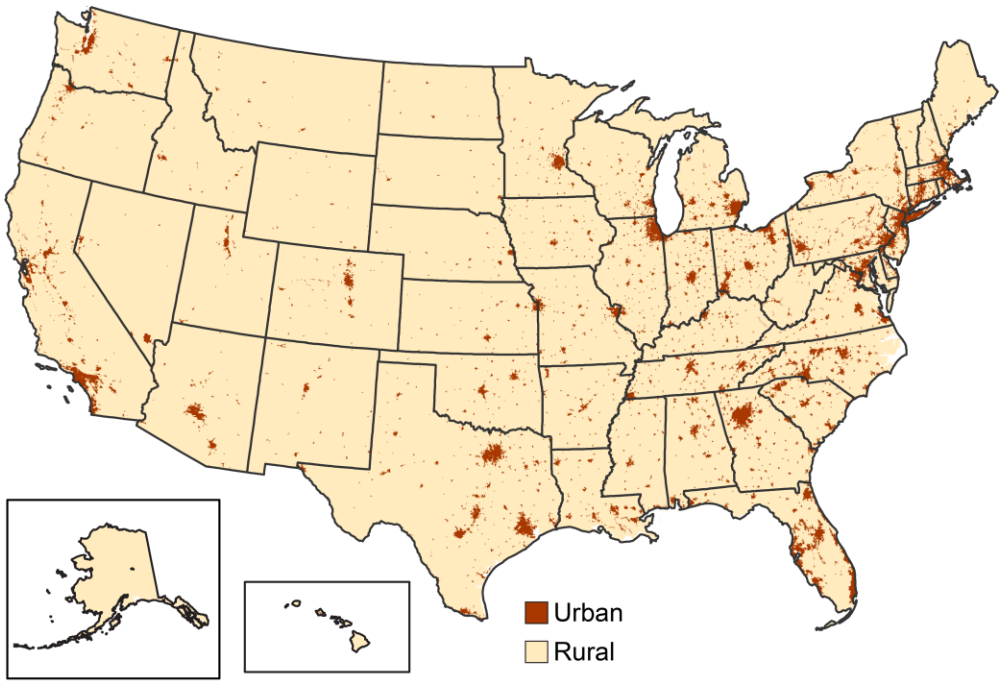
WHAT IS A RURAL AREA?

U.S. Census Bureau's urban and rural areas, 2022



Source: USDA, Economic Research Service using data from U.S. Department of Commerce, Bureau of the Census.

- For the average American, rural is an abstract concept of rolling hills and farmland rather than a concrete definition.
  - Most of the time the word rural is applied to "non-metro" or agricultural areas.
- The united states has a good mix of metropolitan, urban, suburban, and rural areas

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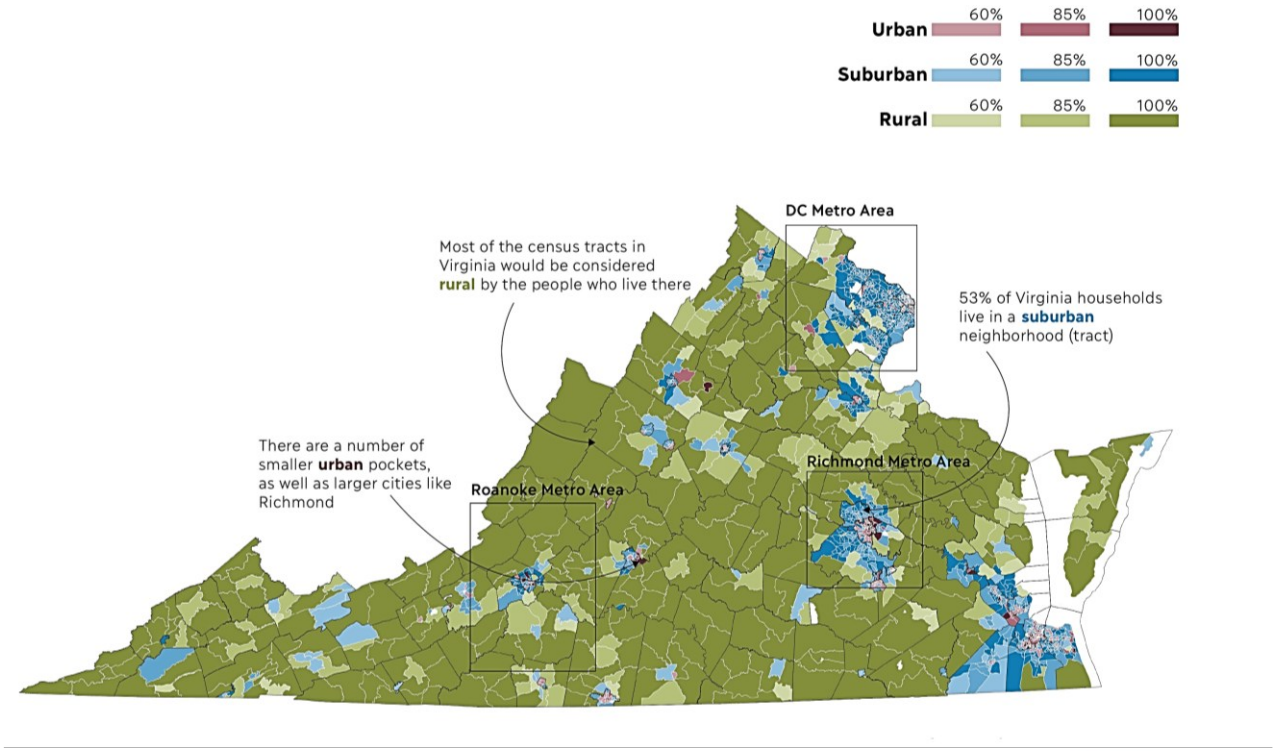
COMMONWEALTH OF VIRGINIA

- 8.6 Million people live in Virginia
  - 2.2 live in rural areas
- Most of the service areas within the commonwealth are rural communities
  - There are pockets of urban and suburban areas around various cities and metropolitan areas



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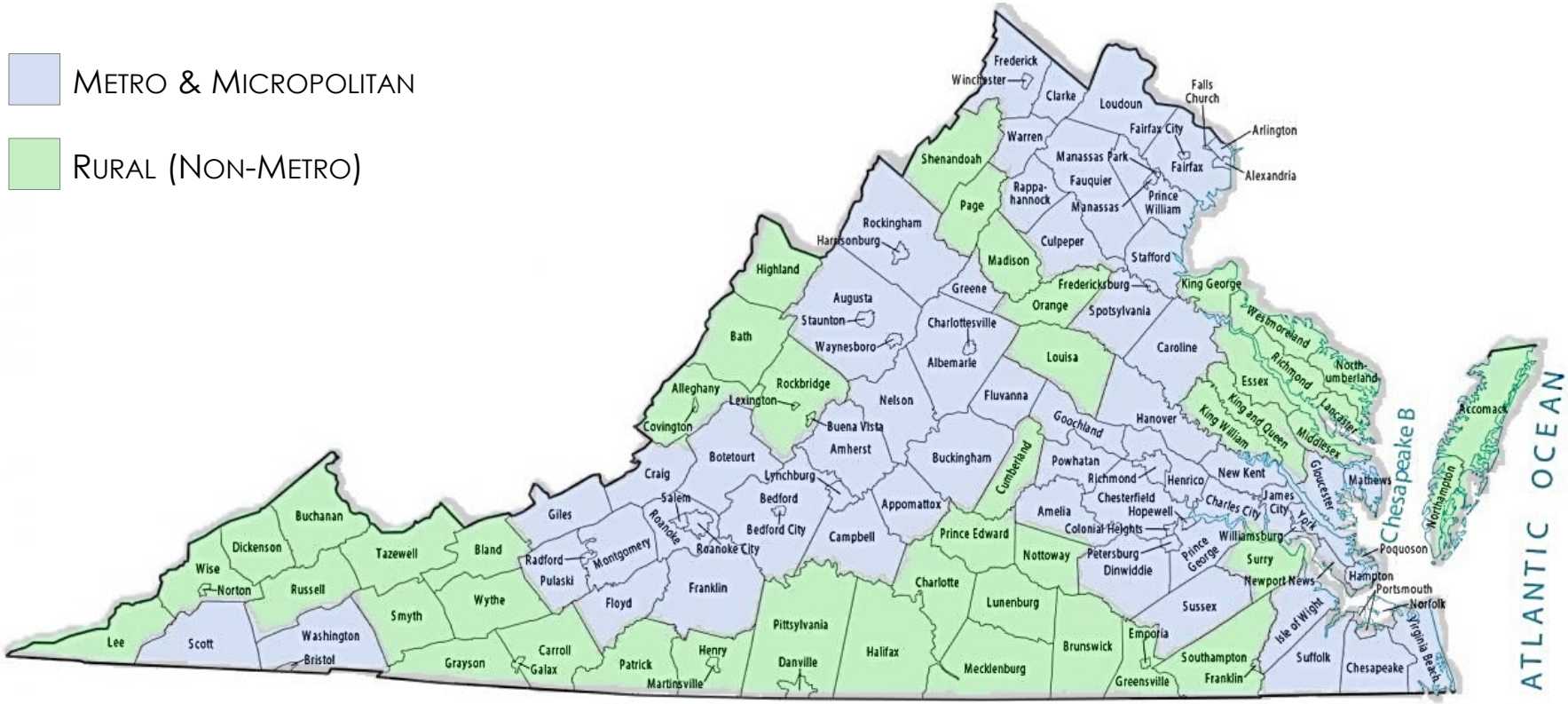
City & County Map of Virginia

Metro & Micropolitan

Rural (Non-Metro)



VA 2022-2026 Rural Health Plan

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WHAT IS RURAL TRAUMA?

- When optimal care of the injured patient is delayed or limited by geography, weather, distance, resources, or lack of experience
  - Trauma care in which patients take longer than 60 minutes to arrive [15]
- 50% of deaths from trauma occur within a rural environment but typically less than 25% of people live within rural areas
- Rural residents face elevated risk of traumatic injury compared to non-rural residents, and injury mortality rates are higher in rural communities than in urban and suburban setting.
  - The incidence of morbidity or long-term disability following a disease or injury is also higher (Grenn et al., 2022).
  - Studies indicate that trauma patients in rural areas are up to twice as likely to die from their injuries as those in urban areas

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Barriers to Rural Emergency and Trauma Care – Pre Hospital

Several Delays are related to pre-hospital variables

1. Discovery
2. Summoning help
3. Mobilizing EMS providers
4. Prehospital response time
5. Prolonged scene time
6. Long transportation time to the hospital

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RURAL TRAUMA CONT.

Roanoke City Fire & EMS

- Service Area: 43 sq. mi; approx. 98,000 citizens
- **11** stations, **1** admin building, & **1** training center
- **260** full time uniformed staff, **38** part-time EMS, **10** civilians
- **10** fire engines, **4** ladder trucks, **9** ambulances, **3** relief units, **4** supervisor vehicles

Botetourt Co. Fire & EMS

- Service Area: 548 sq. mi; approx. 34,000 citizens
- **1** HQ building; **7** stations
- **125** volunteers; **48** full-time and **26** part-time career staff.
- Staffs 5 ALS ambulances and a shift supervisor 24/7.
- 1 Fire engine is staffed out of one of the furthest located station 24/7.

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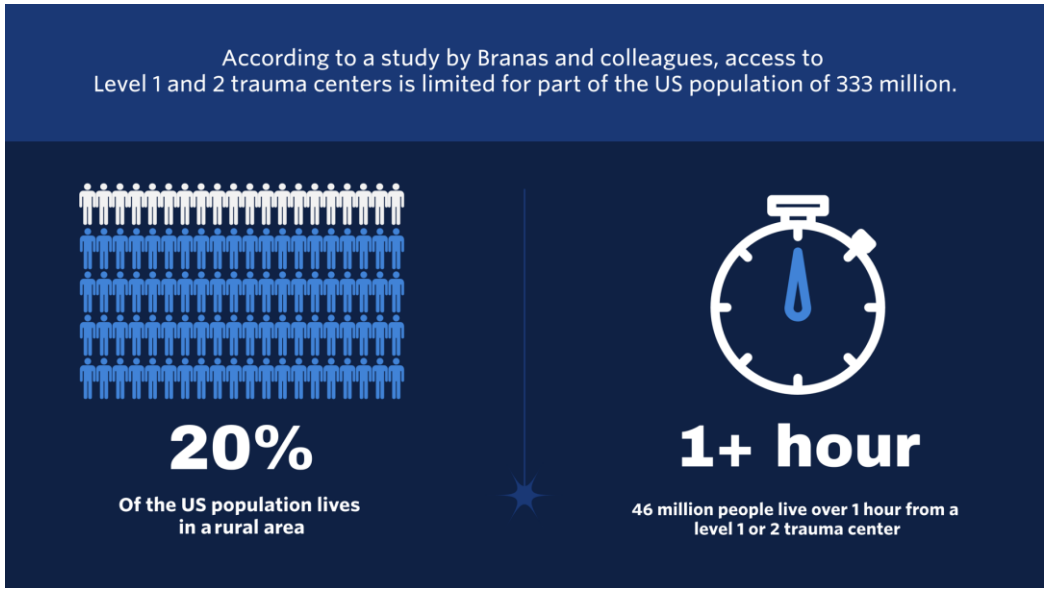
Access to Specialized Care

- The Center for Medicare and Medicaid Services (CMS) describes residents of rural areas as "older," often with more comorbidities that complicate their injuries and treatment.
  - They also encounter "financial hardships", limited infrastructure, and restricted "access to specialized care", trauma centers, or healthcare services overall.
- The greatest challenge for trauma patients is how quickly they can get to a trauma center.
  - Though many people believe that they can have quick access to specialized trauma care, the fact of the matter is that many states do not have any Level 1 Trauma Centers (hospitals that are equipped to care for the highest acuity of patients).



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Scene to Facility Transport

- This lack of access contributes to longer transport times, with rural patients experiencing, on average, 30 % longer prehospital times compared to urban patients.

- Due to the disparities in resources and availability patients in rural areas are up to twice as likely to die from their injuries as those in urban areas.

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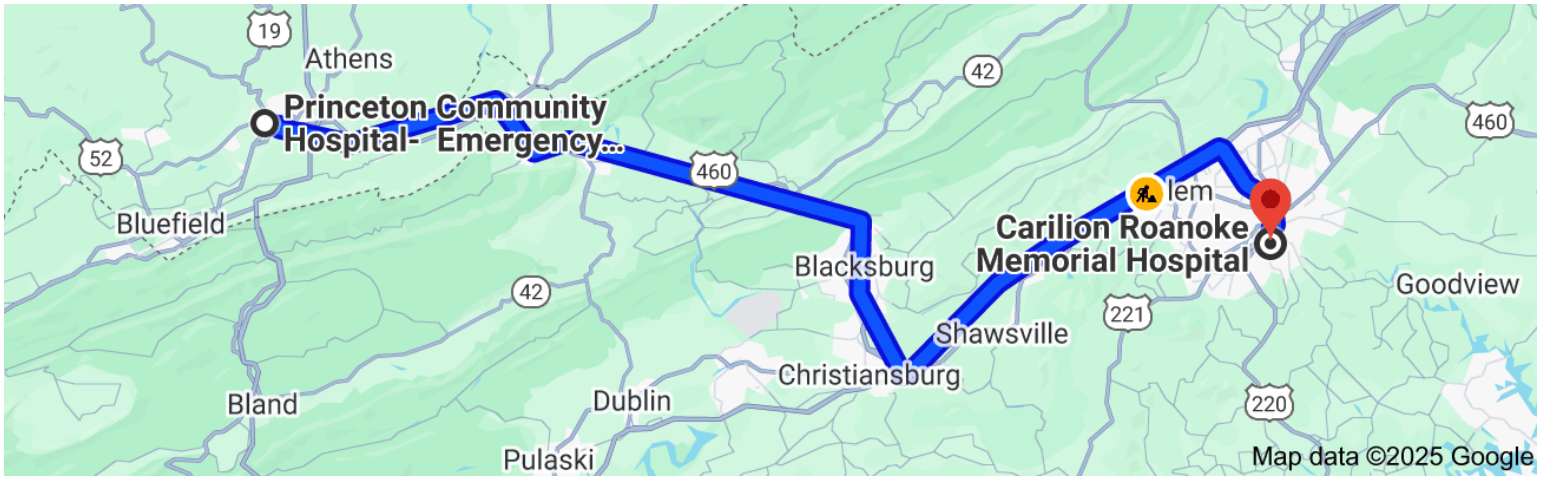
Barriers to Rural Emergency and Trauma Care – Critical Access Facilities

Delays in:

1. Identification of immediately life-threatening injuries
2. Prioritization of life-threatening injuries
3. Budgetary Constraints
4. Staffing
5. Transportation to a higher level of care

Access, Transport, and Patient Outcomes

- Transport times from rural facilities to definitive care at trauma centers can also impact patient outcomes
  - On average it can take anywhere from 20-60 minutes for patients to transported from the initial hospital to definitive care with some transport taking less than 20 mins and others longer than an hour due to location, weather, method etc.

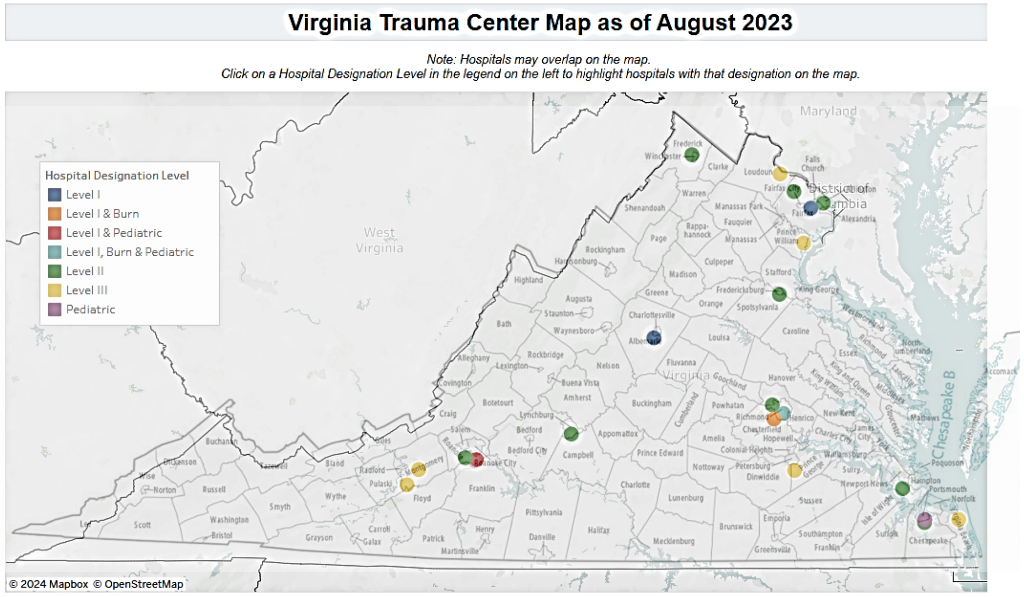


VIRGINIA TRAUMA CENTERS

- Virginia has 21 verified trauma centers of various levels across the commonwealth.

- Level 1 = 6
- Level 2 = 9
- Level 3 = 6

- Specialty Centers
  - Burn = 3
  - Pediatric = 3



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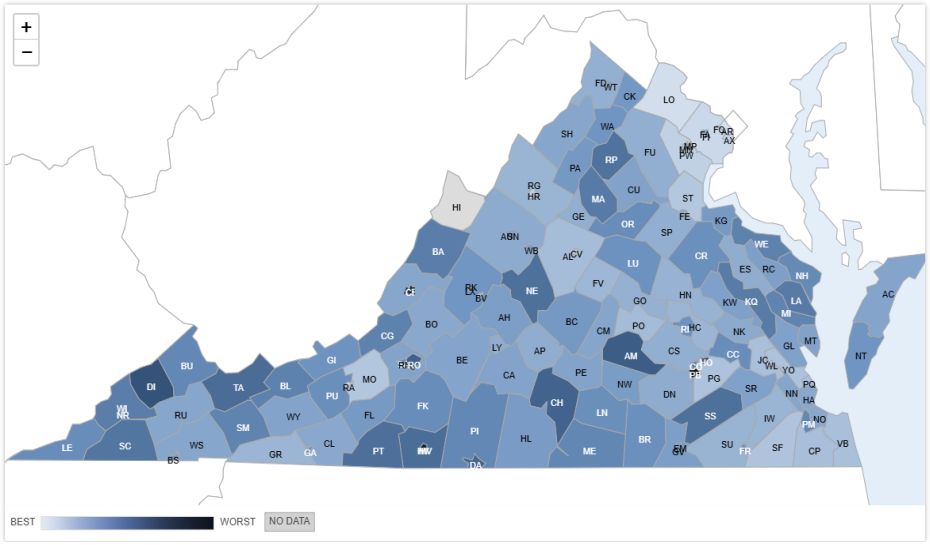
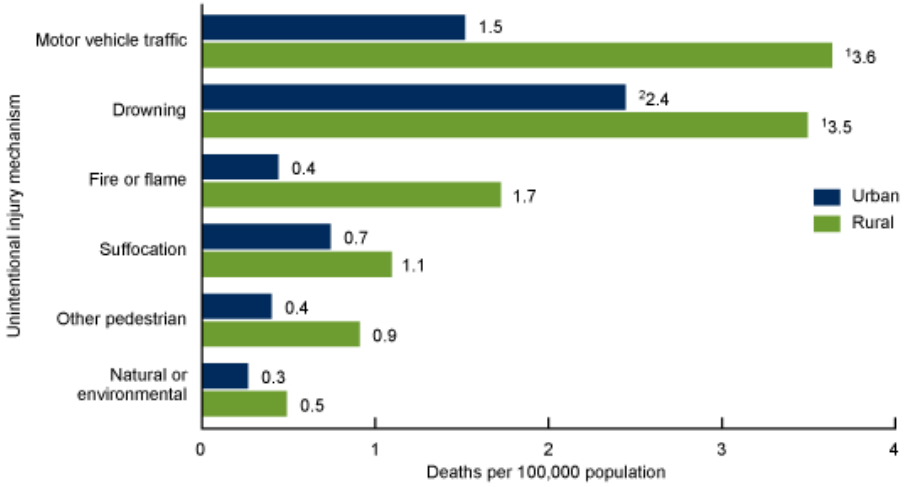
County Health Rankings & Roadmaps

2023 Injury Deaths - Virginia





Rural Trauma Outcomes

- Despite advances in medical technology and science and the overall mortality rate across the nation decreasing, rural communities still face a statistically higher rate of mortality as well as disability following injuries

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Health Policy

- Addressing disparities and improving patient outcomes after traumatic injury involves not only the care team but the entire trauma system, including those involved in health policy creation.

- Rural Emergency Hospitals (**REH**)
  - Due to ongoing uncertainty about national budgets and reimbursement, many small and rural hospitals have had to close, leading to decreased care access in several communities.
  - Implementing REHs can help bridge this gap in communities that are otherwise too small to support a fully equipped hospital

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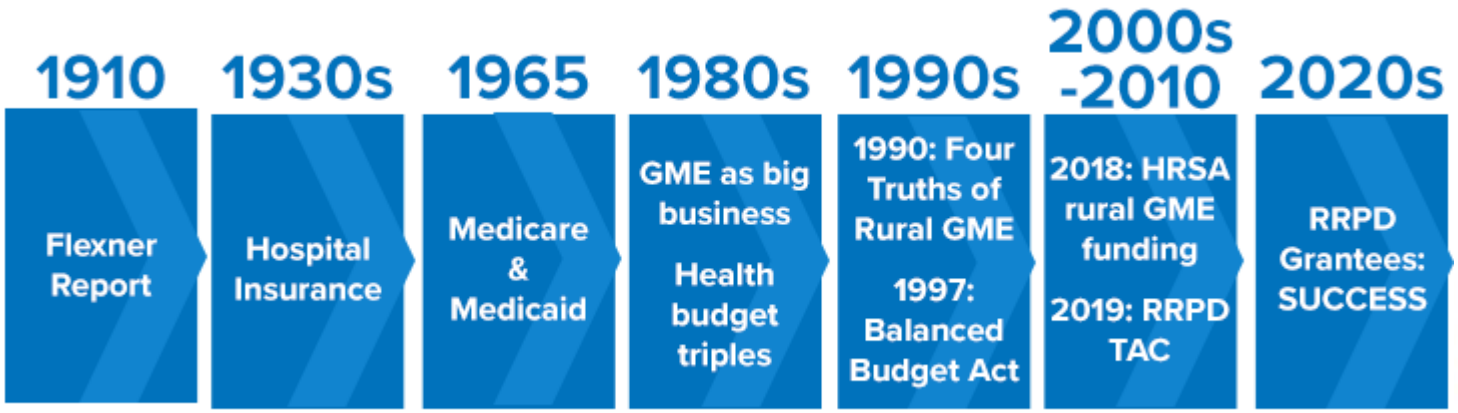
Health Policy

- Healthy People 2030 is a national initiative led by the Office of Disease Prevention and Health Promotion (ODPHP) focused on improving equity and addressing ongoing issues and chronic health conditions.

- Ongoing Legislative Interventions
  - HR 1153 - Rural Physician Workforce Production Act of 2025



Meeting the Needs of Rural Communities

- While policy changes benefit all trauma systems, they cannot be the sole efforts to address care needs. To achieve real impact, it is also crucial to focus on addressing inequities on a personal level within the community and in hospitals serving rural areas.

- Rural Hospitals face the same unique challenges as the people they serve, and ways to assist in meeting their needs without causing undue strain on providers or the economy can be addressed through specialized education and collaboration.

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Meeting Rural Clinics and Hospitals Where They Are

- Would it be reasonable to increase the number of trauma centers in the commonwealth by either designating existing hospitals or building new ones?

- Targeted Education helps to both bridge the gap in critical and trauma informed care, while also making use of the best resource that rural facilities have – their existing teams

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Examples of Targeted Trauma Education

rtdc™

RURAL TRAUMA TEAM DEVELOPMENT COURSE

ATLS

ADVANCED TRAUMA LIFE SUPPORT

ATCN

ADVANCED TRAUMA CARE FOR NURSES®

TNCC®

TRAUMA NURSING CORE COURSE

An ENA® Course

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Rural Trauma Team Development Course (RTTDC)

- The American College of Surgeons offers several programs aimed at addressing equity and resource disparities among various populations and communities, including those living in rural areas. One such program is the Rural Trauma Team Development Course (RTTDC).

- The RTTDC program was developed to improve the quality of care in rural communities by using a "timely, organized, and systemic response to care" and prioritizing a team approach during the initial assessment and stabilization of trauma patients.

Allows all disciplines that are involved in trauma resuscitation to practice relevant skills, ask questions, and work together as they would every day.

Incorporates Didactic Education and Simulation

Trauma Metrics Measured for Best Practice, Quality, and Performance Improvement (PI)

- EMS Transport Time
- Decision to Transport
- Imaging Studies performed prior to transport
- Patient Length-of Stay (LOS) and Outcome

- Anecdotally we also examine provider comfort and confidence

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The Impact of Targeted Education

- Evidence demonstrates that the addition of specialized education has an impact on both provider confidence and patient outcomes.

- A prospective study performed by Bauman et al. in the Midwest demonstrated both a reduction in ED dwell times by an average of 64 minutes and a reduction in decision to transport times by an average of 62 minutes
  - This allowed patients to arrive at designated trauma centers and specialized physicians sooner, allowing for a reduction in morbidity and mortality rates.

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The Impact of Targeted Education

- In the commonwealth, we have an official rural trauma subcommittee that falls under the purview of the state committee on trauma (COT) education committee
- Examining regional data across the commonwealth, the coalition and subcommittee has noted
  - A 20% increase in participant comfort level and confidence across 33 different trauma skills
  - A 42% increase in acknowledging that a definitive diagnosis of all injuries does not have to be made prior to transfer
  - A 21% increase in understanding that CT imaging at the non-trauma hospital is not required prior to transfer
- Course evaluations revealed high participant satisfaction, with an average rating of 4.8 out of 5 stars.
  - 91% percent of participants found the course appropriate for their skill level
  - 100% agreed or strongly agreed that the course materials were valuable and engaging.

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The Impact of Targeted Education

- This education is also applicable outside the organized trauma systems of the United States.
  - Lule et al. (2024) acknowledged that low- and middle-income countries have a significant injury burden, compounded by a lack of resources both inside and outside the hospital.
- Developing nations, like Uganda, and other international localities do not have formal pre-hospital care system meaning many of their injured patients arrive by personal vehicles, public transportation, or are brought by law enforcement officials.
- By addressing emergency stabilization for both hospital workers, those receiving medical education, and law enforcement, each locality or country is able to utilize its available resources effectively and more patients are surviving both their initial injuries and being stabilized for transport to definitive care.

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KEY POINTS

- Rural areas make up the majority of land mass, but only account for a fraction of the population
- Trauma occurrence, morbidity, and mortality remain higher in rural areas than urban communities
- Understand your resources, capabilities, and limitations
- Targeted and specialized education for existing teams can improve patient outcomes and reduce mortality

YOU ARE IMPORTANT, AND YOU ARE NOT ALONE!

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"Where You Live Shouldn't Determine IF You Live"

Dr. Jeff Kerby
American College of Surgeons (ACS)

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