Trauma Care Advisory Council

Trauma Care in Tennessee

2013 Report to the 108th General Assembly

Tennessee Department of Health

Trauma Care Advisory Council

December 20, 2013

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December 20, 2013

Dear Members of the General Assembly,

As required by Tenn. Code Ann §68-59-103, we are pleased to submit our Annual Trauma Report. This report reflects activities and accomplishments of the Trauma Care Advisory Council (TCAC) and Tennessee's designated Trauma Hospitals.

The Trauma Care Advisory Council was implemented in 1990 to advise the Board for Licensing Health Care Facilities and the Emergency Medical Services (EMS) Board in regards to regulatory standards to ensure the adequacy of statewide trauma care. Rule promulgation is guided by national standards.

In 2007, the General Assembly enacted the Trauma Fund Law, providing valuable resources to support and maintain Tennessee's vital Trauma System.

The data in this publication give an overview of patients cared for in Tennessee designated Trauma Centers. With your ongoing support, the TCAC hopes to continue to expand access to quality trauma care for injured Tennesseans.

Respectfully Submitted,

Ben L. Zarzaur, MD, MPH, FACS
Associate Professor of Surgery
University of Tennessee Health Science Center
Chair, Trauma Care Advisory Council
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2013 EXECUTIVE SUMMARY

Last year, over 5,300 Tennesseans were either incapacitated or killed from traumatic injuries, at rates nearly double that of the nation as a whole. Costs to Tennesseans are high in terms of years of potential life lost and treatment costs. The good news is that, like many adverse public health outcomes, these traumatic injuries and subsequent deaths are largely preventable. Preventive measures play a key role in decreasing injuries, but possibly more important is limiting injury-related death through the appropriate response and treatment of those suffering traumatic injuries.

Optimal trauma care requires a timely response and adequate hospital resources, including both personnel and equipment, for a continuum of care from pre-hospital through rehabilitation. A timely response represents a key factor in trauma survival, with the "Golden Hour" representing the first 60 minutes following a severe injury when treatment is most effective. The Trauma Care Advisory Council (TCAC) was established in 1988 to advise the Bureau of Health Care Licensing Facilities (BLHCF) regarding trauma care policy and regulation. The Tennessee Trauma System, when first instituted, boasted 11 trauma hospitals: 4 as Level I (the highest level of care) and 7 as Level II. Several Level III centers were later designated, bringing the total to 13. The last decade has seen an erosion of these services. Currently, Tennessee has 6 Level I trauma centers, 1 Level II center, and 2 Level III centers. This erosion in trauma center availability has put the Tennessee trauma system far behind some surrounding states. Tennessee has significant gaps in coverage across the state in terms of trauma center availability, particularly in rural areas. Lack of inclusiveness and coordination of the trauma system leaves many Tennesseans with suboptimal outcomes following injury.

The good news is that designated trauma centers across the state provide more than just care to the injured – they also provide a safety net of care for those patients in most dire need - 24 hours a day, 7 days a week, at the highest level available. Two years ago, the Board for Licensing Health Care Facilities approved new more demanding requirements for designation of trauma centers in Tennessee, raising the bar for quality care of injured Tennesseans. These new requirements were used in the last year for renewals of designation of 3 trauma centers in the state. These requirements provide that trauma centers have the resources available to care for the severely injured. Level I trauma centers are required to have fully staffed operating rooms, lab and radiologic capabilities, intensive care units, and professional personnel in the hospital (including emergency physicians and surgeons) available on a moments notice – 24 hours a day, 7 days a week, 365 days a year. This service availability provides a halo effect to local communities and regions – by also being available to care for patients with ruptured aneurysms, strokes, cardiac emergencies, and other time-limited, life-threatening emergencies at a moment's notice.

To help coordinate the care of the injured patients as well as to ensure the outcomes of those treated at Tennessee trauma centers is at the highest level, the TCAC, in conjunction with the

Department of Health, implemented a statewide trauma registry. As this registry matures, valuable data regarding the care of injured patients in the state will be available to improve the quality of care at all trauma centers. The trauma registry identified that in 2012; more than 24,000 trauma patients were treated in Tennessee designated trauma centers and that at least one person from every county in Tennessee was treated at a Tennessee trauma center. The overwhelming majority of those injured were the result of motor vehicle crashes and falls.

This report provides information on injury patterns across the state, referral patterns, and financial statistics. Other key aspects of this report include Injury Prevention activities and statewide research efforts. It is the goal of the TCAC to aim future activities based upon data from the state registry and to continually strive to improve patient outcomes through an array of performance improvement initiatives, research activities, and outcomes based evidence.

Despite the advances in the system in the last decade, many gaps still exist across the state. Much work needs to be accomplished to develop a truly *inclusive* trauma care network, forming a system in which all hospitals participate, so ALL citizens of Tennessee can be assured of receiving the same level of care, regardless of where they are injured.

This report speaks volumes about the hospitals designated as trauma centers and dedicated to caring for the injured patient. But, there is still much to be done. With your ongoing support we can continue with our mission of providing the highest level of care, injury prevention, education, and research to minimize the death and disability that occurs as a result of injury across the state of Tennessee

Ben L. Zarzaur, MD, MPH, FACS
Chair, Trauma Care Advisory Council and
The Tennessee Committee on Trauma

INJURY PREVENTION IN TENNESSEE

Injuries are the leading cause of death among Tennessee residents ages 1-44 and the fourth leading cause of death overall after heart disease, cancer and lower respiratory disease. The majority of injuries are unintentional; however, injuries can be intentional through self-harm or by another individual. In 2011, 4,884 Tennessee residents were fatally injured, another 38,008 were hospitalized for non-fatal injuries, and 629,624 visited an emergency department due to injury.

The cost of all of these injuries is tremendous. In 2011, the median admission charge in Tennessee for non-fatal injury hospitalizations was $47,000. The total charges exceeded $1.7 billion; this does not include rehabilitation, emergency medical services, or physician costs. Many of these injuries were preventable.

The Tennessee Department of Health first received the Core Injury Surveillance, Prevention, and Control Grant from the Centers for Disease Control and Prevention (CDC) in 2005 to address injuries. An objective of this grant was to ensure that injury prevention efforts provided by public health and private agencies were coordinated. This coordination assisted with eliminating redundancy, sharing resources, and increasing support and impact for injury prevention initiatives statewide. As part of this coordinated effort, the Commissioner's Council on Injury Prevention and Control was established as an advisory council for injury prevention efforts in Tennessee. The statewide membership includes injury prevention experts from a variety of public and private agencies with a common goal of reducing injuries among Tennesseans.

The Tennessee Department of Health received a five year continuation of that grant in 2011. Under that new grant, four priority areas were chosen with input from the Commissioner's Council. The priority areas for 2011 – 2016 include: motor vehicle crashes, poisoning, sleep-related deaths and senior adult falls. Many injury prevention efforts are being implemented related to these areas and others throughout Tennessee.

Trauma centers and the comprehensive regional pediatric centers (CRPCs) are integral partners in the implementation of programmatic efforts to reduce the burden of injury in Tennessee. Examples of injury prevention efforts among designated trauma centers and CRPCs include:

- **Safe Kids Coalitions** – The safe kids coalitions provide education to families and advocate for better laws to keep children safe and healthy. In addition, the Safe Kids coalitions often provide safety devices, such as car seats, to families in need.

- **Champ's Corner Store** - Champ's Corner Store is located at Monroe Carell Jr. Children's Hospital at Vanderbilt and is the first of its kind in Tennessee. Open to the public, the store serves families in Middle Tennessee and across the state by providing

low cost safety products for children such as child passenger safety seats, cabinet locks and bicycle helmets.

- **Battle of the Belt** – This competition is a collaborative effort between trauma centers and high schools to increase seat belt usage among teens. Each trauma center chose one or more schools and is working with them to conduct two seat belt checks and education for students throughout the year. The school with the most increase in seat belt use and the school with best educational campaign both win a trophy. In addition, an overall winning school is chosen at the end of the school year based on increased percentage of seat belt usage and quality of educational campaign.

- **Trauma Nurses Talk Tough** – This program teaches parents, teenagers and children about safety topics and injury prevention. Topics include: seatbelt safety, dangers of speeding and driving impaired, and the importance of wearing helmets when bicycling and skating.

- **Tennessee Coalition for ATV Safety** – This coalition, supported by the Trauma Center's Injury Prevention Programs, was developed to promote ATV safety among youth and adults.

- **Safe Sleep Education** – The Tennessee Department of Health has provided educational materials and encouraged hospitals to educate staff and parents about safe sleep practices. Some of the trauma centers and comprehensive regional pediatric centers have developed safe sleep policies which require training for their staff, education for parents and modeling of safe sleep practices in the hospital.

TRAUMA CENTER FUNDING

With the passage of the Tennessee Trauma Center Funding Law of 2007, the Trauma Care Advisory Council was charged with developing recommendations on how to distribute Trauma System Fund reserves. In keeping with the intent of the statute, three broad categories for disbursement were identified:

- Money to support the **trauma system infrastructure** at the state level.
- **Readiness costs** to designated trauma centers and comprehensive regional pediatric centers.
- Money for **uncompensated care**.

Trauma System Infrastructure:

Robert Seesholtz is the State Trauma System Manager as of August 2010 and is responsible for providing general oversight for Tennessee's Trauma Care System. Responsibilities include oversight of the trauma fund, the trauma registry, administrative support to the Trauma Care Advisory Council, and the coordination of site visits for new and existing trauma centers.

Readiness Costs:

Tennessee Trauma Centers and CRPC's are ready at a moment's notice to treat those suffering from traumatic injury and are required to maintain life critical services 24 hours a day, 7 days a week, 365 days a year. Readiness costs that support trauma programs vary annually for each designated Trauma Center. While readiness costs disbursed from the trauma fund cannot realistically compensate centers for all of their costs, readiness funds help to ensure that these necessary life critical services are maintained. Readiness cost amounts for those state designated trauma centers and comprehensive regional pediatric centers may be found in **appendix III**.

Uncompensated Care Methodology:

The law provides for uncompensated care funding to be distributed to: 1) designated trauma centers 2) comprehensive regional pediatric centers and 3) other acute care hospitals functioning as a part of the trauma system. Actual hospital claims data was selected by the committee to determine the levels of trauma care provided by each center/hospital and the uncompensated costs related to that care.

While designated trauma centers and comprehensive regional pediatric centers are automatically eligible for participation in this portion of the fund, not all acute care hospitals are. Criteria used to determine which hospitals "function as a part of the trauma system", include: 1) Utilization - the percentage of all claims that are trauma related and 2) Acuity – the acuity of the trauma injuries seen by a hospital. Acute care hospitals, which prove to have a utilization rate and acuity equal to or greater than the minimum utilization and acuity rates of the designated centers, are eligible for participation in the pool.

Distribution to eligible hospitals is based on: 1) the level of funding within the reserve account following infrastructure and readiness costs and 2) the documented level of each hospital's uncompensated trauma cost. Though this amount will vary from year to year, at the end of 2013 this portion of the fund was approximately $8,316,610.13. **Appendix III** shows quarterly payments made to eligible hospitals for calendar year 2013.

Trauma Fund disbursement totals have seen a steady decline for the past three years. Fiscal year 2012 saw its biggest reduction in funds with a drop of over $400,000.00 in reimbursement for those hospitals eligible to receive monies from the trauma fund. The Trauma Care Advisory Council will look at alternative sources of funding to ensure the viability of Tennessee's Trauma System.

TRAUMA REGISTRY

The Tennessee Trauma Registry is the data repository for patients treated at the 9 participating trauma centers and the 4 CRPC's. The first full year of data submission was 2007. Since that

date the Registry shows Tennessee centers have treated 142,989 patients. Each year averaging more than 20,000 patients; however, in 2012 the number of injuries treated exceeds all prior years at 24,298. Serious injury is defined as an injury severity score of 15. The weighted average of reported ISS was 12. Thirty-one percent of patients with ISS reported had scores 15 or higher, indicating serious trauma.

The following reports were generated from the Registry for calendar years 2008 through 2012 and typically represent trauma patients treated in the 13 centers during this period as well as snapshots of activity for 2012 only.

Trauma Registry, Injury Prevention and Injury Surveillance System

The TN Department of Health performs Injury Prevention analysis of Tennessee injuries based on Hospital Discharge data for all hospitals in the State as well as ER and Vital Records. The Trauma Registry serves as a source of information that is not provided in these three sources.

OUTREACH

Tennessee's Trauma Centers and Comprehensive Regional Pediatric Centers (CRPC's) provide many different outreach opportunities for both the public and for those who are responsible for the specialized care of injured Tennesseans and visitors in our state. The outreach opportunities listed below represent just a sample of the outreach opportunities that are being provided.

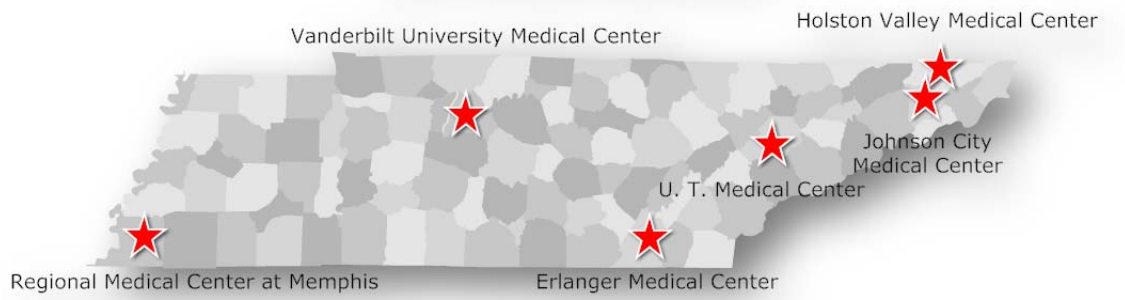
- Advanced Trauma Life Support
- Trauma Nurse Core Course
- Advanced Trauma Care for Nurses
- Emergency Nursing Pediatric Course
- Basic Life Support
- Helicopter scene safety
- EMS night out
- Community Health Leaders Program
- Transport Ventilator Management course
- Fundamental Critical Care Course
- Rural Trauma Team Development Course
- Prehospital Trauma Life Support
- EZIO Course
- EMS appreciation
- Trauma Symposiums
- Bike Helmet Fittings
- Car Seat Inspections
- Health Fairs
- Distracted Driving Simulator
- Sports Safety

RESEARCH

Level 1 Trauma Centers are charged with performing research. These endeavors spur improvements in care on an ongoing basis. In 2012 51 peer reviewed manuscripts were published by Level 1 trauma centers and CRPC's. **Appendix IV** represents these state wide research publication efforts.

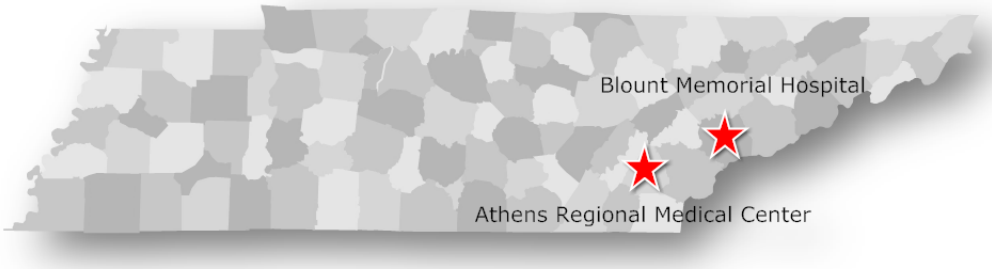
Appendix I:
Trauma Center Location & Level Designation

Level I Tennessee Trauma Centers

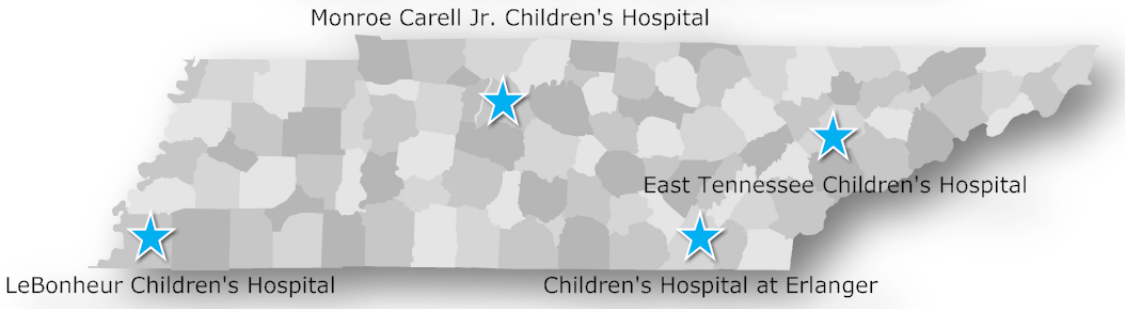


Level II Tennessee Trauma Centers

Level III Tennessee Trauma Centers



Tennessee Comprehensive Regional Pediatric Centers

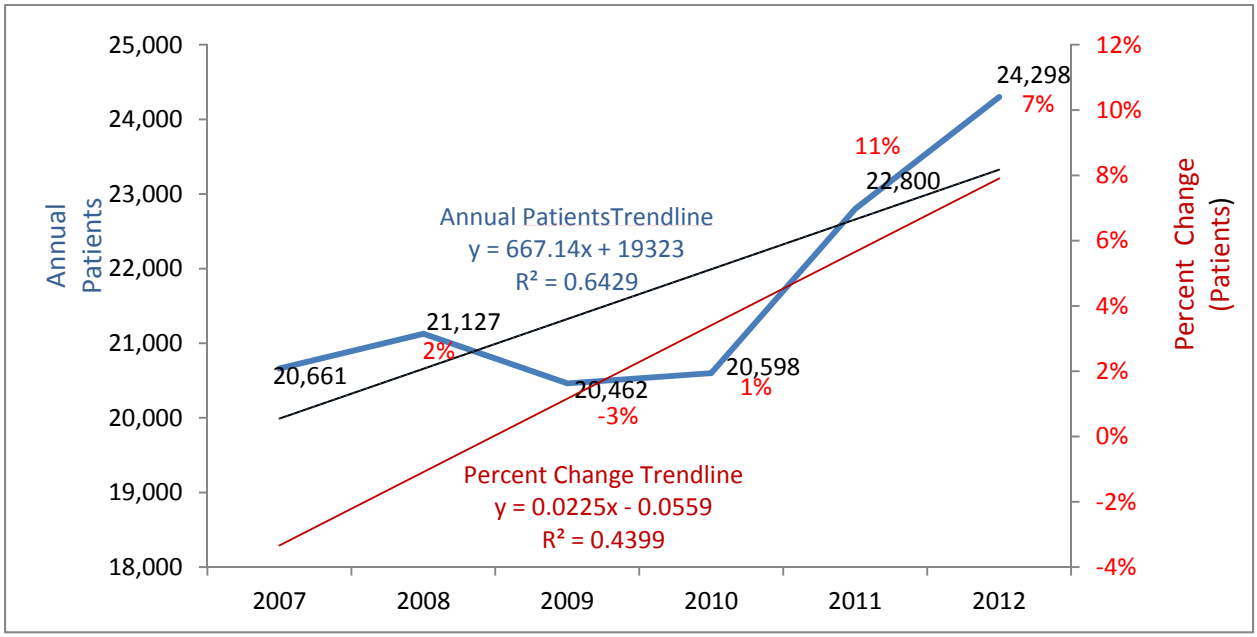


Appendix II:

Trauma Registry Reports

Figure 1:

Yearly Patient Trends



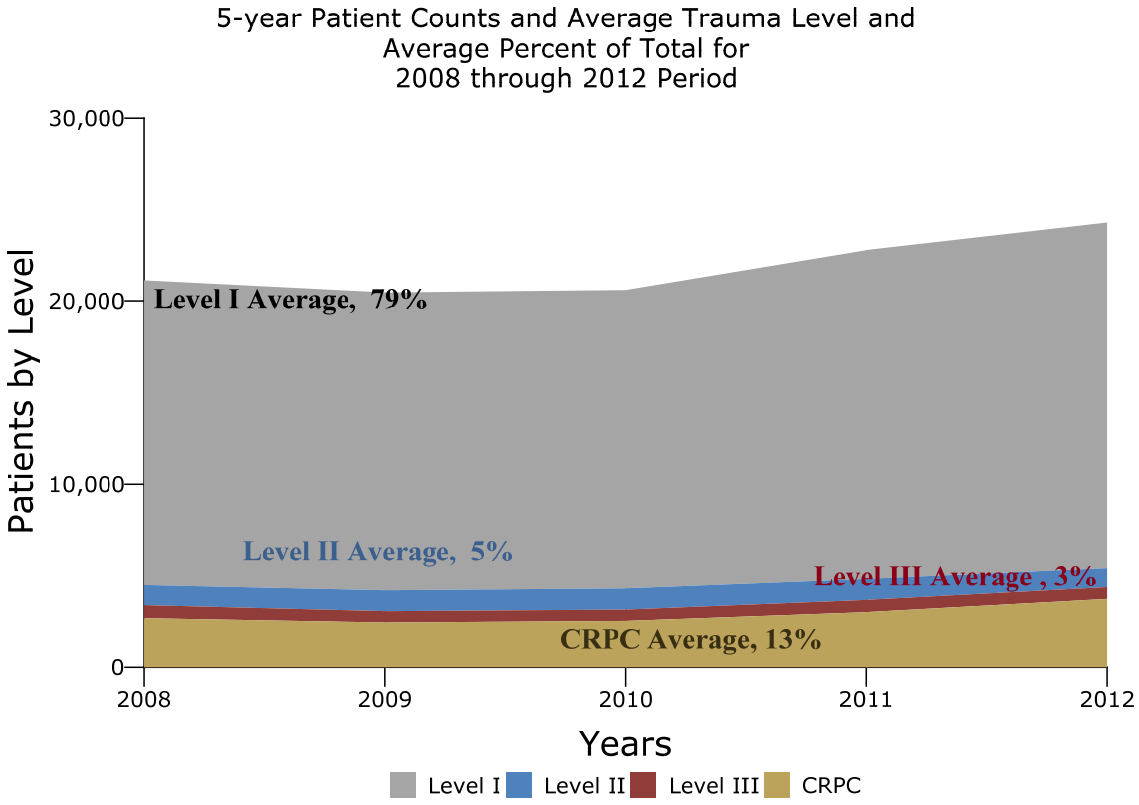
2008	2009	2010	2011	2012
21,127	20,462	20,598	22,800	24,298

Patient Trend (2008 through 2012)

The number of those suffering from traumatic injury and are treated in Tennessee trauma centers and CRPC's have shown an increase since patient tracking was begun. (The last 5 years are shown above.) With the exception of 2009 when trauma activity experienced a 3% drop, annual patient counts have risen. The most dramatic change occurred between 2010 and 2011 when there was an 11% increase in the treatment of trauma patients over 2010 cases.

Figure 2:

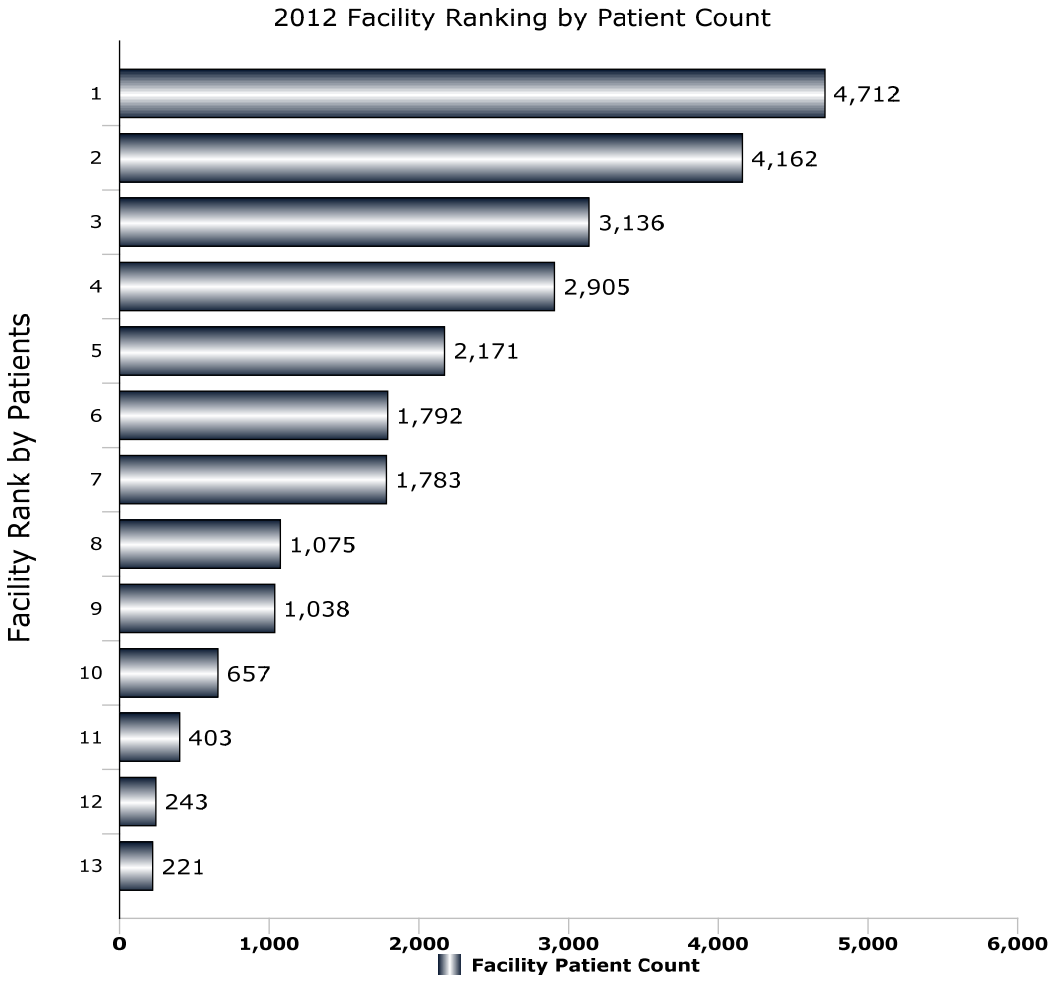
Average Annual Patient Distribution by Trauma Center Level



	2008	2009	2010	2011	2012
CRPC	2,681	2,452	2,523	3,005	3,736
Level III	713	612	618	677	646
Level II	1,102	1,137	1,174	1,143	1,038
Level I	16,631	16,261	16,283	17,975	18,878

Figure 3:

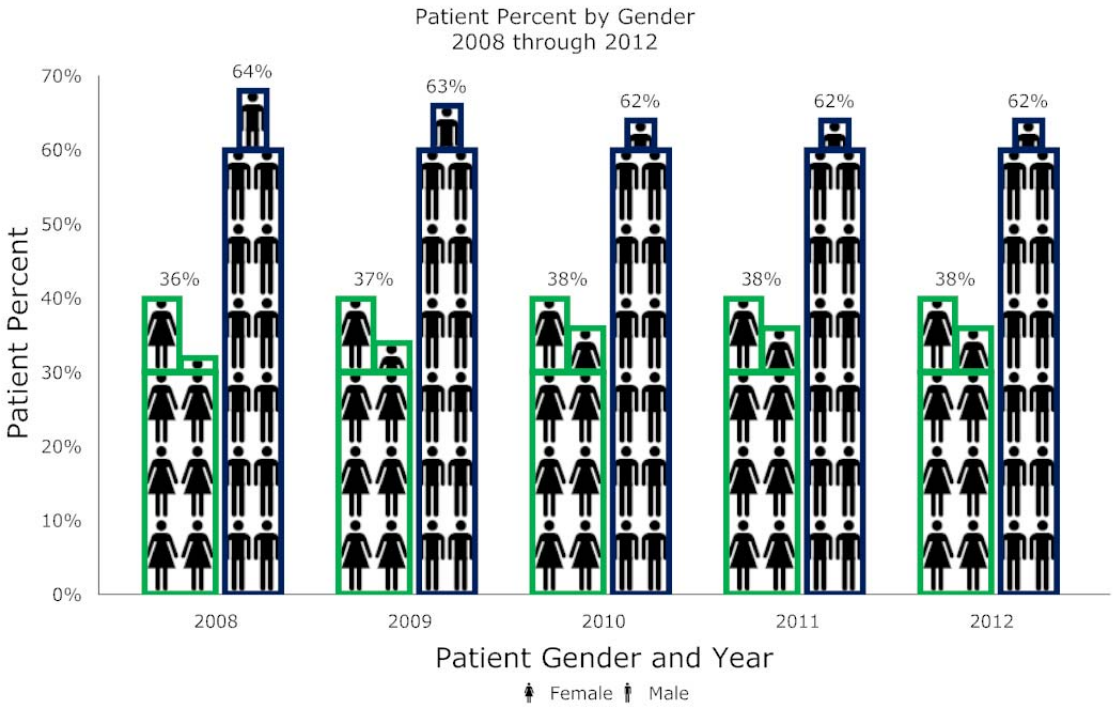
Trauma Center and CRPC's Patient Counts



These numbers represent total patient counts of those suffering from traumatic injury that were treated in Tennessee trauma centers and CRPC's for calendar year 2012.

Figure 4:

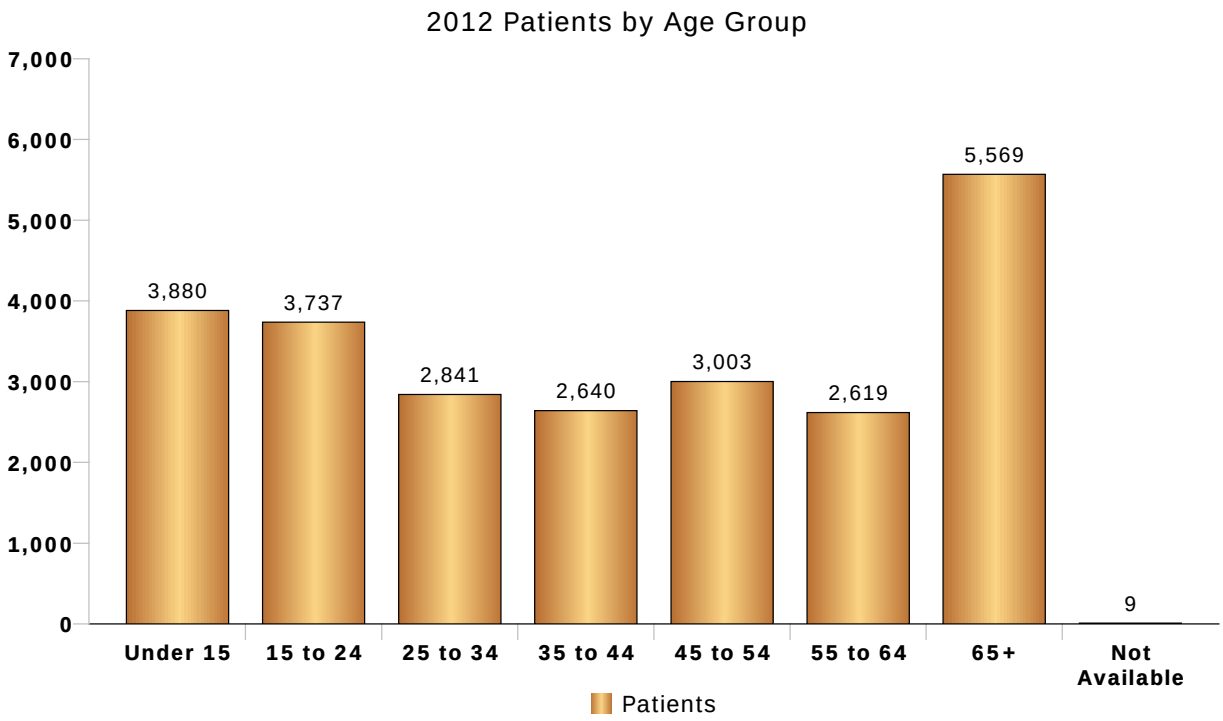
Patient's Treated for Traumatic Injury by Gender



	2008	2009	2010	2011	2012
Female	36%	37%	38%	38%	38%
Male	64%	63%	62%	62%	62%

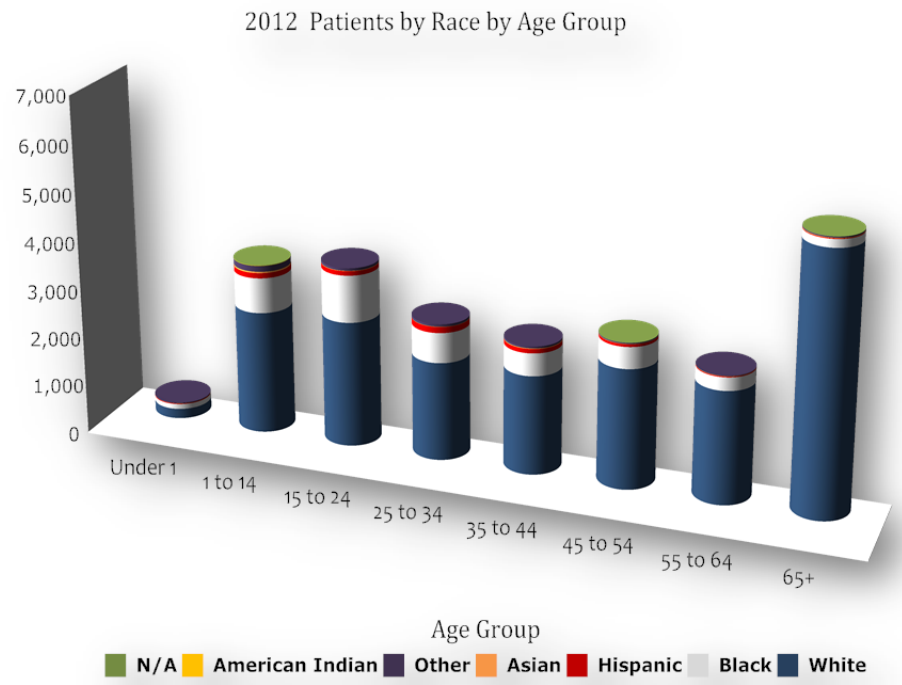
The ratio of male vs. female admits due to trauma has remained consistent for the past 5 years. Each year males account for a little more than 3 of 5 traumas while nearly 2 in 5 patients are female.

Figure 5:



Geriatric traumas account for 23% of all injuries treated in Tennessee trauma centers. More than 1 in every 5 persons was 65 or older.

Figure 6:



Age Group	N/A	American Indian	Other	Asian	Hispanic	Black	White
1 to 4	1	1	52	9	56	248	693
5 to 9	2	4	50	12	37	243	956
10 to 14	0	0	18	7	14	239	895
15 to 24	0	0	54	11	91	976	2,603
25 to 34	0	0	48	6	124	623	2,035
35 to 44	0	1	39	14	88	469	2,046
45 to 54	2	0	24	7	52	447	2,471
55 to 64	0	0	9	7	15	271	2,318
65+	3	1	23	10	12	166	5,355
Total	9	8	334	85	501	3786	19,575

Figure 7a:

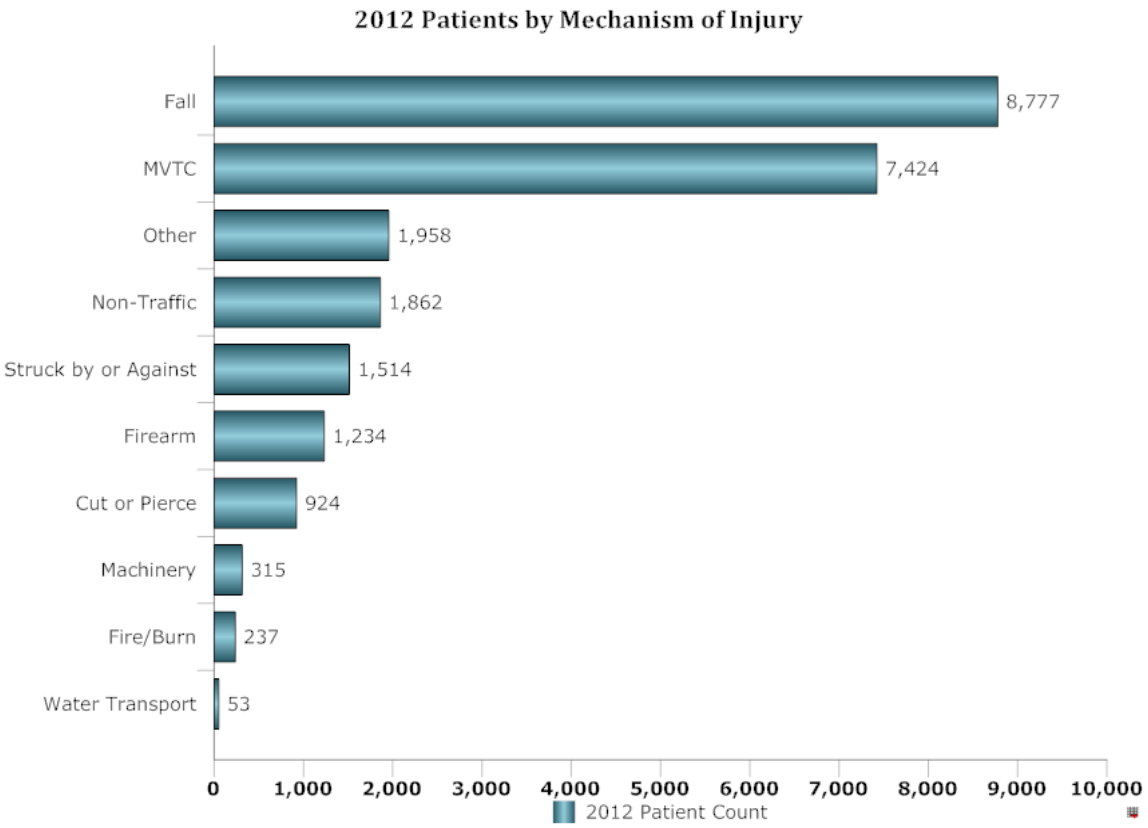


Figure 7b:

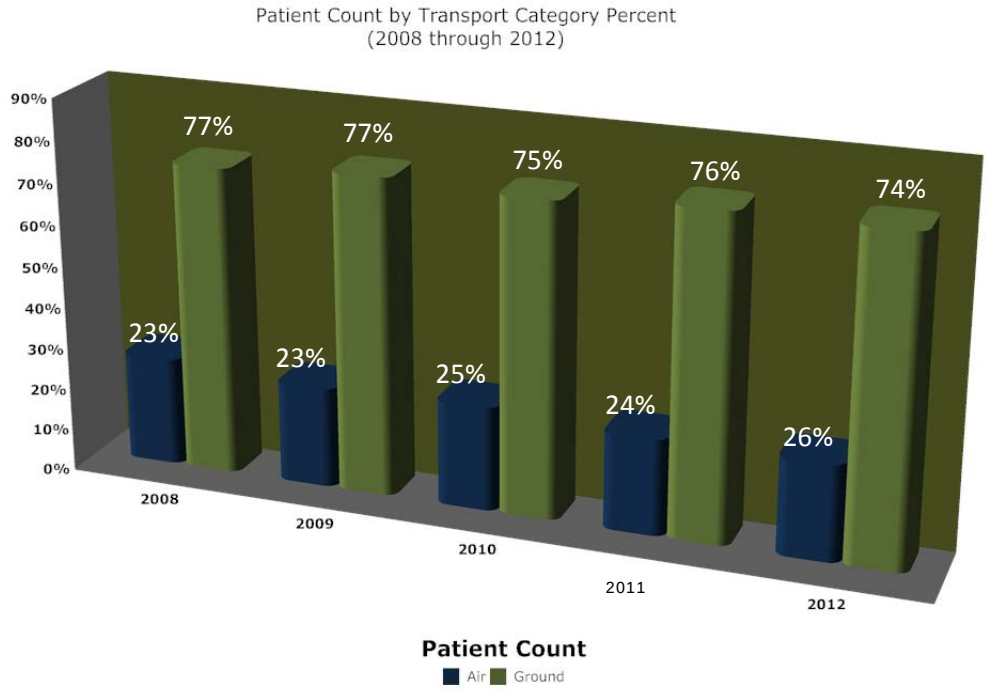


Figure 8:

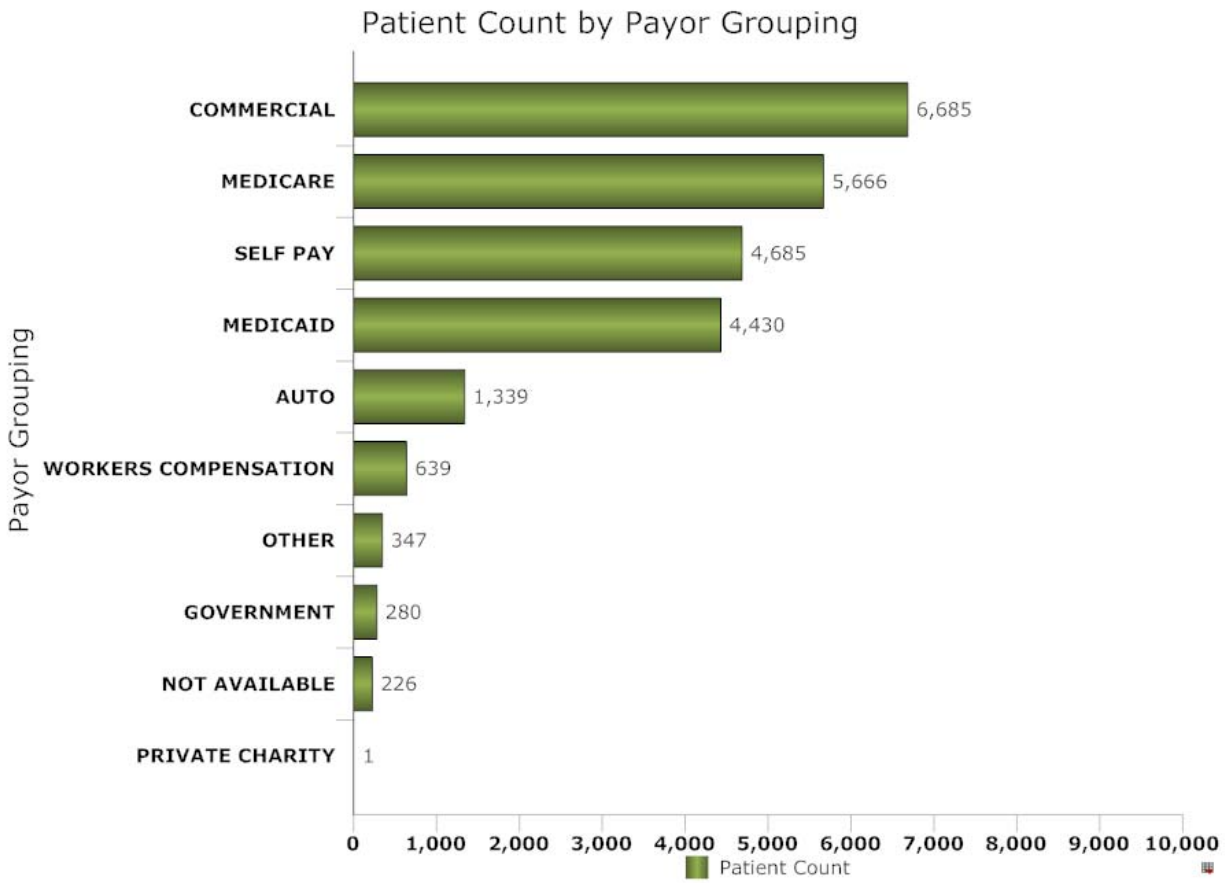

Patient Count by Payor Grouping
Payor Grouping
COMMERCIAL
6,685
MEDICARE
5,666
SELF PAY
4,685
MEDICAID
4,430
AUTO
1,339
WORKERS COMPENSATION
639
OTHER
347
GOVERNMENT
280
NOT AVAILABLE
226
PRIVATE CHARITY
1
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
9,000
10,000
Patient Count

Figure 9a:

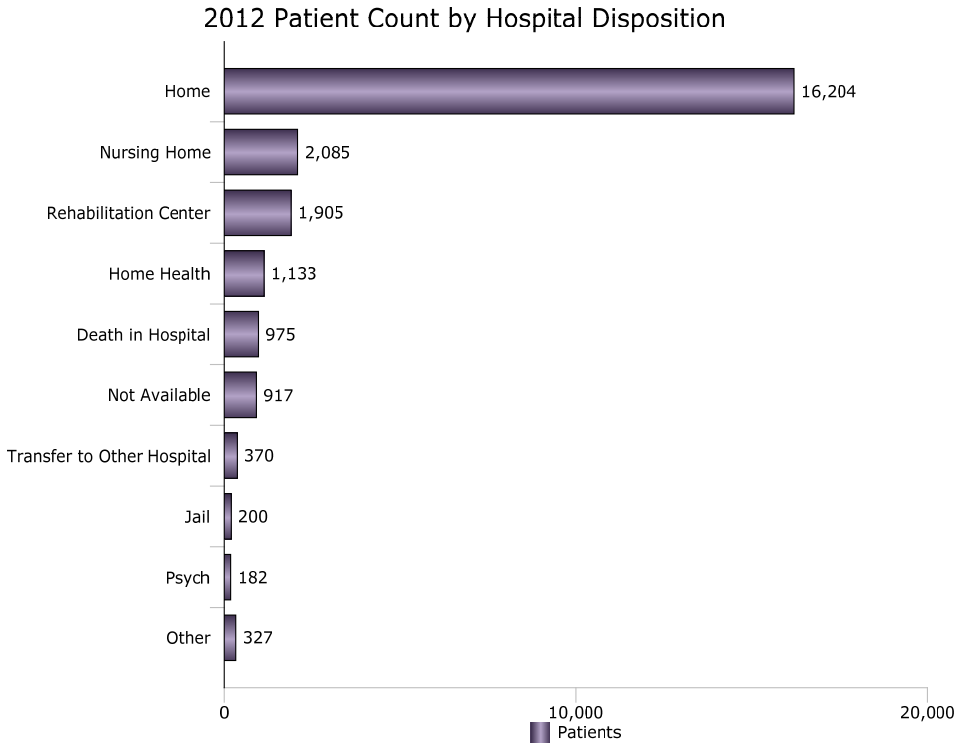


Figure 9b:

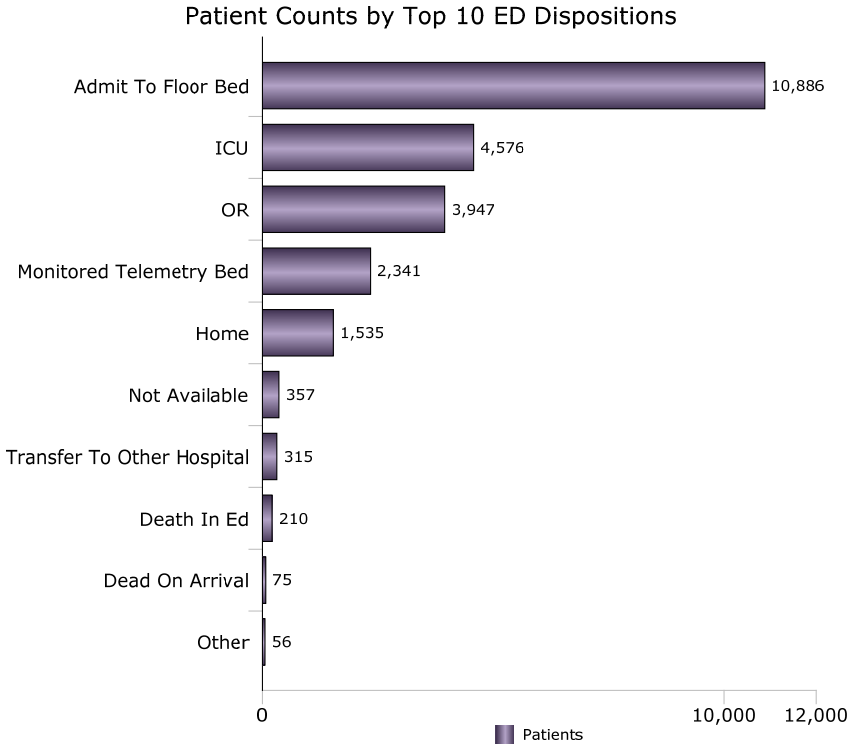
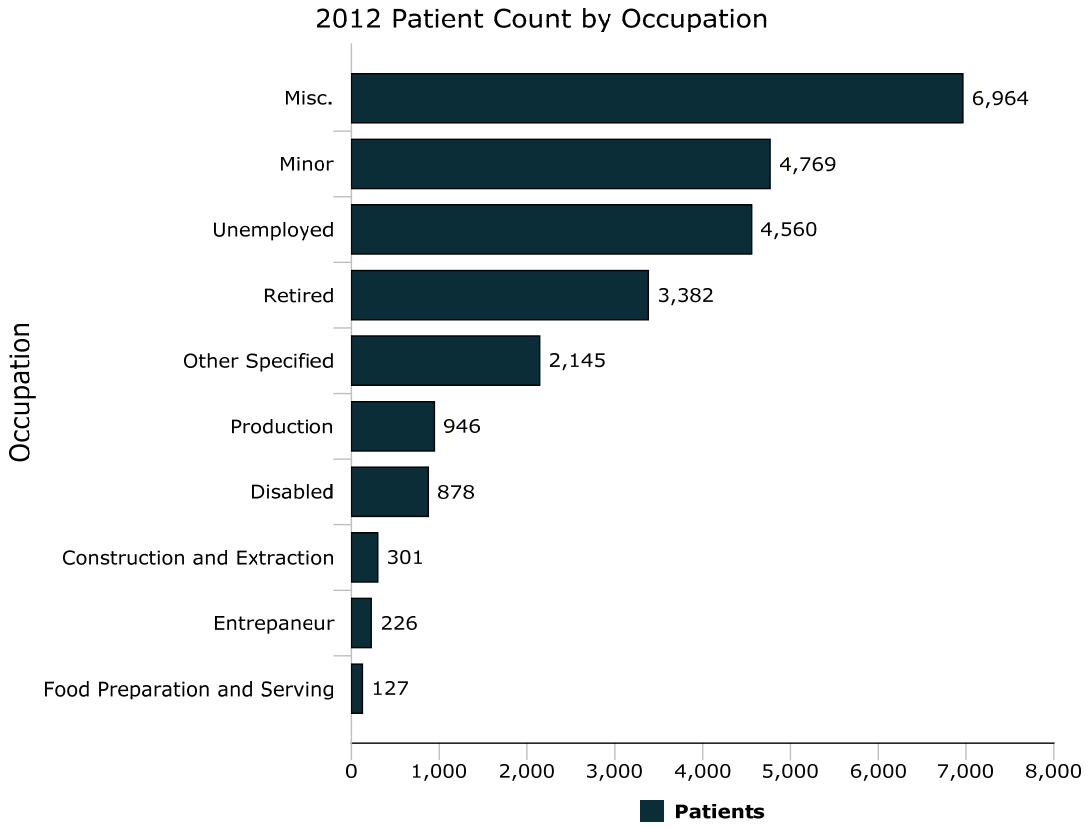


Figure 10:

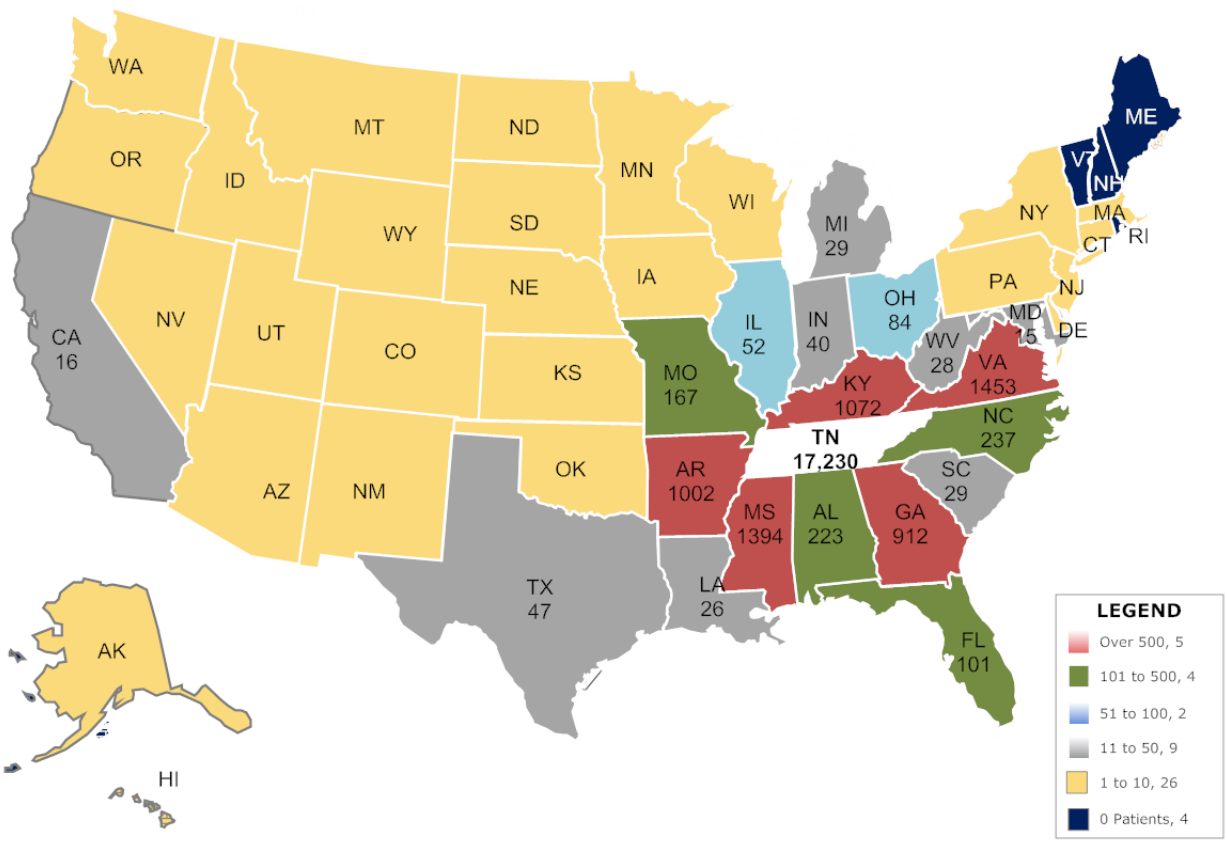


Occupations were grouped by Bureau of Labor SOC Occupation classes. “Misc.” (Less than 100 for each class) include:

Arts, Design, Entertainment, Sports and Media	Healthcare Support
Architecture and Engineering	Installation, Maintenance and Repair
Building and Grounds Cleaning and Maintenance	Legal
Business and Financial Operations	Management
Community and Social Service	Military
Computer and Mathematical	Office and Administrative Support
Education, Training and Library	Personal Care and Service
Farming, Fishing and Forestry	Protective Service
Government	Sales and Related
Healthcare Practitioners and Technical	Transportation and Material Moving

Figure 11:

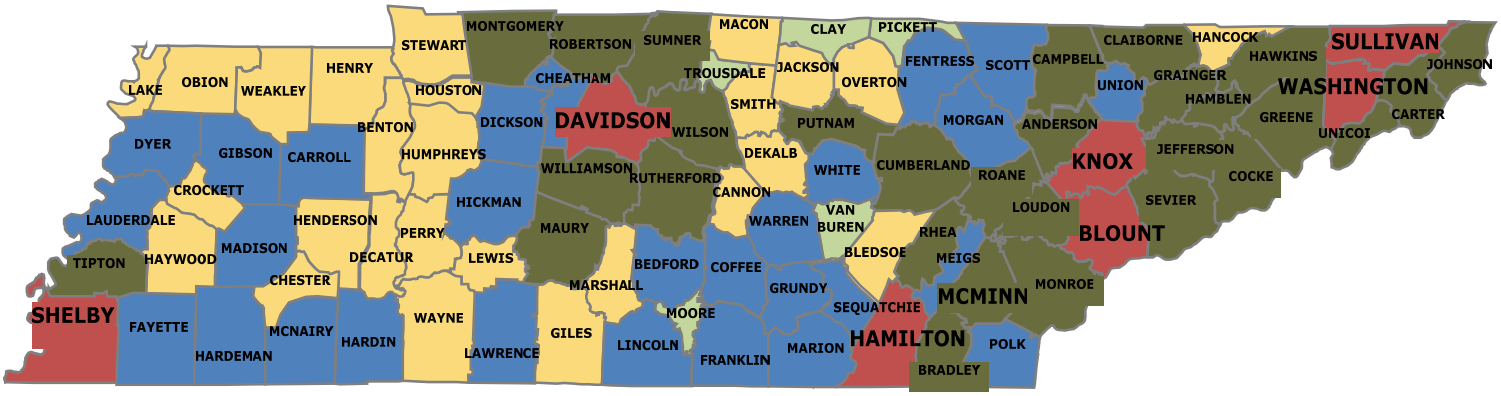
Resident & Non-Resident Patients Treated at *Tennessee Trauma Centers* in 2012



71% of trauma cases were Tennesseans; 29% of cases were residents of other states. Only 4 of the 50 states had no resident treated in a Tennessee trauma center.

Figure 12:

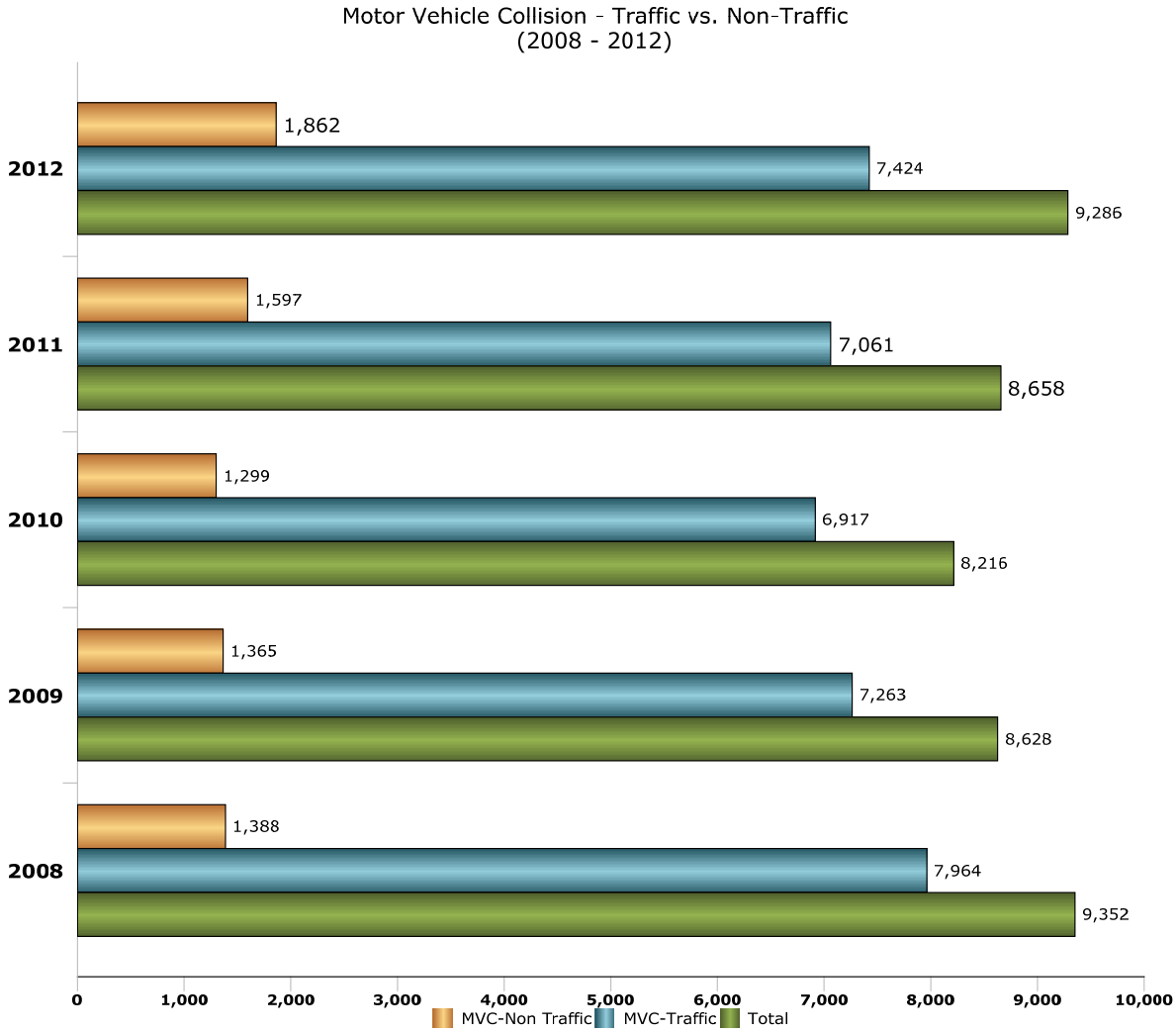
2012 Tennessee Resident Injuries by County



	1 to 10 patients	11 to 50 patients	51 to 100 patients	101 to 500 patients	over 500 patients
2012	5 counties	27 counties	27 counties	29 counties	7 counties
2011	5 counties	29 counties	29 counties	25 counties	7 counties

The number of traumatic injuries to Tennesseans increased by 8% from 15,953 in 2011 to 17,230 in 2012. On the average, injuries per county of residence grew by 13; however the largest spike occurred with Davidson County residents where an additional 204 were treated for trauma. No other county showed an increase exceeding 100 injuries. (The top 5 increases in injured residents subsequent to Davidson County occurred in Knox (84), Williamson (76), Rutherford (73), Shelby (68) and Wilson (68).

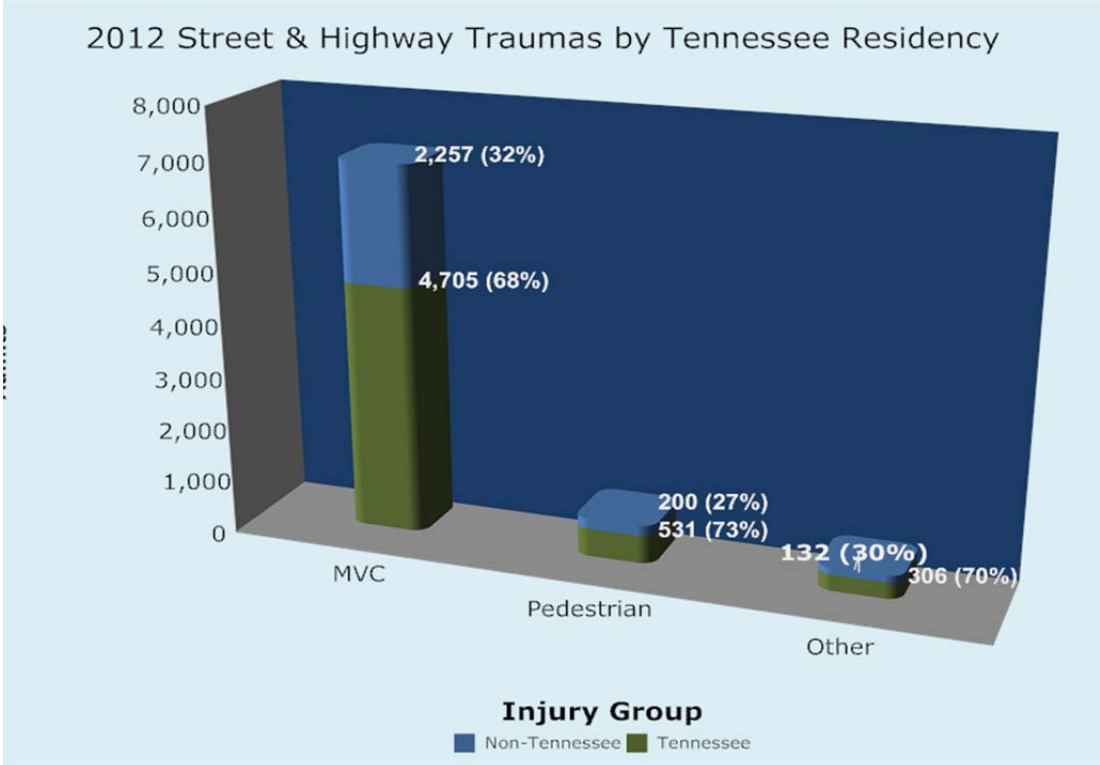
Figure 13:



*MVC non-traffic includes motorized vehicle such as ATV's, go-carts, watercraft, and others.
*MVC traffic includes motorized roadway vehicles

	2008	2009	2010	2011	2012
MVC-Non Traffic	1388	1365	1299	1597	1862
MVC-Traffic	7964	7263	6917	7061	7424
Total	9352	8628	8216	8658	9286

Figure 14:



		Streets & Highways									
		In Tennessee			Outside Tennessee			Residence Total by Class			
		MVC	Peds	Other	MVC	Peds	Other	MVC	Peds	Other	Total
Residence	Tennesseans	3990	478	249	715	53	57	4705	531	306	5542 (68%)
	Non-Tennesseans	395	43	11	1862	157	121	2257	200	132	2589 (32%)
	Location Total	4385	521	260	2577	210	178	**8131**			
	Location Percent	85%	10%	5%	87%	7%	6%	**100%**			
	Total by Location	5166 (64%)			2965 (36%)						

In 2012, 1 of 3 patients (8131) treated in Tennessee Trauma Centers were admitted due to injuries on streets and highways. 64% of these patients were injured on Tennessee roadways. 36% were injured outside of Tennessee, but treated in Tennessee trauma centers.

*MVC = Motor Vehicle Collision
*PEDS = Pedestrian

Figure 15:

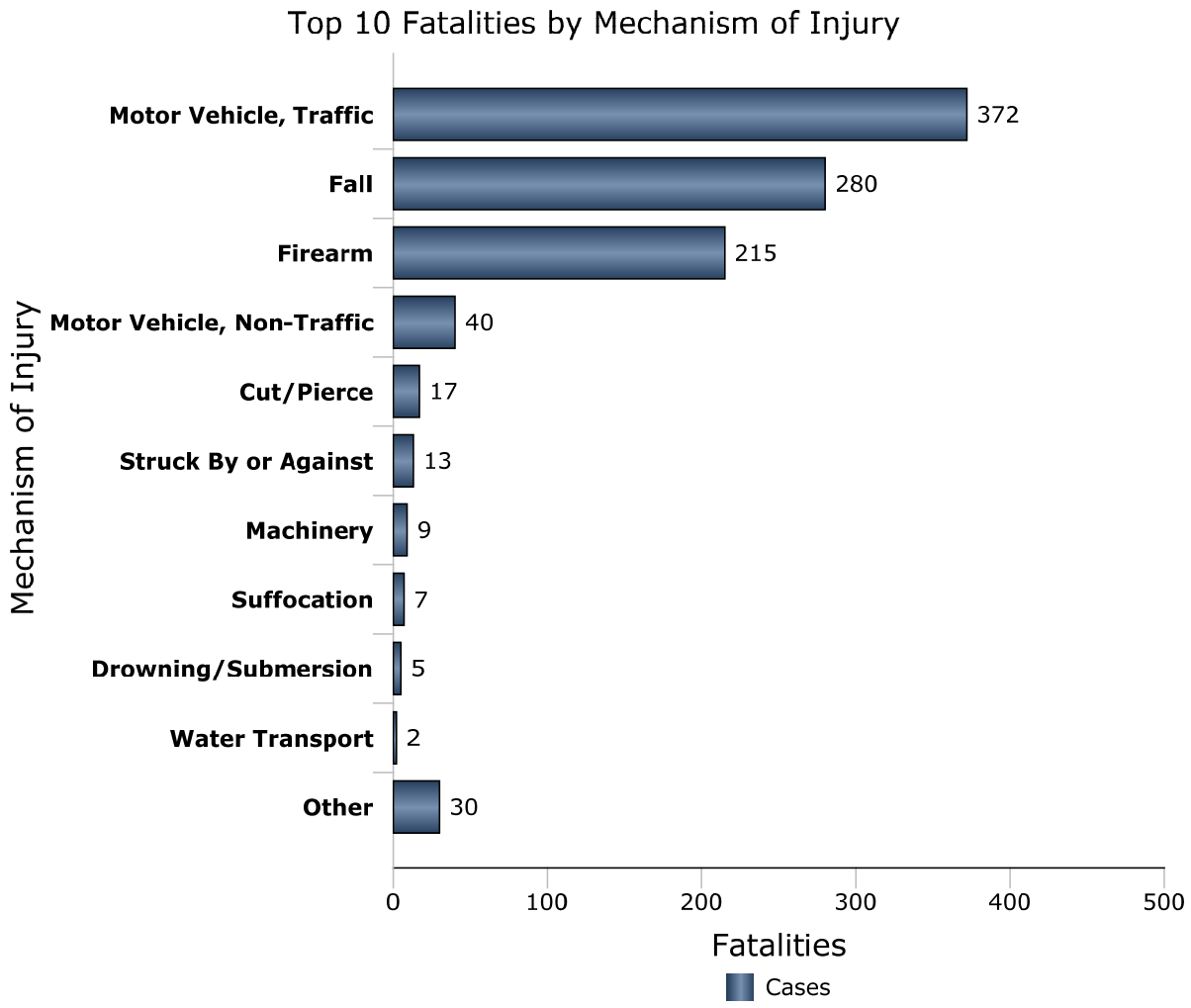
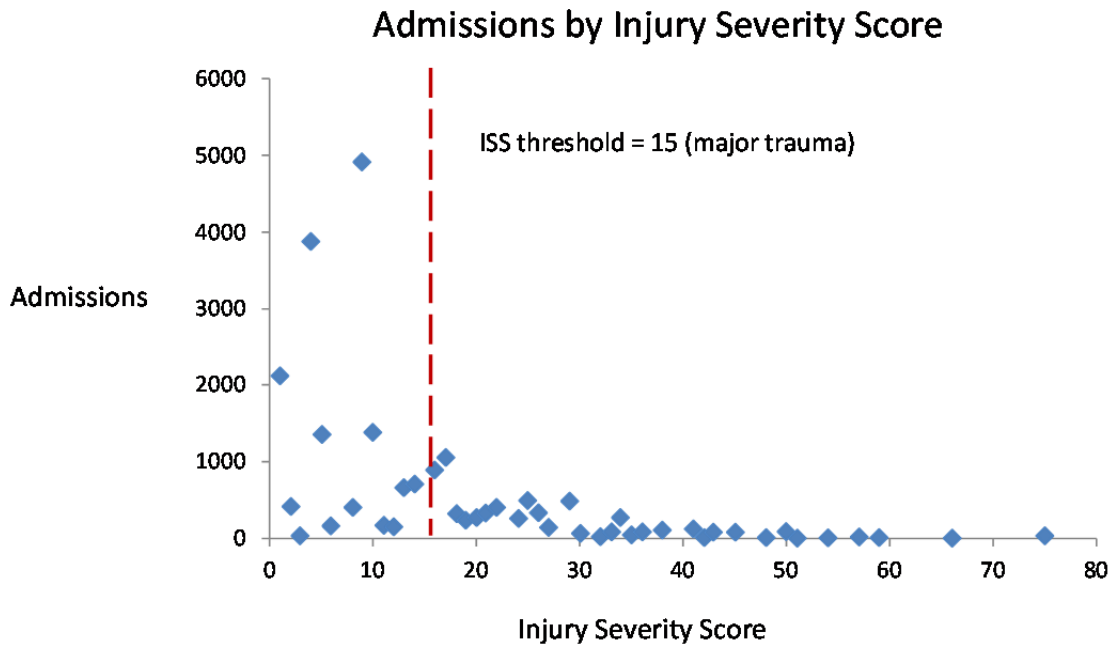

Top 10 Fatalities by Mechanism of Injury
Mechanism of Injury
Motor Vehicle, Traffic
372
Fall
280
Firearm
215
Motor Vehicle, Non-Traffic
40
Cut/Pierce
17
Struck By or Against
13
Machinery
9
Suffocation
7
Drowning/Submersion
5
Water Transport
2
Other
30
0
100
200
300
400
500
Fatalities
Cases

Figure 16:



Major trauma is commonly defined using an Injury Severity Score (ISS) threshold of 15. Sixty-seven percent (16,356) injuries fell below this threshold and twenty-six percent had ISS scores of 15 or higher. Six percent (1,534) were not available. Threshold note retrieved from (PMC U.S. National Library of Medicine, National institute of Health, http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3217501/

Appendix III:

2013 Trauma Fund Distribution

FUNDS DISTRIBUTED TO TRAUMA CENTERS AND NON-TRAUMA CENTERS FROM TENNESSEE TRAUMA FUND - FY2013 – 1st QUARTER DISTRIBUTION				
Level	**Hospital Name**	**Hospital Specific Pool Payment**	**Readiness Costs**	**Total Hospital Distribution Payment**
	TOTAL	$1,276,527.34	$835,000.00	$2,111,527.34
Lev I	Regional Medical Center at Memphis	$459,790.92	$97,250.00	$557,040.92
Lev I	Vanderbilt University Hospital	$352,942.93	$153,250.00	$506,192.93
Lev I	Erlanger Health System	$114,445.05	$153,250.00	$267,695.05
Lev I	University of Tennessee Medical Center	$92,405.89	$102,250.00	$194,655.89
Lev I	Johnson City Medical Center	$66,632.51	$72,500.00	$139,132.51
Lev I	Wellmont Holston Valley Medical Ctr.	$36,115.61	$72,500.00	$108,615.61
PED	LeBonheur Children Hospital	$10,470.94	$64,250.00	$74,720.94
Lev II	Wellmont Bristol Regional Med. Ctr.	$21,418.78	$37,750.00	$59,168.78
PED	East Tennessee Childrens Hospital	$0.00	$51,000.00	$51,000.00
Lev III	Blount Memorial Hospital	$4,680.17	$15,500.00	$20,180.17
Lev III	Athens Regional Medical Center	$1,093.97	$15,500.00	$16,593.97
	Jackson-Madison Cnty. General Hospital	$16,593.97		$16,593.97
	Methodist University Hospital	$16,593.97		$16,593.97
	Skyline Medical Center	$11,770.24		$11,770.24
	Middle Tennessee Medical Center	$8,209.06		$8,209.06
	Baptist Memorial Hospital-Memphis	$6,617.92		$6,617.92
	Methodist North Hospital	$4,540.06		$4,540.06
	Mercy Medical Center St. Mary's	$4,256.05		$4,256.05
	Parkwest Medical Center	$4,192.49		$4,192.49
	Cookeville Regional Medical Center	$3,863.88		$3,863.88
	Gateway Medical Center	$3,756.07		$3,756.07
	Southern Tennessee Medical Center	$3,537.20		$3,537.20
	Summit Medical Center	$3,127.51		$3,127.51
	Maury Regional Medical Center	$2,794.03		$2,794.03
	Saint Thomas Hospital	$2,688.75		$2,688.75
	Henry County Medical Center	$2,354.52		$2,354.52
	River Park Hospital	$1,971.97		$1,971.97
	Hendersonville Medical Center	$1,950.80		$1,950.80
	Memorial Health Care System	$1,782.86		$1,782.86
	Harton Regional Medical Center	$1,716.20		$1,716.20
	University Medical Center	$1,704.66		$1,704.66

	Heritage Medical Center	$1,507.99		$1,507.99
	Methodist Medical Center of Oak Ridge	$1,500.36		$1,500.36
	Sumner Regional Medical Center	$1,491.71		$1,491.71
	Southern Hills Medical Center	$1,471.71		$1,471.71
	Volunteer Community Hospital	$1,212.65		$1,212.65
	Memorial North Park Hospital	$1,120.02		$1,120.02
	Williamson Medical Center	$727.99		$727.99
	Indian Path Medical Center	$689.57		$689.57
	Dyersburg Regional Medical Center	$578.73		$578.73
	NorthCrest Medical Center	$450.30		$450.30
	Baptist Memorial Hospital-Union City	$444.60		$444.60
	Cumberland Medical Center	$402.68		$402.68
	Horizon Medical Center	$329.77		$329.77
	Roane Medical Center	$240.72		$240.72
	Laughlin Memorial Hospital	$225.19		$225.19
	LeConte Medical Center	$114.34		$114.34

FUNDS DISTRIBUTED TO TRAUMA CENTERS AND NON-TRAUMA CENTERS FROM TENNESSEE TRAUMA FUND - FY2013 – 2nd QUARTER DISTRIBUTION

Level	Hospital Name	Hospital Specific Pool Payment	Readiness Costs	Total Hospital Distribution Payment
	TOTAL	$1,116,315.67	$835,000.00	$1,951,315.67
Lev I	Regional Medical Center at Memphis	$447,940.37	$97,250.00	$545,190.37
Lev I	Vanderbilt University Hospital	$291,363.20	$153,250.00	$444,613.20
Lev I	Erlanger Medical Center	$119,413.09	$153,250.00	$272,663.09
Lev I	University of Tennessee Medical Center	$107,793.69	$102,250.00	$210,043.69
Lev I	Johnson City Medical Center	$71,824.76	$72,500.00	$144,324.76
Lev I	Wellmont Holston Valley Medical Center	$40,833.50	$72,500.00	$113,333.50
PED	LeBonheur Children's Medical Center	$3,427.23	$64,250.00	$67,677.23
PED	East Tennessee Childrens Hospital	.	$51,000.00	$51,000.00
Lev II	Wellmont Bristol Regional Medical Center	$8,761.19	$37,750.00	$46,511.19
Lev III	Blount Memorial Hospital	$1,312.11	$15,500.00	$16,812.11
Lev III	Athens Regional Medical Center	$1,056.12	$15,500.00	$16,556.12
	Skyline Medical Center	$8,291.28		$8,291.28
	Henry County Medical Center	$3,486.94		$3,486.94
	Maury Regional Medical Center	$3,385.57		$3,385.57
	Methodist Medical Center of Oak Ridge	$1,991.94		$1,991.94
	Williamson Medical Center	$1,286.15		$1,286.15
	Skyridge Medical Center Main	$831.58		$831.58

	Cumberland Medical Center	$674.24		$674.24
	Southern Tennessee Medical Center	$604.99		$604.99
	Horizon Medical Center	$511.41		$511.41
	Memorial North Park Hospital	$431.90		$431.90
	Sweetwater Hospital Association	$428.51		$428.51
	University Medical Center	$403.94		$403.94
	Dyersburg Regional Medical Center	$261.94		$261.94

FUNDS DISTRIBUTED TO TRAUMA CENTERS AND NON-TRAUMA CENTERS FROM TENNESSEE TRAUMA FUND - FY2013 – 3rd QUARTER DISTRIBUTION

Level	Hospital Name	Hospital Specific Pool Payment	Readiness Costs	Total Hospital Distribution Payment
	TOTAL	$1,255,390.50	$835,000.00	$2,090,390.50
Lev I	Regional Medical Center at Memphis	$446,327.60	$97,250.00	$543,577.60
Lev I	Vanderbilt University Hospital	$373,328.48	$153,250.00	$526,578.48
Lev I	Erlanger Medical Center	$116,330.67	$153,250.00	$269,580.67
Lev I	University of Tennessee Medical Center	$119,954.24	$102,250.00	$222,204.24
Lev I	Johnson City Medical Center	$70,041.49	$72,500.00	$142,541.49
Lev I	Wellmont Holston Valley Medical Center	$51,397.54	$72,500.00	$123,897.54
PED	LeBonheur Children's Medical Center	$8,660.63	$64,250.00	$72,910.63
PED	East Tennessee Childrens Hospital	$0.00	$51,000.00	$51,000.00
Lev II	Wellmont Bristol Regional Medical Center	$12,666.22	$37,750.00	$50,416.22
Lev III	Blount Memorial Hospital	$1,548.99	$15,500.00	$17,048.99
Lev III	Athens Regional Medical Center	$1,256.57	$15,500.00	$16,756.57
	Jackson-Madison County General Hospital	$16,756.57		$16,756.57
	Skyline Medical Center	$5,785.37		$5,785.37
	Baptist Memorial Restorative Care Hospital	$5,776.34		$5,776.34
	Heritage Medical Center	$4,153.23		$4,153.23
	Williamson Medical Center	$3,576.77		$3,576.77
	LeConte Medical Center	$3,423.15		$3,423.15
	Henry County Medical Center	$2,742.80		$2,742.80
	Horizon Medical Center	$2,524.21		$2,524.21
	Southern Tennessee Medical Center	$2,520.80		$2,520.80
	Memorial North Park Hospital	$1,680.79		$1,680.79
	Baptist Memorial Hospital-Union City	$1,382.22		$1,382.22
	Cumberland Medical Center	$1,279.89		$1,279.89
	Methodist Medical Center of Oak Ridge	$1,174.03		$1,174.03
	University Medical Center	$1,101.88		$1,101.88

FUNDS DISTRIBUTED TO TRAUMA CENTERS AND NON-TRAUMA CENTERS FROM TENNESSEE TRAUMA FUND - FY2013 – 4th QUARTER DISTRIBUTION

Level	Hospital Name	Hospital Specific Pool Payment	Readiness Costs	Total Hospital Distribution Payment
	TOTAL	$1,328,376.62	$835,000.00	$2,163,376.62
Lev I	Regional Medical Center at Memphis	$510,198.46	$97,250.00	$607,448.46
Lev I	Vanderbilt University Hospital	$330,269.47	$153,250.00	$483,519.47
Lev I	Erlanger Medical Center	$129,771.67	$153,250.00	$283,021.67
Lev I	University of Tennessee Medical Center	$134,298.33	$102,250.00	$236,548.33
Lev I	Johnson City Medical Center	$85,060.29	$72,500.00	$157,560.29
Lev I	Wellmont Holston Valley Medical Center	$36,541.24	$72,500.00	$109,041.24
PED	LeBonheur Children's Medical Center	$2,355.72	$64,250.00	$66,605.72
PED	East Tennessee Childrens Hospital	.	$51,000.00	$51,000.00
Lev II	Wellmont Bristol Regional Medical Center	$10,702.04	$37,750.00	$48,452.04
Lev III	Blount Memorial Hospital	$3,409.00	$15,500.00	$18,909.00
Lev III	Athens Regional Medical Center	$1,314.27	$15,500.00	$16,814.27
	Methodist Healthcare-Memphis Hospitals	$16,422.91		$16,422.91
	Jackson-Madison Cnty. General Hospital	$16,413.33		$16,413.33
	Skyline Medical Center	$7,941.40		$7,941.40
	Maury Regional Medical Center	$7,685.39		$7,685.39
	Summit Medical Center	$4,749.15		$4,749.15
	Parkwest Medical Center	$3,685.77		$3,685.77
	Cookeville Regional Medical Center	$3,332.67		$3,332.67
	Horizon Medical Center	$2,992.48		$2,992.48
	Southern Hills Medical Center	$2,601.45		$2,601.45
	Williamson Medical Center	$2,430.15		$2,430.15
	Henry County Medical Center	$2,186.83		$2,186.83
	Roane Medical Center	$2,169.79		$2,169.79
	Baptist Memorial Hospital-Collierville	$2,167.90		$2,167.90
	Methodist Medical Center of Oak Ridge	$1,876.77		$1,876.77
	NorthCrest Medical Center	$1,647.11		$1,647.11
	Tennova Healthcare	$1,510.76		$1,510.76
	LeConte Medical Center	$1,342.50		$1,342.50
	Southern Tennessee Medical Center	$922.61		$922.61
	Sumner Regional Medical Center	$741.03		$741.03
	Cumberland Medical Center	$599.46		$599.46
	Hendersonville Medical Center	$570.65		$570.65
	University Medical Center	$465.98		$465.98

Trauma Fund Disbursement Totals Since Inception

	Fiscal Year	Trauma Fund Disbursement Totals
*Start of Trauma Fund	**FY2008**	$9,086,822.57
	FY2009	$9,192,013.69
	FY2010	$8,973,548.13
	FY2011	$8,762,345.31
	FY2012	$8,328,132.57
	FY2013	$8,316,610.13

$770,212 below initial disbursement when trauma fund started

Appendix IV:

Research Publications

1. Sharpe JP, Weinberg JA, Magnotti LJ, Croce MA, Fabian TC. Toward a better definition of massive transfusion: focus on the interval of hemorrhage control. J Trauma Acute Care Surg. 2012 Dec;73(6):1553-7. doi: 10.1097/TA.0b013e3182660119. PubMed PMID: 23032813.

2. Sharpe JP, Magnotti LJ, Weinberg JA, Zarzaur BL, Shahan CP, Parks NA, Fabian TC, Croce MA. Impact of location on outcome after penetrating colon injuries. J Trauma Acute Care Surg. 2012 Dec;73(6):1428-32; discussion 1433. doi: 10.1097/TA.0b013e31825bff06. PubMed PMID: 22914082.

3. Parks NA, Magnotti LJ, Weinberg JA, Zarzaur BL, Schroeppel TJ, Swanson JM, Fabian TC, Croce MA. Use of the clinical pulmonary infection score to guide therapy for ventilator-associated pneumonia risks antibiotic overexposure in patients with trauma. J Trauma Acute Care Surg. 2012 Jul;73(1):52-8; discussion 58-9. doi: 10.1097/TA.0b013e31825ac37b. PubMed PMID: 22743372.

4. Stapley R, Owusu BY, Brandon A, Cusick M, Rodriguez C, Marques MB, Kerby JD, Barnum SR, Weinberg JA, Lancaster JR Jr, Patel RP. Erythrocyte storage increases rates of NO and nitrite scavenging: implications for transfusion-related toxicity. Biochem J. 2012 Sep 15;446(3):499-508. doi: 10.1042/BJ20120675. PubMed PMID: 22720637; PubMed Central PMCID: PMC3572541.

5. Sharpe JP, Weinberg JA, Magnotti LJ, Maclennan PA, Schroeppel TJ, Fabian TC, Croce MA. Accounting for differences in transfusion volume: Are all massive transfusions created equal? J Trauma Acute Care Surg. 2012 Jun;72(6):1536-40. doi: 10.1097/TA.0b013e318251e253. PubMed PMID: 22695418.

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Performance, and Technology Assessment, 83180M (February 20, 2012); doi: 10.1117/12.913639

9. Sams VG, Lawson CM, Coan P, Bemis D, Newkirk K, Karlstad M, Norwood J, Barlow P, Goldman MH, Daley BJ. "Effect of local anesthetic on microorganisms in a murine model of surgical site infection." J Trauma Acute Care Surg. 2012 Aug;73(2):441-6. PMID:22846953

10. Sams VG, Lawson CM, Humphrey CL, Brantley SL, Schumacher LM, Karlstad MD, Norwood JE, Jungwirth JA, Conley CP, Kurek S, Barlow PB and Daley BJ. "Effect of Rotational Therapy on Aspiration Risk of Enteral Feeds" Nutr Clin Pract 2012 27(6):808 - 811.epublished 19 October 2012, DOI:10.1177/0884533612462897

11. Xia H, Daley BJ, Petrie A and Zhao X. "A Neural Network Model for Mortality Prediction in ICU" Computing in Cardiology 2012; 39:261-264. ISSN 0276-6574

12. Alterman DM, Heidel RE, Daley BJ, Grandas OH, Stevens SL, Goldman MH, Freeman MB. "Contemporary outcomes of vertebral artery injury: A 10-year single-center experience." J Vasc Surg. 2012 Dec 7. doi:pii: S0741-5214(12)01946-5. 10.1016/j.jvs.2012.09.006. [Epub ahead of print] PMID:23219513

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16. Burke SJ, Goff MR, Lu D, Proud D, Karlstad MD, and Collier JJ. Synergistic Expression of the CXCL10 Gene in Response to IL-1β and γ-IFN requires NF-κB, Phosphorylation of STAT1 at Tyr701, and Acetylation of Histones H3 and H4. J Immunol. 2013 Jul 1;191(1):323-36.

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27. Adams RC, Gunter OL, Wisler JR et al. Dynamic changes in respiratory frequency/tidal volume may predict failures of ventilatory liberation in patients on prolonged mechanical ventilation and normal preliberation respiratory frequency/tidal volume values. Am Surg 2012; 78:69-73.

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51. Young TR, Buckalew R, May AK et al. A low dimensional dynamical model of the initial pulmonary innate response to infection. Math Biosci 2012; 235:189-200.