

Trauma Care Advisory Council

Trauma Care in Tennessee

A Report to the 2011 108th General Assembly

Tennessee Department of Health

Trauma Care Advisory Council

December 12, 2011

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STATE OF TENNESSEE
DEPARTMENT OF HEALTH
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December 12, 2011

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,

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2011 EXECUTIVE SUMMARY

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. Fortunately for Tennesseans, the 6 Level I centers are well-distributed geographically across the state such that all of its citizens are within 100 air miles.

Over the course of the past 20 years the Tennessee Trauma System has continued to mature. The trauma centers across the state provide more than just trauma care – they 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. This year, the Board for Licensing Health Care Facilities has promulgated new rules for designation of trauma centers in Tennessee, raising the bar for quality care of injured Tennesseans. These regulations require that Level I trauma centers have the resources available to care for the severely injured including fully staffed operating rooms, lab and radiologic capabilities, intensive care units, and professional personnel in-house and available on a moment's notice. 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.

The TCAC, in conjunction with the Department of Health, has 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. From 2007 thru 2009, more than 170,000 Tennesseans were treated in Tennessee hospitals after an injury and of those 53% were treated in Tennessee designated trauma centers. A person from every county in Tennessee was treated at a Tennessee trauma center. The overwhelming majority of those injured were the result of blunt trauma including motor vehicle crashes and falls.

This annual 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 project 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.

The importance of access to a trauma center after injury should not be under estimated. Trauma centers provide life saving care above and beyond that provided by non-trauma center hospitals. The benefits of receiving care in a trauma center are highlighted in the 2006 study “A National Evaluation of the Effect of Trauma-Center Care on Mortality” published in

the New England Journal of Medicine. The authors found that treatment at a trauma center reduced the risk of death by 25% compared to treatment at a non-trauma center. On average, nearly 7000 Tennesseans are deprived of this life saving care every year since they are not treated at a trauma center after suffering an injury. This highlights the need for additional trauma centers across the state of Tennessee.

In conclusion, this annual report speaks volumes about those centers 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

INJURY PREVENTION IN TENNESSEE

The ultimate goal of injury prevention in Tennessee is to reduce the burden of injury to all Tennesseans by working collaboratively with partners to prevent the injuries before they occur. To achieve this goal the Centers for Disease Control (CDC) – Injury Response Unit awarded the Tennessee Department of Health a Core Injury Surveillance, Prevention and Control Grant. The national organization, Safe States Alliance (formerly State and Territorial Injury Prevention Directors Association), has provided recommendations for core competencies that build capacity to support effective state injury prevention programs. While it provides a framework and standards for the prevention of injuries, it is not enough.

During the years 2003-2009, over 32,000 Tennesseans died from an injury. On the average, there were 13 deaths daily in Tennessee resulting from motor vehicle crashes, falls, poisonings, suicides, fires, and drowning (TN – Health Statistics Data). Treatment costs for these injury related hospitalizations and emergency department visits in 2007 was \$2.1 billion. Falls and motor vehicle crashes accounted for 67 percent of the total cost.

The loss of a life is always tragic, especially when the death occurs to someone young. In Tennessee, if someone dies before the age of 44 it is most likely the result of an unintentional injury. The common misconception about these deaths is that they could not have been prevented. Therefore, there is a need to increase awareness about injuries and encourage behaviors that reduce deaths, hospitalizations and emergency department visits related to injury. There is a need to provide proactive outreach and education to inform all Tennesseans that injuries are preventable. The example below illustrates the comparison between the approach to prevent disease and illness to the strategies commonly used to prevent injury.

Pre-Event	Event	Post -Event	Gov't/Media Response
Illness: Education on methods to reduce Swine Flu: Cough into sleeve; Wash Hands; Inoculation for the illness. Schools send home information with students.	Keep exposed children home from school to avoid further spread of the illness. Intake of fluids and medication to minimize symptoms.	Monitor the progress of affected person. Take to the physician's office or hospital if needed.	Funding to support prevention of the illness; inoculation development; production of materials to create awareness; and strong media response.
Injury: Provide education on the prevention of the number one cause of death for children – motor vehicle crashes. There is no requirement to provide safety education in the classroom.	Child is wearing a seatbelt (or properly restrained) to minimize their risk of injury or death. Child less than 12 is in the backseat of the vehicle to prevent death and or injury from deployment of airbag.	Emergency response teams arrive on the wreck scene early and work to get injured person(s) to the closest trauma center where highly trained medical teams can begin life saving treatment and/or surgeries.	Little or no funding is provided to support education or resources needed to create awareness about the #1 cause of death for individuals ages 1-44 nationally (and in Tennessee) The media reports only deaths which are referred to as "accidents" and are not viewed as preventable.

In 2005, the Commissioner's Council for Injury Prevention and Control was established. This state wide injury community planning group (ICPG) is collaborating to ensure the following in Tennessee: (1) There is a continued focus on the prevention of injury and deaths from injury; (2) There is a strategic injury reduction plan which outlines strategies (locally and statewide) to effectively reduce injuries and deaths from injury; (3) There are policies in

place that ensure the safety and well being of all Tennesseans; (4) There is the needed infrastructure to ensure that all targeted high risk populations are being reached; (5) There is sufficient funding to ensure that all phases of the injury event (pre, event, post) and their strategies are viewed as equal in importance as the proactive response given to disease and illness prevention; (6) There is a requirement for an educational campaign that will result in saving lives, minimizing costs and reducing human suffering.

The Commissioner's Council has identified the following injury and violence prevention priorities for 2011 – 2016. They are motor vehicle crashes (all ages), older adult falls, poisoning (related to prescription and synthetic drug usage), shaken baby syndrome and sleep related deaths. Because Tennessee Trauma Centers are at the forefront of the care of the injured person, the Tennessee Trauma Care Advisory Council, the Tennessee Committee on Trauma and the Committee on Pediatric Emergency Care have been working collaboratively with the Commissioner's Council to develop and implement multilevel strategies for the prevention of injuries that fulfill necessary requirements associated with being a designated trauma center in Tennessee. These strategies include the following activities: 1) Collect and analyze injury data; 2) Research, design and implement interventions at multiple levels; 3) Build capacity and a solid infrastructure for the implementation of injury prevention initiatives; 4) Provide technical support and training; and 5) Evaluate the effectiveness of strategies.

Examples of some of the injury prevention efforts going on through designated Trauma Centers and Comprehensive Regional Pediatric Centers throughout the state of Tennessee:

- **Safe Kids Coalitions** - Educating families, providing safety devices to families in need and advocating for better laws to help keep children safe, healthy and out of the emergency room.
- **Trauma Nurses Talk Tough** – Educating teens on the consequences of making bad choices while driving.
- **Pedestrian Safety** – Grant that impacts pedestrian safety issues.
- **Trauma Prevention Guides** – Targeting 12-18 year olds at school functions, health fairs and community events on the use of seatbelts, helmets and fall related injury prevention.
- **Battle of the Belt** – Teen driver program that encourages seat belt usage and discourages risky teen behavior such as text messaging.
- **ATV & Teen Motor Vehicle Safety** – Implemented through hospital based efforts as well as community collaborations. Programs piloted and implemented are evidence based and research driven.
- **The Safety Store** - The first of its kind in Tennessee. Open to the public, it carries a wide variety of low-cost safety products for children of all ages and needs. Products range from bicycle helmets to child passenger safety seats and cabinet locks. Trained Safety Store educators are on-hand to educate consumers on the proper use and maintenance of products as well as make recommendations depending on their unique needs and situation.

PEDIATRIC TRAUMA CARE

The state legislature unanimously passed the TN EMSC (Emergency Medical Services for Children) legislation in 1998 and revised in 2007 creating a standing committee on pediatric emergency care (CoPEC) which reports directly to both the Board for Licensing Health Care Facilities (BLHCF) and the Emergency Medical Services Board (EMSB). CoPEC holds primary responsibility for the pediatric trauma system and interfaces with the Trauma Care Advisory Council by having pediatric representation from CoPEC as members of TCAC.

A comprehensive strategic plan was included in last year's annual report.

Below is a brief synopsis of the efforts toward reaching the five goals and their respective objectives. For further details please refer <http://www.tnemsc.org/Publications>

The five goals include:

1. To exceed the national EMSC performance measures. Statement of Direction: EMSC performance measures are part of the foundation for providing quality pediatric emergency care.
 - In order to measure the effectiveness of federal grant programs, the Health Resources and Services Administration (HRSA) requires grantees to report on specific performance measures related to their grant funded activities. The measures are part of the [Government Performance Results Act \(GPRA\)](#). Below are the required performance measures for the Emergency Medical Services for Children program.
2. To expand membership orientation and leadership capacity to address the various components to TN EMSC including CoPEC.
3. To develop and integrate a statewide disaster plan for children.
 - This task force has been challenged with mapping how disaster management in Tennessee is organized with respect to caring for pediatric patients. Unfortunately, this task force's research to date has discovered that the current disaster organizational and command structures within the state do not adequately address care of the pediatric patient in a disaster. The task force has also been researching how best to address this deficiency and currently there is not a streamlined way to integrate delivery of pediatric disaster care in the state's system. CoPEC is committed to supporting the agencies that are ultimately responsible for caring for Tennessee's pediatric population during a disaster. This task force will continue to research and implement the integration of pediatric disaster care within the state's current disaster organizational and command structures.
4. Use education (including publications) to support, develop, and disseminate current best practice for emergency medical services for children.
5. Develop specific communication tools to drive and promote TN EMSC's mission to our members and communities.

6. The Needs of the State Committee on Pediatric Emergency Care

- Assistance with the integration of pediatrics into the state disaster plans.
- Since 1994, CoPEC members have provided their own travel and per diem expenses. In light of the current fiscal environment, the members are willing to continue to provide travel and per diem as in-kind support. If in the future funding is more available, then CoPEC would like to have this position reconsidered.
- Support from the Department of Health to accomplish the strategic plan found at <http://www.tnemsc.org/Publications>

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:

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

Trauma System Infrastructure

Robert Seesholtz has been hired as the State Trauma System Manager in August 2010 and has assumed responsibility 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

Readiness costs vary annually for each designated Trauma Center. While the fund cannot realistically compensate centers for these costs, certain key elements must be in place to ensure state designation is maintained by state statute. 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 2011 this portion of the fund was approximately \$8,762,345.31. **Appendix III** shows the payments made to eligible hospitals for calendar years 2009 thru 2011.

TRAUMA REGISTRY

The Tennessee Trauma Registry is the data repository for patients treated at the 9 participating trauma centers and the 4 comprehensive regional pediatric centers. The first full year of data submissions was in 2007 and includes data through June 30, 2011. The following reports were generated using data from trauma registry for calendar years 2007 through 2010 and typically represent the average of injured patients treated at trauma centers over the course of these four years.

Since only 53% of injured Tennesseans are treated in Tennessee trauma centers, the Hospital Discharge database was used to get a sense of the overall burden of injury in Tennessee. Hospital Discharge Data are derived from every hospital admission in Tennessee and are the data that are reported to the Centers for Disease Control for national comparisons. A comparison between injury rates in Tennessee and national injury rates using hospital discharge data are shown in Figure 1.

Trauma Registry Profile

Average Annual Submissions: 20737

Number of Adult Facilities: 9

Number of Pediatric Facilities 4

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.

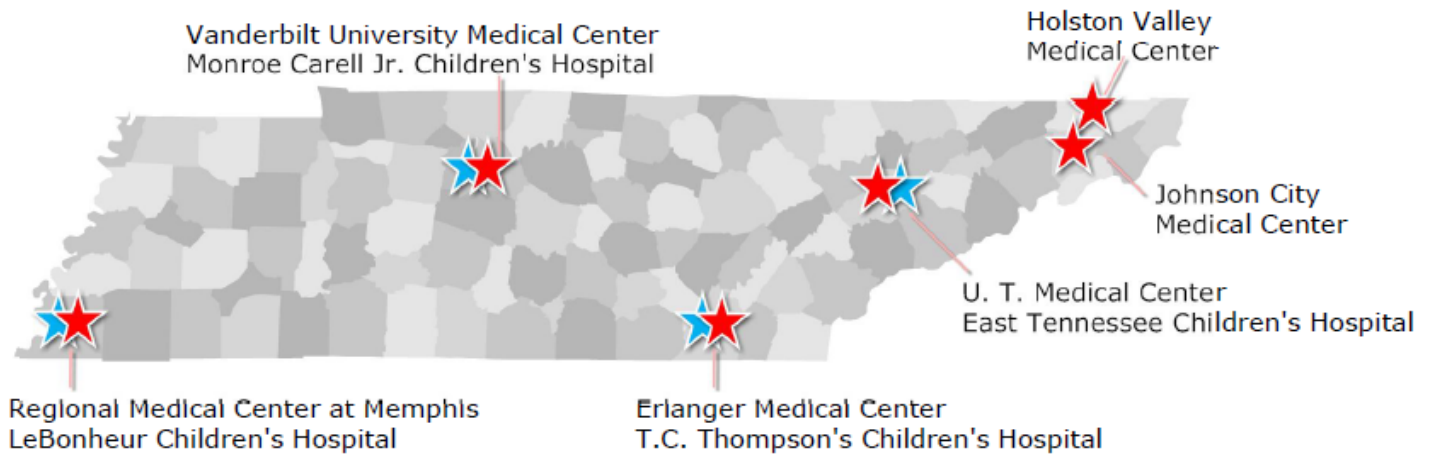
RESEARCH

Level 1 Trauma Centers are charged with performing research. These endeavors spur improvements in care on an ongoing basis. **Appendix IV** represents just a sample of state wide research publication efforts.

Appendix I:

Trauma Center Location & Level Designation

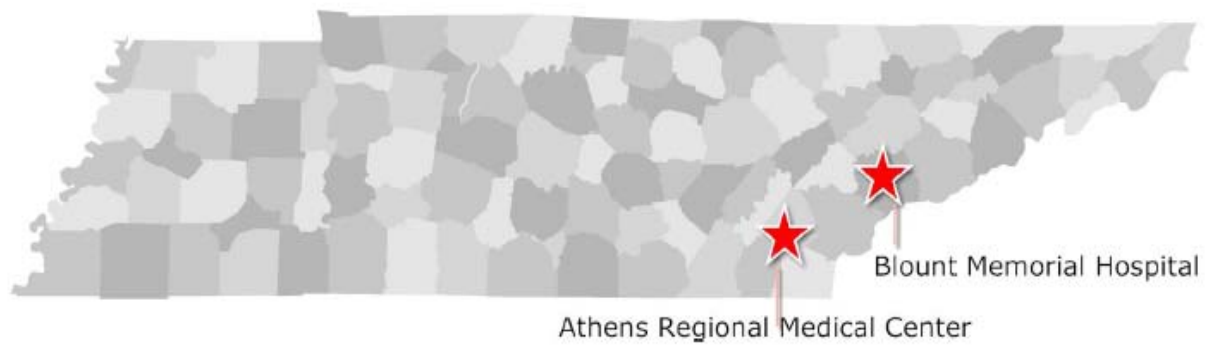
Level I



Level II



Level III



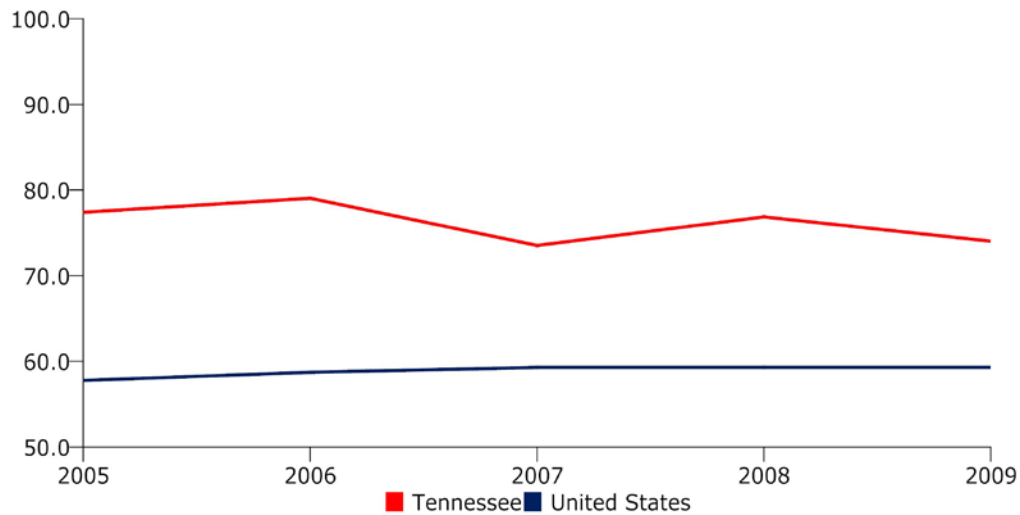
Appendix II:

Trauma Registry Reports

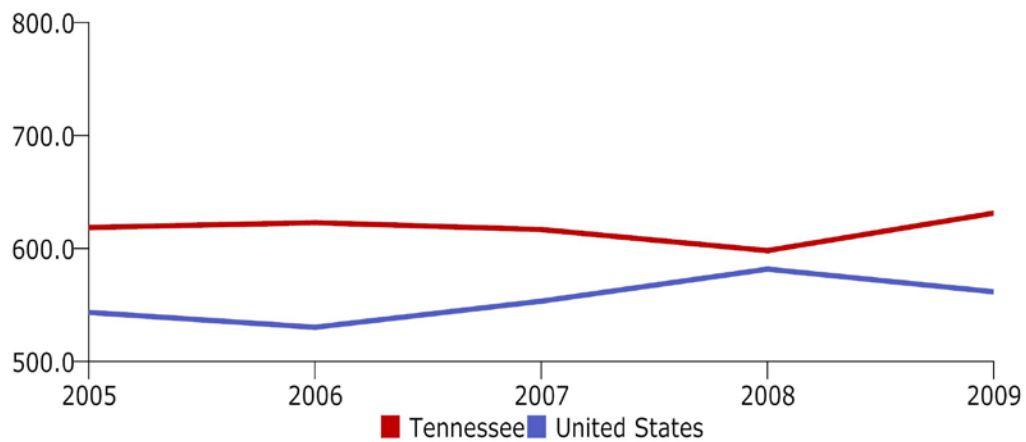
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Figure 1:

Tennessee vs. United States
Death Rate per 100,000
2005 through 2009



Tennessee vs. United States
Injury Death Rate per 100,000
2005 through 2009



Source: Tennessee Department of Health, Division of Health Statistics (Hospital Discharge Data)

WISQARS – CDC Injury Center

Produced by: Tennessee Department of Health, EMS & Division of Health Facilities

Figure 2:

4-year Average of
Tennessee Trauma Registry Injury Counts by County
(2007 through 2010)

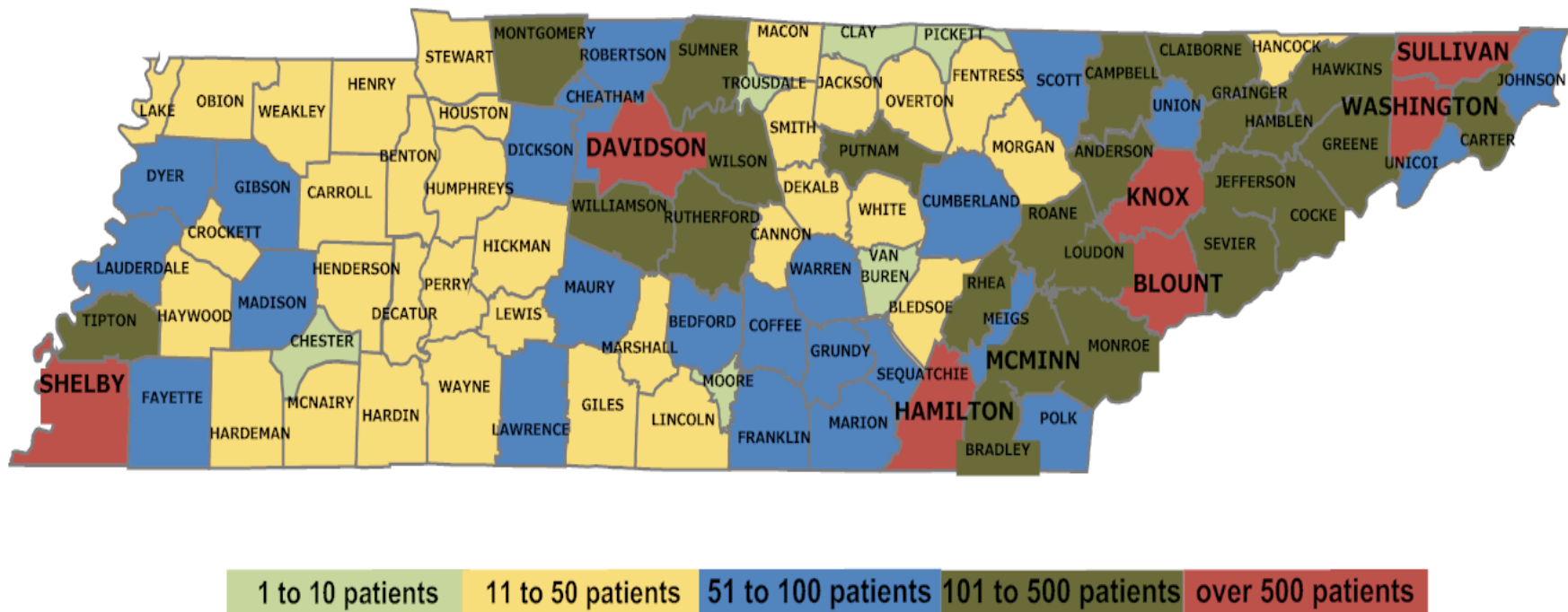


Figure 3:
4-year Injury Average by Resident County Treated at Trauma Centers
2007 through 2010

Patient County	Avg. Co Injuries	Avg. Co Population
Anderson	148	73,811
Bedford	62	44,928
Benton	18	16,510
Bledsoe	45	13,215
Blount	609	120,844
Bradley	189	95,368
Campbell	144	41,191
Cannon	23	13,731
Carroll	34	29,352
Carter	232	59,402
Cheatham	65	40,061
Chester	9	16,334
Claiborne	122	31,746
Clay	8	8,107
Cocke	163	35,751
Coffee	77	52,631
Crockett	14	14,645
Cumberland	96	53,535
Davidson	758	586,743
Decatur	13	11,456
DeKalb	40	18,707
Dickson	77	47,606
Dyer	63	38,258
Fayette	70	37,086
Fentress	45	17,704
Franklin	67	41,905
Gibson	51	48,664
Giles	29	29,523
Grainger	109	22,904
Greene	260	66,659
Grundy	71	14,630
Hamblen	195	61,874
Hamilton	921	314,752
Hancock	34	6,765
Hardeman	41	28,805
Hardin	44	26,385
Hawkins	290	57,784
Haywood	22	19,518
Henderson	24	27,128
Henry	40	32,086
Hickman	40	24,580
Houston	16	8,151
Humphreys	29	18,624
Jackson	11	11,084
Jefferson	174	50,751
Johnson	90	18,295
Knox	1297	417,709
Lake	11	7,422

Patient County	Avg. Co Injuries	Avg. Co Population
Lauderdale	67	27,292
Lawrence	60	41,530
Lewis	16	11,813
Lincoln	27	33,205
Loudon	178	45,470
Macon	33	22,219
Madison	53	97,521
Marion	62	28,114
Marshall	34	29,561
Maury	96	80,217
McMinn	278	52,928
McNairy	34	25,920
Meigs	80	11,946
Monroe	209	45,281
Montgomery	130	151,074
Moore	5	6,156
Morgan	50	20,388
Obion	39	32,377
Overton	30	20,955
Perry	14	7,711
Pickett	6	4,924
Polk	56	16,026
Putnam	106	69,666
Rhea	120	30,809
Roane	177	53,742
Robertson	87	64,264
Rutherford	174	238,158
Scott	73	22,381
Sequatchie	93	13,344
Sevier	330	83,922
Shelby	2450	923,928
Smith	29	19,218
Stewart	21	13,412
Sullivan	1047	153,574
Sumner	140	153,740
Tipton	138	59,236
Trousdale	10	7,969
Unicoi	95	17,753
Union	72	19,695
Van Buren	8	5,469
Warren	72	40,755
Washington	750	116,019
Wayne	20	17,041
Weakley	34	33,558
White	48	24,816
Williamson	150	168,549
Wilson	102	107,496
Average Total	14882	6,145,861

Figure 4a:

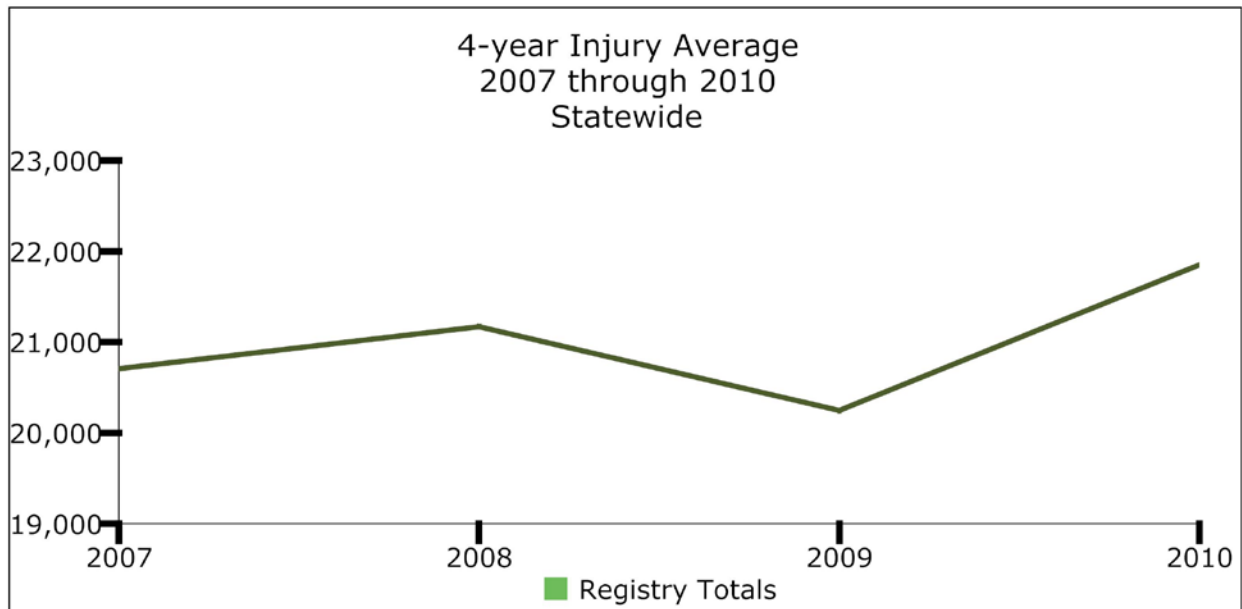


Figure 4b:

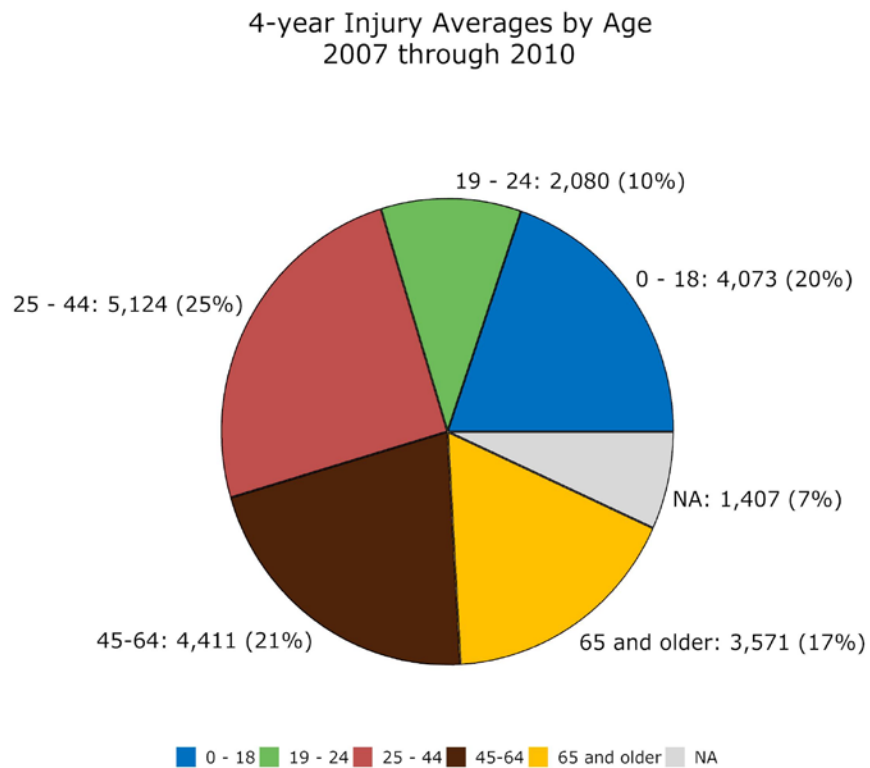


Figure 5a:

**4-year Injury Averages by Race
2007 through 2010**

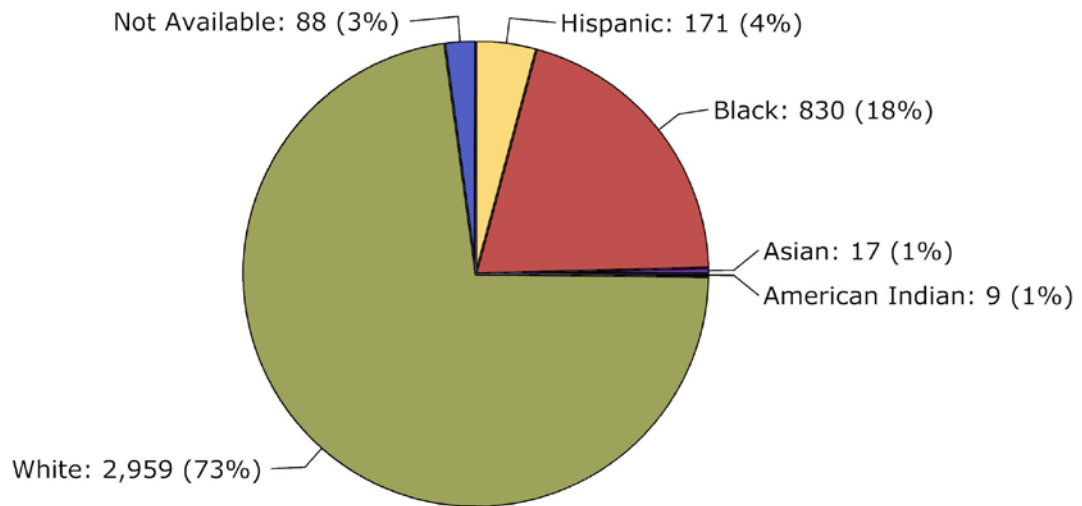


Figure 5b:

4-year Injury Averages by Race and Age Group

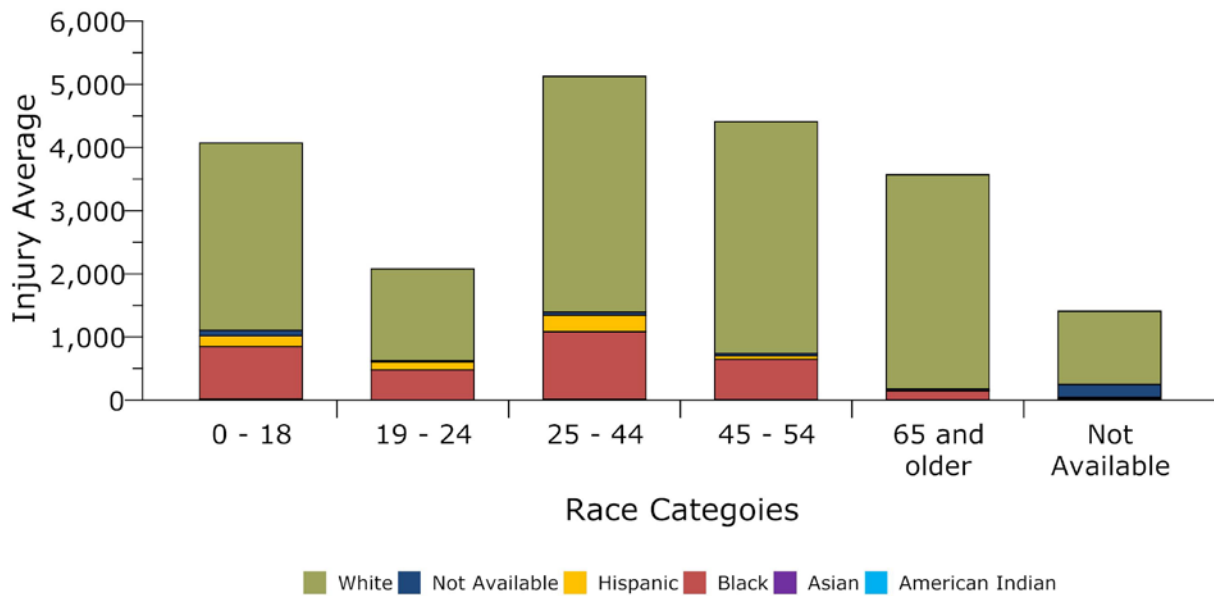


Figure 6a:

4-year Injury Averages by Gender
2007 through 2010

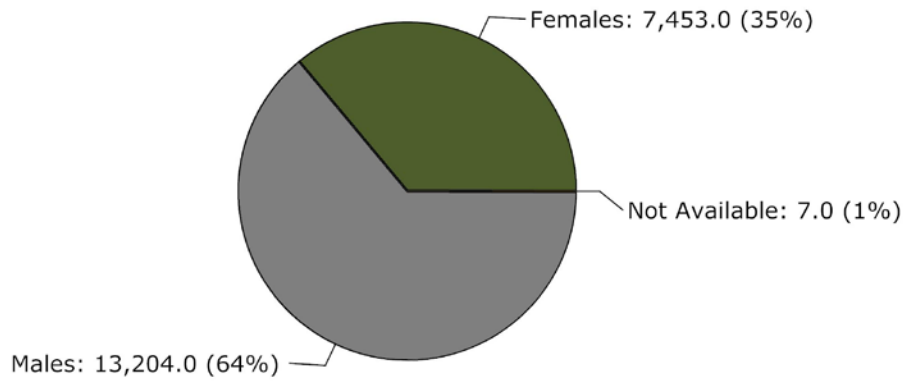


Figure 6b:

4-year Injury Averages by Gender and Age Group

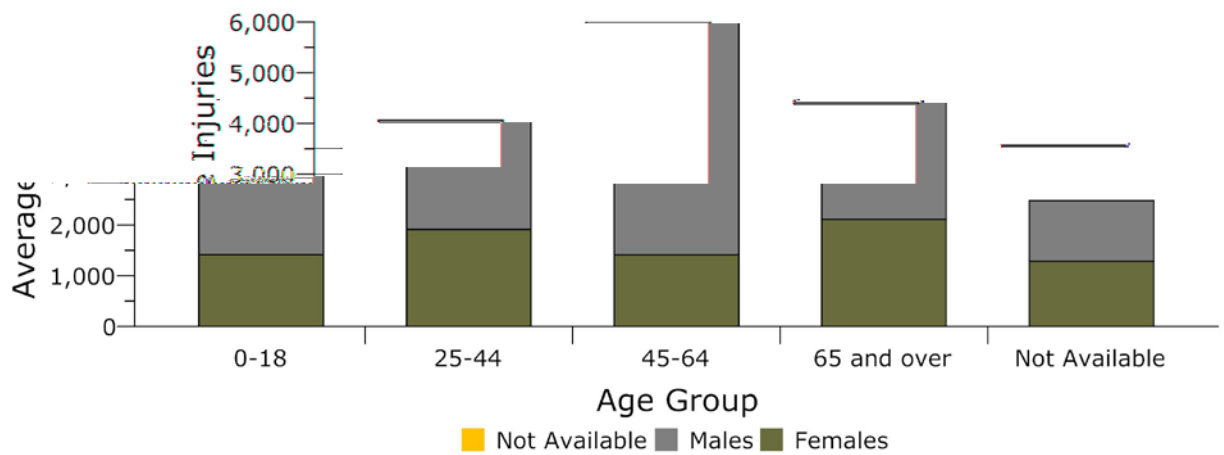


Figure 7a:

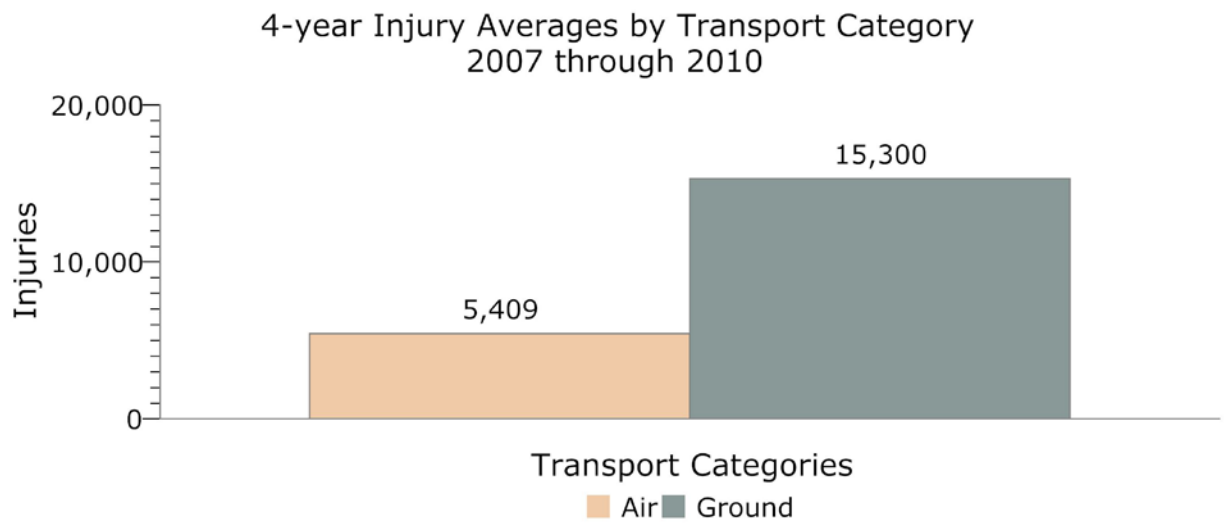


Figure 7b:

4-year Injury Averages by State Geographical Grand Divisions
2007 through 2010

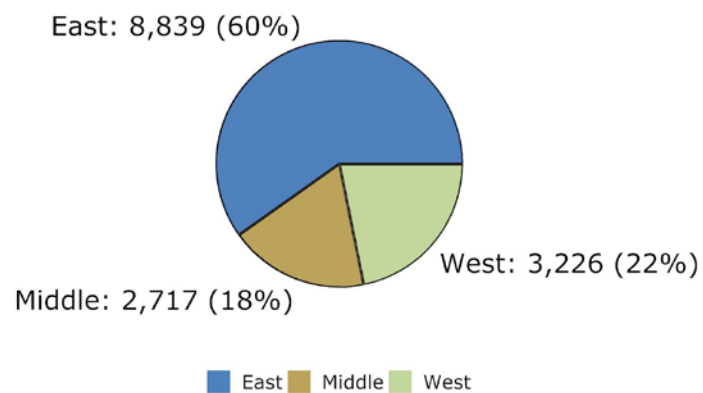


Figure 8:

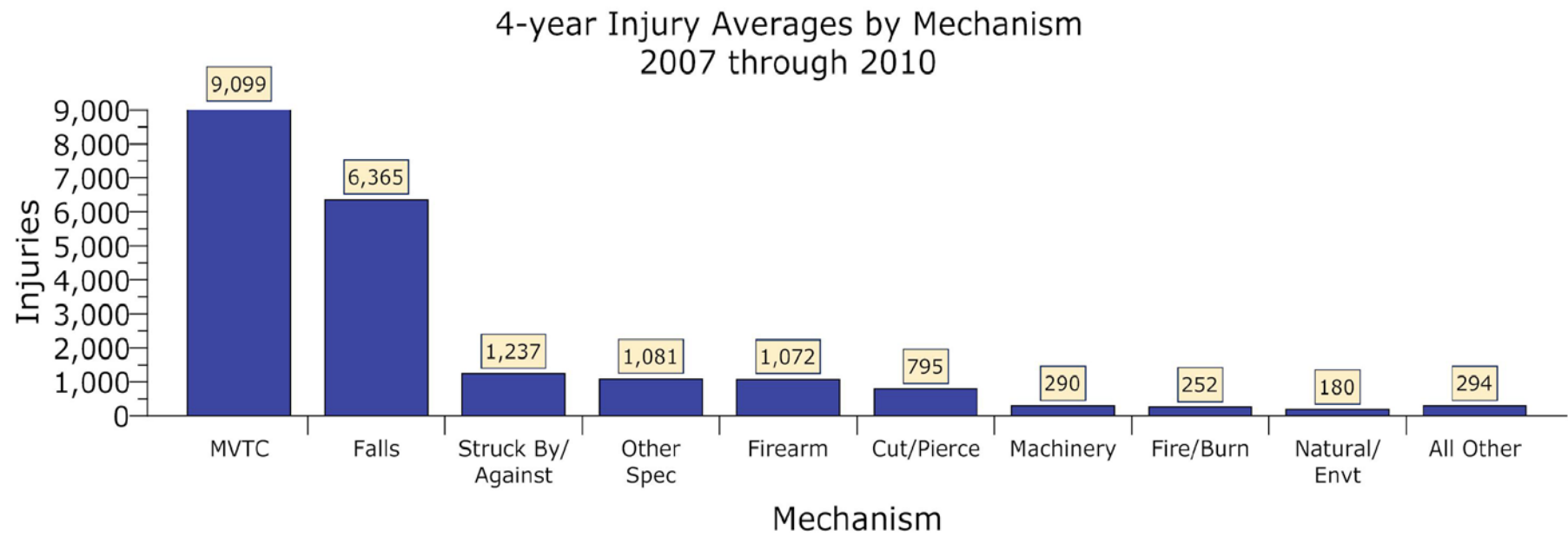
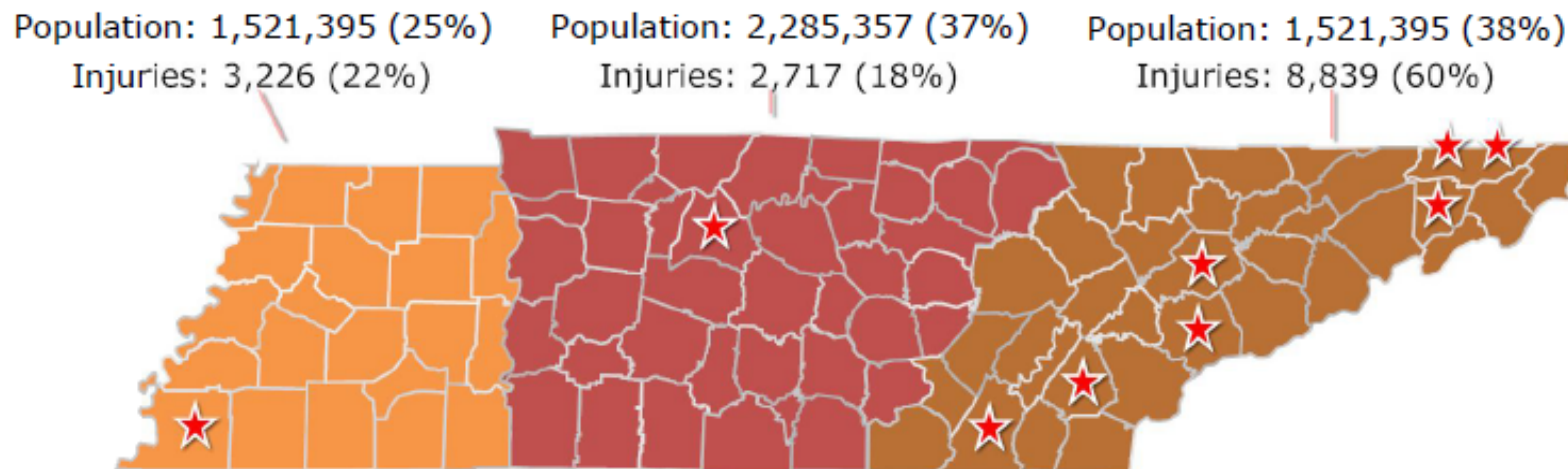


Figure 9:

4-year Average Population and Injury Averages per State Geographical Grand Divisions



★ Tennessee Trauma Center Locations

	West	Middle	East
Average TN Population Percent	25%	37%	38%
Average TN Injury Percent	22%	18%	60%
Number of Trauma Centers (Adult)	1	1	7

Figure 10a:

4-year Injury Averages by ED Disposition
2007 through 2010

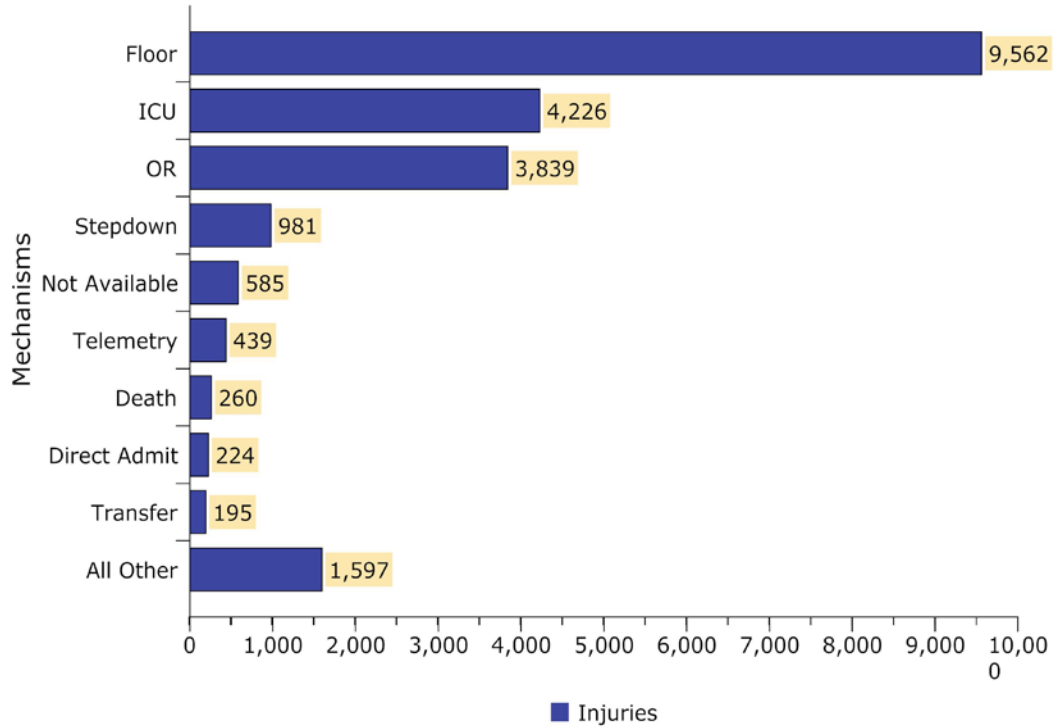


Figure 10b:

Top Ten Annual Injury Average by
Hospital Disposition
2007 through 2010

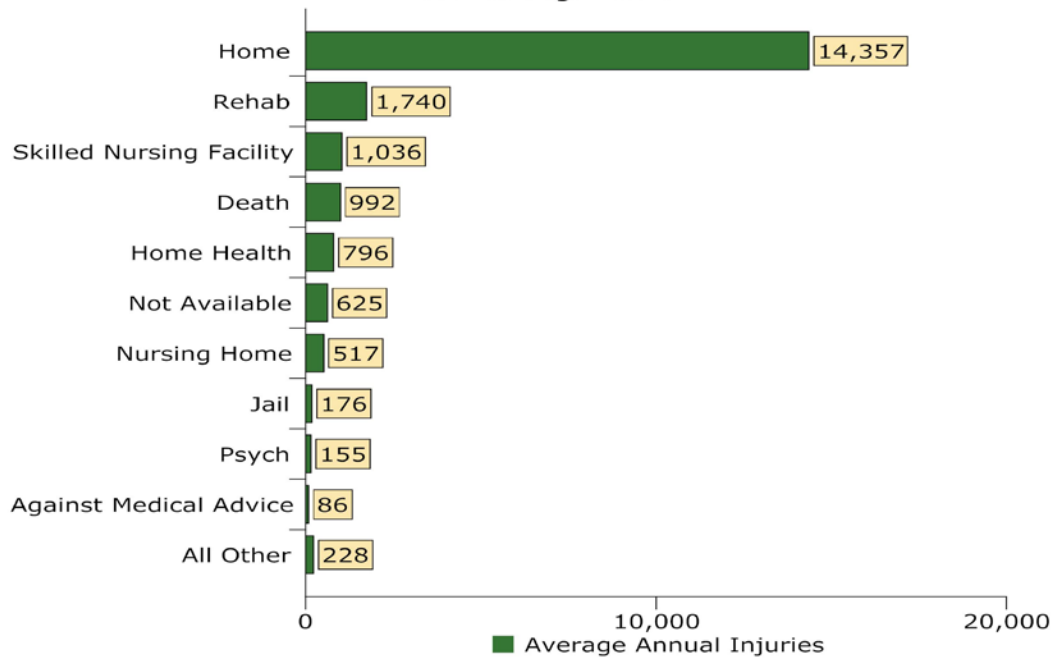


Figure 11a:

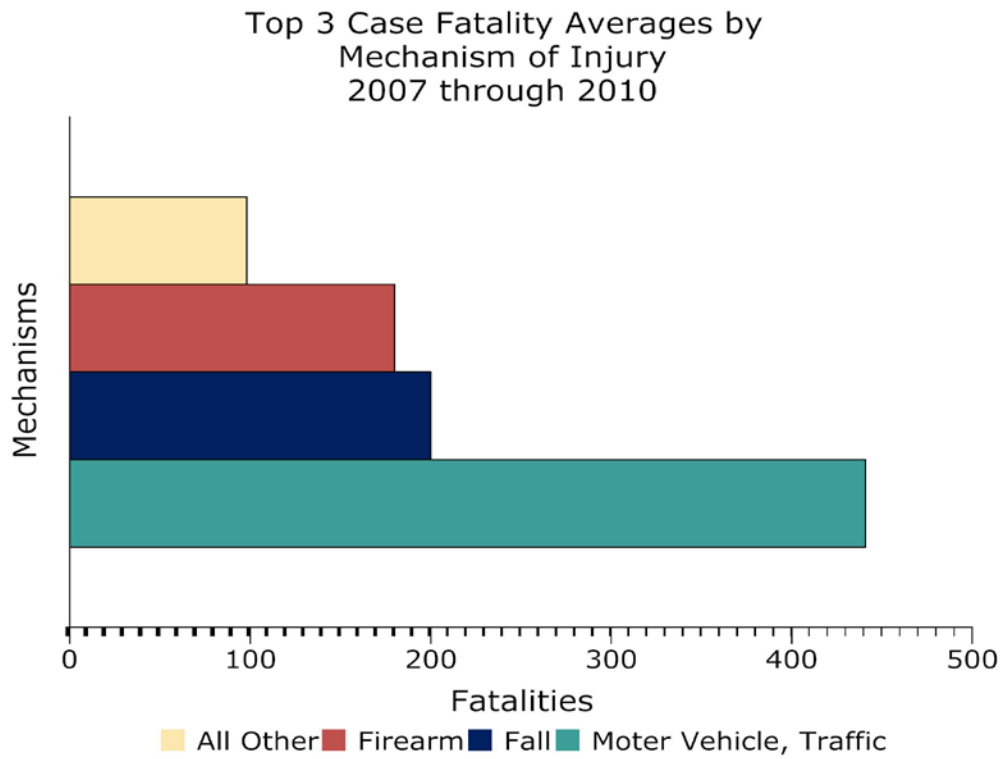


Figure 11b:

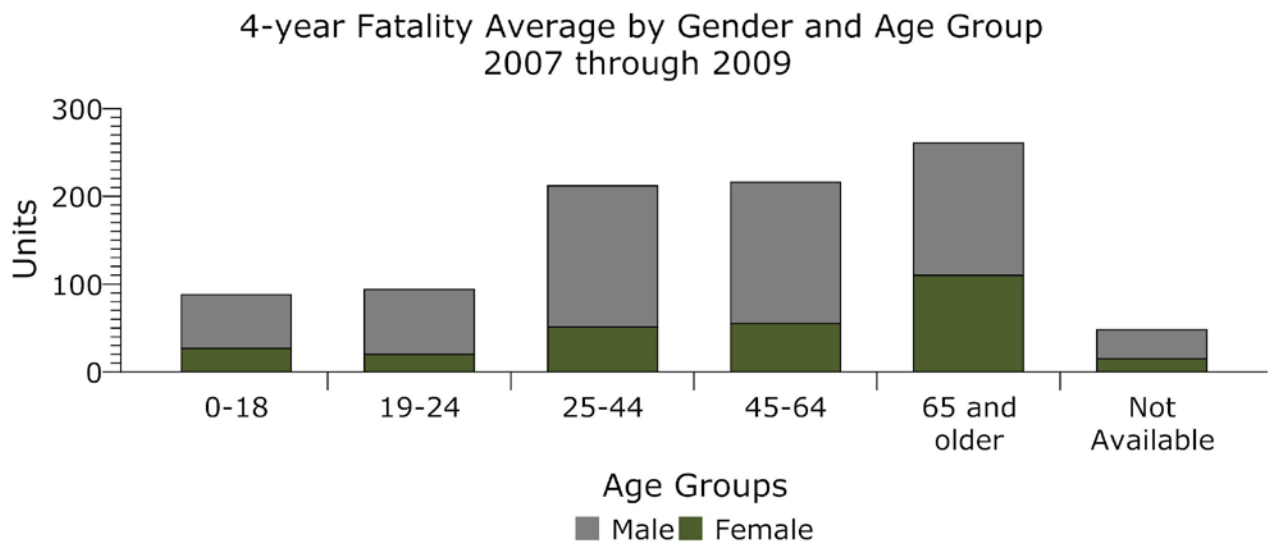


Figure 12a:

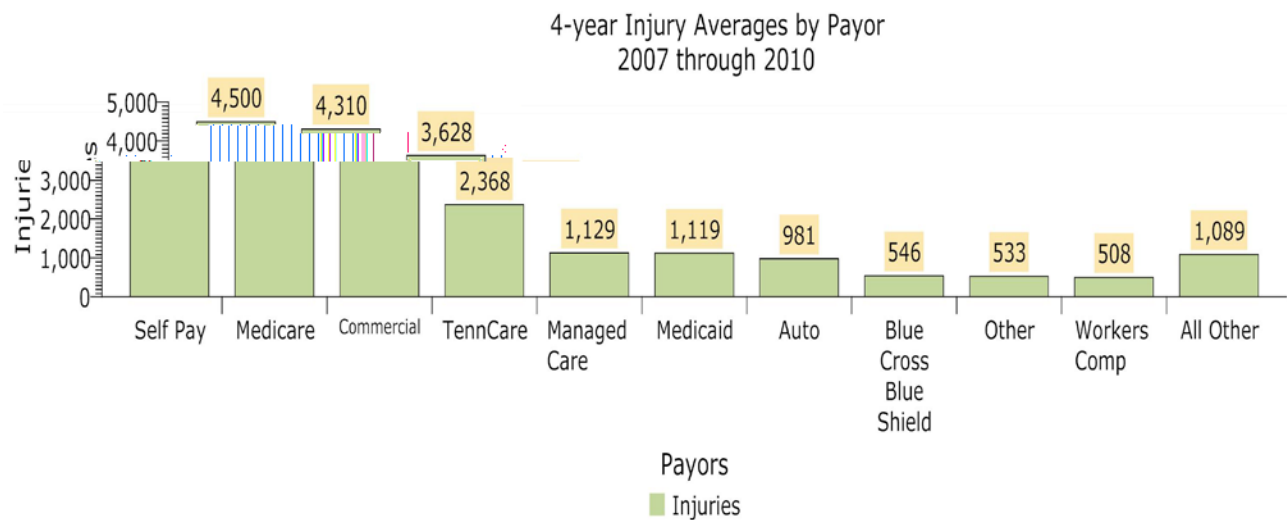
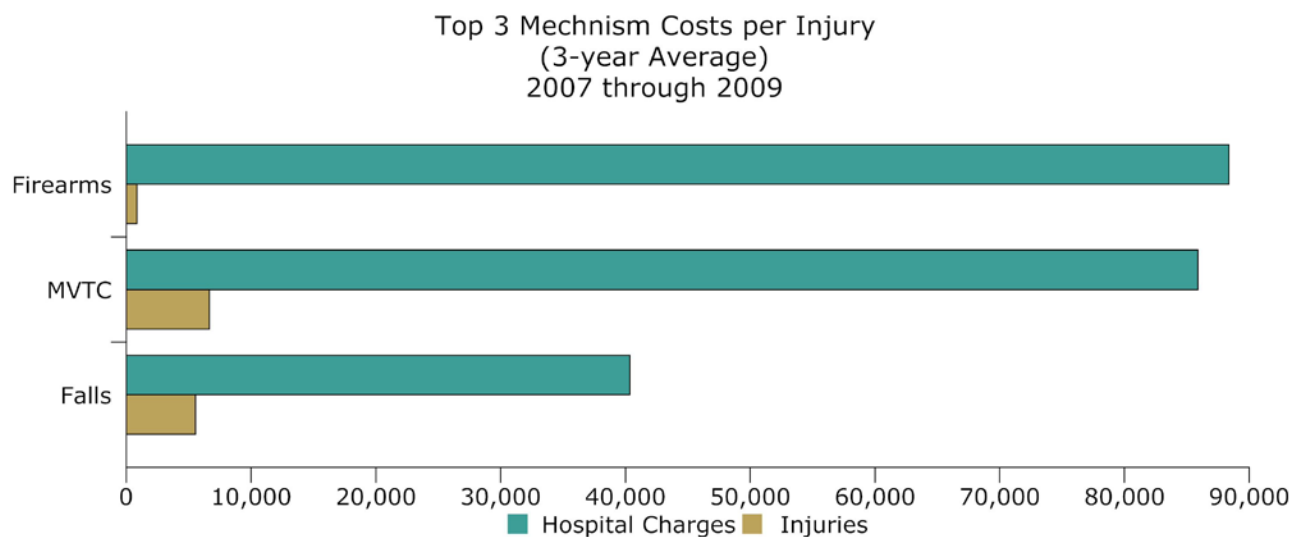


Figure 12b:



Source: Tennessee Department of Health, Division of Health Statistics (Hospital Discharge Data)
Produced by: Tennessee Department of Health, EMS & Division of Health Facilities

Appendix III:

2009 - 2011 Trauma Fund Distribution

FUNDS DISTRIBUTED TO TRAUMA CENTERS AND NON-TRAUMA CENTERS FROM TENNESSEE TRAUMA FUND - FY2009				
Level	Hospital Name	Hospital Specific Pool Payment	Readiness Costs	Total Hospital Distribution Payment
	Totals	\$5,852,013.69	\$3,340,000.00	\$9,192,013.69
Lev I	Vanderbilt University Hospitals	\$1,676,298.94	\$613,000.00	\$2,289,298.94
Lev I	Regional Medical Center at Memphis	\$1,798,108.10	\$389,000.00	\$2,187,108.10
Lev I	Erlanger Medical Center	\$677,167.02	\$613,000.00	\$1,290,167.02
Lev I	University of Tennessee Memorial Hospital	\$677,177.39	\$409,000.00	\$1,086,177.39
Lev I	Johnson City Medical Center	\$285,248.85	\$290,000.00	\$575,248.85
Lev I	Wellmont Holston Valley Medical Center	\$236,244.66	\$290,000.00	\$526,244.66
PED	Methodist Healthcare - LeBonheur	\$44,926.20	\$257,000.00	\$301,926.20
Lev II	Wellmont Bristol Regional Medical Center	\$62,322.01	\$151,000.00	\$213,322.01
PED	East Tennessee Children's Hospital		\$204,000.00	\$204,000.00
	Jackson - Madison County General Hospital	\$117,836.23		\$117,836.23
Lev III	Blount Memorial Hospital	\$10,329.11	\$62,000.00	\$72,329.11
Lev III	Athens Regional Medical Center	\$2,062.39	\$62,000.00	\$64,062.39
	Maury Regional Hospital	\$35,663.71		\$35,663.71
	Saint Mary's Medical Center	\$34,176.75		\$34,176.75
	Baptist Memorial Hospital - Memphis	\$29,159.35		\$29,159.35
	Middle Tennessee Medical Center	\$25,930.34		\$25,930.34
	Methodist Medical Center of Oak Ridge	\$19,397.36		\$19,397.36
	Skyline Medical Center	\$17,743.16		\$17,743.16
	Henry County Medical Center	\$16,645.71		\$16,645.71
	Williamson Medical Center	\$15,702.91		\$15,702.91
	Horizon Medical Center	\$9,846.97		\$9,846.97
	Harton Regional Medical Center	\$9,067.51		\$9,067.51
	Laughlin Memorial Hospital	\$9,018.00		\$9,018.00
	Sumner Regional Medical Center	\$8,880.56		\$8,880.56
	Memorial Healthcare System	\$8,113.31		\$8,113.31
	Cumberland Medical Center	\$7,072.29		\$7,072.29
	Hendersonville Medical Center	\$6,688.52		\$6,688.52
	Roane Medical Center	\$3,969.54		\$3,969.54
	Memorial North Park Hospital	\$3,635.29		\$3,635.29
	Volunteer Community Hospital	\$2,513.19		\$2,513.19
	Baptist Hospital - West	\$1,068.32		\$1,068.32

**FUNDS DISTRIBUTED TO TRAUMA CENTERS AND NON-TRAUMA CENTERS
FROM TENNESSEE TRAUMA FUND - FY2010**

Level	Hospital Name	Hospital Specific Pool Payment	Readiness Costs	Total Hospital Distribution Payment
	Totals	\$5,633,548.13	\$3,340,000.00	\$8,973,548.13
Lev I	Regional Medical Center at Memphis	\$1,936,556.97	\$389,000.00	\$2,325,556.97
Lev I	Vanderbilt University Hospital	\$1,499,384.15	\$613,000.00	\$2,112,384.15
Lev I	Erlanger Medical Center	\$500,230.70	\$613,000.00	\$1,113,230.70
Lev I	University of Tennessee Memorial Hospital	\$596,923.54	\$409,000.00	\$1,005,923.54
Lev I	Johnson City Medical Center	\$243,763.19	\$290,000.00	\$533,763.19
Lev I	Wellmont Holston Valley Medical Center	\$208,143.19	\$290,000.00	\$498,143.19
PED	Methodist Healthcare - LeBonheur	\$39,723.87	\$257,000.00	\$296,723.87
Lev II	Wellmont Bristol Regional Medical Center	\$65,481.53	\$151,000.00	\$216,481.53
PED	East Tennessee Children's Hospital		\$204,000.00	\$204,000.00
	Jackson - Madison County General Hospital	\$111,253.33		\$111,253.33
Lev III	Blount Memorial Hospital	\$12,983.31	\$62,000.00	\$74,983.31
	Methodist University Healthcare	\$72,211.51		\$72,211.51
Lev III	Athens Regional Medical Center	\$5,318.13	\$62,000.00	\$67,318.13
	Baptist Memorial Hospital - Memphis	\$35,389.39		\$35,389.39
	Middle Tennessee Medical Center	\$33,114.25		\$33,114.25
	Saint Mary's Medical Center	\$28,161.06		\$28,161.06
	Saint Thomas Hospital	\$27,849.46		\$27,849.46
	Maury Regional Hospital	\$26,579.20		\$26,579.20
	University Medical Center	\$22,004.77		\$22,004.77
	Skyline Medical Center	\$20,821.08		\$20,821.08
	Henry County Medical Center	\$15,569.98		\$15,569.98
	Cookeville Regional Medical Center	\$13,696.57		\$13,696.57
	Methodist Medical Center of Oak Ridge	\$13,421.84		\$13,421.84
	Summit Medical Center	\$12,822.17		\$12,822.17
	Williamson Medical Center	\$11,919.51		\$11,919.51
	Parkwest Medical Center	\$11,749.50		\$11,749.50
	Horizon Medical Center	\$11,095.03		\$11,095.03
	Sumner Regional Medical Center	\$9,522.19		\$9,522.19
	Harton Regional Medical Center	\$7,936.00		\$7,936.00
	Hendersonville Medical Center	\$5,385.71		\$5,385.71
	Fort Sanders Sevier Medical Center	\$5,232.05		\$5,232.05
	Memorial Healthcare System	\$4,526.54		\$4,526.54
	Baptist Hospital - West	\$4,361.42		\$4,361.42
	Laughlin Memorial Hospital	\$4,210.27		\$4,210.27
	Baptist Hospital of East Tennessee	\$3,974.63		\$3,974.63
	Cumberland Medical Center	\$3,692.08		\$3,692.08
	Memorial North Park Hospital	\$2,875.71		\$2,875.71
	Southern Tennessee Medical Center	\$2,857.49		\$2,857.49
	Erlanger North Hospital	\$2,480.68		\$2,480.68
	Skyridge Medical Center - West	\$326.12		\$326.12

**FUNDS DISTRIBUTED TO TRAUMA CENTERS AND NON-TRAUMA CENTERS
FROM TENNESSEE TRAUMA FUND - FY2011 – 1st QUARTER DISTRIBUTION**

Level	Hospital Name	Hospital Specific Pool Payment	Readiness Costs	Total Hospital Distribution Payment
	Total	\$1,438,551.46	\$835,000.00	\$2,273,551.46
Lev I	Regional Medical Center at Memphis	\$528,475.76	\$97,250.00	\$625,725.76
Lev I	Vanderbilt University Hospitals	\$432,062.16	\$153,250.00	\$585,312.16
Lev I	Erlanger Medical Center	\$101,261.40	\$153,250.00	\$254,511.40
Lev I	University of Tennessee Memorial Hospital	\$115,528.14	\$102,250.00	\$217,778.14
Lev I	Johnson City Medical Center	\$48,809.57	\$72,500.00	\$121,309.57
Lev I	Wellmont Holston Valley Medical Center	\$39,887.49	\$72,500.00	\$112,387.49
PED	LeBonheur Children's Hospital	\$8,546.46	\$64,250.00	\$72,796.46
Lev II	Wellmont Bristol Regional Medical Center	\$13,934.54	\$37,750.00	\$51,684.54
PED	East Tennessee Children's Hospital		\$51,000.00	\$51,000.00
	Jackson - Madison County General Hospital	\$33,398.13		\$33,398.13
	Middle Tennessee Medical Center	\$23,993.71		\$23,993.71
Lev III	Blount Memorial Hospital	\$2,727.74	\$15,500.00	\$18,227.74
Lev III	Athens Regional Medical Center	\$1,323.12	\$15,500.00	\$16,823.12
	Methodist University Healthcare	\$11,293.00		\$11,293.00
	Baptist Memorial Hospital - Memphis	\$8,595.56		\$8,595.56
	Methodist Medical Ctr of Oak Ridge	\$7,918.61		\$7,918.61
	Sumner Regional Medical Center	\$7,375.83		\$7,375.83
	Skyline Medical Center	\$7,095.81		\$7,095.81
	Summit Medical Center	\$4,849.03		\$4,849.03
	Henry County Medical Center	\$4,799.93		\$4,799.93
	Saint Thomas Hospital	\$3,820.43		\$3,820.43
	Maury Regional Hospital	\$3,742.40		\$3,742.40
	Saint Francis Hospital	\$3,398.38		\$3,398.38
	Southern Hills Medical Center	\$2,882.90		\$2,882.90
	Indian Path Medical Center	\$2,784.30		\$2,784.30
	Saint Mary's Medical Center	\$2,781.06		\$2,781.06
	Williamson Medical Center	\$2,613.26		\$2,613.26
	Methodist Healthcare - North	\$2,446.35		\$2,446.35
	Baptist Hospital - West	\$2,238.60		\$2,238.60
	Cumberland Medical Center	\$1,756.68		\$1,756.68
	Laughlin Memorial Hospital	\$1,665.12		\$1,665.12
	Parkwest Medical Center	\$1,614.72		\$1,614.72
	University Medical Center	\$1,336.81		\$1,336.81
	Cookeville Regional Medical Center	\$1,271.34		\$1,271.34
	Horizon Medical Center	\$751.17		\$751.17
	Memorial Healthcare System	\$713.98		\$713.98
	Morristown - Hamblen Healthcare System	\$638.71		\$638.71
	Skyridge Medical Center	\$219.25		\$219.25

**FUNDS DISTRIBUTED TO TRAUMA CENTERS AND NON-TRAUMA CENTERS
FROM TENNESSEE TRAUMA FUND - FY2011 – 2nd QUARTER DISTRIBUTION**

Level	Hospital Name	Hospital Specific Pool Payment	Readiness Costs	Total Hospital Distribution Payment
	Total	\$1,267,765.58	\$835,000.00	\$2,102,765.58
Lev I	Vanderbilt University Hospitals	\$381,499.95	\$153,250.00	\$534,749.95
Lev I	Regional Medical Center at Memphis	\$408,496.85	\$97,250.00	\$505,746.85
Lev I	Erlanger Medical Center	\$114,189.79	\$153,250.00	\$267,439.79
Lev I	University of Tennessee Memorial Hospital	\$126,360.67	\$102,250.00	\$228,610.67
Lev I	Johnson City Medical Center	\$47,004.74	\$72,500.00	\$119,504.74
Lev I	Wellmont Holston Valley Medical Center	\$43,592.67	\$72,500.00	\$116,092.67
PED	LeBonheur Children's Hospital	\$7,602.72	\$64,250.00	\$71,852.72
Lev II	Wellmont Bristol Regional Medical Center	\$14,207.00	\$37,750.00	\$51,957.00
PED	East Tennessee Children's Hospital		\$51,000.00	\$51,000.00
	Jackson - Madison County General Hospital	\$21,974.47		\$21,974.47
Lev III	Athens Regional Medical Center	\$2,359.52	\$15,500.00	\$17,859.52
Lev III	Blount Memorial Hospital	\$1,428.22	\$15,500.00	\$16,928.22
	Middle Tennessee Medical Center	\$11,485.62		\$11,485.62
	Saint Thomas Hospital	\$8,401.92		\$8,401.92
	Metropolitan Nashville Genera	\$6,957.15		\$6,957.15
	Saint Francis Hospital	\$5,733.53		\$5,733.53
	Skyline Medical Center	\$5,338.46		\$5,338.46
	Baptist Memorial Hospital	\$5,031.16		\$5,031.16
	Maury Regional Hospital	\$4,661.86		\$4,661.86
	Summit Medical Center	\$4,492.02		\$4,492.02
	Mercy Medical Center	\$4,481.40		\$4,481.40
	Cookeville Regional Medical Center	\$3,843.65		\$3,843.65
	Parkwest Medical Center	\$3,129.32		\$3,129.32
	University Medical Center	\$3,082.30		\$3,082.30
	Southern Hills Medical Center	\$2,807.20		\$2,807.20
	Harton Regional Medical Center	\$2,695.62		\$2,695.62
	Williamson Medical Center	\$2,529.86		\$2,529.86
	Henry County Medical Center	\$2,462.55		\$2,462.55
	Horizon Medical Center	\$2,232.12		\$2,232.12
	Regional Hospital of Jackson	\$2,227.14		\$2,227.14
	Memorial Healthcare System, Inc.	\$1,978.26		\$1,978.26
	NorthCrest Medical Center	\$1,952.49		\$1,952.49
	Laughlin Memorial Hospital	\$1,767.17		\$1,767.17
	Methodist Medical Center of Oak Ridge	\$1,495.53		\$1,495.53
	LeConte Medical Center	\$1,307.58		\$1,307.58
	Hendersonville Medical Center	\$1,296.74		\$1,296.74
	Claiborne County Hospital	\$1,244.08		\$1,244.08
	Southern Tennessee Medical Center	\$1,208.86		\$1,208.86
	Morristown - Hamblen Healthcare System	\$1,176.77		\$1,176.77
	Indian Path Medical Center	\$987.76		\$987.76
	Methodist Hospital - North	\$963.55		\$963.55
	Memorial North Park	\$783.66		\$783.66
	Mercy Medical Center West	\$664.08		\$664.08
	Cumberland Medical Center, Inc.	\$629.59		\$629.59

**FUNDS DISTRIBUTED TO TRAUMA CENTERS AND NON-TRAUMA CENTERS
FROM TENNESSEE TRAUMA FUND - FY2011 – 3rd QUARTER DISTRIBUTION**

Level	Hospital Name	Hospital Specific Pool Payment	Readiness Costs	Total Hospital Distribution Payment
	Total	\$1,248,301.16	\$835,000.00	\$2,083,301.16
Lev I	Regional Medical Center at Memphis	\$443,740.10	\$97,250.00	\$540,990.10
Lev I	Vanderbilt University Hospitals	\$329,209.94	\$153,250.00	\$482,459.94
Lev I	Erlanger Medical Center	\$97,219.94	\$153,250.00	\$250,469.94
Lev I	University of Tennessee Memorial Hospital	\$112,899.35	\$102,250.00	\$215,149.35
Lev I	Johnson City Medical Center	\$74,576.62	\$72,500.00	\$147,076.62
Lev I	Wellmont Holston Valley Medical Center	\$62,965.60	\$72,500.00	\$135,465.60
PED	LeBonheur Children's Hospital	\$5,794.86	\$64,250.00	\$70,044.86
Lev II	Wellmont Bristol Regional Medical Center	\$15,369.28	\$37,750.00	\$53,119.28
PED	East Tennessee Children's Hospital	\$770.40	\$51,000.00	\$51,770.40
	Jackson - Madison County General Hospital	\$21,605.76		\$21,605.76
Lev III	Blount Memorial Hospital	\$3,265.11	\$15,500.00	\$18,765.11
Lev III	Athens Regional Medical Center	\$981.81	\$15,500.00	\$16,481.81
	Baptist Memorial Hospital	\$13,119.27		\$13,119.27
	Saint Thomas Hospital	\$11,689.55		\$11,689.55
	Maury Regional Hospital	\$6,467.70		\$6,467.70
	Methodist Medical Center of Oak Ridge	\$6,062.55		\$6,062.55
	Parkwest Medical Center	\$5,365.03		\$5,365.03
	Skyline Medical Center	\$4,697.52		\$4,697.52
	Mercy Medical Center	\$4,447.27		\$4,447.27
	University Medical Center	\$3,957.19		\$3,957.19
	Williamson Medical Center	\$3,009.95		\$3,009.95
	Horizon Medical Center	\$2,892.78		\$2,892.78
	Cookeville Regional Medical Center	\$2,869.79		\$2,869.79
	Sumner Regional Medical Center	\$2,374.74		\$2,374.74
	Harton Regional Medical Center	\$2,049.55		\$2,049.55
	Skyridge Medical Center	\$1,377.87		\$1,377.87
	Henry County Medical Center	\$1,348.70		\$1,348.70
	Memorial Healthcare System, Inc.	\$1,311.49		\$1,311.49
	Summit Medical Center	\$1,211.39		\$1,211.39
	Cumberland Medical Center, Inc.	\$1,084.81		\$1,084.81
	Claiborne County Hospital	\$1,036.30		\$1,036.30
	Dyersburg Regional Medical Center	\$897.25		\$897.25
	Southern Tennessee Medical Center	\$804.81		\$804.81
	Indian Path Medical Center	\$588.39		\$588.39
	LeConte Medical Center	\$587.54		\$587.54
	Baptist Memorial Hospital - Collierville	\$363.88		\$363.88
	Laughlin Memorial Hospital	\$238.88		\$238.88
	Hendersonville Medical Center	\$48.20		\$48.20

**FUNDS DISTRIBUTED TO TRAUMA CENTERS AND NON-TRAUMA CENTERS
FROM TENNESSEE TRAUMA FUND - FY2011 – 4th QUARTER DISTRIBUTION**

Level	Hospital Name	Hospital Specific Pool Payment	Readiness Costs	Total Hospital Distribution Payment
	Total	\$1,467,727.11	\$835,000.00	\$2,302,727.11
Lev I	Regional Medical Center at Memphis	\$593,732.99	\$97,250.00	\$690,982.99
Lev I	Vanderbilt University Hospitals	\$378,773.74	\$153,250.00	\$532,023.74
Lev I	Erlanger Medical Center	\$117,373.14	\$153,250.00	\$270,623.14
Lev I	University of Tennessee Memorial Hospital	\$99,237.68	\$102,250.00	\$201,487.68
Lev I	Johnson City Medical Center	\$101,690.50	\$72,500.00	\$174,190.50
Lev I	Wellmont Holston Valley Medical Center	\$41,542.77	\$72,500.00	\$114,042.77
PED	LeBonheur Children's Hospital	\$1,495.11	\$64,250.00	\$65,745.11
PED	East Tennessee Children's Hospital		\$51,000.00	\$51,000.00
Lev II	Wellmont Bristol Regional Medical Center	\$8,130.19	\$37,750.00	\$45,880.19
	Jackson Madison County General Hospital	\$35,659.01		\$35,659.01
Lev III	Blount Memorial Hospital	\$2,801.32	\$15,500.00	\$18,301.32
Lev III	Athens Regional Medical Center	\$529.03	\$15,500.00	\$16,029.03
	Middle Tennessee Medical Center	\$15,443.93		\$15,443.93
	Baptist Memorial Hospital	\$9,782.98		\$9,782.98
	Maury Regional Hospital	\$7,908.54		\$7,908.54
	Saint Mary's Medical Center	\$7,535.01		\$7,535.01
	Saint Thomas Hospital	\$7,425.02		\$7,425.02
	Henry County Medical Center	\$6,677.69		\$6,677.69
	Skyline Medical Center	\$4,926.76		\$4,926.76
	Summit Medical Center	\$4,310.40		\$4,310.40
	Horizon Medical Center	\$4,202.79		\$4,202.79
	Sumner Regional Medical Center	\$3,365.42		\$3,365.42
	Methodist Hospital - North	\$3,329.19		\$3,329.19
	Methodist Medical Center of Oak Ridge	\$3,276.29		\$3,276.29
	Williamson Medical Center	\$2,311.62		\$2,311.62
	Cookeville Regional Medical Center	\$2,213.54		\$2,213.54
	University Medical Center	\$1,631.87		\$1,631.87
	Cumberland Medical Center	\$875.14		\$875.14
	Indian Path Medical Center	\$736.32		\$736.32
	Leconte Medical Center	\$730.98		\$730.98
	Southern Tennessee Medical Center	\$78.13		\$78.13

Appendix IV:

Research Publications

1. Solomkin JS, Mazuski JE, Bradley JS, Rodvold KA, Goldstein EJ, Baron EJ, O'Neill PJ, Chow AW, Dellinger EP, Eachempati SR, Gorbach S, Hilfiker M, May AK, Nathens AB, Sawyer RG, Bartlett JG. Diagnosis and management of complicated intra-abdominal infection in adults and children: guidelines by the Surgical Infection Society and the Infectious Diseases Society of America. *Clinical Infectious Diseases*. 2010; 50:133-164.
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11. Campion TR, Jr, May AK, Waitman LR, Ozdas A, Gadd CS. Effects of Blood Glucose Transcription Mismatches on a Computer-based Intensive Insulin Therapy Protocol. *Intensive Care Medicine*. 2010; 36:1566-1570.
12. Siew E, Ikizler TA, Gebretsadik T, Shintani A, Wickersham N, Bossert F, Peterson JF, Parikh CR, May AK, Ware LB. Elevated Urinary IL-18 Levels at the Time of ICU Admission Predict Adverse Clinical Outcomes. *Clinical Journal of the American Society of Nephrology*. 2010; 5:1497-1505.
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