



SOUTH CAROLINA OFFICE OF
RURAL HEALTH

Investment. Opportunity. Health.

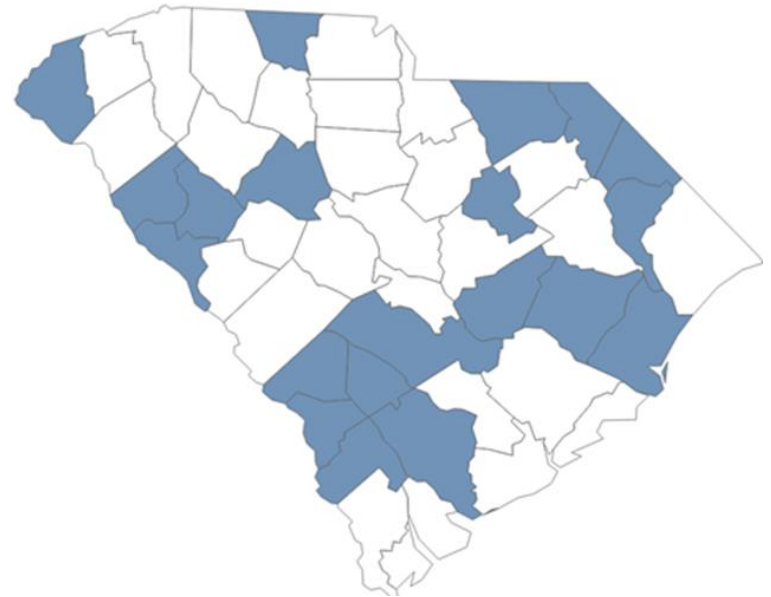
SC Trauma System:

Analysis & Adjustment to Fit Trauma Needs

Britton Herbert

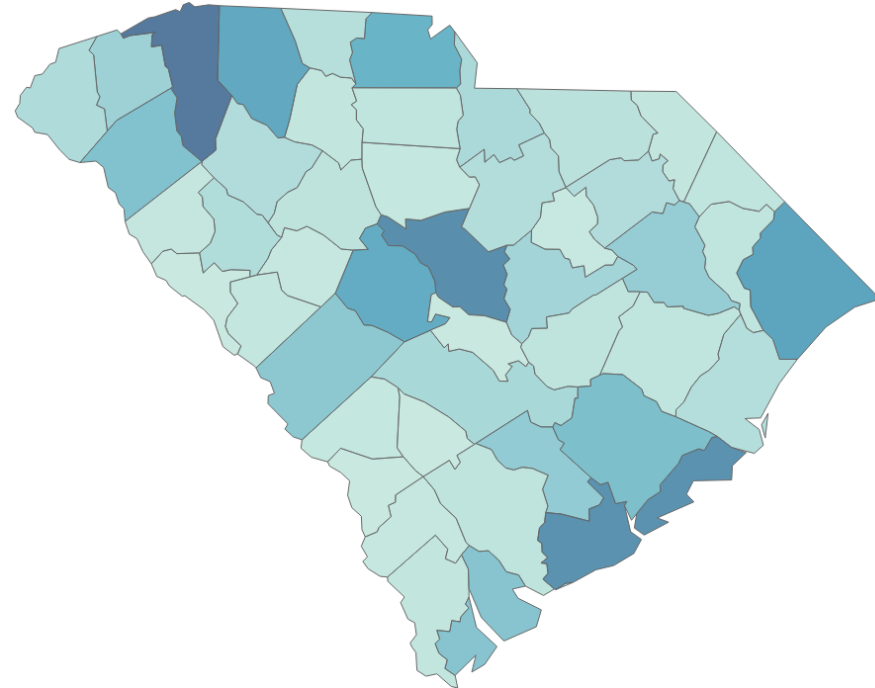
SC Office of Rural Health

- Investment. Opportunity. Health.
- 501 (c)3 nonprofit est. 1991
- Medicare Rural Hospital Flexibility Program - Flex
- Rural South Carolina
 - Rural Urban Commuting Areas
 - 20 counties fully rural



South Carolina

- Population: 5,084,127
- Land Area: 32,020 sq. mi.
- 70 Hospitals
- 7 Freestanding Emergency Departments
- 4 Critical Access Hospitals



What is Trauma

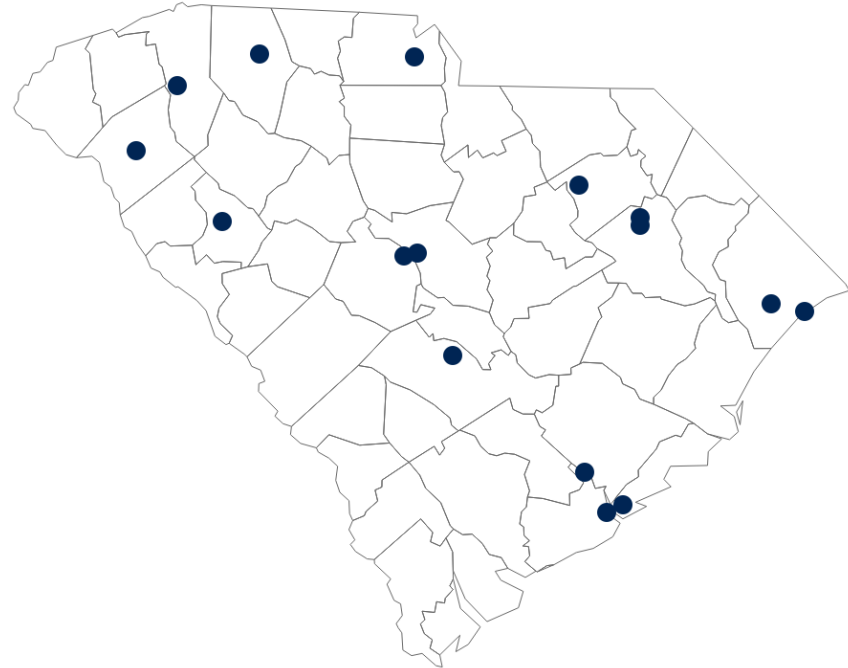
- “An injury to living tissue caused by an extrinsic agent”
- National Trauma Data Standard Patient Inclusion Criteria
 - S00-99 (Injuries to specific body parts)
 - Excluding superficial injuries
 - T07 (unspecified multiple regions)
 - T14 (Injury of unspecified body region)
 - T20-T28 (burns by specific body parts)
 - T30-32 (burn by TBSA percentages)
 - T79.A1-T79.A9 (Traumatic Compartment Syndrome)
 - Must also include: hospital admission, patient transfer, or patient death

Trauma Centers

- American College of Surgeons Committee on Trauma
 - Resource for the Optimal Care of Injured Patients
- Whole facility designation, not just Emergency Department
- Dedicated trauma administration staffing
 - Trauma Medical Director
 - Trauma Program Manager
- Level designation based on increasingly rigorous criteria

SC Trauma System

- 16 Adult Trauma Centers
 - 5 Level I
 - 2 Level II
 - 9 Level III
- 3 Pediatric Trauma Centers
- Located across 12 counties
- Governed by:
 - Regulation 61. 2016
 - SC Department of Health and Environmental Control (DHEC)
 - Trauma Advisory Council (TAC)

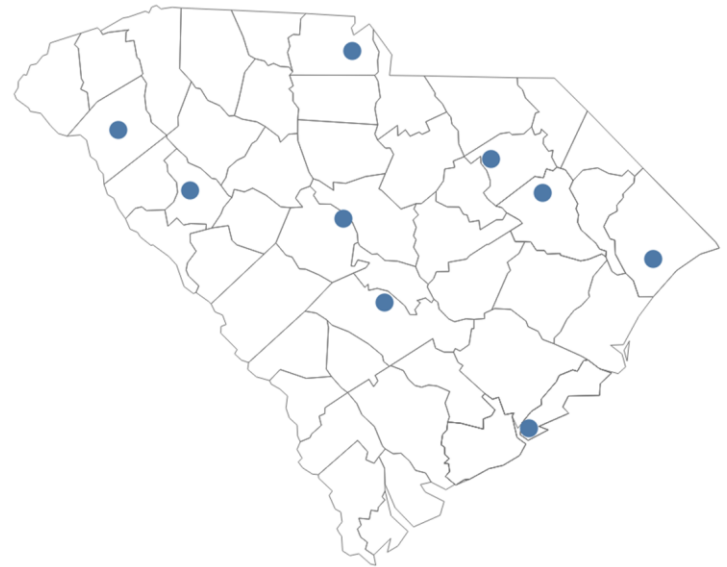


Level IV

- Summer 2017 – Level IV Trauma Designation Subcommittee
- April 2018 – Criteria & protocols approved by TAC
- Most accessible level of the trauma system
- Designed with Small/Rural hospitals in mind

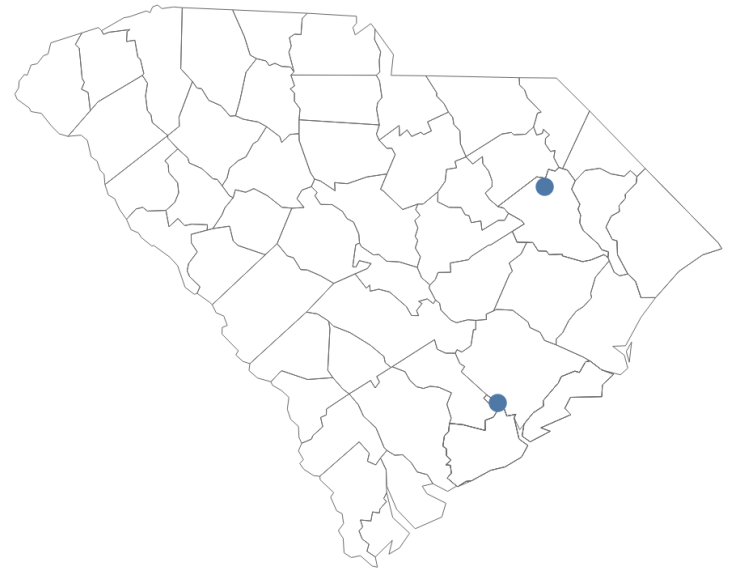
Level III

- AnMed Health Medical Center
- Carolina Pines RMC
- Conway Medical Center
- East Cooper Medical Center
- Lexington Medical Center
- MUSC Health Florence MC
- Piedmont Medical Center
- Regional Medical Center
- Self Regional Healthcare



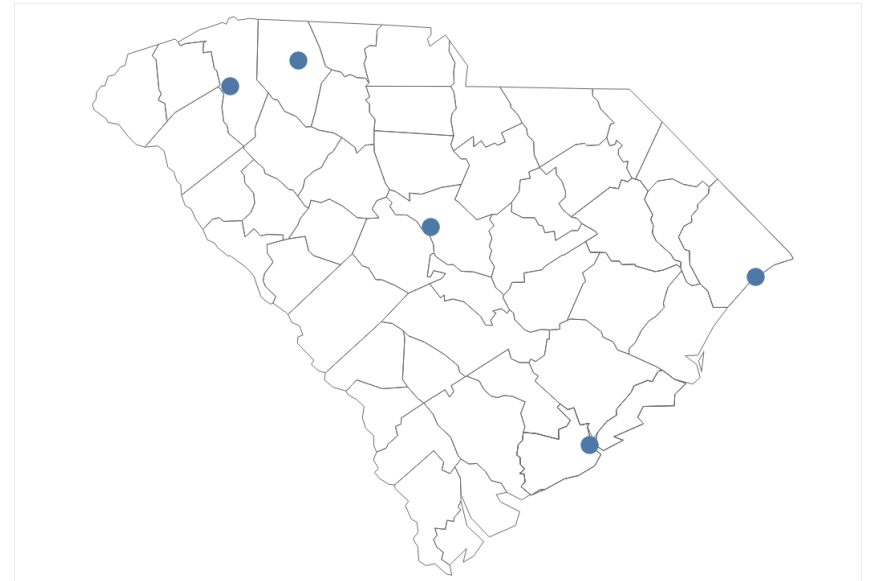
Level II

- McLeod Regional Medical Center
- Trident Medical Center



Level I

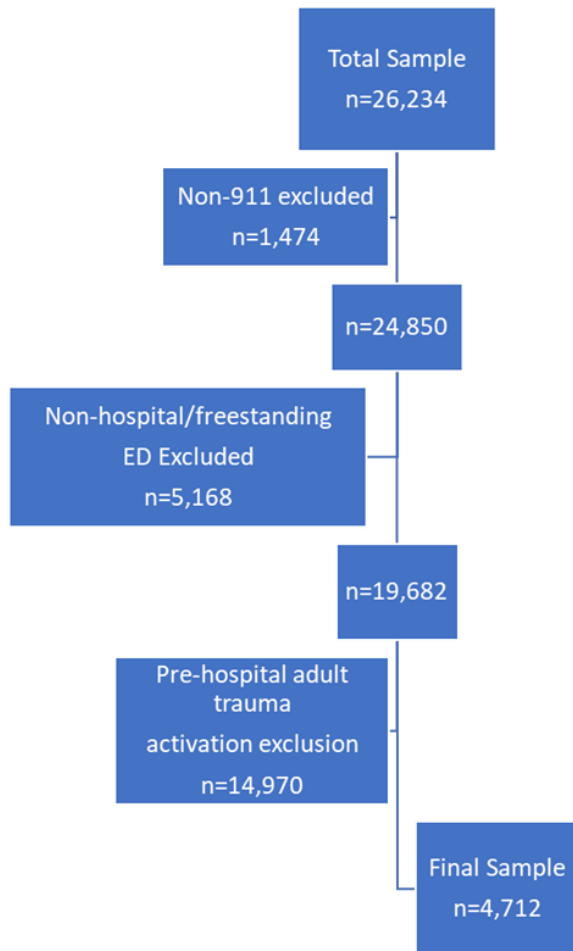
- Grand Strand RMC
- MUSC University Medical Center
- Prisma Health – Greenville
- Prisma Health – Richland
- Spartanburg Medical Center



Data Collection & Analysis

- DHEC Emergency Services and Trauma Division
 - NEMSIS – National Emergency Medical Services Information System
 - September 1, 2017 – February 28, 2019
- Visual and Analytical Software Analysis
 - Excel, Tableau, GIS
 - Two-sample one-tailed t-tests
 - Alpha Value (0.05)

Filters & Limitations



- Accuracy
 - Records removed for impossibilities
- Specificity
 - T14 – Trauma to an unspecified region
- Utilization
 - Counties displayed low trauma volume

NEMESIS Trauma

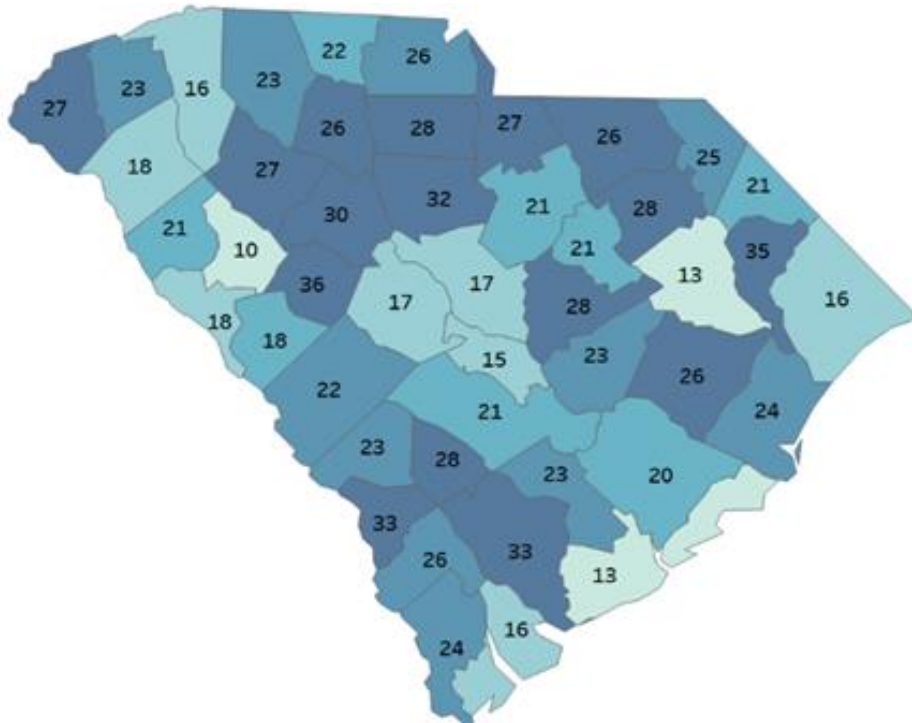
Incidents by County

County of Incidence	# of Records	% of Records
Horry	1,376	29.2 %
Greenville	613	13.0 %
Charleston	449	9.5 %
Georgetown	357	7.6 %
Berkeley	251	5.3 %

Rates by County

County of Incidence	Rate per 100,000 Residents
Georgetown	585
Horry	444
Jasper	222
Allendale	202
Colleton	192

Transport Times



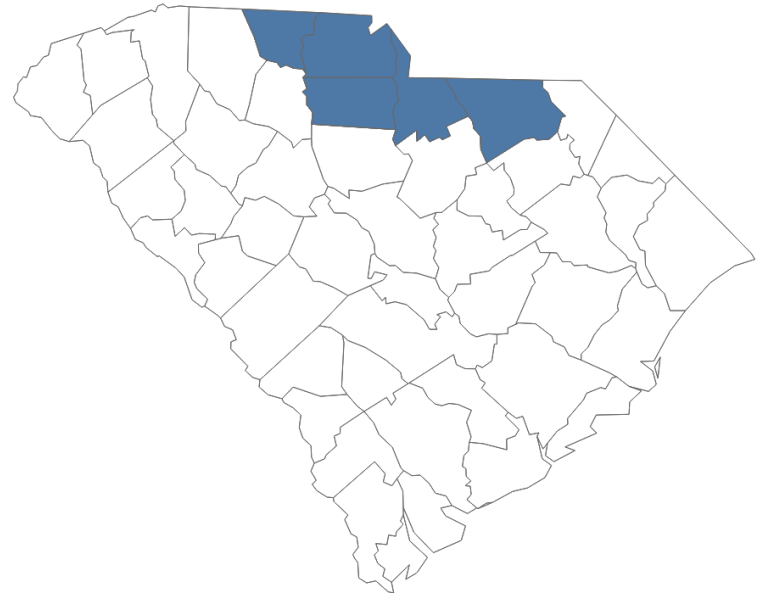
- South Carolina Mean
 - 18 minutes 48 seconds
- Maximum
 - Saluda – 36 minutes
- Minimum
 - Greenwood – 10 minutes

Transport Methods

- 12.6% of all records were air transport
- Average Times
 - 18.69 minutes for air transports
 - 18.81 minutes for ground transports
- Slightly more urban
 - 52% Urban
 - 48% Rural

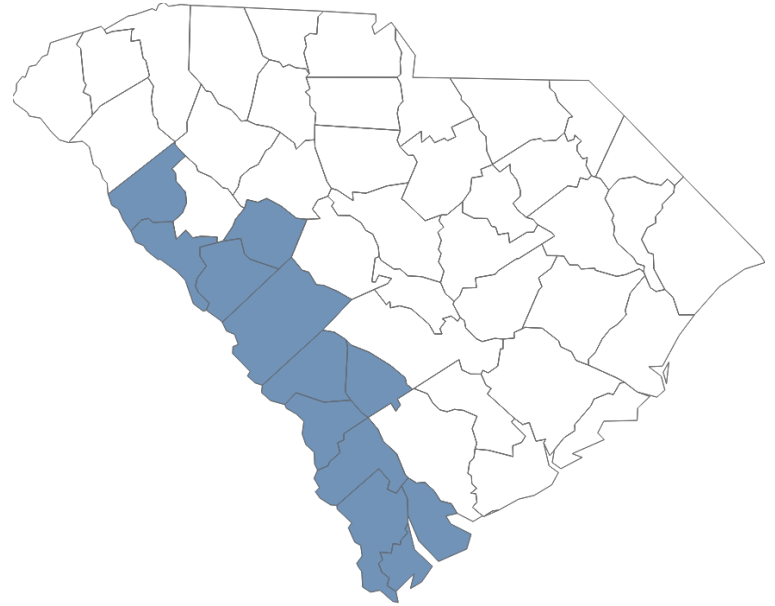
North Carolina

- 79 Transports
- Mean Transport Time
31.7 Minutes
- 5 Counties
- 2 North Carolina Trauma Centers
 - Carolinas Medical Center – Level I Trauma Center
 - CaroMont Regional Medical Center – Level III Trauma Center



Georgia

- 473 Transports
- Mean Transport Time
22.3 Minutes
- 11 Counties
- 2 Georgia Trauma Centers
 - Medical Center at Augusta University – Level I
 - Memorial Health – Level I



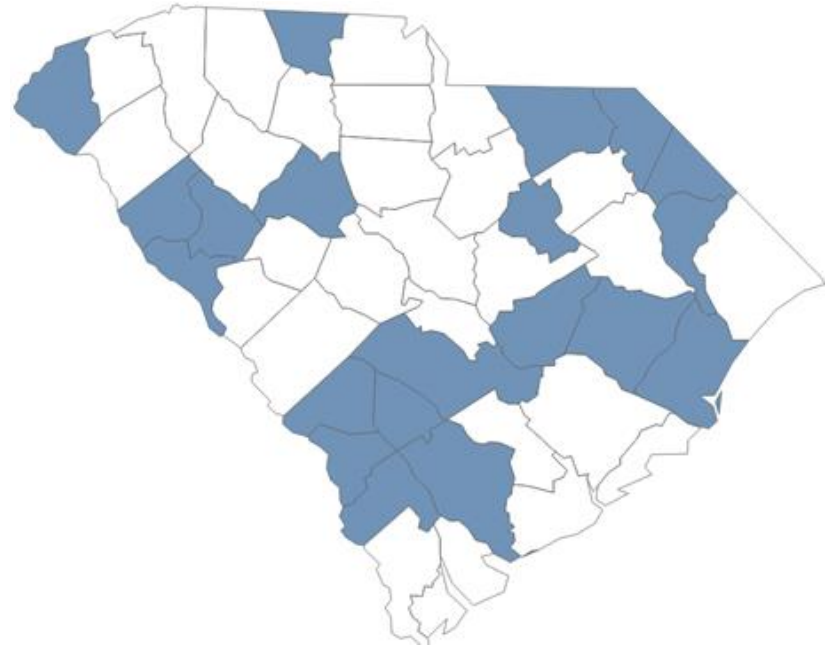
Counties without Trauma Centers

- 40% of SC Trauma volume
- 23.4 minute average transport
 - Vs. 15.9 minutes w/ Trauma Centers
- Air Transports
 - 66% of all SC air transports
 - 19 minute average vs 25 minute ground

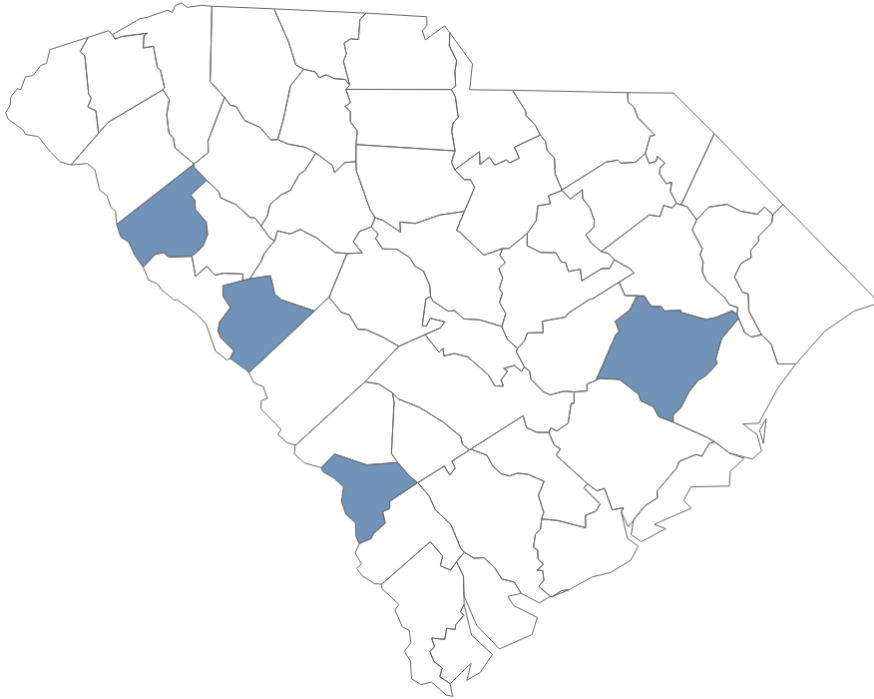


Rural Counties

- 18% of SC trauma volume
- 24 Minute Average Transport
- Air Transport
 - 33% of Rural Transports
 - 22 minute average vs 25 minutes for ground
 - 60% of counties used air more than ground



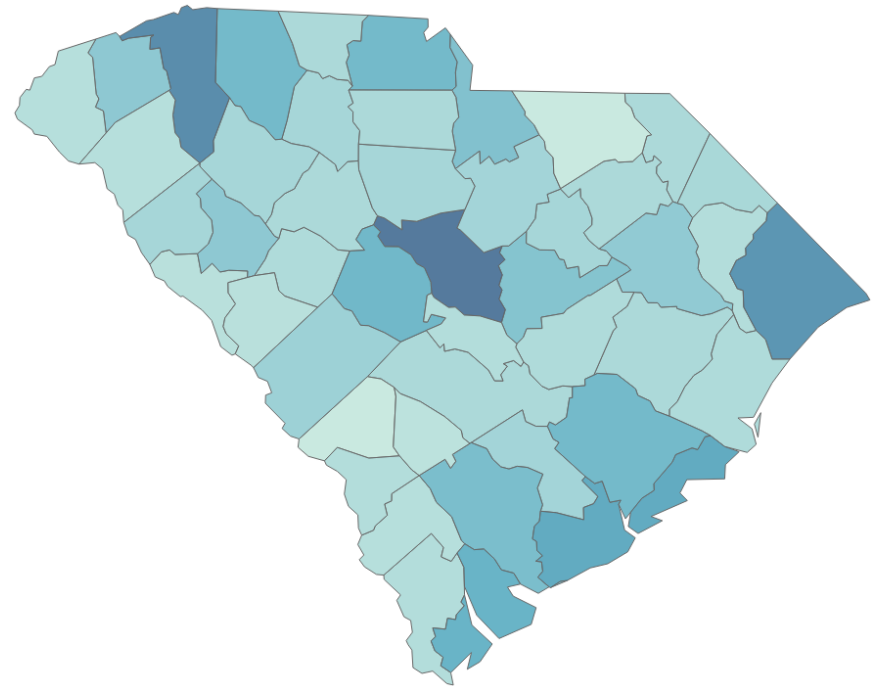
CAH Counties



- 26 Minute average transport time
- Split evenly between air and ground transports
- 24 minute air transport vs 27 minute ground transport

EMS Agencies

- 11 EMS vehicles is the SC median per county
- 18 Counties above median - 17.2 minute average travel time
 - Compared to 26 at or below median – 24.2 minute average travel time
- 9 Counties above median have an established trauma center
- 2 Counties above median are designated fully rural
- No CAHs were above median



Large Urban Counties

- Charleston, Greenville, Horry, Richland, and Spartanburg
- Nearly 1.9 million South Carolina residents
- Level I Trauma Centers
 - Charleston and Horry both have other lower levels

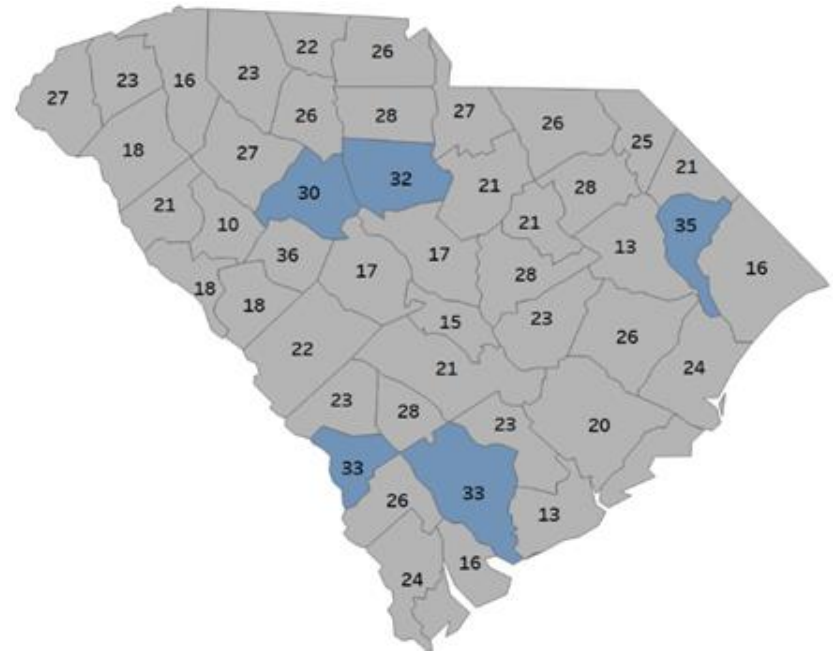
Trauma Volume

- Top 5 counties of need by trauma volume
- Aiken, Beaufort, Berkeley, Georgetown and Pickens



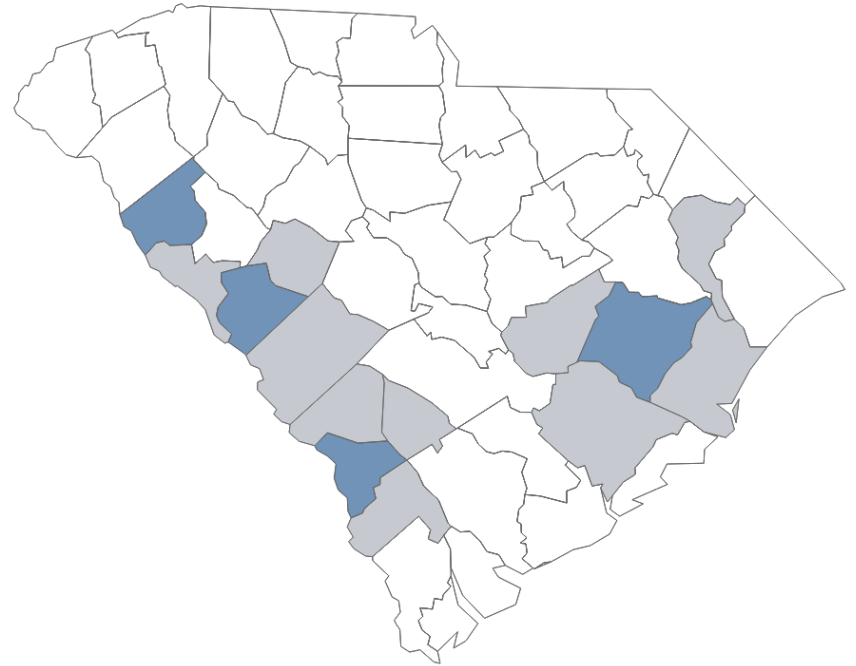
Travel Time

- Top 5 counties of need by travel time
- Allendale, Colleton, Fairfield, Marion & Newberry



Critical Access Hospitals

- 4 Critical Access Hospitals
- Abbeville, Allendale, Edgefield, Williamsburg



Trauma Care Fund

- Distribution should be increased for counties which:
 - Do not have an established trauma center
 - Are designated fully rural
 - Experience higher rates of trauma incidents
 - Have longer EMS transport times
 - Utilize higher rates of air transports
- Distribution should be increased for facilities which:
 - Are Critical Access Hospitals
 - New to the Trauma System
 - Recently raised level of designation
 - See higher volumes of trauma patients

SOUTH CAROLINA OFFICE OF RURAL HEALTH

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