KENTUCKY TRAUMA CARE SYSTEM
ANNUAL REPORT
to the
KENTUCKY GENERAL ASSEMBLY
for
Calendar Years 2011-2012

Issued

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Kentucky State Trauma System

Right Patient • Right Care • Right Time

Required by KRS 211.494(7)

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Additional contributions to the report are acknowledged from Dr. Andrew Bernard, Chair of the Kentucky Trauma Advisory Committee (KyTAC) and a surgeon from the University of Kentucky Trauma Center; Julia F. Costich, J.D., Ph.D., and Svetla Slavova, Ph.D., from the Kentucky Injury Prevention and Research Center (KIPRC), the University of Kentucky College of Public Health.

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This report, and its individual Attachments, can be downloaded from KYTRAUMA.ORG.

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EXECUTIVE SUMMARY

The Kentucky's Trauma Care System, now in its fifth year, is a work in progress. Created by KRS 211.490-211.496 in 2008, the program resides within the Kentucky Department for Public Health (KDPH), and is overseen by the Kentucky Trauma Advisory Committee (KyTAC) which was established by the statute. New Trauma Care System regulations were completed and adopted in April, 2012. A copy of these documents can be found in Attachment A.

The number of verified trauma centers has again increased during calendar years 2011 and 2012, and with the verification of the Frankfort Regional Medical Center during the summer of 2013 the Kentucky Trauma Care System is now up to eleven verified trauma centers. A map showing these facilities can be found in Attachment B.

There continues to be interest in trauma system development across the state. A number of facilities are now preparing for potential verifications in 2014 and 2015.

The on-going challenge for the Trauma Care System continues to be developing a reliable and on-going source of funding to support the core operation and functions of a growing trauma system.

Kentucky Trauma Centers

- Level I - Adults: University of Kentucky Chandler Medical Center
- Level-I - Adults: University of Louisville Hospital
- Level I - Pediatrics: Norton's Kosair Children's Hospital, Louisville
- Level I - Pediatrics: Kentucky Children's Hospital, Lexington

- Level III: Ephraim McDowell Medical Center, Danville
- Level III: Frankfort Regional Medical Center *(Verified/KDPH designation pending)*
- Level III: Taylor Regional Medical Center, Campbellsville

- Level IV: Ephraim McDowell Ft. Logan Hospital, Stanford
- Level IV: James B. Haggin Hospital, Harrodsburg
- Level IV: Livingston County Hospital, Salem
- Level IV: Marcum and Wallace Hospital, Irvine

(Listing as of December 1, 2013)

KY TRAUMA ADVISORY COMMITTEE

KRS 211.494 establishes an advisory committee to assist the Kentucky Department for Public Health in the development and implementation of the trauma care system. The KyTAC has 20 official appointed positions, all of whom are serving voluntarily without reimbursement for expenses at this time since the group does not have a source of funds.

The KyTAC includes representation from the major interests associated with a trauma program, including representatives from each category of trauma center, the KY Chapters of the American College of Emergency Physicians, the American College of Surgeons Committee on Trauma, and the Emergency Nurses Association. Also represented on the Committee are the Kentucky Board of EMS, the Kentucky Boards of Medical Licensure and Nursing, and the Kentucky Transportation Cabinet because of its active role in the Highway Safety Program. The Kentucky Hospital Association, the Kentucky Medical Association, and the Kentucky Injury Prevention and Research Center (KIPRC) are on the committee, along with advocates for pediatric trauma programs and the public at large.

The Kentucky Trauma Advisory Committee normally meets on the third Tuesday of each month at 3 PM ET via the Kentucky public health video teleconference network. A public viewing site is provided for each meeting at a designated location, and members of the public are welcome to go to a site being used by a KyTAC member to participate in the meeting.

Program Goals and Objectives

The *goals* of KyTAC, as set forth in the law, are as follows:

- Reduce or prevent death and disability from trauma without regard to the patient's insurance coverage or ability to pay for services;
- Provide optimal care for trauma victims by utilization of best practices, protocols, and guidelines;
- Minimize the economic impact of lost wages and productivity for trauma patients; and
- Contain costs of trauma care.

The *objectives* of the program, as outlined in the law, indicate that the KyTAC and the Trauma Director are to:

- Develop and implement a statewide trauma care system, integrated with the public health system for injury prevention;
- Recognize levels of care for the appropriate delivery of a full range of medical services to all trauma patients in the Commonwealth;
- Develop and implement trauma prevention and education initiatives;
- Facilitate appropriate education and continuing education about trauma care and procedures for physicians, nurses and emergency medical services personnel;
- Develop and distribute statewide guidelines and protocols for care and treatment of trauma victims, to include special populations;
- Integrate the programs, guidelines and protocols with EMS, physicians, nurses and hospitals;
- Establish a voluntary hospital trauma center verification program;
- Coordinate local and regional triage and transport protocols with the KY Board of EMS, EMS providers, emergency departments; and
- Assure that the new system has continuing quality assurance and peer review programs.

Strategic Planning

In April 2013, KyTAC held a day-long strategic planning workshop at the University of Kentucky's Chandler Medical Center. The group articulated its vision as *Right Patient, Right Care, Right Time.* Its mission is to provide a comprehensive, coordinated, accessible trauma care system, striving for optimal prevention, management and mitigation of injury in the Commonwealth of Kentucky. Important values include inclusivity, accessibility, cost-efficiency, evidence-based care, timeliness, attention to performance improvement, collaboration, consistency, professionalism, reliability, equitability, and adequate funding.

Further analysis identified strengths in leadership, collegial work of the Trauma Advisory Council, its members' commitment and representation, the growth in the state's trauma system including the forthcoming addition of the first Level II facility and at least one more Level III hospital, the existence of enabling statutes and regulations, some modest grant funding, the state trauma registry, the primary data system vendor, training for rural facilities and willingness of TAC leadership to participate, statewide trauma registrar meetings, support of the Kentucky Hospital Association, state agency support through the Department for Public Health and state Board of Emergency Medical Services, inter-facility cooperation, modular education programs, and the state's extensive telemedicine capability.

Weaknesses identified by the group included the lack of any state funding for core activities, lack of public understanding regarding trauma facilities, the widespread perception of trauma as "accidents", lack of support from some of the state's largest health systems, physicians' unwillingness to support hospital participation in the trauma system, some EMS reluctance to bypass local facilities in order to get patients to definitive care, a shortage of beds and training for burn patients, chronic underfunding of rural EMS, specialist shortages in rural areas, lack of time for statewide outreach, and the need for more research and continuing education.

Opportunities were identified to: educate the General Assembly and recommend legislation to secure ongoing state funding, include more facilities and increase the level of care (notably with the developing Level II facility in Pikeville), build on the current wave of healthcare provider consolidation, partner with other groups (for example, including EMS in quality improvement), learn from other states, identify grant funding opportunities, reward participation in the state trauma system, improve data collection and injury prevention effectiveness, develop a trauma system scorecard, establish statewide medical director-trauma coordinator meetings, and to emphasize the extent to which trauma system participation improves hospitals' quality of care and the life of the communities they serve.

At the strategic planning session, threats were also identified, including the lack of access to trauma care in much of the state (see maps in this report), funding uncertainties and shrinking hospital revenue, the consolidation of health systems, the potential for future competition among trauma system members, lack of a full-time trauma coordinator position or office, the expense of going through the American College of Surgeons verification process, the financial implications of trauma system participation (for example, the cost of surgical specialty staffing), the threat to quality improvement monitoring posed by lack of EMS run reports in some areas, and above all, the lack of consistent, dependable funding.

At the conclusion of the strategic planning meeting, the group identified the following strategic initiatives:

1. Achieve state general funding using partners from KyTAC, trauma centers, EMS, KHA and the legislature
2. Educate legislators, public and providers about the value and relevance of the trauma system
3. Enhance EMS engagement in the system
4. Elevate EMS relevance as defined by role, purpose and identity
5. Support hospital initiatives to achieve trauma reimbursement.
6. Use state trauma data to provide a dashboard for legislature and public, enhanced by personal stories.

To begin implementing these strategies, KyTAC members have scheduled meetings with key legislators and agencies to discuss the trauma care system and potential funding, KIPRC has been working on development of a trauma data dashboard, and KyTAC has developed some marketing pieces to help raise awareness.

The picture at the left is a sample of an educational poster that was developed by the University of Kentucky's marketing department for the Kentucky Trauma Care System. It features members of the trauma team that includes both hospital and pre-hospital staff, and a trauma survivor giving a testimonial about the care she received. Variations of this poster can be developed for each trauma center featuring a local trauma survivor or family member, and pictures of local trauma team members.

The other items initially developed are some simple stress reliever rubber ambulances and helicopters which are branded with the Kentucky State Trauma System logo found on the cover of this report, along with a new website, KYTRAUMA.ORG, that connects to the trauma system website hosted by the Kentucky Hospital Association. These have been distributed at conferences and meetings as a way of getting discussion going on the future of the Kentucky Trauma Care System.

The Kentucky Trauma Advisory Committee has partnered with the *Kentucky Safety and Prevention Alignment Network* (KSPAN), an activity of KIPRC. KSPAN is a coalition of organizations from across the Commonwealth that is working on, or has an interest in, injury prevention. KyTAC has been encouraging existing and developing trauma centers to become engaged with KSPAN and its coalition partners to help develop or enhance their own injury prevention and community outreach programs.

KSPAN and KIPRC are also working to develop a network of *Safe Communities* in Kentucky modeled after the National Safety Council's *Safe Communities America* program. Madison County was designated as a Safe Community in 2010, and Murray State University became designated in 2012. KIPRC has partnered with NSC in the recruitment of other communities and universities for Safe Community designation.

For more information on **KSPAN** go to: http://safekentucky.org/
For more information on **Safe Communities** go to:
http://www.nsc.org/safety_work/SafeCommunitiesAmerica/Pages/SafeCommunitiesAmericaHome.aspx

Trauma Center Workshops

To help encourage facilities across the Commonwealth to become engaged in the trauma system a series of workshops were conducted in 2012. These programs were funded through the generosity of the Good Samaritan Foundation of the Kentucky Methodist Conference. Over a hundred hospital and EMS staffers participated at sites in Hazard, Frankfort, Bowling Green and Paducah. A fifth program was conducted as a webinar.

These workshops walked potential and developing facilities and their community partners through the process, from getting organized to the verification site visit. Experienced trauma center managers and coordinators from hospitals who had already "been there and done that" came to each program to share their best practices, sample forms and information. Exercises were conducted to show the students what a typical quality assurance meeting would look like, and how they could get "loop closure" for subjects that came up in their Process Improvement program. The workshops were a big success, and extremely well received.

EMS-C Study on Pediatric Emergency Care Standards

The EMS for Children program in Kentucky, in partnership with KIPRC, the Kentucky Board of EMS, the Kentucky Hospital Association, University of Kentucky College of Public Health and the University of Louisville School of Medicine undertook a comprehensive study in 2010 that was concluded and published in 2013. The study looked at the capabilities of hospital emergency departments in Kentucky against the recommendations of the American Academy of Pediatrics, the American College of Emergency Physicians, and the Emergency Nursing Association. The results were published in the Journal of Pediatric Emergency Care in July, 2013 (Vol 29, No 7). The complete article can be found in Attachment H.

Seventy respondents completed the survey section on supplies and equipment either online or by fax. Results identified items unavailable at 20% or more of responding facilities, primarily the smallest sizes of equipment.

The study concluded that Kentucky facilities were reasonably well equipped by national standards, but rural facilities and small hospitals did not stock the smallest equipment sizes because of low reported volume of pediatric emergency department cases. Thus, a centralized procurement process that gives them access to an adequate range of pediatric supplies and equipment would support capacity building for the care of children across the entire state.

Grant proposals were received by the Kentucky EMS for Children program at the Kentucky Board of EMS from 30 facilities to help fund items needed to bring the facilities up to the program's recommendations.

There was an additional study completed in early 2013 called the National Pediatric Readiness Project. Its focus was on ensuring good emergency care for all children. There were 105 hospitals assessed (response rate of 98.1%). The national median of 4,143 hospitals was 69. Kentucky state median hospital score was 66 out of 100. The project's report card can be found in Attachment I.

TRAUMA SYSTEM DATA

The Kentucky Trauma Care System regulations include a requirement that all trauma centers have a registry that is compatible with the National Trauma Data Bank (NTDB) standards, and that they submit trauma registry data to both the NTDB and the Kentucky Trauma Registry on a regular basis.

Thanks to initial seed money from the Marshall Emergency Services Association (MESA) physicians group, KyTAC agreed to acquire a license from Clinical Data Management (CDM) for the eTraumaBase software system. The agreement also provides for them to house the registry, provide some on-line training and support, and assist the Kentucky Injury Prevention and Research Center (KIPRC) at the University of Kentucky in the creation of periodic extracts and reports. KIPRC has historically been the lead agency for injury-related data collection and management in the state, and continues in this role.

The eTraumaBase software comes in two variations. One is an on-site installation that is primarily used by Level I-III trauma centers. The, called eTraumaLite, is an on-line version that is best suited for Level IV facilities. Both packages have report-writing capabilities, although the on-line system has more pre-defined reports.

While the KyTAC regulations require that a trauma center have a registry and submit data, they do not require the CDM software. Trauma centers must be capable of submitting data in NTDB standard format to both the NTDB and the Kentucky Trauma Registry. Two facilities use other software and submit data on a regular basis.

Enclosed with this report you will find the following documents:

- 2011Kentucky Trauma Registry Report
- 2011Kentucky Hospital Discharge and ED Traumatic Injuries Report
- 2012 Kentucky Trauma Registry Report
- 2012 Kentucky Hospital Discharge and ED Traumatic Injuries Report

People often want to know about the community they live in. Following is a 2011 report on traumatic injury hospitalizations by COUNTY.

Traumatic injury hospitalizations by county, 2011

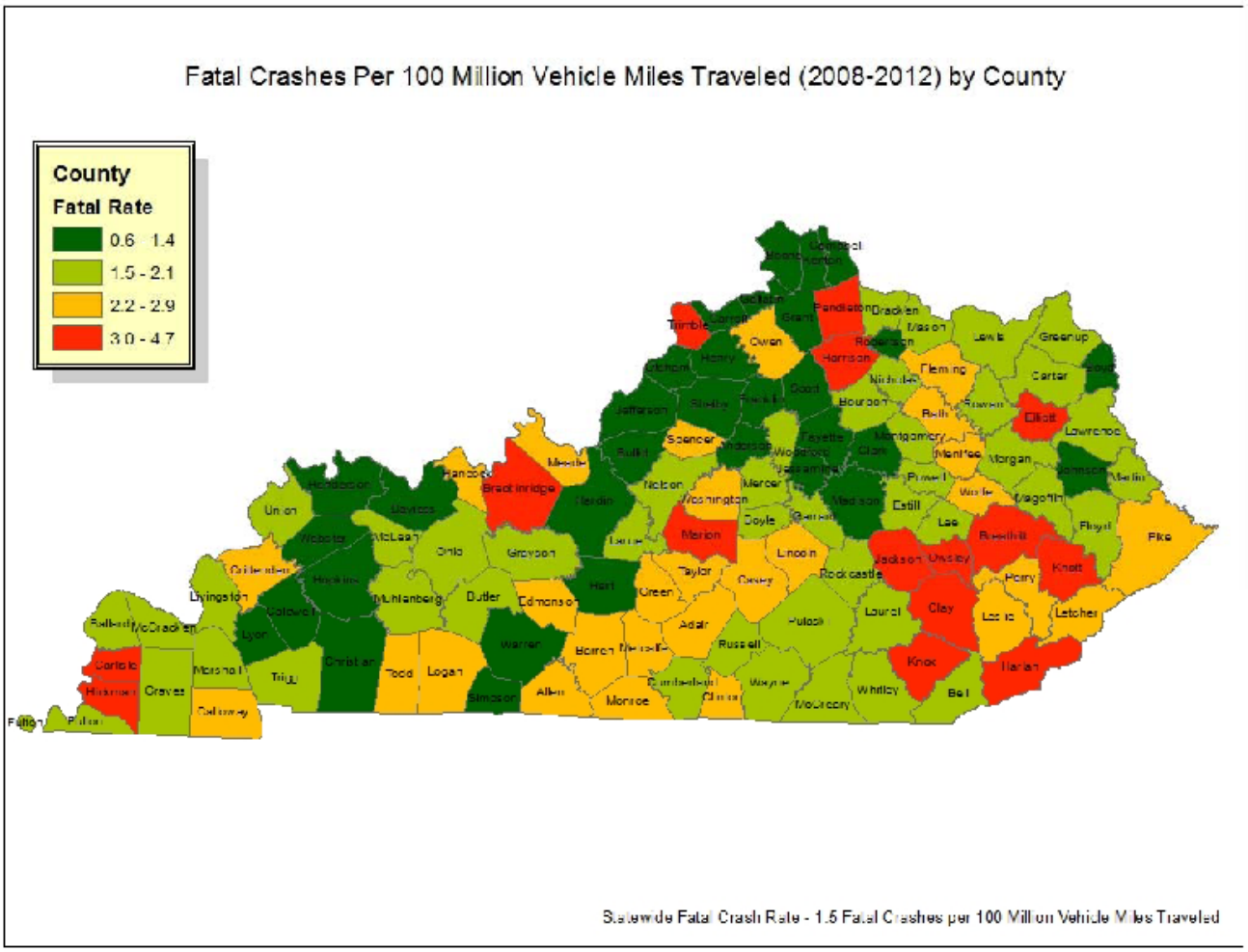
County of patient's residence	Number of traumatic injury hospitalizations, 2011	Rate of traumatic injury hospitalizations per 10,000 residents
Adair	96	51.4
Allen	81	40.2
Anderson	80	37
Ballard	34	41.2
Barren	174	41.2
Bath	41	34.9
Bell	151	52.6
Boone	249	20.5
Bourbon	82	41
Boyd	197	39.8
Boyle	165	57.8
Bracken	17	20
Breathitt	124	89.6
Breckinridge	89	43.9
Bullitt	247	32.9
Butler	63	49.1
Caldwell	63	48.6
Calloway	206	54.9
Campbell	257	28.3
Carlisle	36	71.3
Carroll	55	49.9
Carter	85	30.8
Casey	82	51.5
Christian	123	16.7
Clark	158	44.5
Clay	146	67.2
Clinton	60	58.8
Crittenden	66	70.7
Cumberland	43	62.9

Daviess	435	44.7
Edmonson	40	33.1
Elliott	20	26
Estill	73	49.8
Fayette	1121	37.2
Fleming	65	44.8
Floyd	178	45.4
Franklin	207	41.9
Fulton	26	38.5
Gallatin	34	39.5
Garrard	71	42
Grant	88	35.5
Graves	204	54.4
Grayson	136	52.4
Green	61	54.4
Greenup	122	33.1
Hancock	35	40.8
Hardin	430	40
Harlan	101	34.8
Harrison	89	47.4
Hart	76	41.7
Henderson	137	29.5
Henry	110	71.2
Hickman	17	35.5
Hopkins	171	36.5
Jackson	71	52.8
Jefferson	3723	49.8
Jessamine	201	41
Johnson	103	44
Kenton	483	30.1
Knott	110	67.5
Knox	142	44.5
Larue	66	46.1
Laurel	282	47.5
Lawrence	61	38
Lee	55	70.4
Leslie	77	68.5
Letcher	137	56
Lewis	30	21.6
Lincoln	127	51.4
Livingston	74	77.6
Logan	92	34.3
Lyon	52	62.5
Madison	300	35.6
Magoffin	46	34.8
Marion	97	48.5
Marshall	209	66.8
Martin	27	21.2
Mason	43	24.4
McCracken	469	71.2
McCreary	70	38.3
McLean	50	52.5
Meade	85	28.8
Menifee	30	47.5
Mercer	112	52.6
Metcalfe	61	60.6
Monroe	74	67.7
Montgomery	110	41.1
Morgan	46	33
Muhlenberg	140	44.8
Nelson	242	55
Nicholas	42	59.4
Ohio	136	56.4
Oldham	209	34.5
Owen	41	37.8
Owsley	54	112
Pendleton	41	27.9
Perry	243	84.5
Pike	258	39.8
Powell	77	60.9
Pulaski	391	61.4
Robertson	14	62.8
Rockcastle	88	51.6
Rowan	98	41.6
Russell	120	68.1
Scott	169	35.1
Shelby	147	34.1
Simpson	52	29.9
Spencer	66	38
Taylor	158	63.9
Todd	18	14.4
Trigg	47	32.9
Trimble	33	37.8
Union	50	33.2
Warren	384	33.2
Washington	63	53.2
Wayne	103	49.1
Webster	58	42.4

Whitley	260	72.6
Wolfe	45	61.3

Woodford	111	44.5

The pattern of injury rates per 10,000 residents in the table above is very similar to the map of fatalities per 100 million vehicle miles traveled below.



As it relates to Pediatric Injuries, Dr. Mary Fallat who is a Pediatric Trauma Surgeon at Kosair Children's Hospital and medical director for the Kentucky EMS-C program, made a detailed presentation at a recent KSPAN meeting. She noted that in 2010 there were 447 non-injury deaths and 193 injury deaths among infants and children ages 1-17. In 2011 61 Kentucky children ages birth to 5 died as the result of an unintentional or intentional injury. 23 (38%) were infants under age 1, and 38 (62%) were between 1 and 5 years of age. 74% were white, 22% were black, and 4% were other races. For every chlid age birth to 5 years that died s the result of injury, 7 were hospitalized and more than 700 were treated and released from an emergency department. These numbers do not include children who were treated in a physician's office, at home or at school.

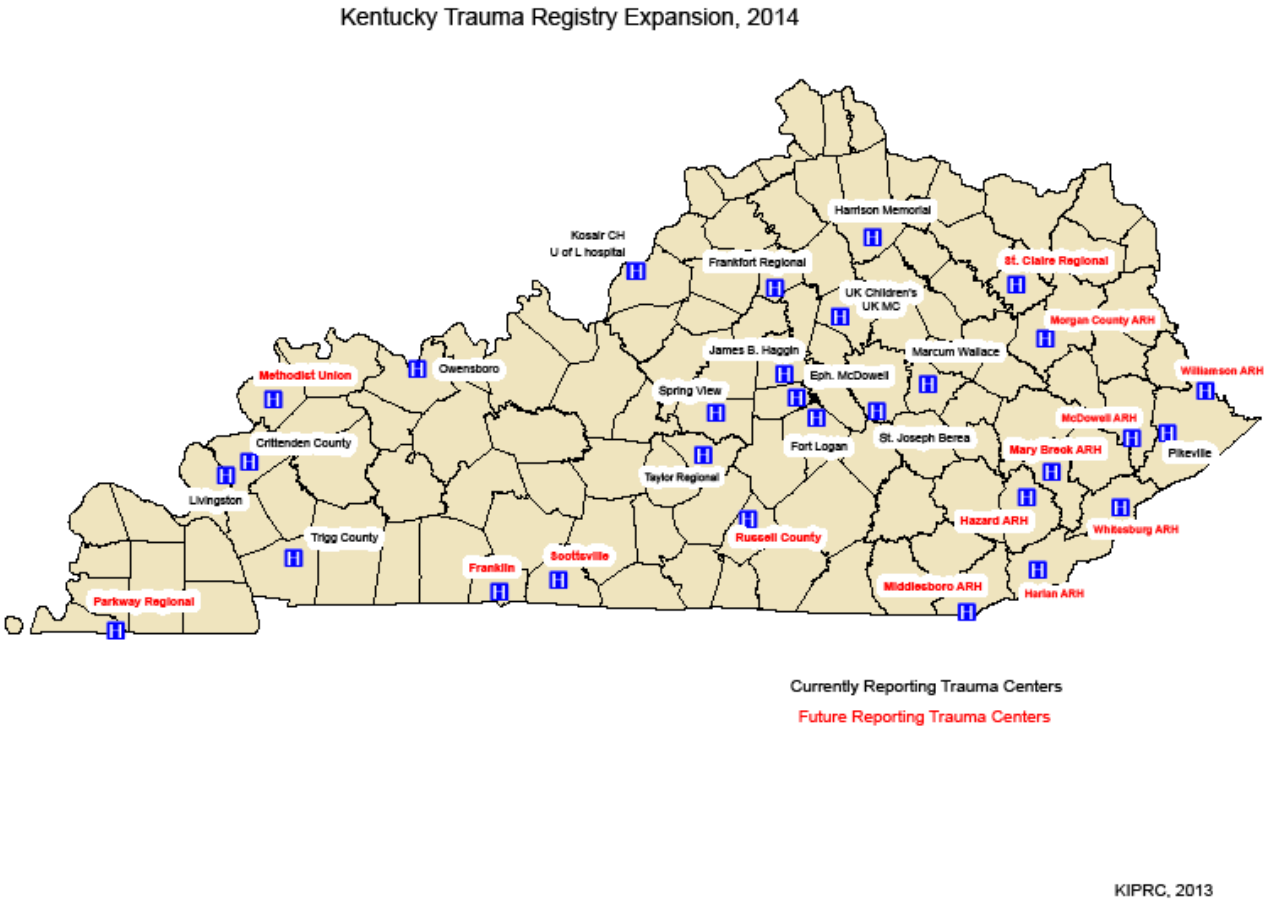
Dr. Fallat's full presentation, which goes into the need for a modified child booster seat law, and detailed information on a variety of other causes for injuries to children and adolescents (including the underreported "car surfing" problem of our youth, can be found in Attachment J.

Other sources of data frequently used to study trauma in the state are:

1. A database of hospital inpatient and emergency department discharge data that is gathered by the Kentucky Hospital Association under contract with the Kentucky Department for Public Health. This information is shared with KIPRC on a regular basis.
2. Traffic accident report information provided by the Kentucky Department of Transportation's Highway Safety Program.

All of these sources of data are valuable, and tell different parts of the trauma story. Trauma Registry data comes from cases seen in a verified or applicant (developing) trauma center. The cases are filtered to meet case definition criteria generally set by the American College of Surgeons Committee on Trauma, and can contain extensive clinical information. Hospital discharge data includes all non-federal facilities, and will include all cases with injury-related ICD (International Classification of Diseases) codes.

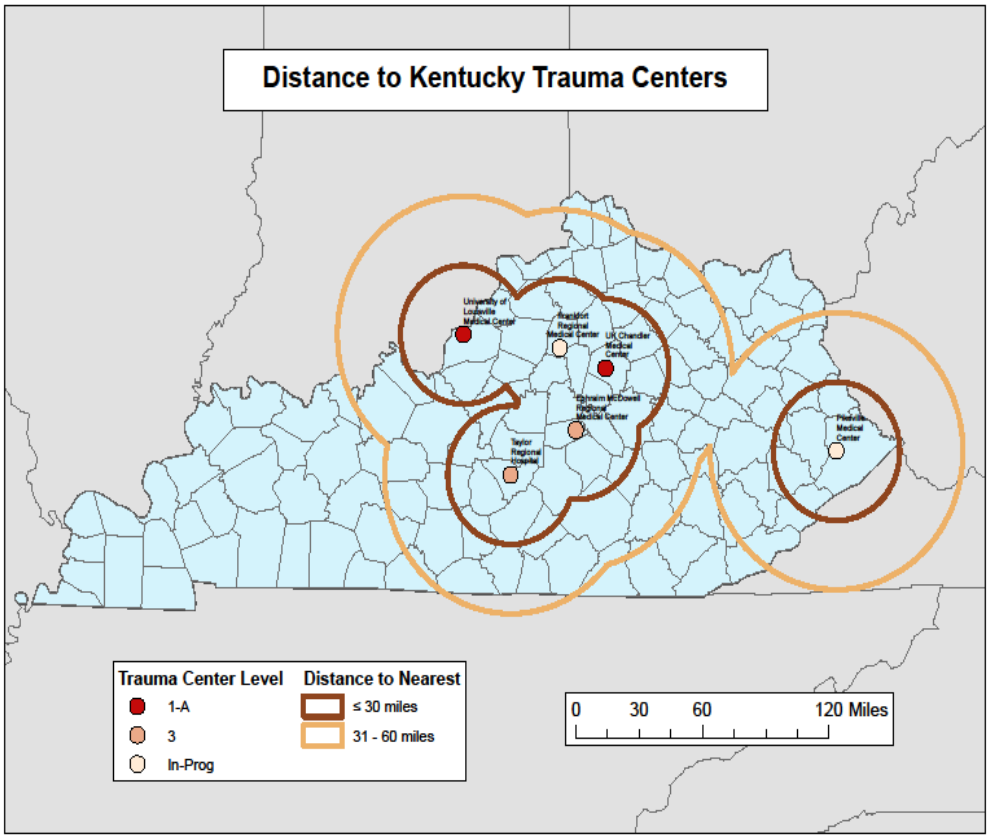
The map below shows trauma centers that are currently reporting to the Kentucky Trauma Registry. The facilities denoted in RED are in development, and are expected to be verified in 2014 or early 2015.



Julia Costich, JD, PhD, and Svetla Slavova, PhD, from KIPRC and the UK College of Public Health, Departments of Health Services Management and Biostatistics, gave a presentation at the state trauma symposium in September 2013 entitled "Kentucky's Trauma System: A Work in Progress". That presentation can be found in Attachment G and is summarized here to provide additional detail about the system.

There were 10,044 records from at least twelve facilities submitted to the Kentucky Trauma Registry in 2012. The majority came from the University of Louisville Hospital (2964 - 30%) and the University of Kentucky Hospital (2875 - 29%).

The primary body parts injured were the brain (24%), lower extremity (21%), torso (19%), and upper extremity (15%). Motor vehicle crashes on roadways were the primary cause of injury, followed by falls in the home. ED discharge data shows that 1181 patients were admitted to the hospital or sent to another hospital for follow-on care, and 135 died. About one-third (626, 31.7%) were sent home.

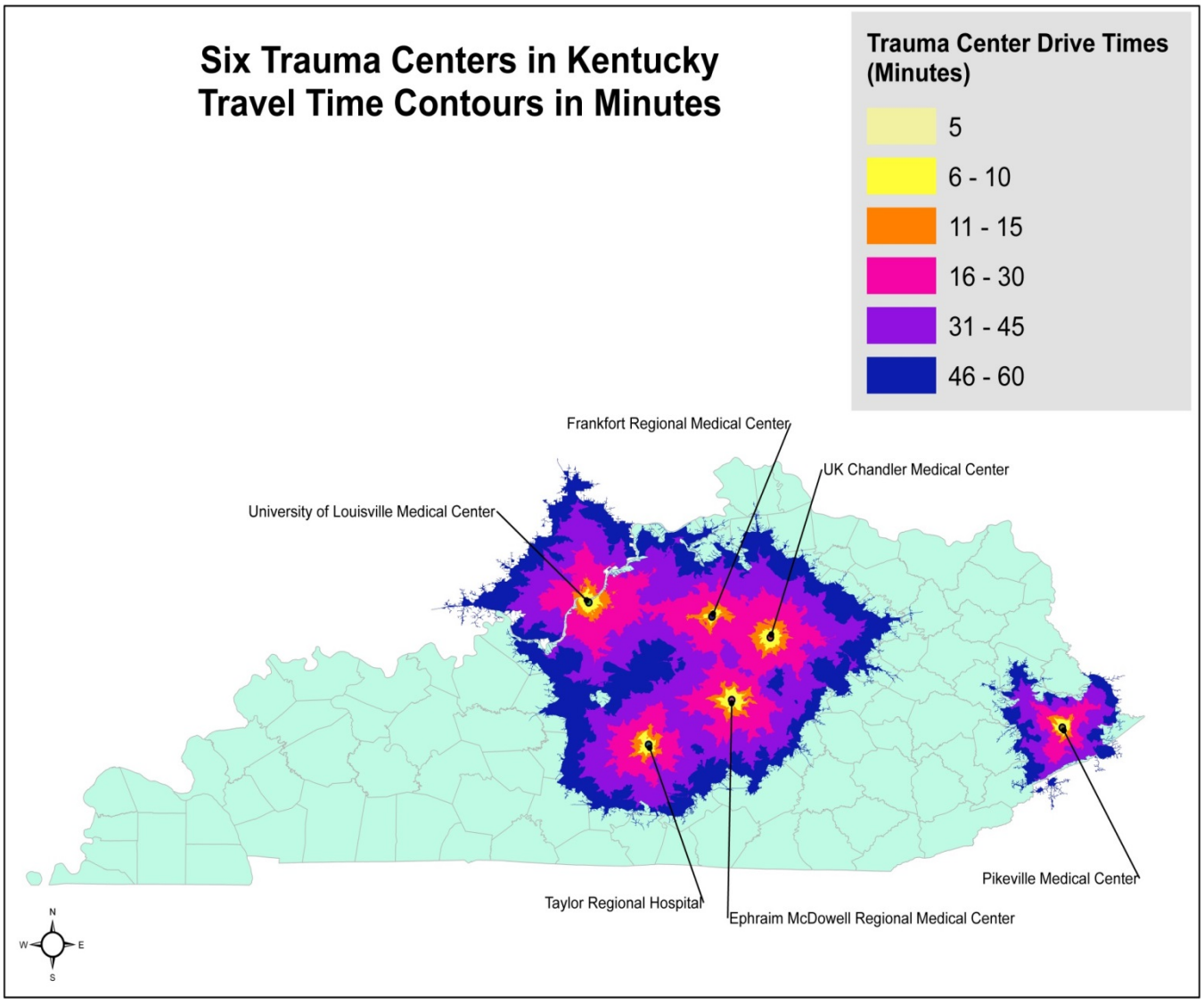


Auto insurance (19.6%), commercial insurance (18.7%), "self-pay" (18.6%), Medicare (17.6%) and Medicaid (13%) are the primary payers for emergency care.

Nearly two-thirds (64%) of the trauma registry patients were between the ages of 15 and 64. Motor vehicle incidents were the primary cause of injury for the 15-54 age group, while falls were the leading cause for those over 55 and younger than 15. A substantial majority (61.8%) was male, and 89% were white. Drugs or alcohol were a factor in 18.1% of the cases. Two-thirds (66.8%) stayed in the hospital from 1-7 days, and 12.6% were hospitalized for over 30 days.

Looking at the location of the Level I and II facilities, and including the developing Level-II facility at Pikeville Regional Medical Center, the map at the left shows the point-to-point distance to definitive care as of 2013. The Level IV facilities were not show on this map because the majority does not have surgical intervention capability available on a 24x7 basis.

Air mileage alone does not provide sufficient information regarding access. Terrain and the road network can influence transport times. In another map prepared for KIPRC by the Kentucky Transportation Center, a time-distance model was applied to the location of the same Level I-III facilities.



Because the best outcomes follow intervention within 60 minutes (referred to as the "golden hour"), optimal driving times fall in the pink and light purple travel zones.

To summarize where the state's trauma system is today and where it needs to be tomorrow, Dr. Andrew Bernard, Chair of the Kentucky Trauma Advisory Committee and a trauma surgeon at UK Chandler Medical Center, developed the following document.

The Bloody Truth
15 Facts about Trauma in Kentucky

1. Trauma is the leading cause of death in Kentuckians under 45.

2. Trauma costs our society more than cancer, stroke, and heart disease combined.

3. Kentucky has the nation's 10th highest rate of trauma-related deaths.

4. Kentucky was 38th out of the 50 United States to establish a trauma care system.

5. Kentucky's trauma care system is unfunded and is operated largely on volunteer time, limiting potential progress.

But, we've made progress!

6. Kentucky has doubled its number of trauma centers in just 5 years.

7. Kentucky now has level 4 trauma centers, a totally new type of trauma care facility.

8. Patients with serious injuries treated at some community hospitals now reach specialty care three times as fast as they used to.

9. Hundreds of health professionals have been educated state-wide on optimal trauma care and trauma systems.

10. Traffic fatalities are down 13% in Kentucky (74 fewer lives lost so far this year).

And there's still much to do.

11. Support for the trauma care system in Kentucky is widespread-among hospitals, physicians, nurses and EMS.

12. The Kentucky Trauma System has no salaried staff at all and a full-time State Trauma Program Manager is desperately needed.

13. Kentucky's Trauma Registry, which provides critical information for resource allocation, prevention initiatives and policy-making, literally survives from grant to grant, and it risks being mothballed if no durable funding is identified.

14. Survival from trauma in Kentucky depends upon *where you are when you're hurt*.

15. 4 or 5 children still die every month in Kentucky from traffic crashes alone.

TABLE OF ATTACHMENTS