CENTRAL NERVOUS SYSTEM INJURY IN KENTUCKY

Emergency Department Visits and Hospitalizations 2016

Prepared by: the Kentucky Injury Prevention and Research Center, University of Kentucky
Funded by the Kentucky Traumatic Brain Injury Trust Fund under the Cabinet for Health and Family Services, Department of Aging and Independent Living.

FOR MORE INFORMATION

This report was prepared by Shannon Beaven of the Kentucky Injury Prevention and Research Center (Director: Dr. Terry Bunn), with funding from the Kentucky Traumatic Brain Injury Trust Fund Board. Data requests, questions, or other correspondence should be directed to the address/phone numbers below.

Address: 333 Waller Avenue, Suite 206
Lexington, KY 40504

Telephone: (859) 323-4750

Fax: (859) 257-3909

E-mail: slbeav1@email.uky.edu

Table of Contents

Table of Contents

Appendix A: Tables

Table of Contents

This report presents basic data about emergency department (ED) visits, hospitalizations, and hospital deaths for the calendar year 2016 for central nervous system injuries (CNSI) that include traumatic brain injuries (TBI), acquired brain injuries (ABI), spinal cord injuries (SCI) and cerebrovascular disease (stroke). The numbers found in this report should not be used in comparison with previous years of this report due to the transition from the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) to the most recent Tenth Revision (ICD-10-CM). ED visits represent approximately three out of four of all TBIs. This report will illustrate the leading causes of central nervous system injuries in Kentucky, what age groups are affected, and who pays for care received. The report is intended as a reference for policy makers, service providers, educators, researchers, advocates, and others interested in knowing more about the impact of central nervous system injuries with a focus on TBI.

Introduction

Awareness of traumatic brain injury (TBI) is fairly limited in the general public because the complications and issues related to TBI are often not visible to others. Symptoms of brain injury cover a wide range of issues and can include:

Mild TBI	**Severe TBI**
Fatigue	Amnesia
Headaches	Paralysis
Seizures	Loss of limb, bladder and/or bowel control
Emotional disturbances	Aggressiveness
Balance issues	Speech, language and/or vision problems
Memory loss	Respiratory issues
Impulsive Behavior	Mood, personality, or behavioral changes

These issues very often are not physically visible yet can have a devastating impact on day to day life of the injured person as well as their family, friends and colleagues. Even minor TBI may have serious, long term consequences.

Understanding how and who brain and spinal cord injuries affect is crucial to understanding the resources need to educate, prevent, and respond as a society to those with brain and spinal cord injuries.

Major sections of this report include:

- Non-Fatal TBI, ABI, SCI and stroke case demographics, causes and outcomes
- TBI, ABI and stroke case frequencies and rates at the county level
- SCI demographics, causes and outcomes

Later reports will include trends.

Also, this report does not include TBIs from federal, military, or Veterans' Administration hospitals. Data regarding deaths due to TBI, ABI, SCI and stroke only include deaths treated or seen in an ED or admitted as an inpatient to an acute care hospital. Deaths that occur due to BI, SCI or stroke outside of the hospital environment are not included in this analysis due to unavailable data. Deaths that occur in the hospital setting will be noted when included in analysis in this report.

Purpose of the Report

This report answers a wide range of important questions about how many CNSIs occur each year in the Commonwealth, who is affected, and how these CNSIs occur. This report is intended as a reference for policy makers, service providers, educators, researchers, advocates, and others interested in knowing more about the impact of CNSI in Kentucky. This information can be used to document the need for prevention, to identify priorities for research, and to support the need for services among those living with CNSI-related impairment and disability.

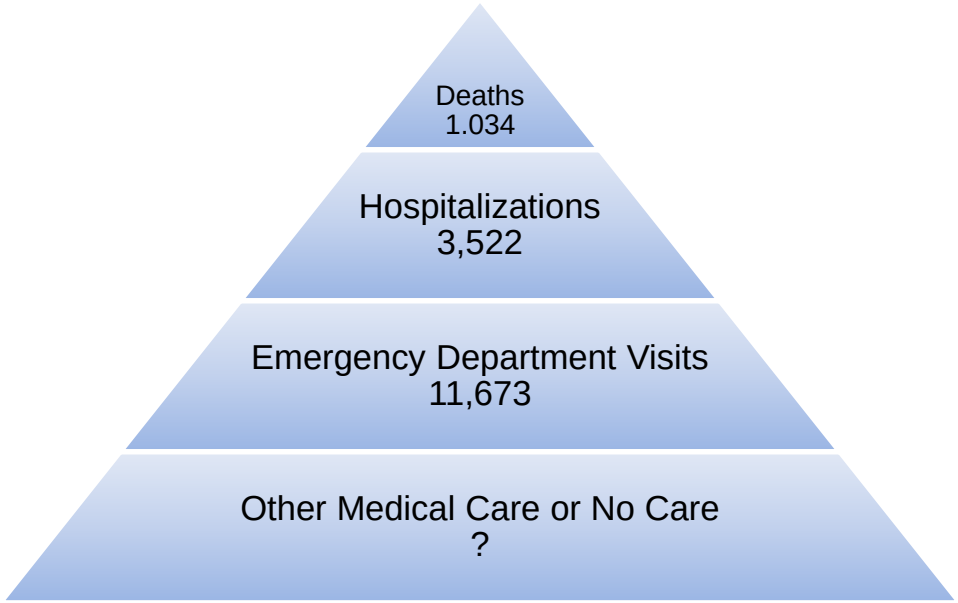
Contents and Organization

This report describes CNSI-related ED visits and hospitalizations in Kentucky for the calendar year 2016. The numbers show the magnitude of the problem, but the rates are also important. Rates show how a certain group is affected by CNSI by relating the number of CNSIs to the size of the population. For example, a relatively small number of TBIs occurring in a small population (e.g., persons ages 65 years or older) would result in a higher TBI rate than if the same number of TBIs occurred in a larger population (e.g., persons ages 25 to 44 years). The report findings are organized into two main sections. The Overview summarizes and interprets some key findings. The Appendices present more detailed data tables, along with a description of the methods and limitations.

Overview of TBI in Kentucky

In Kentucky, it is estimated that over 16,000 traumatic brain injuries and deaths occur each year. In 2016, 11,673 (76.8%) ED discharges and 3,522 (23.2%) hospitalization discharges (non-fatal) were recorded in Kentucky hospitals. In addition to these non-fatal incidents, there were an additional 1,034 Kentucky residents who died from a TBI related injury. The following figure is a pyramid depicting the estimated average annual number of TBI-related ED visits, hospitalizations, and estimated deaths in Kentucky for 2016. The number of individuals with a TBI that treat themselves at home (estimated to be close to 25% of all mild to moderate TBIs) or by seeking other means of medical care are unknown and will not be included in this report.

Figure 1: Number of Traumatic Brain Injury-Related Emergency Department Visits, Hospitalizations, and Estimated Deaths*, Kentucky, 2016



TBI in Kentucky, 2016:

- Over 15,000 people visited Kentucky hospitals with a TBI related injury. Of those, 11,673 were treated and released from an ED, 3,522 were hospitalized, and 1,034 died.

- 2,346 TBIs occurred among children ages 0 to 14 years; ED visits accounted for more than 90% of the TBIs in this age group.

- Falls were the leading cause of TBI for both ED visits as well as hospitalizations. Rates were highest for children ages 0 to 4 years (ED visits) and for adults 65 years or older.

- Falls resulted in the greatest number of TBI-related hospitalizations with a rate almost 2 times motor vehicle traffic crashes.

- Adults ages 65 years or older had the highest rates of TBI-related hospitalization with a rate almost equal to all other ages combined.

- Falls accounted for almost twice as many TBI injuries as motor vehicle traffic crashes (MVTC).

- Data indicates that TBIs led to over 41 state residents per day being treated in Kentucky hospitals (ED and hospitalization).

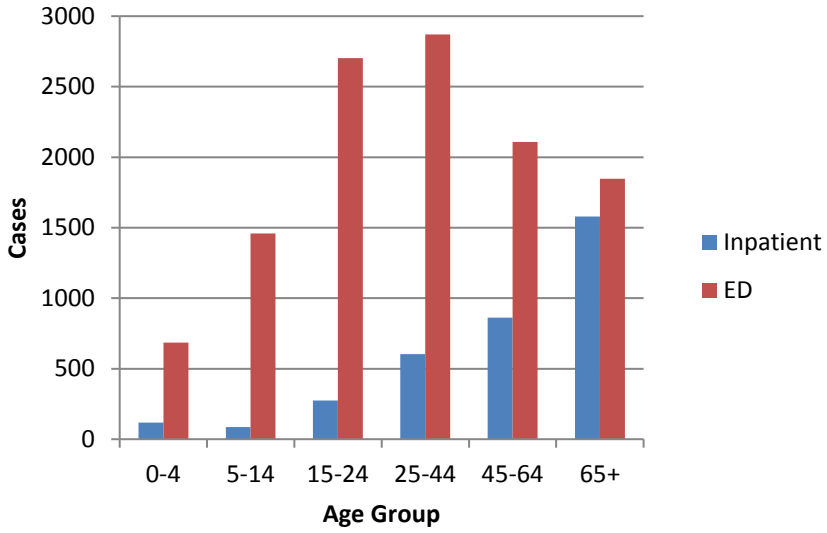
Our results indicate a need to focus prevention efforts on the following causes and target populations:

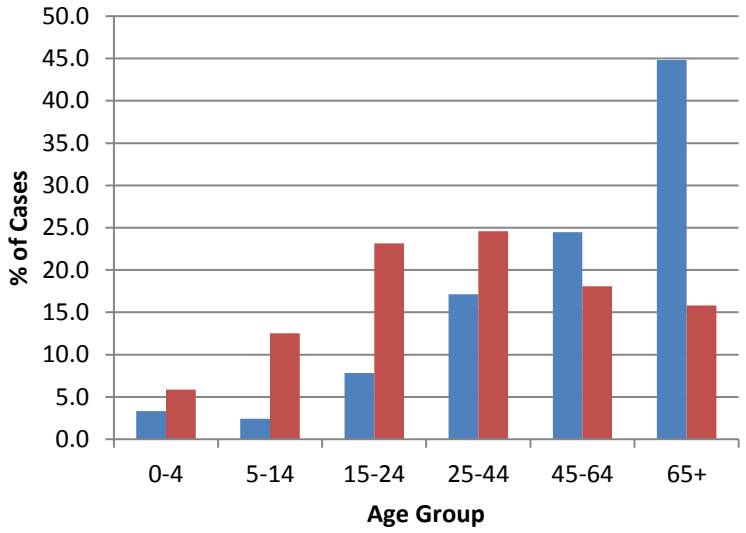
- Motor vehicle traffic crashes (TBI and SCI), especially among ages 15-24
- Falls (TBI and SCI), especially among ages 0-14 and 65 and older
- Anoxia (ABI), especially among ages 45 and older
- Exposure to toxic substances (ABI), especially among ages 45 and older

TBI by Age: Comparing the Numbers

Figure 2: Numbers of Non-Fatal Traumatic Brain Injury-Related Emergency Department Visits, and Hospitalizations, by Age Group, Kentucky, 2016

A non-fatal TBI related injury treated at a Kentucky hospital results in an *inpatient* admission for almost half of older adults (65 and older) TBI related injuries while over 9 out of 10 TBI related injuries in children (under the age of 15) are treated and released in the ED.

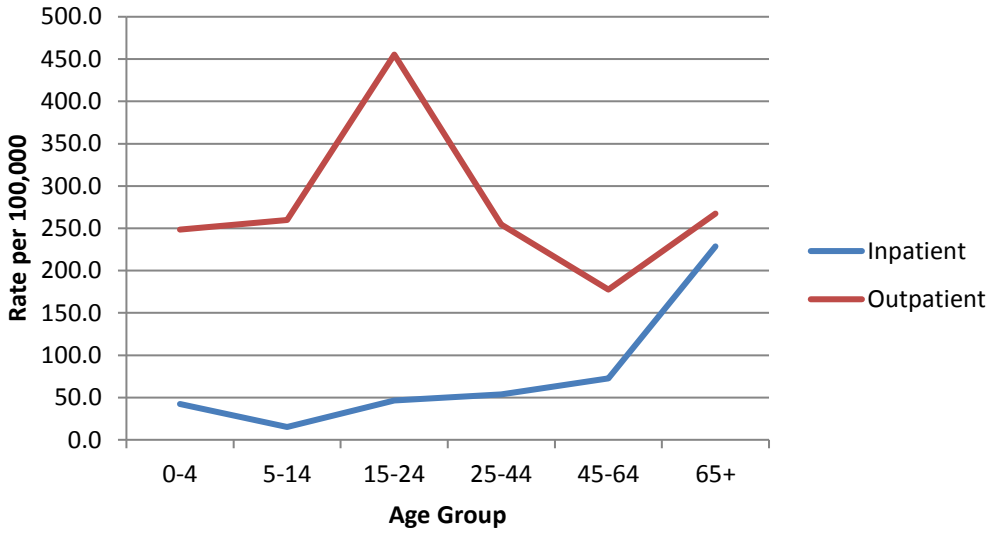




TBI by Age: Comparing the Rates

The following figure, **Figure 3**, is a graph depicting the annual rate of TBI-related ED visits and hospitalizations by age groups in Kentucky for 2016. The y axis represents the rate per 100,000 population. During 2016, young adults, ages 15 to 24 years had the highest rate of non-fatal TBI-related ED visits, 455 per 100,000 population. From age 25 to age 64 the rates for ED visits decline, then begin to rise again for those ages 65 and over. The highest rates of non-fatal TBI-related hospitalization occurred among adults age 65 years or older (229 per 100,000).

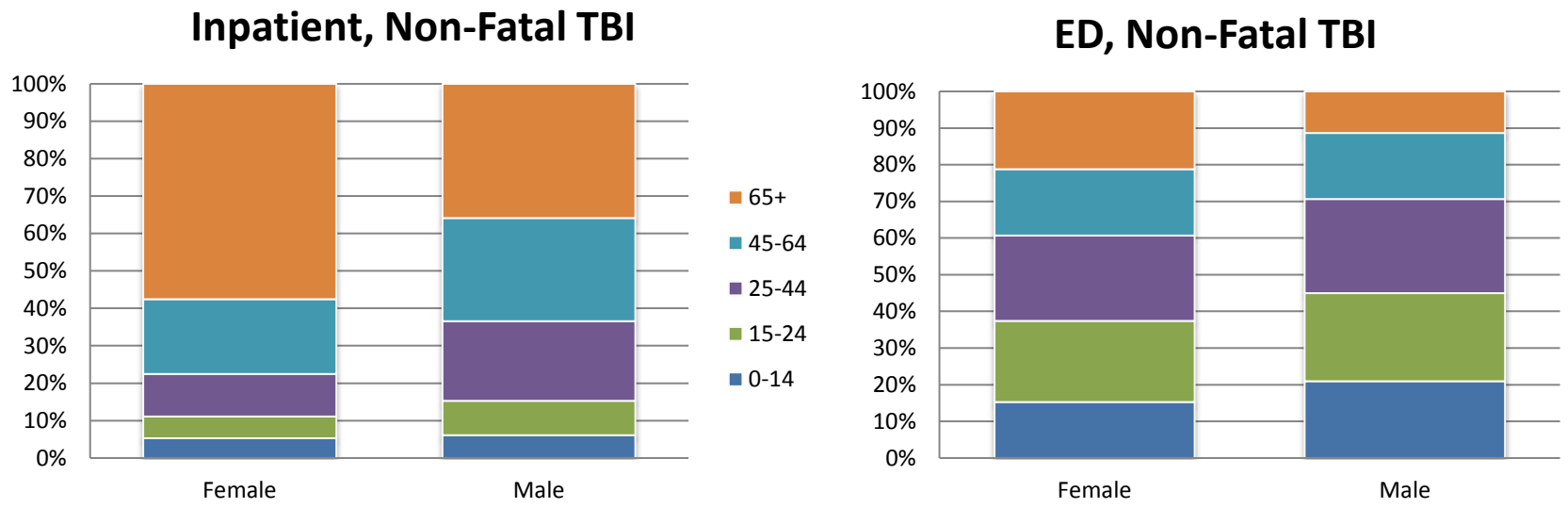
Figure 3: Rates of Traumatic Brain Injury-Related Emergency Department Visits and Hospitalizations, by Age Group, Kentucky, 2016



TBI by Gender: Comparing the Numbers

The following figure represents the estimated average annual numbers of TBI-related ED visits and hospitalizations, by gender and age, in the Commonwealth for 2016. Overall 8,445 non-fatal TBIs occurred among males compared with 6,747 among females.

Figure 4: Traumatic Brain Injury-Related Emergency Department Visits and Hospitalizations, by Age Group and Gender, Kentucky, 2016



Over half of female, non-fatal TBI related inpatient admissions were over the age of 64 while men over 64 made up just over one third of non-fatal inpatient admissions for males.

TBI by Sex: Comparing the Rates

The following figure, **Figure 5**, is a graph depicting the rates of TBI-related ED visits and hospitalizations by sex. The y axis represents the rate per 100,000 population. Males from 15 to 24 years of age had the highest rates for TBI-related ED visits, 501 per 100,000. Rates were also high for females from 15 to 24 years of age, 406 per 100,000. Both males and females had high rates for ages 65 and older inpatient visits, 242 per 100,000 for males and 218 per 100,000 for females.

Figure 5: Rates of Non-Fatal Traumatic Brain Injury-Related Emergency Department Visits and Hospitalizations, by Sex, Kentucky, 2016

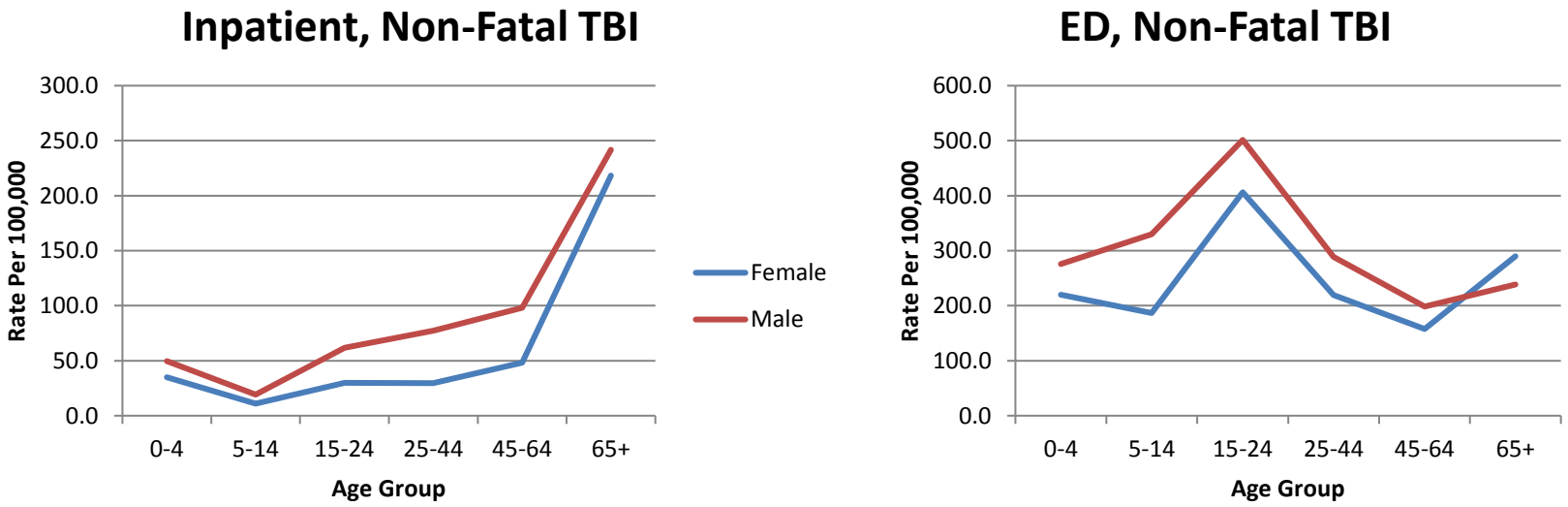
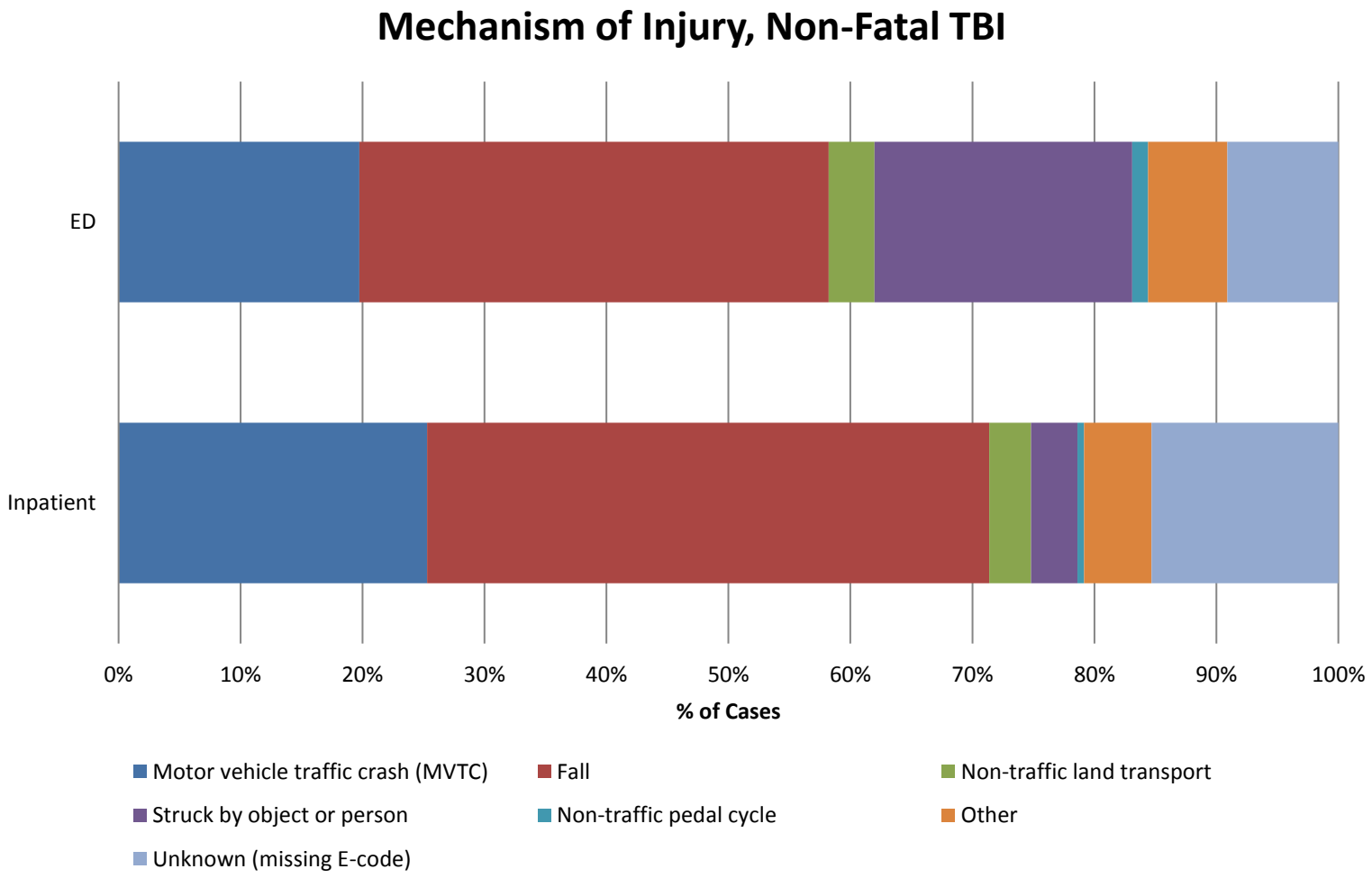


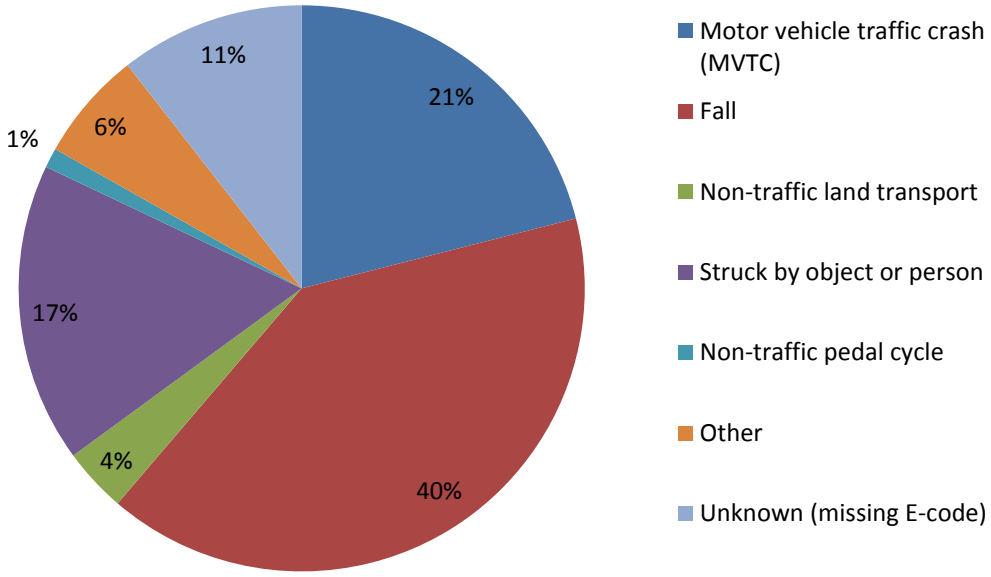
Figure 6: Non-Fatal Traumatic Brain Injury-Related Emergency Department Visits and Hospitalizations, Kentucky, 2016



TBI by External Cause: Comparing the Percentages

Following is a pie chart depicting the percentage of TBI-related ED visits and hospitalizations, combined, by external cause of injury. Falls were the leading known cause of TBI covering 40% of all non-fatal TBI in Kentucky in 2016. The second leading known cause was motor vehicle traffic crashes (MVTC) which contributed 21% of all non-fatal TBI. With the change in coding still being translated on the surveillance side, there are a larger number of unknown codes for this year. This number is expected to be reduced and confidence in coding increase as consistent coding crosswalks are generated.

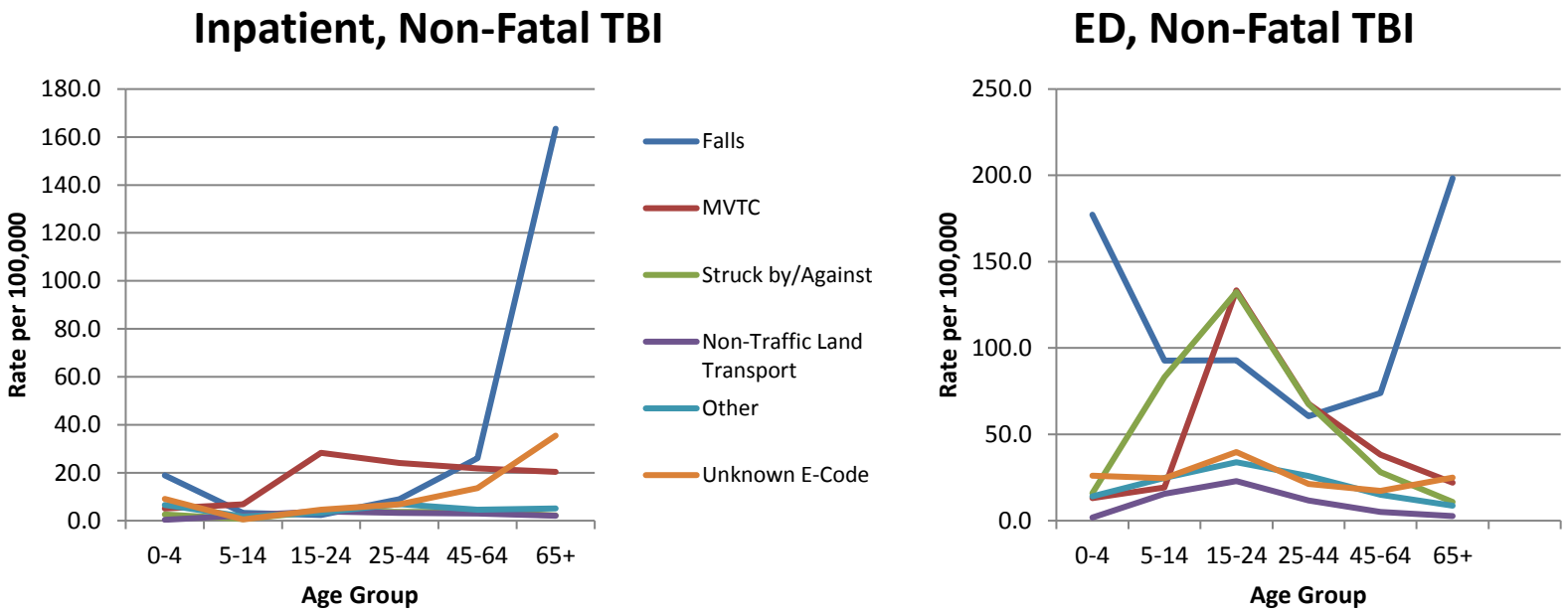
Figure 7: Percentage of Traumatic Brain Injury-Combined Emergency Department Visits and Hospitalizations, by External Cause, Kentucky, 2016



The following figure, **Figure 8**, is a graph depicting the rates of TBI-related ED visits and hospitalizations by external cause. The y axis represents the rate per 100,000 population.

The data indicate that Falls were the leading cause of TBI in Kentucky. Rates were highest among ages 0-4 years (ED) and 65 years and older (both, hospitalizations and ED). The rates for motor vehicle crash related TBI were highest among young adults ages 15 to 24 years.

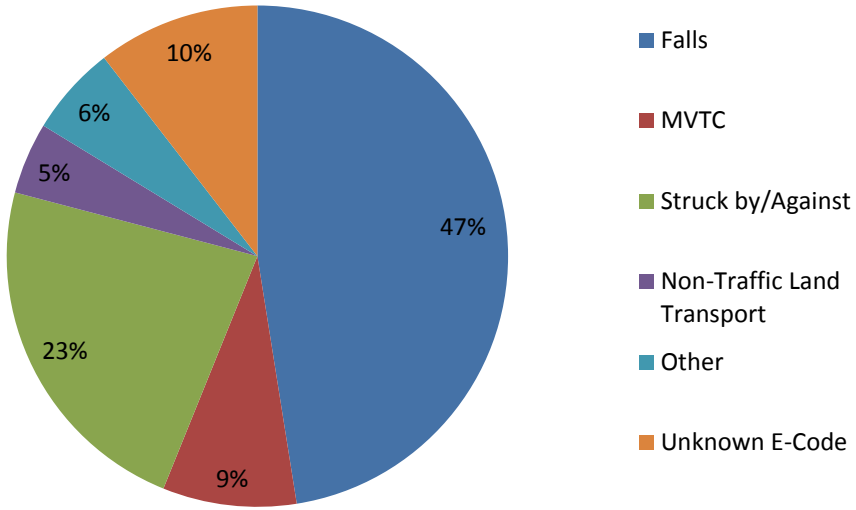
Figure 8: Rates of Non-Fatal Traumatic Brain Injury-Related Emergency Department Visits and Hospitalizations, by External Cause, Kentucky, 2016



TBI by External Cause: Comparing the Percentages by Age Groups

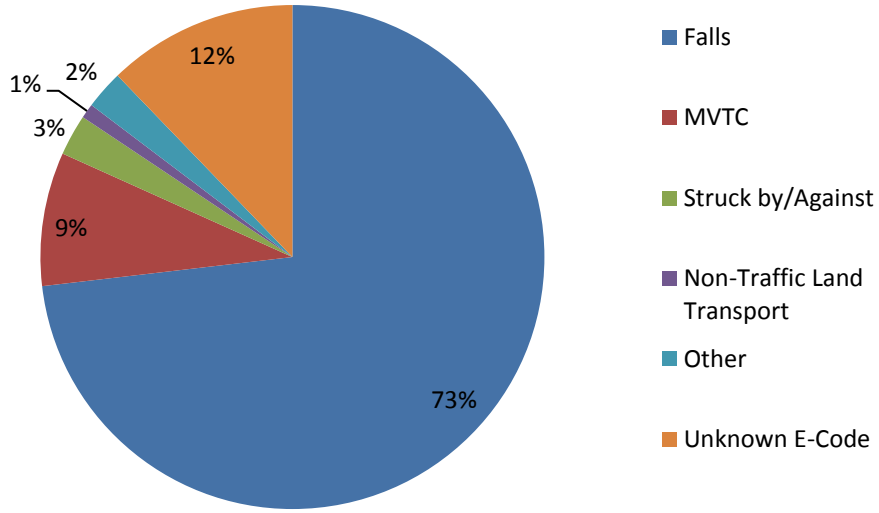
The following two figures depict the percentage of non-fatal TBI-related ED visits and hospitalizations by external cause for specific age groups. Figure 9 presents data for children ages 0 to 14 years. Figure 10 presents data for adults age 65 or older.

Figure 9: Percentage of Traumatic Brain Injury-Combined Emergency Department Visits and Hospitalizations Among Children 0 to 14 Years, by External Cause, Kentucky, 2016



For children ages 0 to 14 years, falls were the leading known external cause of non-fatal TBI, contributing to almost half of all TBIs in this age group. The second leading known external cause was struck by or against events which accounted for nearly a quarter of injuries.

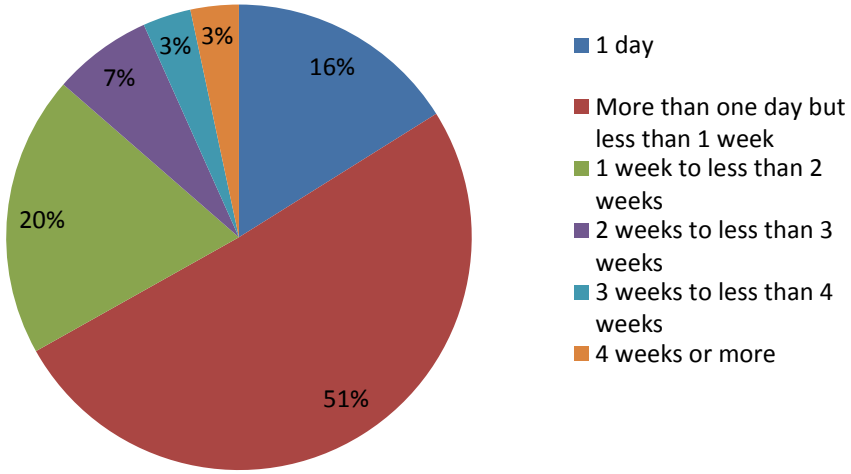
Figure 10: Percentage of Non-Fatal Traumatic Brain Injury-Combined Emergency Department Visits and Hospitalizations Among Older Adults 65 Years or Older, by External Cause, Kentucky, 2016



Falls were also the leading cause of non-fatal TBI for adults age 65 years or older and contributed to almost three quarters of non-fatal TBI injuries.

The length of stay (LOS) for hospitalized, non-fatal TBI (n=3,522) ranged from 1 day to 303 days. The mean LOS was 7.4 days with a median LOS of 4 days. Figure 11 shows the distribution of stays for those hospitalized with a TBI. Two thirds of admitted TBI injuries stayed for less than 1 week.

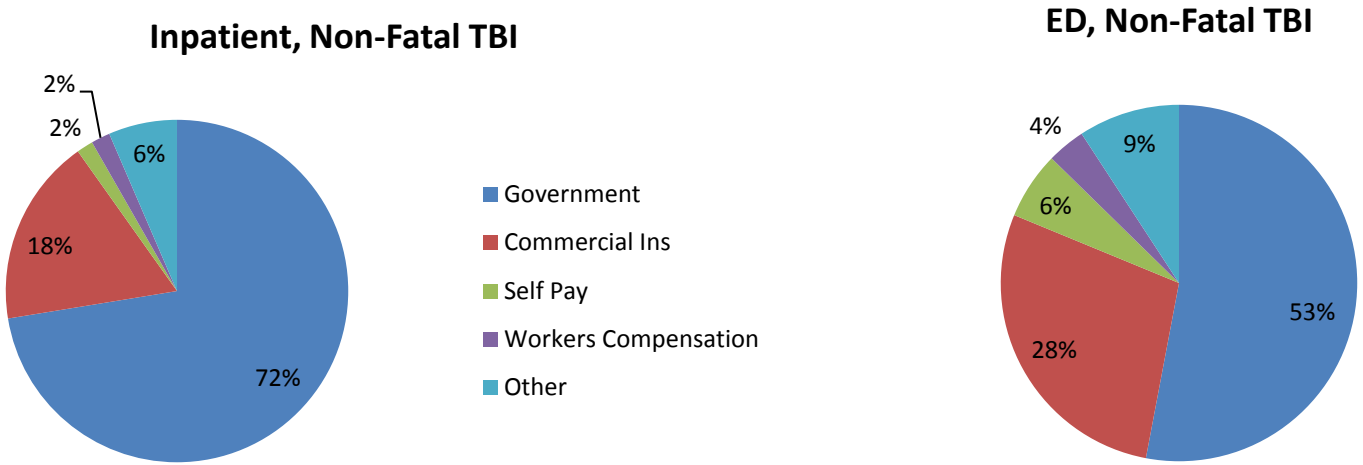
Figure 11: Non-Fatal Traumatic Brain Injury-Hospitalization Length of Stay, Kentucky, 2016

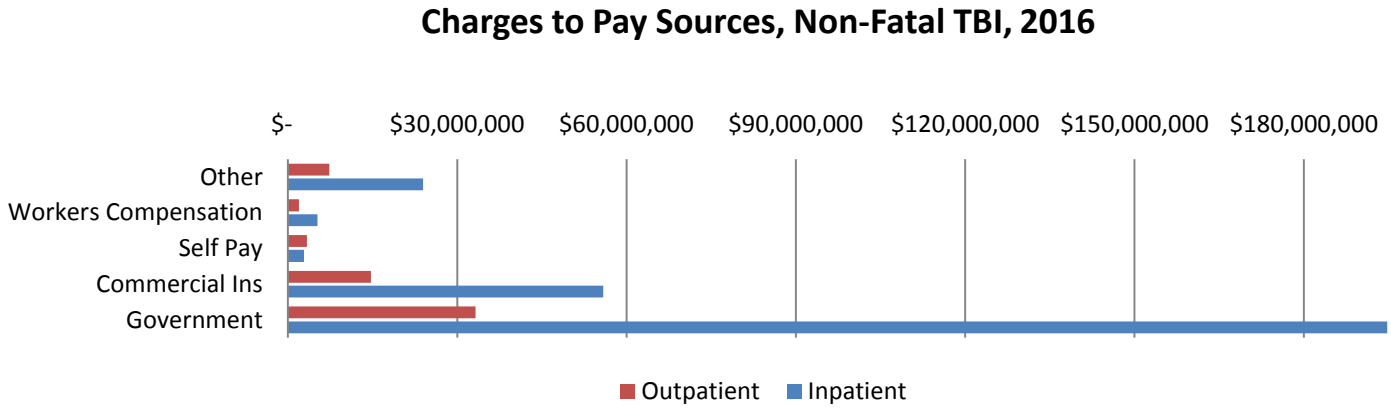


For non-fatal inpatient TBIs, 1,714 (48.7%) had a disposition other than “routine”. The three most frequent non-routine discharges were “skilled nursing facility”, “home health”, and “rehabilitation”. A total of 1,371 inpatient discharges had one of these three dispositions. ED discharges were nearly always (84.1%) to home or self care (routine) with “inpatient – other short term hospital” being the most frequent non-routine discharge.

Government sources were the primary payers billed for inpatient care charges in almost three quarters (72.4%) of non-fatal TBI as well asover half ED care charges (53.0%). Please note that the amount billed by the hospital will generally be larger than the amount actually paid after adjudication of the claim.

Figure 12: Non-Fatal Traumatic Brain Injury-Emergency Department and Hospitalizations, Payer Source and Charges, Kentucky, 2016



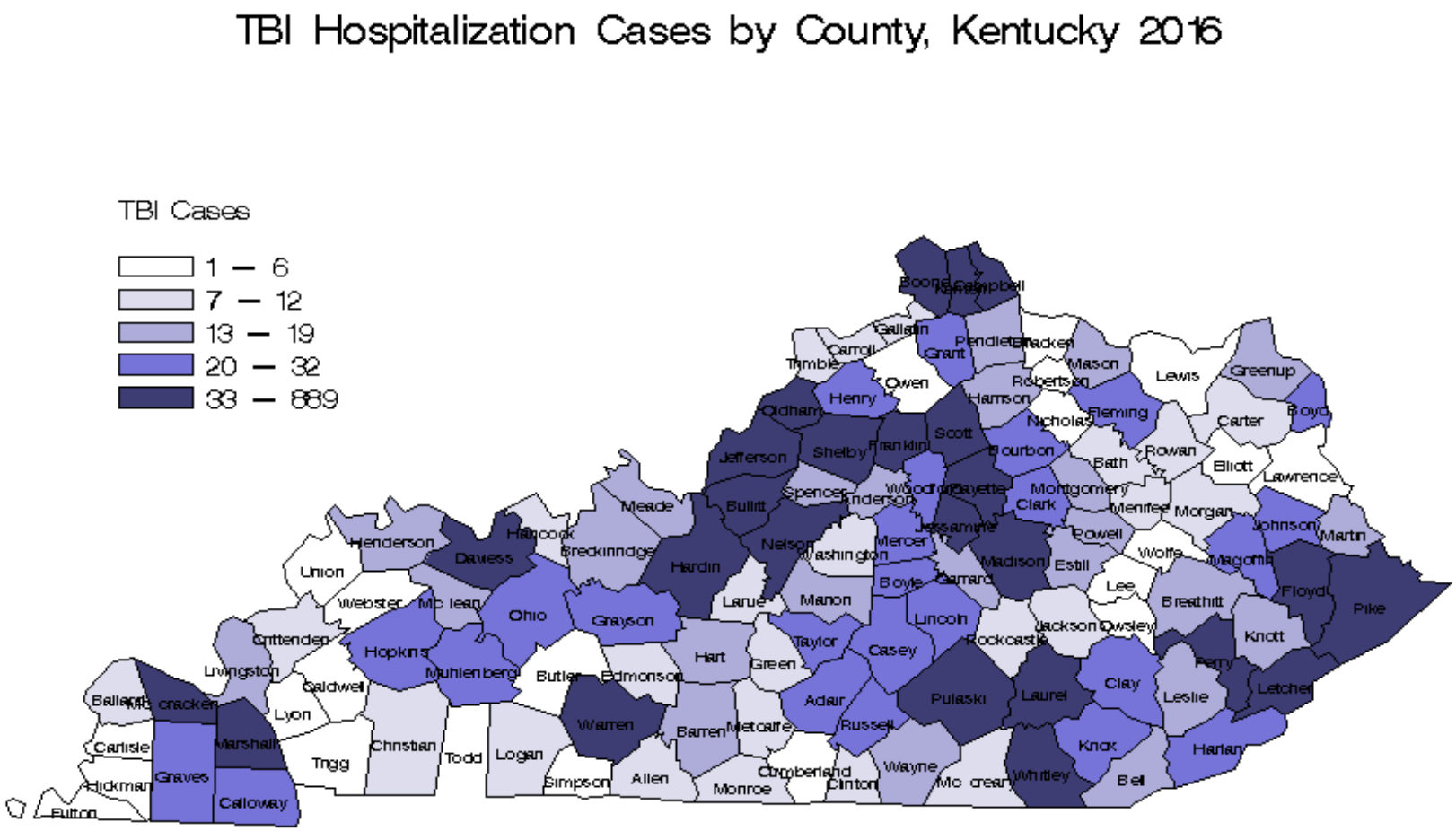


As one would expect, the incidence of TBI was highest in the larger counties. The top three in overall (inpatient and ED combined) TBI incidence (Jefferson, Fayette, and Hardin) are among the top most populous counties in Kentucky. McCracken County makes the top five in incidence while only being 13th in population rank in the state. Another notable exception was Whitley County, which was 12th in TBI incidence but 29th in population. Clay, Menifee, Fleming and Owsley also stood out by being the top 4 age-adjusted rate while ranking 54th, 115th, 76th and 119th in population size. Clay has consistently been one of the highest rated counties in Kentucky since 2001. In the past when data was available, it was noted that several southern border counties have significant numbers of residents treated in Tennessee hospitals. Prominent examples include Christian, Whitley, Warren, Bell, Harlan, Graves, Logan, and McCracken. This illustrates an important point: *if this report shows a county to have a high rate of TBI, we can be confident that this is a county in need. Conversely, however, if a county is shown to have a low rate we cannot conclude that there is not a significant problem in that county, particularly if it is located on or near the state border.*

The following illustrations map both the frequency of TBI in Kentucky counties (Figures 13 and 14) as well as the age adjusted rate of TBI in each county (Figures 15 and 16) for inpatient and outpatient TBIs. It should be noted that these mappings include ALL inpatient TBI cases (Figures 13 and 15) as well as ALL ED TBI cases (Figures 14 and 16) – including those that died at the hospital. Fatalities are not included in other analysis in this report unless noted but are included here to capture a visual representation of the magnitude of the problem of TBI in each county. These numbers DO NOT include those that died before admission to an acute care hospital.

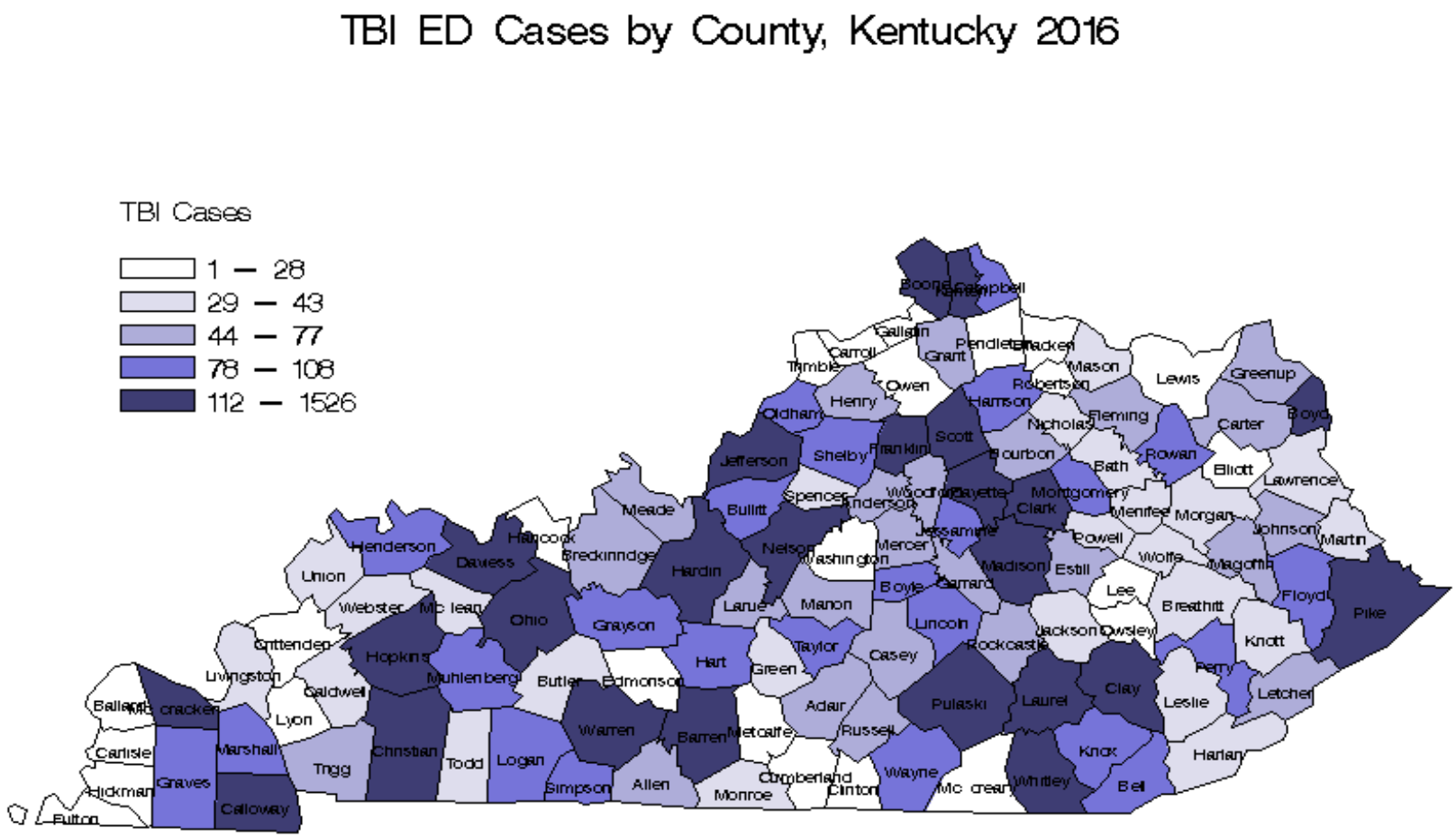
Multiple tables can be found in the Appendix detailing specific rates and frequencies by county, frequency, and age adjusted rates for both inpatient and ED TBIs.

Figure 13:



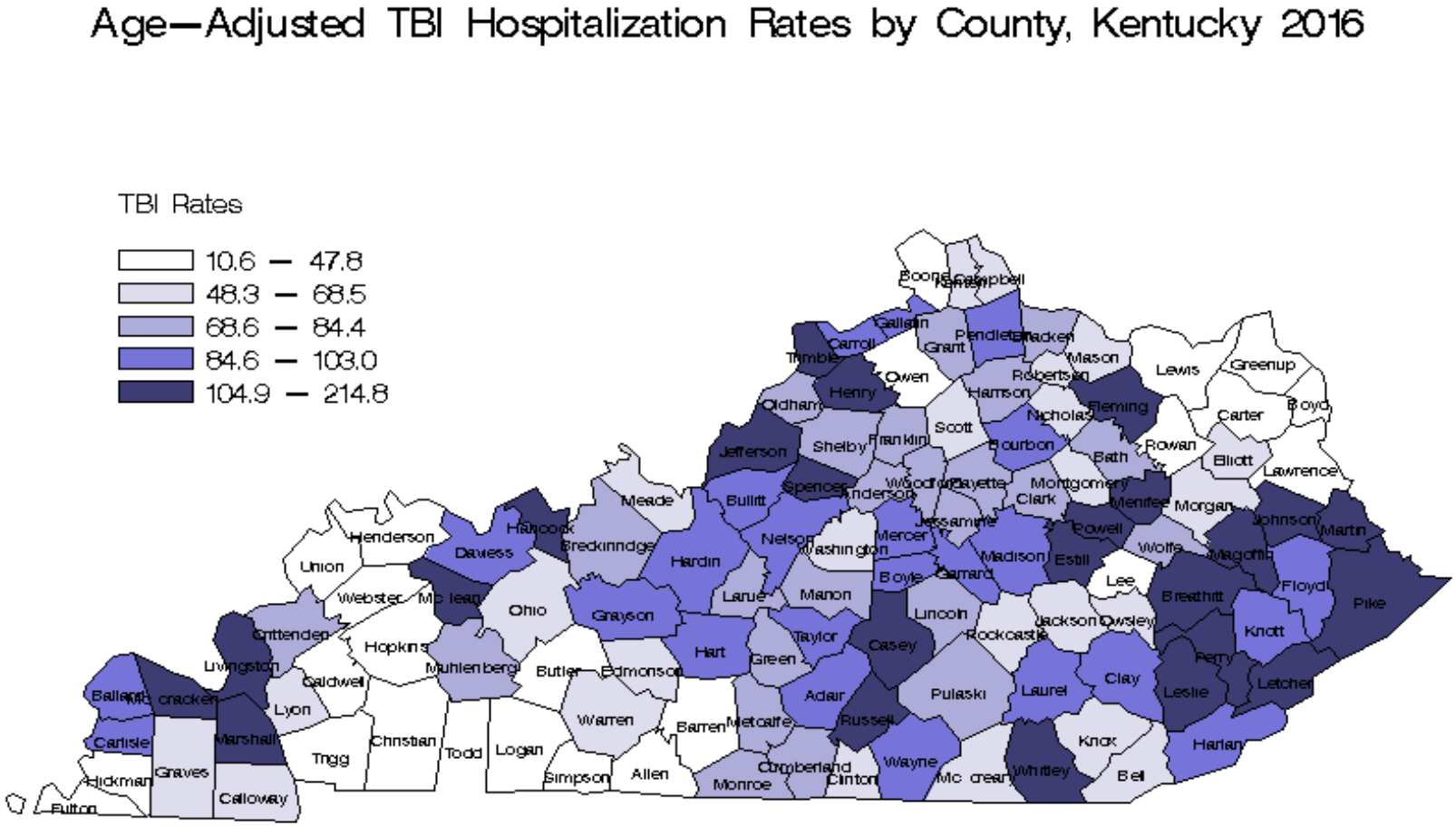
Source: Kentucky TBI Surveillance Project 2016.

Figure 14:



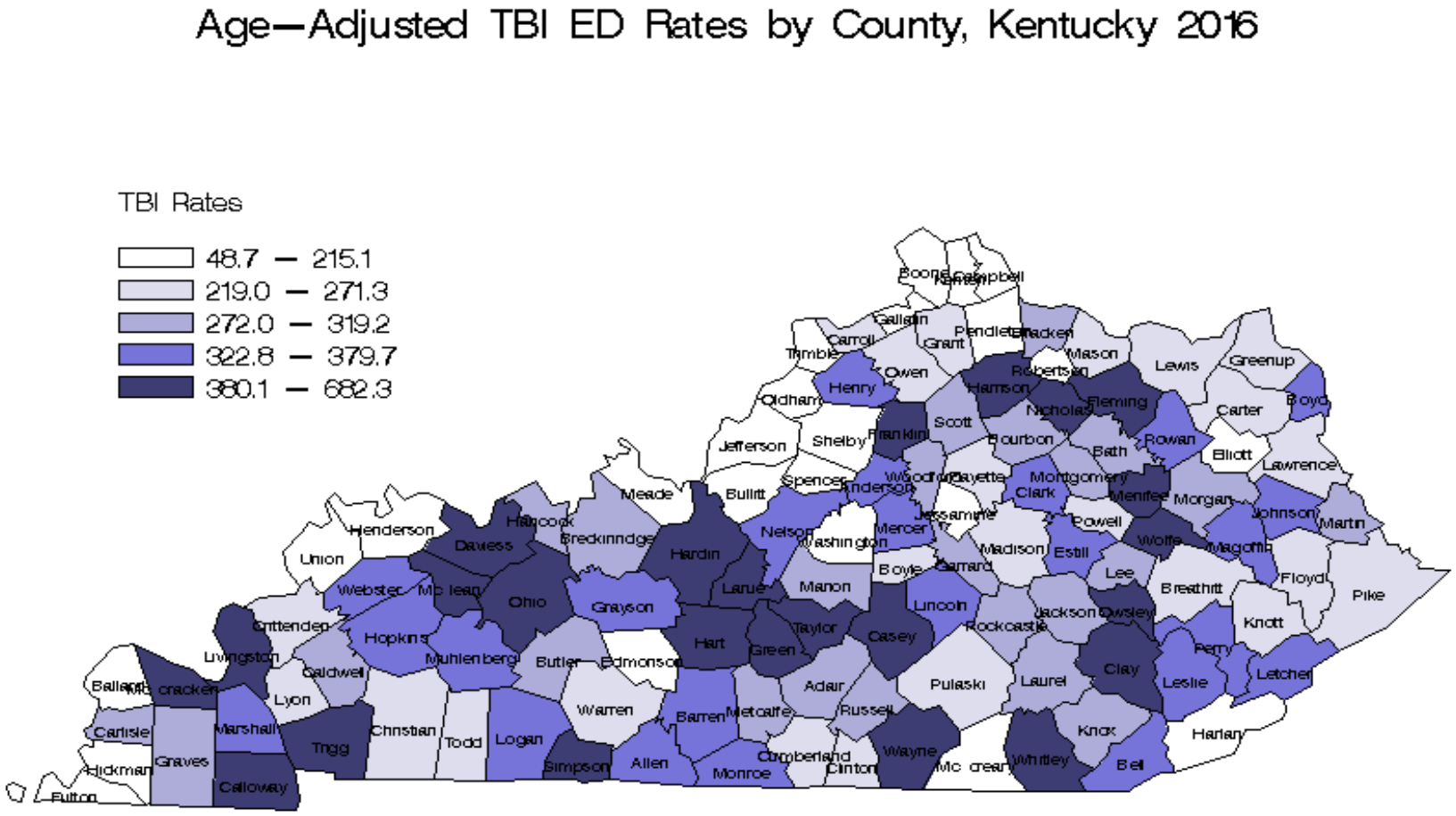
Source: Kentucky TBI Surveillance Project 2016.

Figure 15:



Source: Kentucky TBI Surveillance Project 2016.

Figure 16:



Source: Kentucky TBI Surveillance Project 2016.

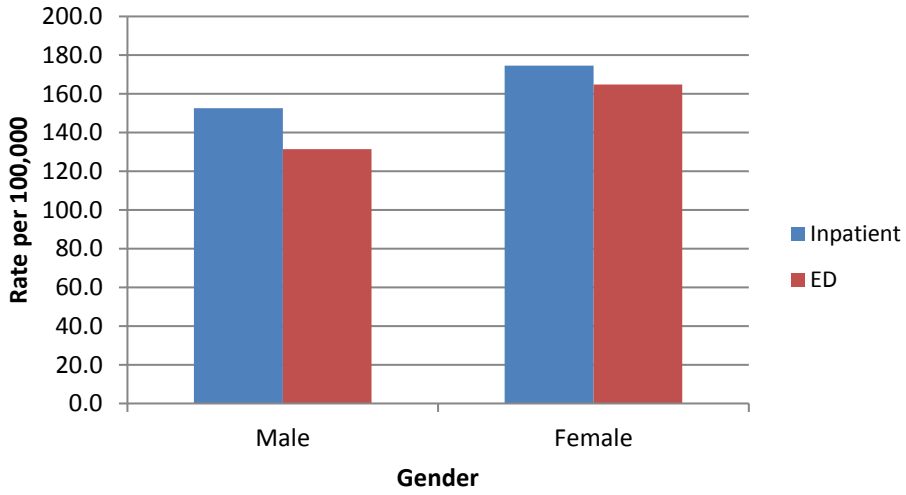
Acquired Brain Injury in Kentucky

In addition to CDC-defined TBI, there are many brain injuries that have non-traumatic etiologies. These we have classified as ABI. (See Appendix for diagnosis codes.) Because these diagnoses are not included in the CDC definition of TBI, they have been analyzed separately. There were 13,846 non-fatal ABI cases for Kentucky residents identified in 2016. This includes both inpatient (7,264) and ED (6,582) cases. The crude incidence rate for 2016 was 312 per 100,000 population.

ABI by Sex: Comparing the Rates

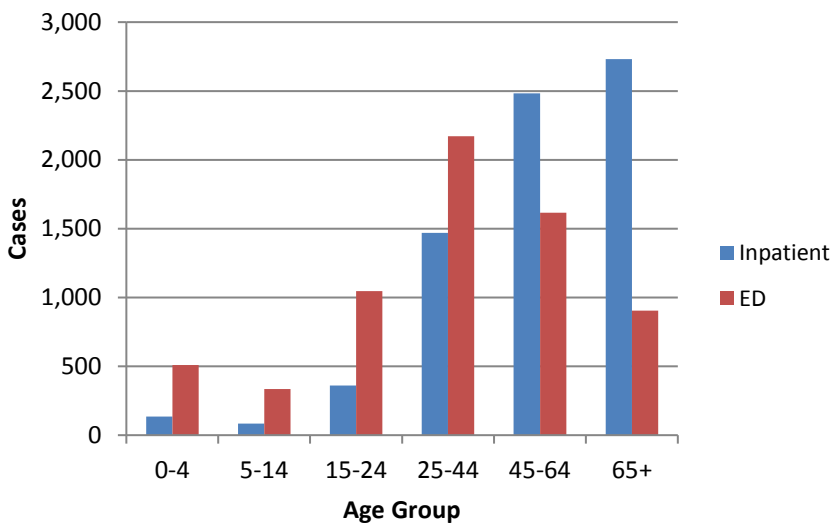
The following figure, **Figure 17**, is a graph depicting the rates of non-fatal ABI-related ED visits and hospitalizations by sex. The y axis represents the rate per 100,000 population. Rates were slightly higher for females in both ED and inpatient ABI cases.

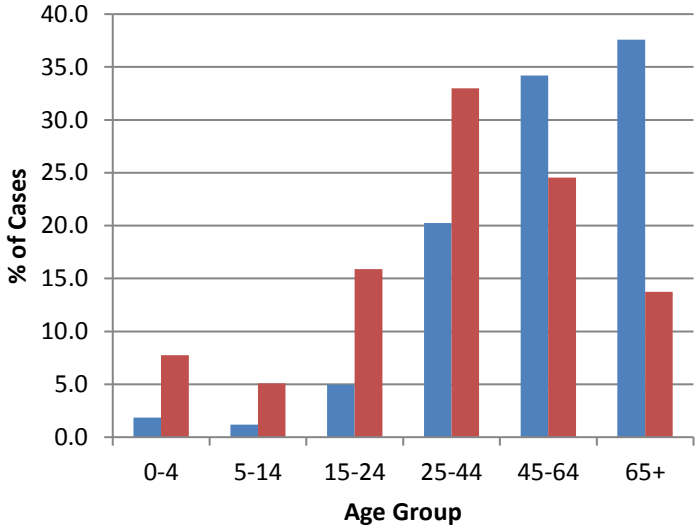
Figure 17: Rates of Non-Fatal Acquired Brain Injury-Related Emergency Department Visits and Hospitalizations, by Gender, Kentucky, 2016



ABI by Age: Comparing the Numbers

Figure 18: Numbers of Non-Fatal Acquired Brain Injury-Related Emergency Department Visits, and Hospitalizations, by Age Group, Kentucky, 2016

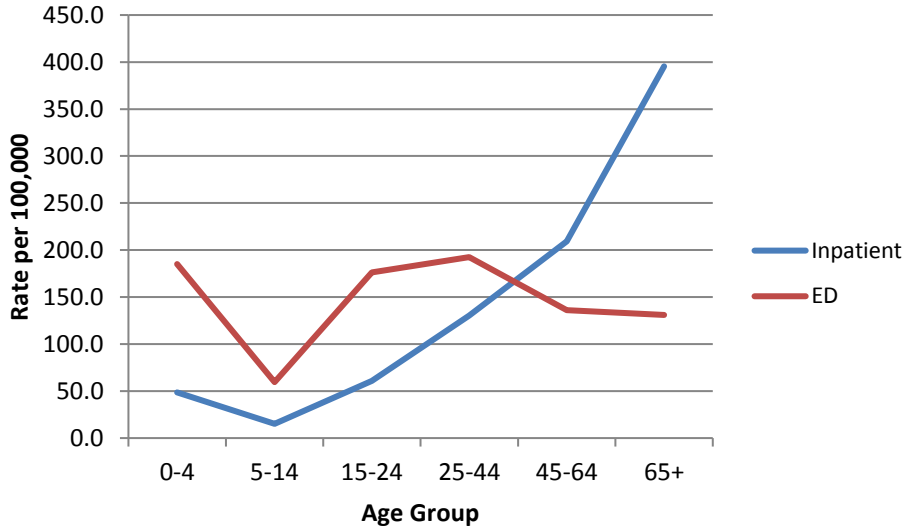




ABI by Age: Comparing the Rates

The following figure, **Figure 19**, is a graph depicting the annual rate of ABI-related ED visits and hospitalizations by age groups in Kentucky for 2016. The y axis represents the rate per 100,000 population. During 2016, the highest rate of non-fatal ABI-related ED visits at 192 per 100,000 population were those in the 25-44. The highest rates of non-fatal ABI-related hospitalization occurred among adults age 65 years or older (395 per 100,000).

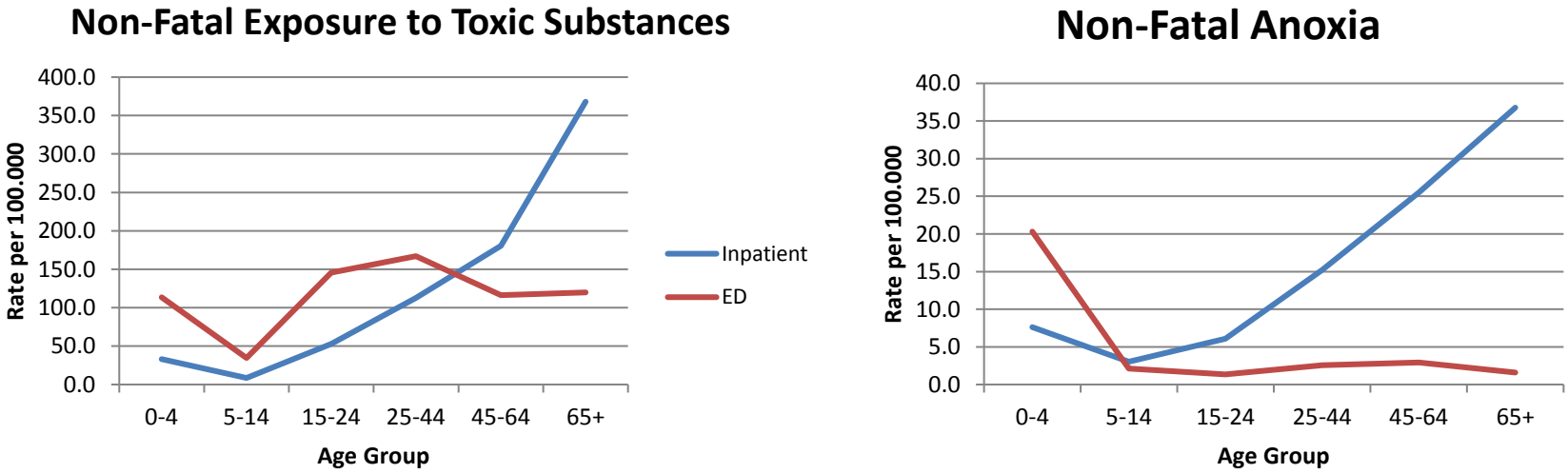
Figure 19: Rates of Acquired Brain Injury-Related Emergency Department Visits and Hospitalizations, by Age Group, Kentucky, 2016



ABI by Age and Type: Comparing the Rates

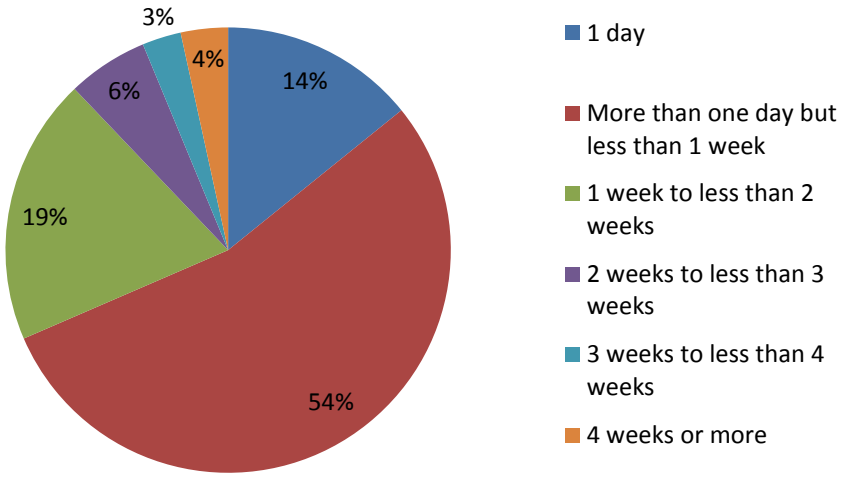
Nearly all ABI (84.9% of inpatient and 84.5% of ED) were a result of exposure to toxic substances (ETS). Almost half of all ETS cases included poisoning by sedatives, hypnotics, central nervous system depressants/anesthetics and toxic effects of alcohol. Over two thirds of all anoxia cases were due to anoxic brain damage related to hereditary and degenerative disease of the central nervous system. In non-fatal ABI inpatient visits, anoxia tends to affect older people (ages 45 and over) considerably more often than younger people, whereas ETS affects persons 15 and older. In general, very young children, 0-4, always have one of the highest rates of non-fatal ABI related ED visits.

Figure 20: Rates of Non-Fatal Acquired Brain Injury-Related Emergency Department Visits, and Hospitalizations, by Age Group and Type, Kentucky, 2016



The length of stay (LOS) for hospitalized, non-fatal ABI (n=4,011) ranged from 1 day to 303 days. The mean LOS was 7.2 days with a median LOS of 4 days. Figure 22 shows the distribution of stays for those hospitalized with ABI. Almost one in three admitted (inpatient) ABI injuries stayed for 1 week or longer.

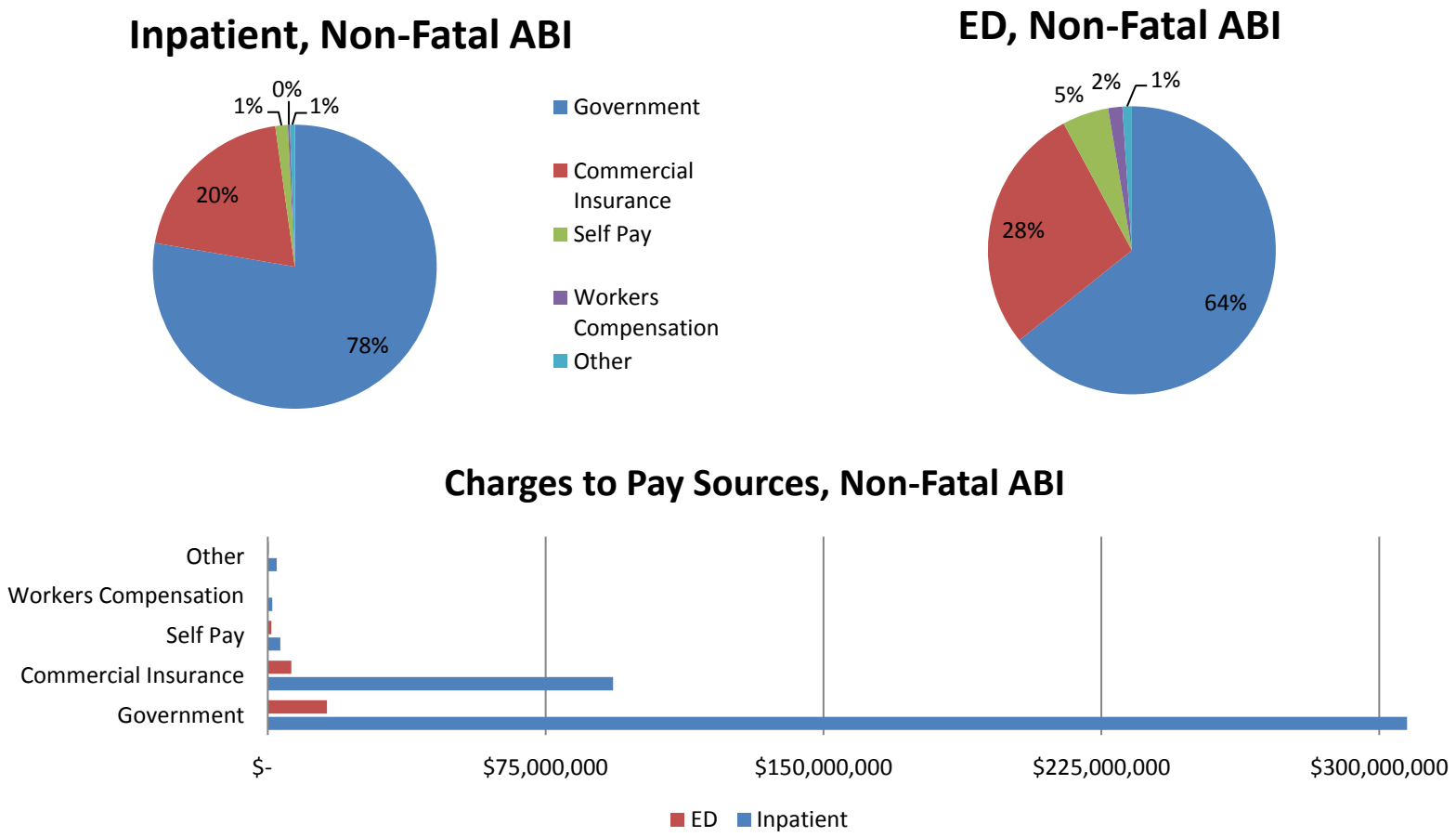
Figure 21: Non-Fatal Acquired Brain Injury-Hospitalization Length of Stay, Kentucky, 2016



For non-fatal inpatient ABIs, 3,312 (45.6%) had a disposition other than "routine". The three most frequent non-routine discharges were "skilled nursing facility", "home health", and "rehabilitation". A total of 2,029 inpatient discharges had one of these three dispositions. ED discharges were most likely (82.8%) routinely discharged to home or self care (routine) with "inpatient – other short term hospital" being the most frequent non-routine discharge.

Government sources were the most often primary payers billed for both inpatient (77.7%) and ED (64.3%) cases for non-fatal ABI. Please note that the amount billed by the hospital will generally be larger than the amount actually paid after adjudication of the claim.

Figure 22: Non-Fatal Acquired Brain Injury-Emergency Department and Hospitalizations, Payer Source and Charges, Kentucky, 2016

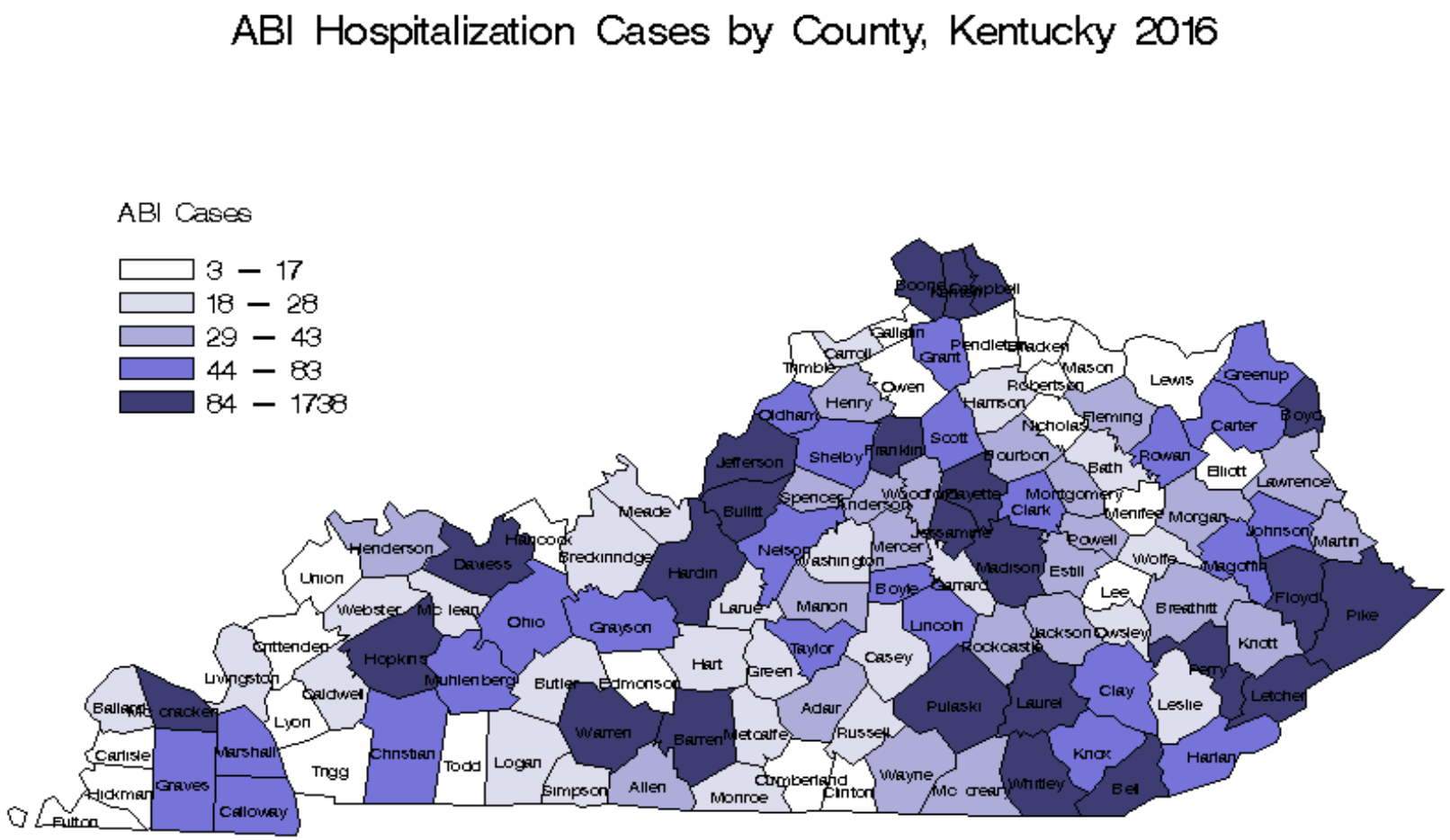


In general, as with TBI, the more populous counties had high numbers of ABI. However, only one of the ten most populous counties appeared in the top 25 counties when ranked by age-adjusted rate for hospitalized cases (Jefferson County, ranked 1st in population and 24th in age adjusted rate). Perry, which ranks 38th with respect to county population, had the highest age adjusted rate of inpatient ABI in the state. Leading the state for age adjusted rate for ED cases was Clay County, the 54th (most populated) county when ranked by population size, followed by Owsley which is ranked 119th in population. The counties with the highest inpatient rates were concentrated in eastern Kentucky with another cluster showing in the western region (Figure 26).

The following figures map both the frequency of ABI in Kentucky counties (Figures 24 and 25) as well as the age adjusted rate of ABI in each county (Figures 26 and 27) for inpatient and outpatient ABIs. It should be noted that these mappings include ALL inpatient ABI cases (Figures 24 and 26) as well as ALL ED ABI cases (Figures 25 and 27) – including those that died at the hospital. Fatalities are not included in other analysis in this report unless noted but are included here to capture a visual representation of the magnitude of the problem of ABI in each county. These numbers DO NOT include those that died before admission to an acute care hospital.

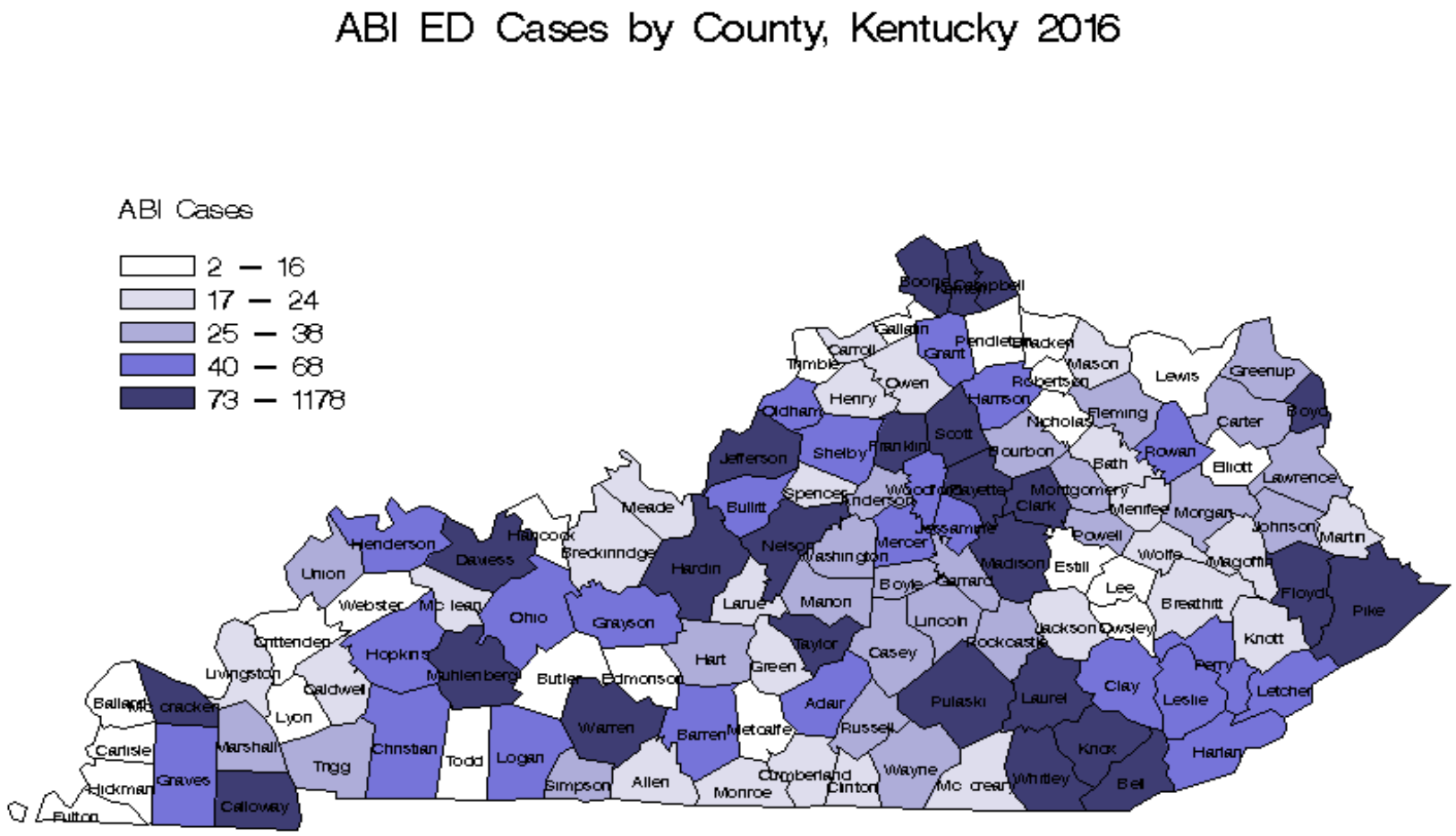
Multiple tables can be found in the Appendix detailing specific rates and frequencies by county, frequency, and age adjusted rates for both inpatient and ED ABIs.

Figure 23.



Source: Kentucky TBI Surveillance Project 2016.

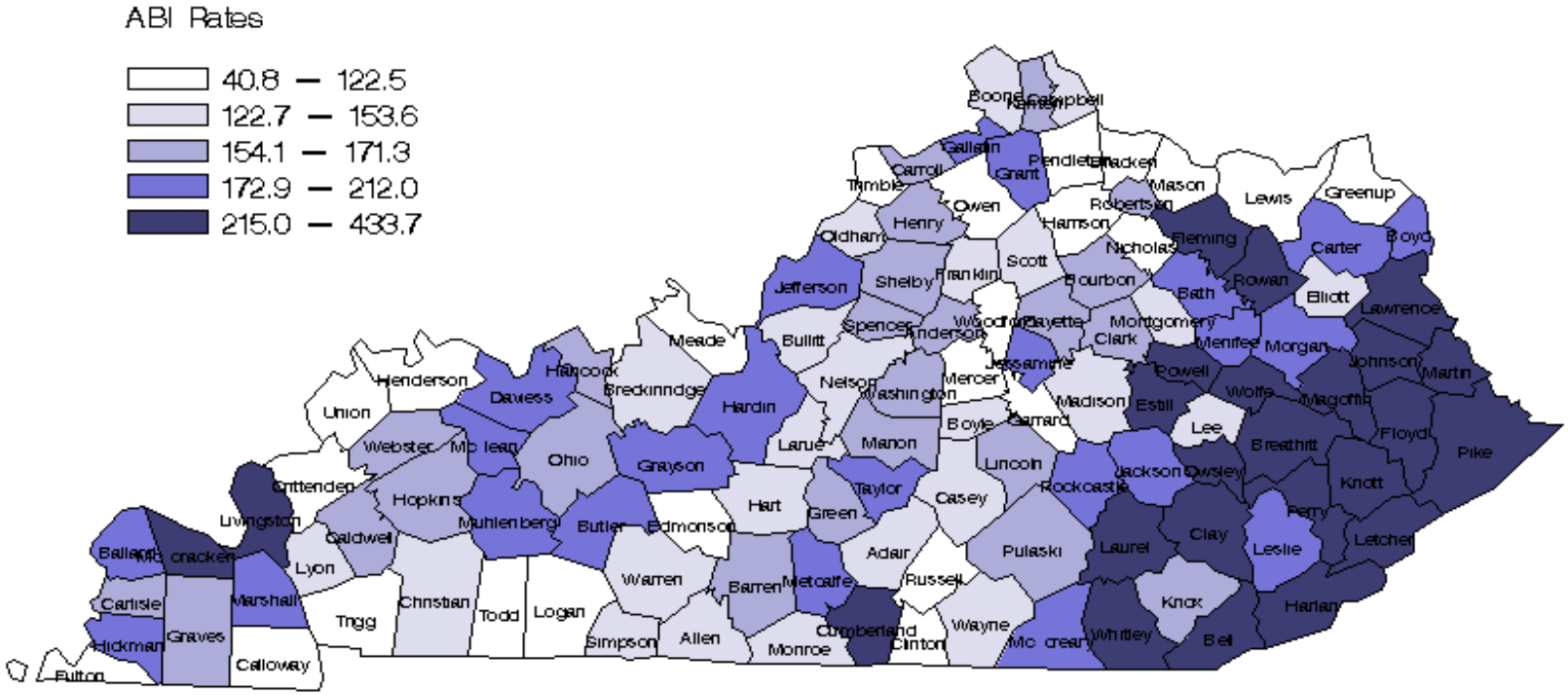
Figure 24.



Source: Kentucky TBI Surveillance Project 2016.

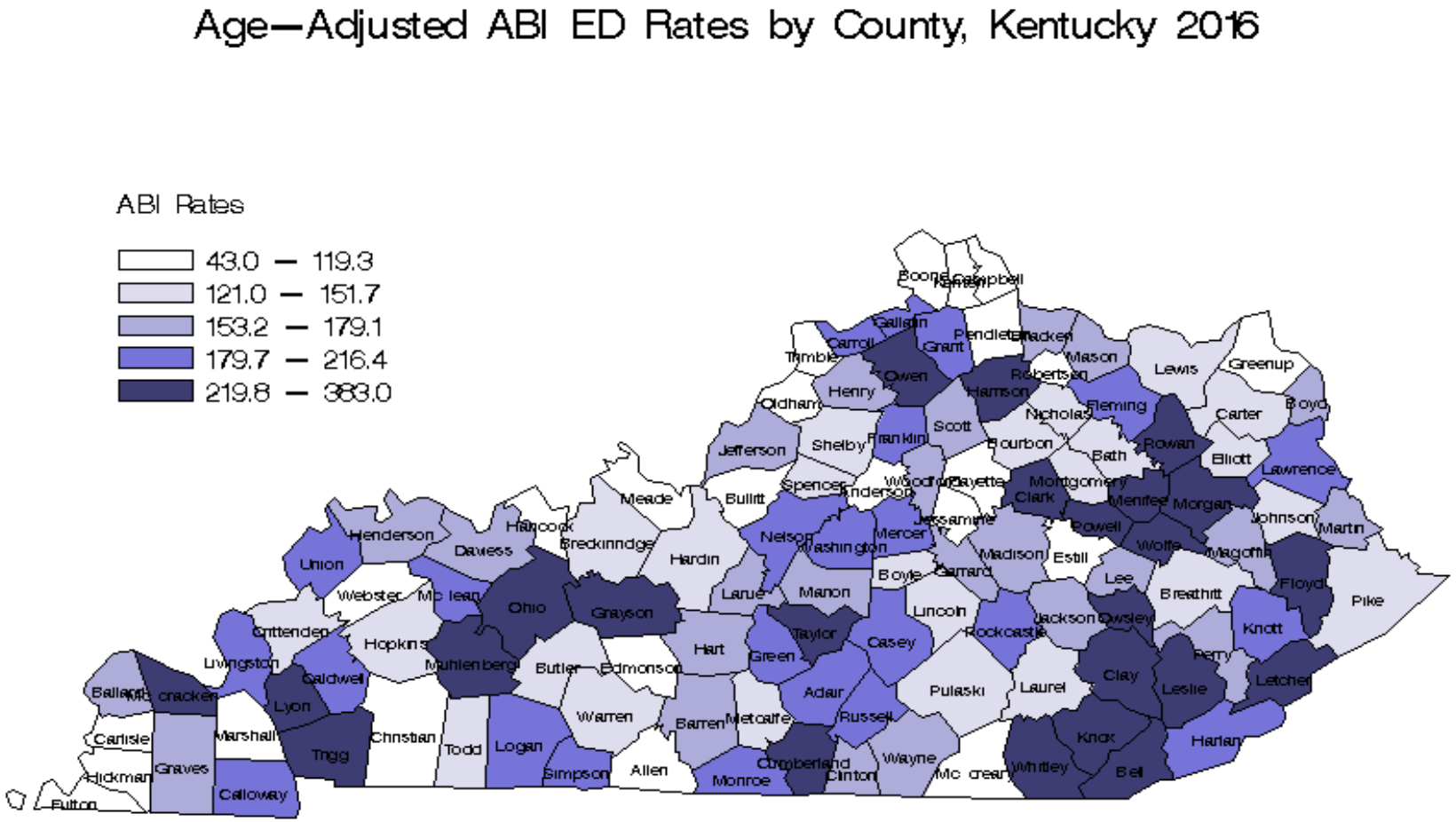
Figure 25.

Age—Adjusted ABI Hospitalization Rates by County, Kentucky 2016



Source: Kentucky TBI Surveillance Project 2016.

Figure 26.



Source: Kentucky TBI Surveillance Project 2016.

Spinal Cord Injury in Kentucky

SCI patients often are readmitted for problems stemming from the original injury. In an effort to avoid double counting in such cases, for SCI we looked only at the first three listed diagnosis codes. There were 154 non-fatal inpatient SCI cases for Kentucky residents identified in 2016 as well as 87 non-fatal ED cases. The crude incidence rate of any non-fatal SCI was 5.4 per 100,000 population.

SCI by Sex: Comparing the Rates

Figure 27: Rates of Non-Fatal Spinal Cord Injury-Related Emergency Department Visits and Hospitalizations, by Gender, Kentucky, 2016

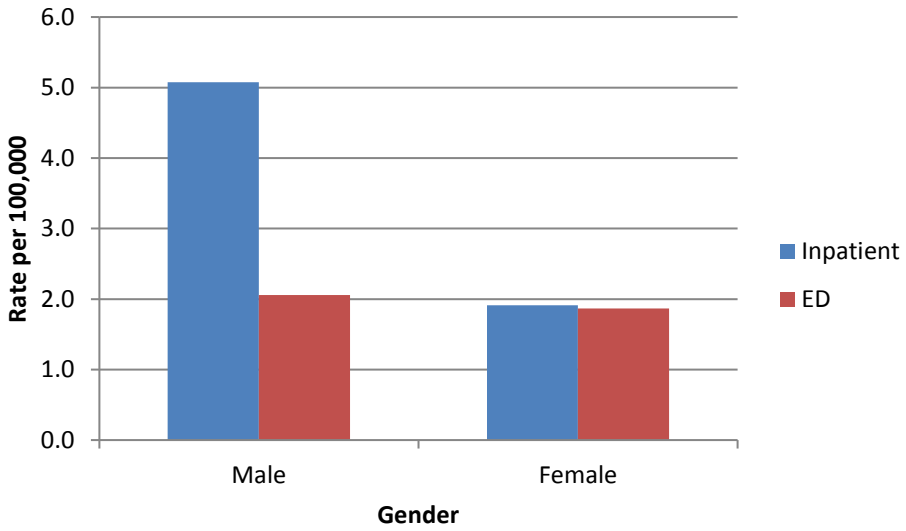
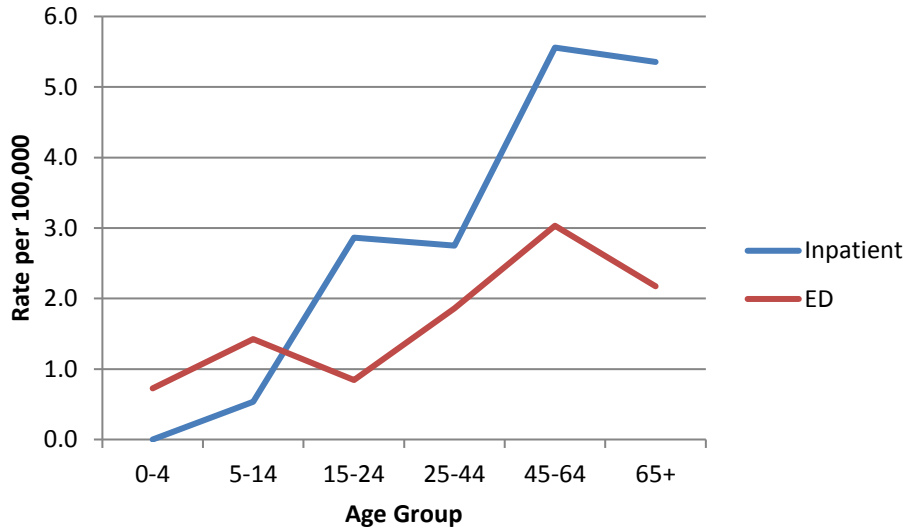
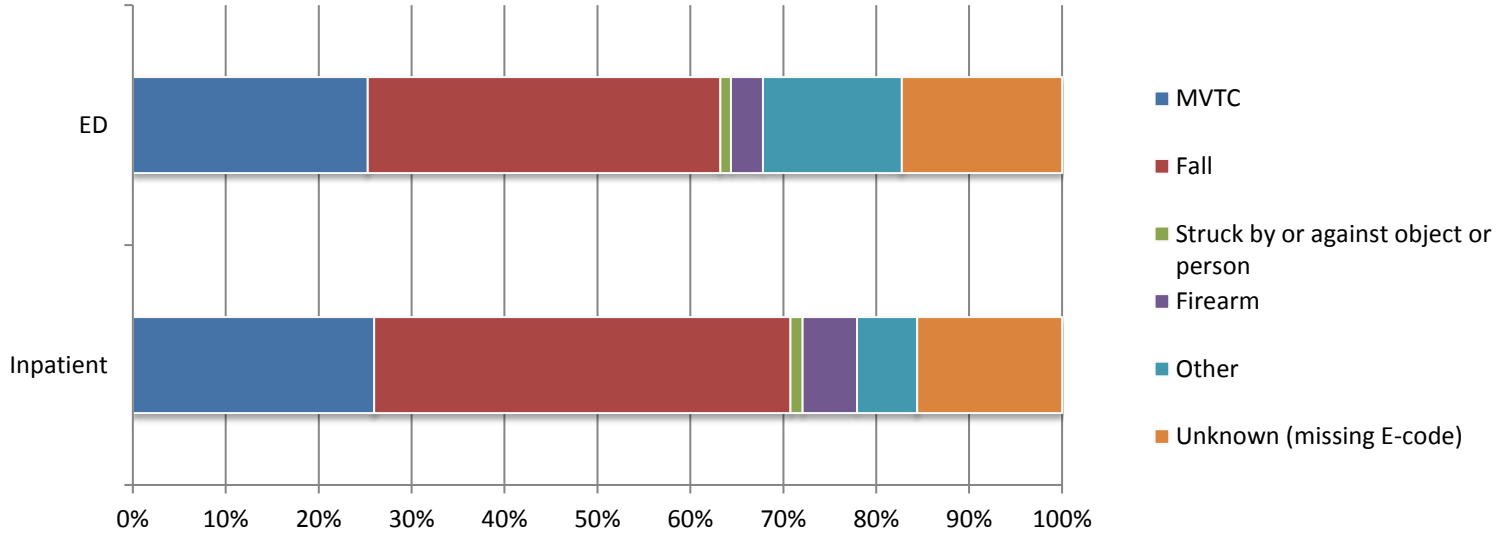


Figure 28: Rates of Spinal Cord Injury-Related Emergency Department Visits and Hospitalizations, by Age Group, Kentucky, 2016



The highest age-specific rates were found in the 45-64 age group for both non-fatal inpatient and ED SCI.

Figure 29: Non-Fatal Spinal Cord Injury-Related Emergency Department Visits and Hospitalizations by External Cause, Kentucky, 2016

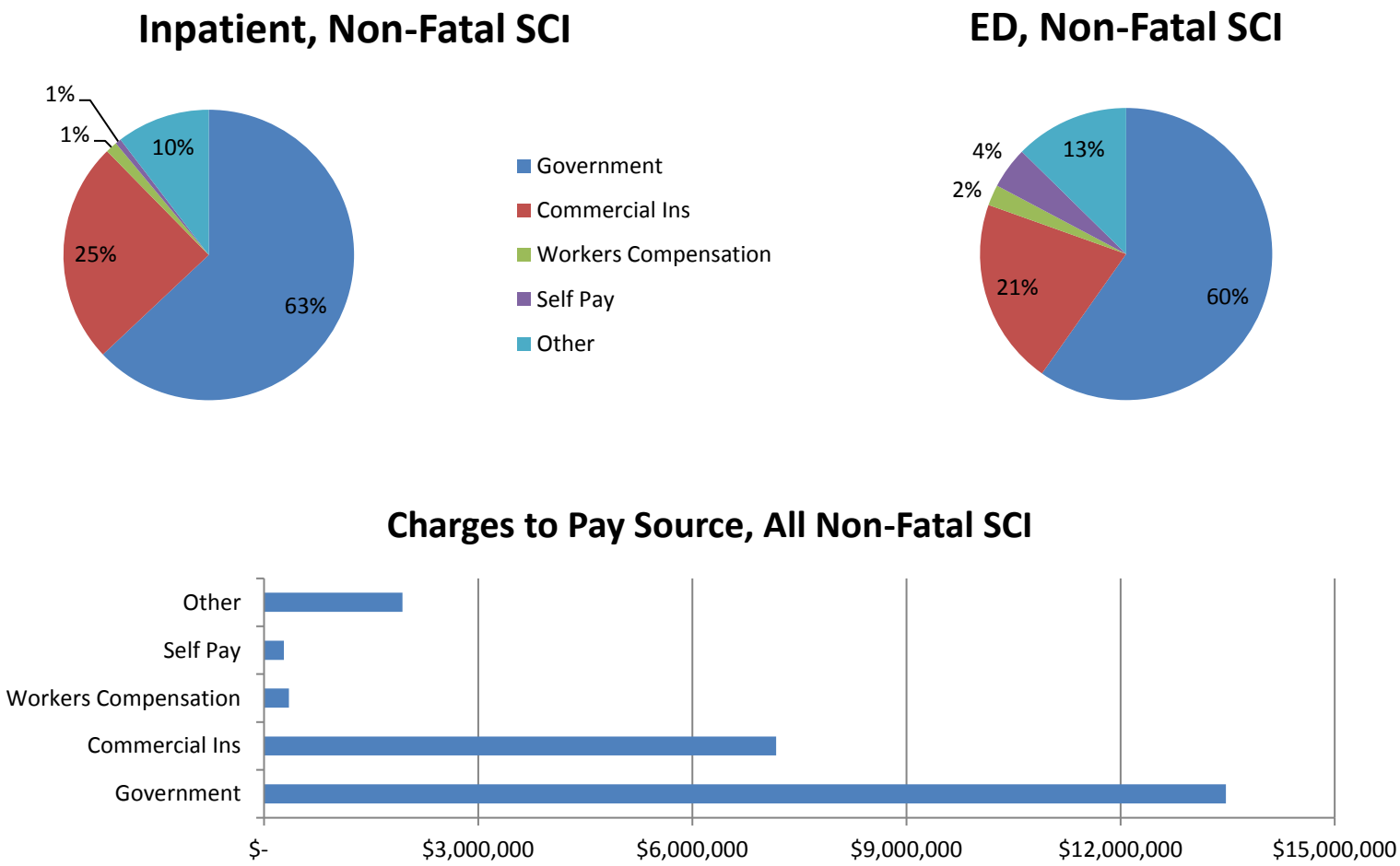


Among non-fatal SCI's for which an E-code was reported, falls were the leading mechanisms of injury for both inpatient and ED SCI visits. Unfortunately, almost one out of five of the inpatient SCI discharges had no E-code reported.

Hospitalized SCI patients had a length of stay (LOS) varying from 1 day to 83 days. The mean LOS was 10.5 days with a median of 7.5 days. Almost 3 out of 4 (70.8%) of the non-fatal inpatient SCI discharges had dispositions other than "routine", while 335.6% of ED discharges were non-routine. In total, almost 6 out of 10 of all SCI non-fatal discharges went on to receive further care. In comparison, non-fatal TBI inpatient visits were routinely discharged almost 50% of the time and TBI visits to the ED were routinely discharged over 84% of the time. Overall, 3 out of 4 non-fatal TBI discharges were discharged to home or self care (routine).

Government sources were the primary payer billed for acute care charges in almost two thirds of all non-fatal SCI. Government payers were billed almost $13.5 million in 2016, and commercial payers over $7.1 million.

Figure 30: Non-Fatal Spinal Cord Injury-Emergency Department and Hospitalizations, Payer Source and Charges, Kentucky, 2016



Cerebrovascular Disease in Kentucky

The highest death rates for cerebrovascular disease (stroke) occur in the southeastern US which has been dubbed the "stroke belt". This region consists of a group of 11 southeastern states that have an age-adjusted stroke mortality rate more than 10% above the national average. Kentucky is included in this region. In 2016, over 20,000 non-fatal hospital visits by Kentucky residents were coded with stroke related ICD-10 codes in one or more diagnosis fields. Of these, 78.8% listed stroke as the principal diagnosis. There were 13,132 non-fatal inpatient stroke cases for Kentucky residents identified in 2016 as well as 7,747 non-fatal ED cases. The crude incidence rate was 471 per 100,000 population.

Stroke by Sex: Comparing the Rates

Figure 31: Rates of Non-Fatal Stroke Related Emergency Department Visits and Hospitalizations, by Gender, Kentucky, 2016

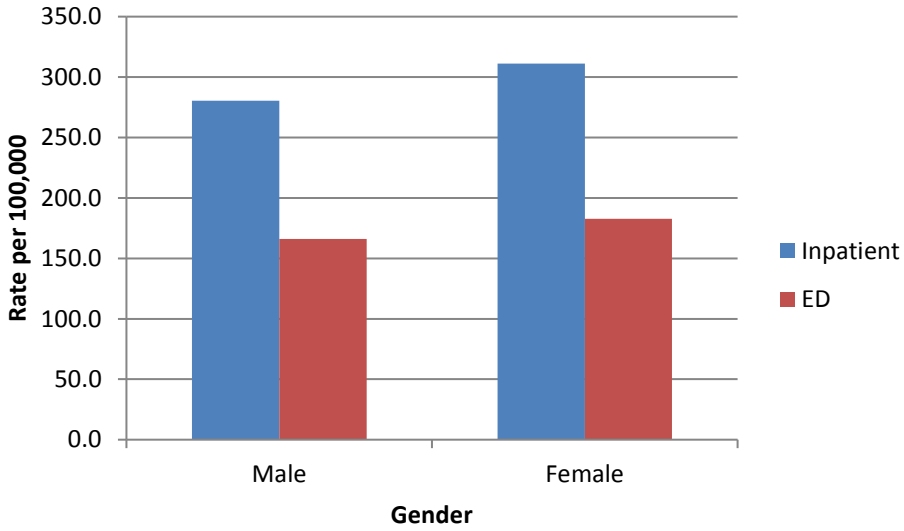
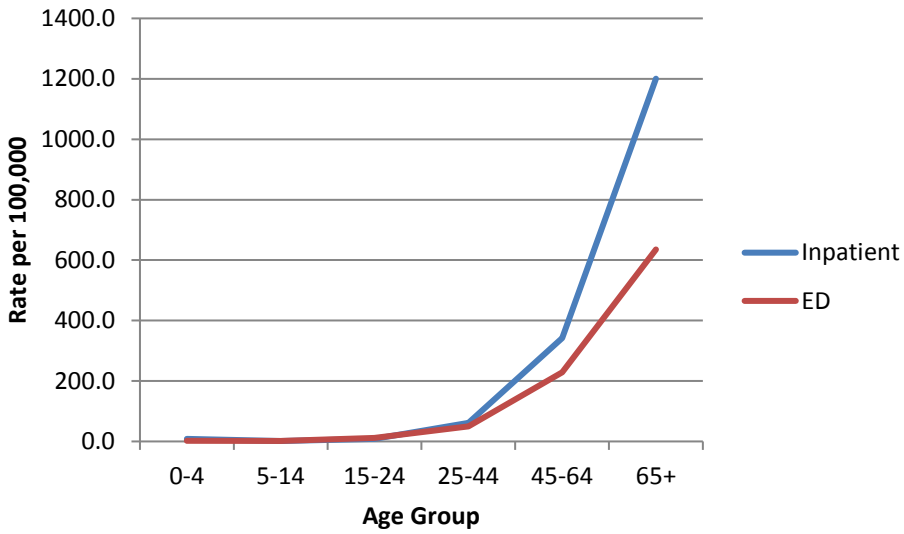


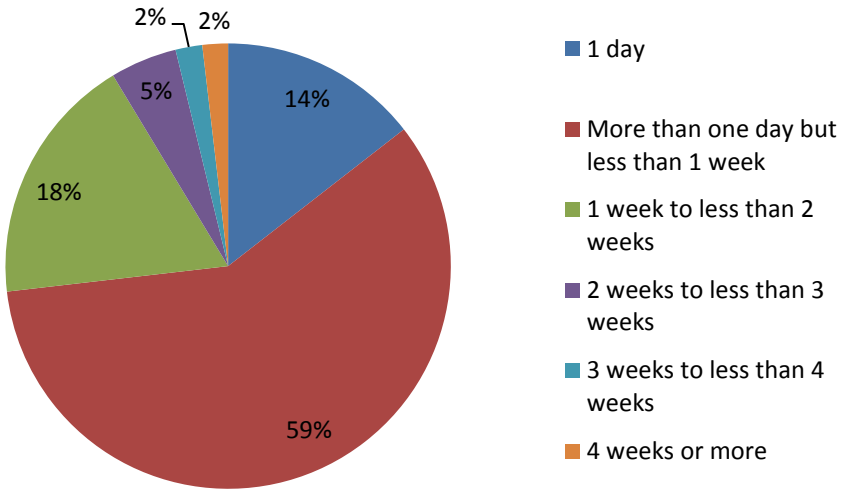
Figure 32: Rates of Stroke Related Emergency Department Visits and Hospitalizations, by Age Group, Kentucky, 2016



The highest age-specific rates were found in the 65 or older age group for both non-fatal inpatient and ED stroke cases.

The length of stay (LOS) for non-fatal stroke related hospitalizations (n=13,132) ranged from 1 day to 315 days. The mean LOS was 5.9 days with a median LOS of 4 days. Figure 34 shows the distribution of stays for those hospitalized with a stroke diagnosis. Over one in four admitted (inpatient) stroke related hospitalizations stayed for 1 week or longer.

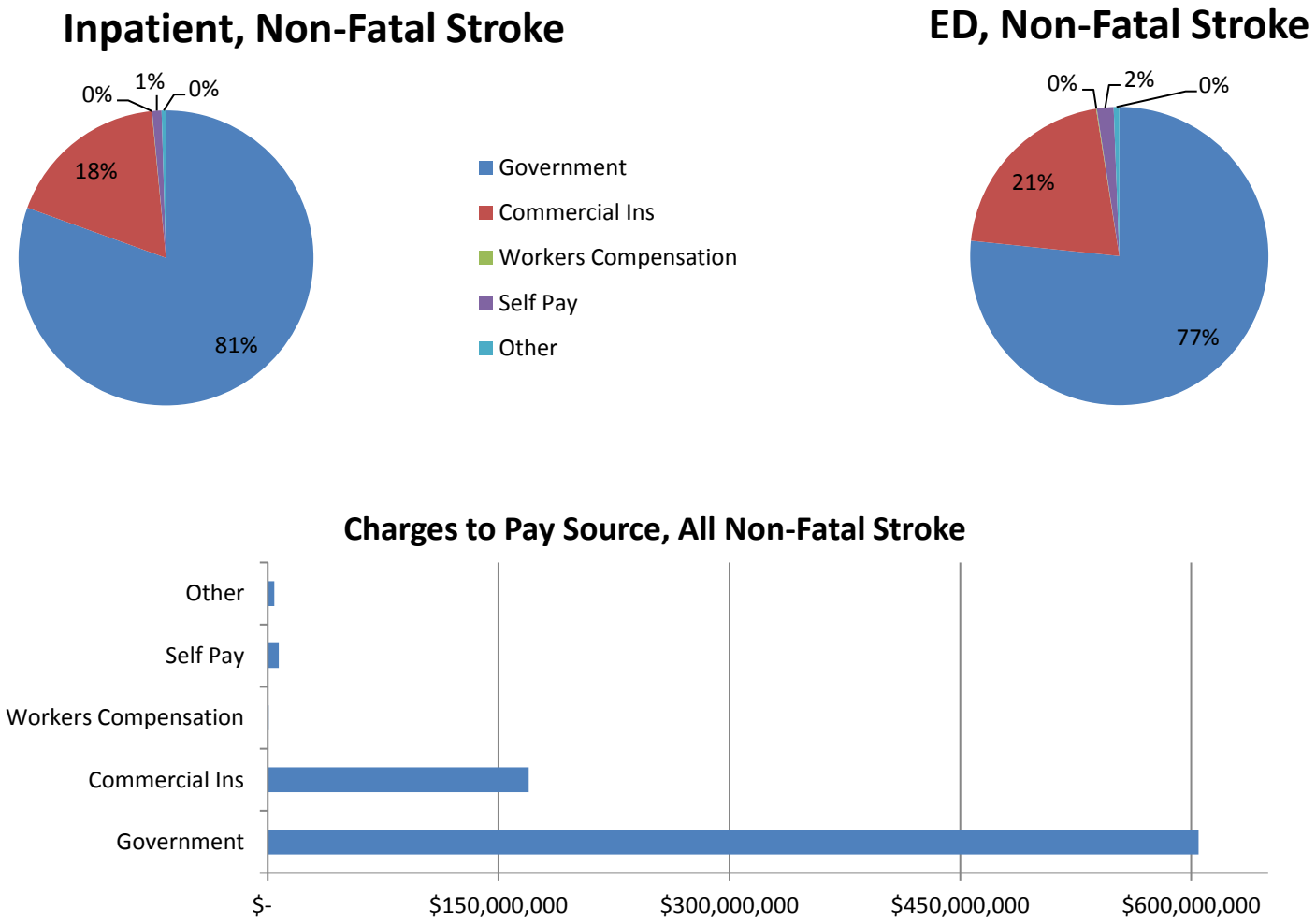
Figure 33: Non-Fatal Stroke Related Hospitalization Length of Stay, Kentucky, 2016



For non-fatal stroke related hospitalizations, 7,378 (56.2%) had a disposition other than "routine". The three most frequent non-routine discharges were "skilled nursing facility", "home health", and "rehabilitation". A total of 5,806 inpatient discharges had one of these three dispositions. ED discharges were most likely (52.2%) routinely discharged to home or self care (routine) with "inpatient – other" being the most frequent non-routine discharge.

Government sources were the primary payer billed for acute care charges in almost 8 out of 10 of all non-fatal stroke related hospital visits. Government payers were billed over $600 million in 2016, and commercial payers almost $170 million.

Figure 34: Non-Fatal Stroke Related Emergency Department Visits and Hospitalizations, Payer Source and Charges, Kentucky, 2016



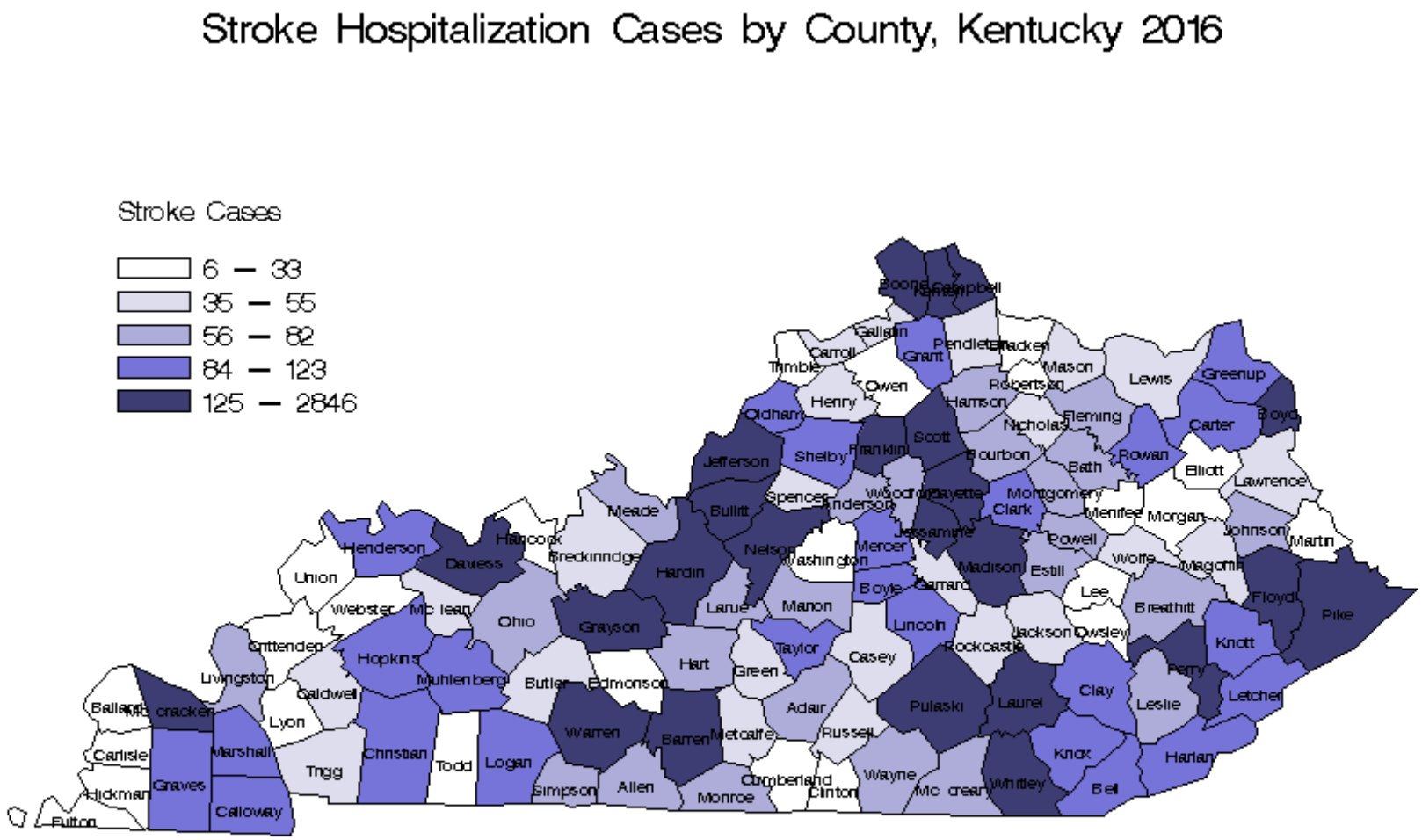
As one would expect, the incidence of stroke was highest in the larger counties. The top four in overall (inpatient and ED combined) stroke incidence (Jefferson, Fayette, Warren and Hardin) are the four of the six most populous counties in Kentucky. Notable exceptions include Leslie and Wolfe Counties, which were ranked 2nd and 3rd in age adjusted rate for stroke but were 98th and 111th in population (respectively). Metcalfe (100th in population) and Menifee (115th) are also in the top fifteen counties with highest age adjusted rates despite their smaller populations. Several southern border counties may have significant numbers of residents treated in Tennessee hospitals. Prominent examples include Christian, Whitley, Warren, Bell, Harlan, Graves, Logan, and McCracken. This illustrates an important point: *if this report shows a county to have a high rate of stroke, we can be confident that this is a county in need. Conversely, however, if a county is shown to have a low rate we cannot conclude that there is not a significant problem in that county, particularly if it is located on or near the state border.*

The following illustrations map both the frequency of stroke hospital visits in Kentucky counties (Figures 36 and 37) as well as the age adjusted rate of stroke in each county (Figures 38 and 39) for inpatient and outpatient stroke records. It should be noted that these mappings include ALL inpatient stroke cases (Figures 36 and 38) as well as ALL ED stroke cases (Figures 37 and 39) – including those that died at the hospital. Fatalities are not included in other analysis in this report unless noted but are included here to capture a visual representation of the magnitude of the problem of stroke in each county. These numbers DO NOT include those that died before admission to an acute care hospital.

Multiple tables can be found in the Appendix detailing specific rates and frequencies by county, frequency, and age adjusted rates for both inpatient and ED stroke records

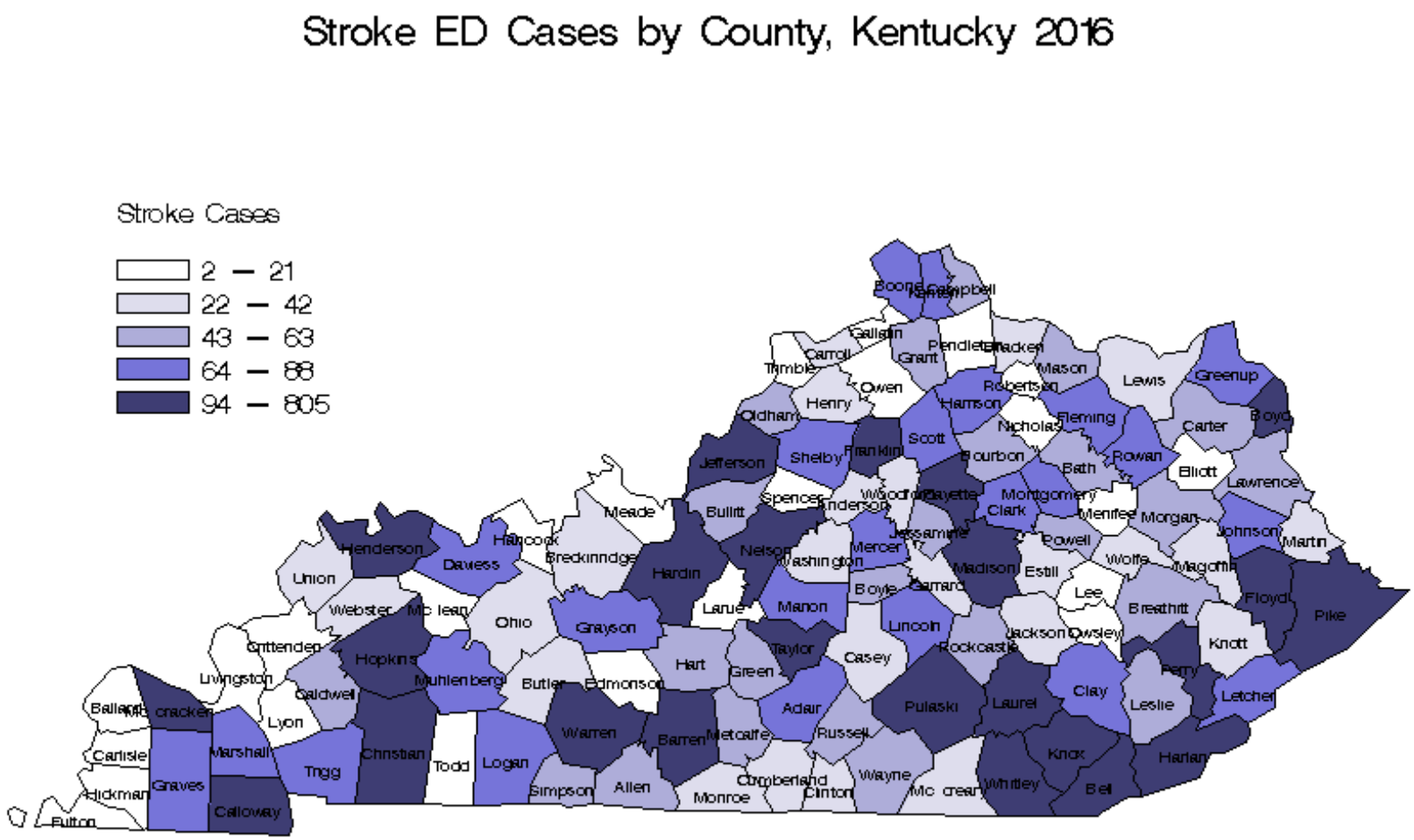
.

Figure 35.



Source: Kentucky TBI Surveillance Project 2016.

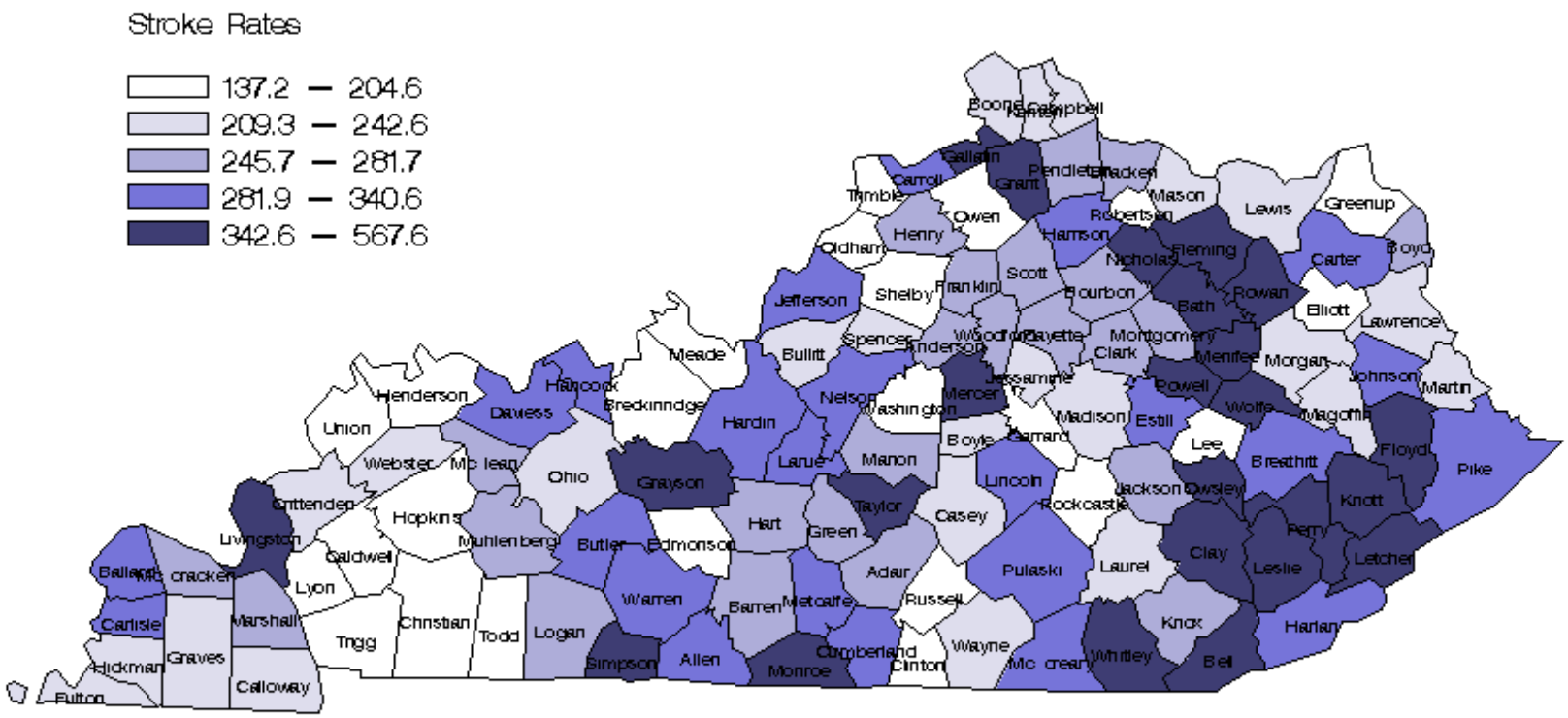
Figure 36.



Source: Kentucky TBI Surveillance Project 2016.

Figure 37.

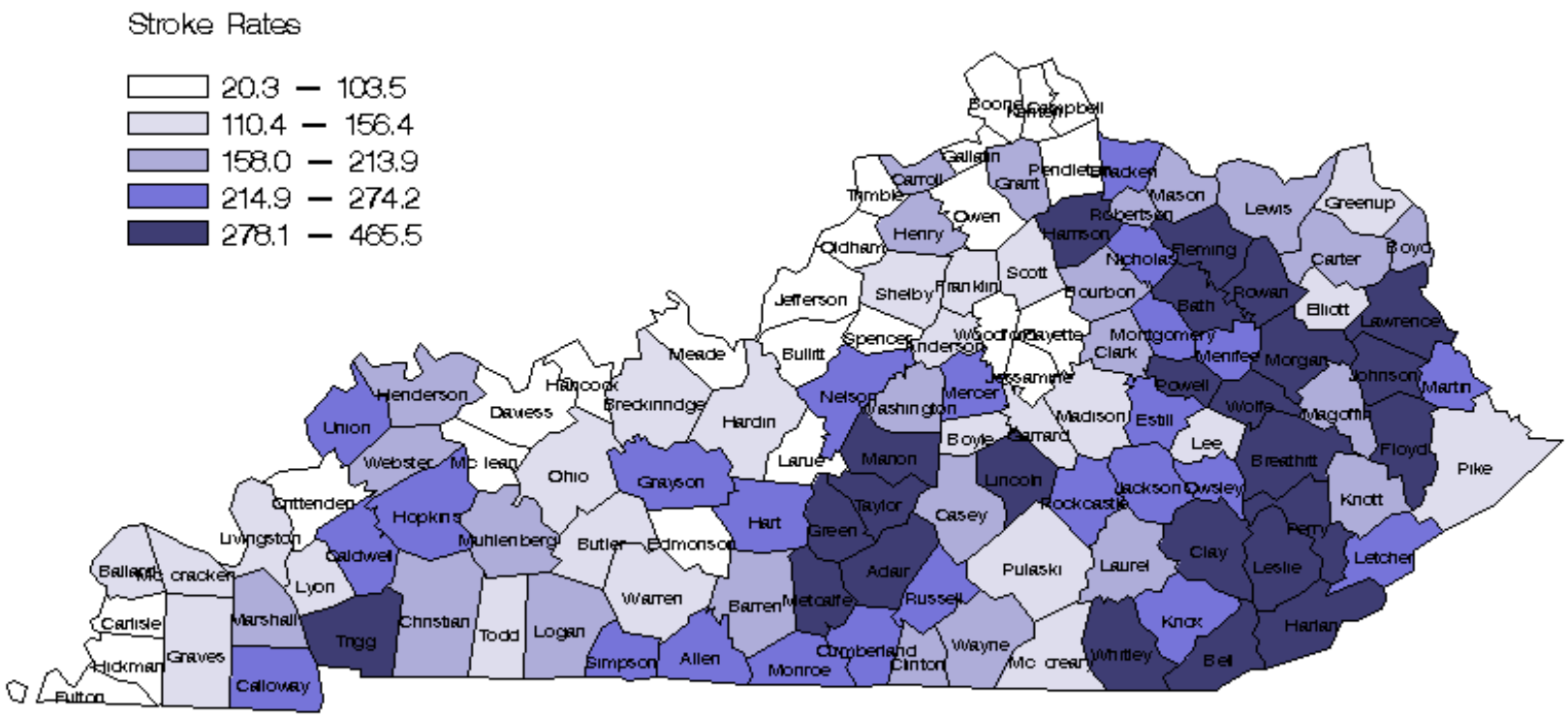
Age—Adjusted Stroke Hospitalization Rates by County, Kentucky 2016



Source: Kentucky TBI Surveillance Project 2016.

Figure 38.

Age—Adjusted Stroke ED Rates by County, Kentucky 2016



Source: Kentucky TBI Surveillance Project 2016.

Conclusion

Almost 50,000 non-fatal central nervous system injury-related ED visits and hospitalizations occurred in Kentucky in 2016. The findings show the importance of including ED visits because of the large number of TBIs seen only in that setting, especially among children. Although this report provides data on a wide range of CNSI occurring in Kentucky, it still does not capture all of them. It does not include those treated by emergency medical services that refused transport to a hospital, or those hospitalized outside of Kentucky nor does it include those seen by non-hospital medical services or who sought no care at all. While the 2016 data is not recommended for use in comparisons with years past due to coding changes made in the third quarter of 2015, the data is still important when discussing the larger issue of brain injury in Kentucky. Many people recover from their injuries, but in 2016 alone, over 143 Kentuckians per day received either inpatient or ED care for a CNSI, many of which will result in some long term disability. Thus, brain and spinal cord injury prevention, improved acute care and rehabilitation to reduce the likelihood of injury-related disability, and also increased access to services for those who do not fully recover are critical to improving quality of life of persons following a CNSI.

Appendix A: Tables and Figures

For the following tables: Unless otherwise noted, persons who were hospitalized or died were excluded from the data for ED Visits. For Hospitalizations, in-hospital deaths were excluded. The average annual rate is per 100,000 population. Rates calculated using the most recent available Kentucky population estimates (2016) and are per 100,000.

Table 1: Non-Fatal TBI ED Visits and Hospitalizations by Age Group, Kentucky, 2016

	Inpatient			Outpatient			Total		
Age	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	117	14.6	42.4	685	85.4	248.4	802	100.0	290.8
5-14	85	5.5	15.1	1459	94.5	260.0	1,544	100.0	275.1
15-24	275	9.2	46.3	2703	90.8	455.3	2,978	100.0	501.6
25-44	604	17.4	53.5	2871	82.6	254.4	3,475	100.0	308.0
45-64	862	29.0	72.6	2108	71.0	177.5	2,970	100.0	250.1
65+	1,579	46.1	228.6	1847	53.9	267.4	3,426	100.0	496.0
Total	3,522	23.2	79.4	11,673	76.8	263.1	15,195	100.0	342.5

Table 2: Non-Fatal TBI ED Visits and Hospitalizations by Gender, Kentucky, 2016

	Inpatient			ED			Total		
Age	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Male	2,057	24.4	94.1	6,388	75.6	292.1	8,445	100.0	386.2
Female	1,464	21.7	65.1	5,283	78.3	234.8	6,747	100.0	299.8
Total	3,521	23.2	79.4	11,671	76.8	263.0	15,192	100.0	342.4

Table 3: Non-Fatal TBI ED Visits and Hospitalizations by External Cause of Injury, Kentucky, 2016

	Inpatient			ED			Total		
Mechanism of Injury	Number	Pct.	Rate	Number	Pct.	Rate	Number	Pct.	Rate
Motor vehicle traffic crash	891	27.9	20.1	2,304	72.1	52.1	3,195	100.0	72.2
Fall	1,623	26.5	36.7	4,491	73.5	101.5	6,114	100.0	138.2
Firearm	39	73.6	0.9	14	26.4	0.3	53	100.0	1.2
Non-traffic land transport	121	21.6	2.7	438	78.4	9.9	559	100.0	12.6
Struck by object or person	134	5.2	3.0	2,467	94.8	55.8	2,601	100.0	58.8
Non-traffic pedal cycle	19	11.1	0.4	152	88.9	3.4	171	100.0	3.9
Machinery	10	37.0	0.2	17	63.0	0.4	27	100.0	0.6
Other	146	16.7	3.3	727	83.3	16.4	873	100.0	19.7
Unknown (missing E-code)	539	33.6	12.2	1,063	66.4	24.0	1,602	100.0	36.2
Total	3,522	23.2	79.6	11,673	76.8	263.8	15,195	100.0	343.4

Table 4: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 00-04, Kentucky, 2016

	Inpatient		ED		Total	
Mechanism of Injury	Number	Percent	Number	Percent	Number	Percent
Fall	52	44.4	489	71.4	541	67.5
Motor vehicle traffic crash	14	12.0	36	5.3	50	6.2
Struck by or against object or person	7	6.0	44	6.4	51	6.4
Non-traffic land transportation	1	0.9	5	0.7	6	0.7
Other (including non-specific codes)	18	15.4	39	5.7	57	7.1
Unknown (missing E-code)	25	21.4	72	10.5	97	12.1
Total	117	100.0	685	100.0	802	100.0

Table 5: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 05-14, Kentucky, 2016

	Inpatient		ED		Total	
Mechanism of Injury	Number	Percent	Number	Percent	Number	Percent
Motor vehicle traffic crash	38	44.7	108	7.4	146	9.5
Fall	18	21.2	520	35.6	538	34.8
Non-traffic land transportation	12	14.1	87	6.0	99	6.4
Other pedal cycle	7	8.2	67	4.6	74	4.8
Struck by or against object or person	4	4.7	467	32.0	471	30.5
Other (including non-specific codes)	3	3.5	72	4.9	75	4.9
Unknown (missing E-code)	3	3.5	138	9.5	141	9.1
Total	85	100.0	1,459	100.0	1,544	100.0

Table 6: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 15-24, Kentucky, 2016

	Inpatient		ED		Total	
Mechanism of Injury	Number	Percent	Number	Percent	Number	Percent
Motor vehicle traffic crash	168	61.1	792	29.3	960	32.2
Firearm	9	3.3	1	0.0	10	0.3
Non-traffic land transportation	23	8.4	136	5.0	159	5.3
Fall	14	5.1	552	20.4	566	19.0
Struck by or against object or person	23	8.4	786	29.1	809	27.2
Other (including non-specific codes)	11	4.0	200	7.4	211	7.1
Unknown (missing E-code)	27	9.8	236	8.7	263	8.8
Total	275	100.0	2,703	100.0	2,978	100.0

Table 7: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 25-44, Kentucky, 2016

	Inpatient		ED		Total	
Mechanism of Injury	Number	Percent	Number	Percent	Number	Percent
Motor vehicle traffic crash	271	44.9	763	26.6	1,034	29.8
Firearm	19	3.1	4	0.1	23	0.7
Fall	101	16.7	683	23.8	784	22.6
Struck by or against object or person	41	6.8	762	26.5	803	23.1
Non-traffic land transportation	36	6.0	131	4.6	167	4.8
Machinery	5	0.8	2	0.1	7	0.2
Other (including non-specific codes)	54	8.9	286	10.0	340	9.8
Unknown (missing E-code)	77	12.7	240	8.4	317	9.1
Total	604	100.0	2,871	100.0	3,475	100.0

Table 8: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 45-64, Kentucky, 2016

	Inpatient		ED		Total	
Mechanism of Injury	Number	Percent	Number	Percent	Number	Percent
Fall	309	35.8	877	41.6	1,186	39.9
Motor vehicle traffic crash	259	30.0	453	21.5	712	24.0
Firearm	4	0.5	4	0.2	8	0.3
Struck by or against object or person	44	5.1	333	15.8	377	12.7
Non-traffic land transportation	35	4.1	61	2.9	96	3.2
Other (including non-specific codes)	50	5.8	175	8.3	225	7.6
Unknown (missing E-code)	161	18.7	205	9.7	366	12.3
Total	862	100.0	2,108	100.0	2,970	100.0

Table 9: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 65 or Over, Kentucky, 2016

	Inpatient		ED		Total	
Mechanism of Injury	Number	Percent	Number	Percent	Number	Percent
Fall	1,129	71.5	1,370	74.2	2,499	72.9
Motor vehicle traffic crash	141	8.9	152	8.2	293	8.6
Firearm	7	0.4	3	0.2	10	0.3
Struck by or against object or person	15	0.9	75	4.1	90	2.6
Non-traffic land transportation	14	0.9	18	1.0	32	0.9
Other (including non-specific codes)	28	1.8	57	3.1	85	2.5
Unknown (missing E-code)	245	15.5	172	9.3	417	12.2
Total	1,579	100.0	1,847	100.0	3,426	100.0

Table 10: Hospital Discharges by Disposition for Non-Fatal TBI ED Visits and Hospitalizations, Kentucky, 2016

	Inpatient		ED	
Discharge Disposition	Number	Percent	Number	Percent
Routine discharge (home/self care)	1,808	51.3	9,818	84.1
Skilled nursing facility (SNF)	554	15.7	86	0.7
Home health	253	7.2	20	0.2
Inpatient-other short-term hospital	68	1.9	1,290	11.1
Intermediate care facility (ICF)	14	0.4	7	0.1
Rehab	564	16.0	7	0.1
Other	261	7.4	445	3.8
Total	3,522	100.0	11,673	100.0

Table 11: Incidence of All Inpatient TBI* by County, Sorted by County, Kentucky, 2016
***Includes inpatient deaths as well as non-fatal inpatient cases**

County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate
Adair	20	0.5	95.5	103.7	Grant	20	0.5	80.9	80.2	McLean	14	0.4	127.5	147.8
Allen	9	0.2	37.3	43.6	Graves	28	0.7	60.3	75.3	Meade	18	0.5	62.0	64.0
Anderson	19	0.5	76.6	85.7	Grayson	26	0.7	87.7	99.3	Menifee	10	0.3	166.8	156.1
Ballard	10	0.3	103.0	124.2	Green	8	0.2	68.6	72.3	Mercer	22	0.6	97.9	102.4
Barren	19	0.5	37.3	43.2	Greenup	14	0.4	27.3	39.0	Metcalfe	7	0.2	68.6	69.9
Bath	11	0.3	71.9	89.2	Hancock	11	0.3	129.5	124.9	Monroe	8	0.2	68.8	75.6
Bell	16	0.4	54.9	59.0	Hardin	107	2.8	100.1	99.7	Montgomery	15	0.4	52.5	54.0
Boone	55	1.4	46.3	42.8	Harlan	25	0.7	86.6	92.0	Morgan	7	0.2	52.3	52.6
Bourbon	22	0.6	97.3	109.8	Harrison	14	0.4	76.5	75.1	Muhlenberg	27	0.7	71.9	87.0
Boyd	21	0.5	36.5	43.6	Hart	17	0.4	91.7	91.3	Nelson	42	1.1	91.7	92.2
Boyle	32	0.8	101.4	106.6	Henderson	13	0.3	25.6	28.1	Nicholas	*	-	-	-
Bracken	6	0.2	79.1	71.4	Henry	25	0.7	145.5	158.0	Ohio	20	0.5	66.7	82.0
Breathitt	15	0.4	120.0	112.9	Hickman	*	-	-	-	Oldham	48	1.3	83.9	73.2
Breckinridge	18	0.5	83.7	90.2	Hopkins	21	0.5	46.6	45.7	Owen	5	0.1	40.7	47.0
Bullitt	73	1.9	92.6	92.2	Jackson	10	0.3	65.1	74.8	Owsley	*	-	-	-
Butler	*	-	-	-	Jefferson	889	23.2	106.8	116.2	Pendleton	13	0.3	91.8	89.3
Caldwell	*	-	-	-	Jessamine	46	1.2	81.4	87.9	Perry	61	1.6	214.8	223.1
Calloway	24	0.6	57.6	62.4	Johnson	29	0.8	109.9	126.2	Pike	90	2.3	140.7	148.6
Campbell	57	1.5	54.3	61.8	Kenton	97	2.5	54.0	58.8	Powell	14	0.4	120.1	113.7
Carlisle	6	0.2	100.7	123.6	Knott	14	0.4	99.1	90.1	Pulaski	59	1.5	84.4	92.3
Carroll	11	0.3	102.9	103.0	Knox	23	0.6	64.7	72.6	Robertson	*	-	-	-
Carter	12	0.3	44.4	44.4	Larue	12	0.3	76.6	85.1	Rockcastle	9	0.2	48.3	53.4
Casey	24	0.6	146.4	151.8	Laurel	60	1.6	92.1	99.6	Rowan	11	0.3	47.8	45.0
Christian	7	0.2	10.6	9.7	Lawrence	*	-	-	-	Russell	24	0.6	134.1	135.4
Clark	31	0.8	76.7	86.5	Lee	*	-	-	-	Scott	33	0.9	66.0	61.1
Clay	21	0.5	98.5	101.1	Leslie	18	0.5	151.2	170.8	Shelby	33	0.9	71.3	71.1
Clinton	7	0.2	68.0	68.8	Letcher	36	0.9	159.5	158.1	Simpson	5	0.1	23.8	27.7
Crittenden	9	0.2	77.4	98.0	Lewis	5	0.1	32.1	37.2	Spencer	19	0.5	115.0	104.0
Cumberland	6	0.2	80.7	89.0	Lincoln	21	0.5	82.6	86.2	Taylor	29	0.8	99.3	114.2
Daviess	115	3.0	102.4	115.4	Livingston	19	0.5	159.0	205.0	Todd	0	0.0	0.0	0.0
Edmonson	8	0.2	52.6	66.0	Logan	11	0.3	32.0	41.4	Trigg	6	0.2	26.7	42.1
Elliott	*	-	-	-	Lyon	6	0.2	63.2	74.4	Trimble	11	0.3	131.2	127.6
Estill	19	0.5	143.3	132.8	Madison	71	1.8	85.7	79.3	Union	*	-	-	-
Fayette	239	6.2	76.2	75.1	Magoffin	22	0.6	168.2	173.4	Warren	66	1.7	54.5	52.6
Fleming	23	0.6	146.8	158.5	Marion	14	0.4	70.1	72.9	Washington	8	0.2	68.5	65.6
Floyd	44	1.1	103.0	118.6	Marshall	44	1.1	104.9	140.3	Wayne	19	0.5	87.1	92.9
Franklin	41	1.1	77.5	81.1	Martin	17	0.4	133.3	141.6	Webster	*	-	-	-
Fulton	0	0.0	0.0	0.0	Mason	13	0.3	61.0	75.6	Whitley	45	1.2	121.2	124.7
Gallatin	7	0.2	94.3	81.3	McCracken	88	2.3	109.6	135.0	Wolfe	5	0.1	75.6	69.8
Garrard	16	0.4	84.6	92.5	McCreary	11	0.3	55.5	62.8	Woodford	25	0.7	82.1	95.7

* At least one but fewer than five

\- Percentage or rate suppressed to prevent disclosure of the value on which it was based

Table 12: Incidence of All ED TBI* by County, Sorted by County, Kentucky, 2016
*Includes ED deaths as well as non-fatal ED cases

County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate
Adair	58	0.5	311.7	300.8	Grant	66	0.6	271.3	264.8	McLean	37	0.3	409.8	390.5
Allen	64	0.5	341.0	310.2	Graves	102	0.9	277.2	274.3	Meade	54	0.5	199.1	192.0
Anderson	69	0.6	324.8	311.4	Grayson	91	0.8	366.1	347.5	Menifee	32	0.3	535.7	499.4
Ballard	14	0.1	191.8	173.8	Green	43	0.4	425.4	388.8	Mercer	71	0.6	358.5	330.6
Barren	162	1.4	379.7	368.2	Greenup	76	0.6	219.0	211.7	Metcalfe	27	0.2	281.3	269.5
Bath	41	0.3	318.3	332.6	Hancock	25	0.2	313.1	283.8	Monroe	32	0.3	328.4	302.2
Bell	101	0.9	369.9	372.5	Hardin	526	4.5	497.1	490.1	Montgomery	78	0.7	289.9	280.9
Boone	156	1.3	125.1	121.4	Harlan	33	0.3	127.5	121.5	Morgan	37	0.3	289.4	278.2
Bourbon	53	0.5	279.3	264.6	Harrison	96	0.8	545.6	514.9	Muhlenberg	106	0.9	343.3	341.6
Boyd	166	1.4	360.3	344.9	Hart	80	0.7	435.9	429.5	Nelson	160	1.4	369.7	351.2
Boyle	82	0.7	264.3	273.2	Henderson	92	0.8	207.1	198.9	Nicholas	30	0.3	453.5	423.5
Bracken	22	0.2	288.8	261.9	Henry	48	0.4	322.8	303.5	Ohio	122	1.0	525.4	500.5
Breathitt	31	0.3	245.1	233.4	Hickman	*	-	-	-	Oldham	108	0.9	169.1	164.7
Breckinridge	50	0.4	272.0	250.5	Hopkins	149	1.3	336.9	324.6	Owen	22	0.2	241.1	206.7
Bullitt	83	0.7	110.6	104.9	Jackson	36	0.3	292.5	269.3	Owsley	24	0.2	583.4	534.4
Butler	35	0.3	288.8	272.5	Jefferson	1526	13.0	202.2	199.4	Pendleton	22	0.2	161.4	151.1
Caldwell	32	0.3	278.5	254.6	Jessamine	85	0.7	164.9	162.3	Perry	92	0.8	357.4	336.5
Callow ay	179	1.5	486.5	465.7	Johnson	73	0.6	335.6	317.7	Pike	141	1.2	247.9	232.8
Campbell	105	0.9	117.7	113.9	Kenton	197	1.7	124.1	119.4	Powell	30	0.3	259.4	243.7
Carlisle	12	0.1	278.2	247.2	Knott	38	0.3	243.1	244.5	Pulaski	131	1.1	228.4	204.8
Carroll	23	0.2	227.3	215.4	Knox	92	0.8	310.6	290.3	Robertson	*	-	-	-
Carter	70	0.6	270.1	258.8	Larue	77	0.7	550.3	546.3	Rockcastle	47	0.4	285.8	278.9
Casey	63	0.5	406.3	398.4	Laurel	185	1.6	308.2	307.1	Rowan	80	0.7	328.1	327.2
Christian	185	1.6	259.4	255.7	Lawrence	39	0.3	264.4	245.9	Russell	55	0.5	316.4	310.3
Clark	112	1.0	326.3	312.7	Lee	20	0.2	274.5	304.0	Scott	146	1.2	277.5	270.5
Clay	138	1.2	682.3	664.5	Leslie	31	0.3	328.2	294.2	Shelby	92	0.8	203.0	198.2
Clinton	21	0.2	226.2	206.3	Letcher	69	0.6	343.0	303.0	Simpson	82	0.7	452.0	453.5
Crittenden	21	0.2	244.3	228.6	Lewis	28	0.2	226.1	208.3	Spencer	38	0.3	215.1	207.9
Cumberland	19	0.2	260.8	282.0	Lincoln	83	0.7	345.7	340.6	Taylor	99	0.8	380.1	389.8
Daviess	421	3.6	438.8	422.4	Livingston	31	0.3	406.4	334.4	Todd	29	0.2	226.0	235.9
Edmonson	22	0.2	186.6	181.6	Logan	85	0.7	339.2	319.6	Trigg	57	0.5	432.7	399.6
Elliott	16	0.1	196.2	210.9	Lyon	20	0.2	257.5	247.9	Trimble	17	0.1	201.5	197.2
Estill	47	0.4	360.7	328.5	Madison	217	1.9	242.8	242.3	Union	29	0.2	197.6	194.9
Fayette	839	7.2	265.7	263.5	Magoffin	44	0.4	371.0	346.9	Warren	289	2.5	222.9	230.2
Fleming	71	0.6	511.4	489.4	Marion	57	0.5	319.2	296.8	Washington	26	0.2	212.0	213.3
Floyd	81	0.7	232.9	218.3	Marshall	98	0.8	327.9	312.5	Wayne	83	0.7	453.1	405.8
Franklin	211	1.8	443.9	417.3	Martin	33	0.3	280.9	275.0	Webster	42	0.4	324.7	315.4
Fulton	*	-	-	-	Mason	40	0.3	224.8	232.7	Whitley	185	1.6	508.2	512.5
Gallatin	13	0.1	160.9	151.0	McCracken	271	2.3	441.2	415.9	Wolfe	32	0.3	437.2	447.0
Garrard	50	0.4	309.2	289.2	McCreary	24	0.2	140.8	137.1	Woodford	75	0.6	316.1	287.1

* At least one but few er than five

- Percentage or rate suppressed to prevent disclosure of the value on w hich it w as based

Table 13: Incidence of All Inpatient TBI* by County, Sorted by Frequency, Kentucky, 2016
***Includes inpatient deaths as well as non-fatal inpatient cases**

County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate
Jefferson	889	23.2	106.8	116.2	Bourbon	22	0.6	97.3	109.8	McCreary	11	0.3	55.5	62.8
Fayette	239	6.2	76.2	75.1	Magoffin	22	0.6	168.2	173.4	Rowan	11	0.3	47.8	45.0
Daviess	115	3.0	102.4	115.4	Mercer	22	0.6	97.9	102.4	Trimble	11	0.3	131.2	127.6
Hardin	107	2.8	100.1	99.7	Boyd	21	0.5	36.5	43.6	Ballard	10	0.3	103.0	124.2
Kenton	97	2.5	54.0	58.8	Clay	21	0.5	98.5	101.1	Jackson	10	0.3	65.1	74.8
Pike	90	2.3	140.7	148.6	Hopkins	21	0.5	46.6	45.7	Menifee	10	0.3	166.8	156.1
McCracken	88	2.3	109.6	135.0	Lincoln	21	0.5	82.6	86.2	Allen	9	0.2	37.3	43.6
Bullitt	73	1.9	92.6	92.2	Adair	20	0.5	95.5	103.7	Crittenden	9	0.2	77.4	98.0
Madison	71	1.8	85.7	79.3	Grant	20	0.5	80.9	80.2	Rockcastle	9	0.2	48.3	53.4
Warren	66	1.7	54.5	52.6	Ohio	20	0.5	66.7	82.0	Edmonson	8	0.2	52.6	66.0
Perry	61	1.6	214.8	223.1	Anderson	19	0.5	76.6	85.7	Green	8	0.2	68.6	72.3
Laurel	60	1.6	92.1	99.6	Barren	19	0.5	37.3	43.2	Monroe	8	0.2	68.8	75.6
Pulaski	59	1.5	84.4	92.3	Estill	19	0.5	143.3	132.8	Washington	8	0.2	68.5	65.6
Campbell	57	1.5	54.3	61.8	Livingston	19	0.5	159.0	205.0	Christian	7	0.2	10.6	9.7
Boone	55	1.4	46.3	42.8	Spencer	19	0.5	115.0	104.0	Clinton	7	0.2	68.0	68.8
Oldham	48	1.3	83.9	73.2	Wayne	19	0.5	87.1	92.9	Gallatin	7	0.2	94.3	81.3
Jessamine	46	1.2	81.4	87.9	Breckinridge	18	0.5	83.7	90.2	Metcalfe	7	0.2	68.6	69.9
Whitley	45	1.2	121.2	124.7	Leslie	18	0.5	151.2	170.8	Morgan	7	0.2	52.3	52.6
Floyd	44	1.1	103.0	118.6	Meade	18	0.5	62.0	64.0	Bracken	6	0.2	79.1	71.4
Marshall	44	1.1	104.9	140.3	Hart	17	0.4	91.7	91.3	Carlisle	6	0.2	100.7	123.6
Nelson	42	1.1	91.7	92.2	Martin	17	0.4	133.3	141.6	Cumberland	6	0.2	80.7	89.0
Franklin	41	1.1	77.5	81.1	Bell	16	0.4	54.9	59.0	Lyon	6	0.2	63.2	74.4
Letcher	36	0.9	159.5	158.1	Garrard	16	0.4	84.6	92.5	Trigg	6	0.2	26.7	42.1
Scott	33	0.9	66.0	61.1	Breathitt	15	0.4	120.0	112.9	Lewis	5	0.1	32.1	37.2
Shelby	33	0.9	71.3	71.1	Montgomery	15	0.4	52.5	54.0	Owen	5	0.1	40.7	47.0
Boyle	32	0.8	101.4	106.6	Greenup	14	0.4	27.3	39.0	Simpson	5	0.1	23.8	27.7
Clark	31	0.8	76.7	86.5	Harrison	14	0.4	76.5	75.1	Wolfe	5	0.1	75.6	69.8
Johnson	29	0.8	109.9	126.2	Knott	14	0.4	99.1	90.1	Elliott	*	-	-	-
Taylor	29	0.8	99.3	114.2	Marion	14	0.4	70.1	72.9	Lawrence	*	-	-	-
Graves	28	0.7	60.3	75.3	McLean	14	0.4	127.5	147.8	Nicholas	*	-	-	-
Muhlenberg	27	0.7	71.9	87.0	Powell	14	0.4	120.1	113.7	Union	*	-	-	-
Grayson	26	0.7	87.7	99.3	Henderson	13	0.3	25.6	28.1	Butler	*	-	-	-
Harlan	25	0.7	86.6	92.0	Mason	13	0.3	61.0	75.6	Caldwell	*	-	-	-
Henry	25	0.7	145.5	158.0	Pendleton	13	0.3	91.8	89.3	Lee	*	-	-	-
Woodford	25	0.7	82.1	95.7	Carter	12	0.3	44.4	44.4	Owsley	*	-	-	-
Calloway	24	0.6	57.6	62.4	Larue	12	0.3	76.6	85.1	Hickman	*	-	-	-
Casey	24	0.6	146.4	151.8	Bath	11	0.3	71.9	89.2	Robertson	*	-	-	-
Russell	24	0.6	134.1	135.4	Carroll	11	0.3	102.9	103.0	Webster	*	-	-	-
Fleming	23	0.6	146.8	158.5	Hancock	11	0.3	129.5	124.9	Fulton	0	0.0	0.0	0.0
Knox	23	0.6	64.7	72.6	Logan	11	0.3	32.0	41.4	Todd	0	0.0	0.0	0.0

* At least one but fewer than five

\- Percentage or rate suppressed to prevent disclosure of the value on which it was based

Table 14: Incidence of All ED TBI* by County, Sorted by Frequency, Kentucky, 2016
***Includes ED deaths as well as non-fatal ED cases**

County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate
Jefferson	1526	13.0	202.2	199.4	Lincoln	83	0.7	345.7	340.6	Morgan	37	0.3	289.4	278.2
Fayette	839	7.2	265.7	263.5	Wayne	83	0.7	453.1	405.8	Jackson	36	0.3	292.5	269.3
Hardin	526	4.5	497.1	490.1	Boyle	82	0.7	264.3	273.2	Butler	35	0.3	288.8	272.5
Daviess	421	3.6	438.8	422.4	Simpson	82	0.7	452.0	453.5	Harlan	33	0.3	127.5	121.5
Warren	289	2.5	222.9	230.2	Floyd	81	0.7	232.9	218.3	Martin	33	0.3	280.9	275.0
McCracken	271	2.3	441.2	415.9	Hart	80	0.7	435.9	429.5	Caldwell	32	0.3	278.5	254.6
Madison	217	1.9	242.8	242.3	Rowan	80	0.7	328.1	327.2	Menifee	32	0.3	535.7	499.4
Franklin	211	1.8	443.9	417.3	Montgomery	78	0.7	289.9	280.9	Monroe	32	0.3	328.4	302.2
Kenton	197	1.7	124.1	119.4	Larue	77	0.7	550.3	546.3	Wolfe	32	0.3	437.2	447.0
Christian	185	1.6	259.4	255.7	Greenup	76	0.6	219.0	211.7	Breathitt	31	0.3	245.1	233.4
Laurel	185	1.6	308.2	307.1	Woodford	75	0.6	316.1	287.1	Leslie	31	0.3	328.2	294.2
Whitley	185	1.6	508.2	512.5	Johnson	73	0.6	335.6	317.7	Livingston	31	0.3	406.4	334.4
Calloway	179	1.5	486.5	465.7	Fleming	71	0.6	511.4	489.4	Nicholas	30	0.3	453.5	423.5
Boyd	166	1.4	360.3	344.9	Mercer	71	0.6	358.5	330.6	Powell	30	0.3	259.4	243.7
Barren	162	1.4	379.7	368.2	Carter	70	0.6	270.1	258.8	Todd	29	0.2	226.0	235.9
Nelson	160	1.4	369.7	351.2	Anderson	69	0.6	324.8	311.4	Union	29	0.2	197.6	194.9
Boone	156	1.3	125.1	121.4	Letcher	69	0.6	343.0	303.0	Lewis	28	0.2	226.1	208.3
Hopkins	149	1.3	336.9	324.6	Grant	66	0.6	271.3	264.8	Metcalfe	27	0.2	281.3	269.5
Scott	146	1.2	277.5	270.5	Allen	64	0.5	341.0	310.2	Washington	26	0.2	212.0	213.3
Pike	141	1.2	247.9	232.8	Casey	63	0.5	406.3	398.4	Hancock	25	0.2	313.1	283.8
Clay	138	1.2	682.3	664.5	Adair	58	0.5	311.7	300.8	McCreary	24	0.2	140.8	137.1
Pulaski	131	1.1	228.4	204.8	Marion	57	0.5	319.2	296.8	Owsley	24	0.2	583.4	534.4
Ohio	122	1.0	525.4	500.5	Trigg	57	0.5	432.7	399.6	Carroll	23	0.2	227.3	215.4
Clark	112	1.0	326.3	312.7	Russell	55	0.5	316.4	310.3	Bracken	22	0.2	288.8	261.9
Oldham	108	0.9	169.1	164.7	Meade	54	0.5	199.1	192.0	Edmonson	22	0.2	186.6	181.6
Muhlenberg	106	0.9	343.3	341.6	Bourbon	53	0.5	279.3	264.6	Owen	22	0.2	241.1	206.7
Campbell	105	0.9	117.7	113.9	Breckinridge	50	0.4	272.0	250.5	Pendleton	22	0.2	161.4	151.1
Graves	102	0.9	277.2	274.3	Garrard	50	0.4	309.2	289.2	Clinton	21	0.2	226.2	206.3
Bell	101	0.9	369.9	372.5	Henry	48	0.4	322.8	303.5	Crittenden	21	0.2	244.3	228.6
Taylor	99	0.8	380.1	389.8	Estill	47	0.4	360.7	328.5	Lee	20	0.2	274.5	304.0
Marshall	98	0.8	327.9	312.5	Rockcastle	47	0.4	285.8	278.9	Lyon	20	0.2	257.5	247.9
Harrison	96	0.8	545.6	514.9	Magoffin	44	0.4	371.0	346.9	Cumberland	19	0.2	260.8	282.0
Henderson	92	0.8	207.1	198.9	Green	43	0.4	425.4	388.8	Trimble	17	0.1	201.5	197.2
Knox	92	0.8	310.6	290.3	Webster	42	0.4	324.7	315.4	Elliott	16	0.1	196.2	210.9
Perry	92	0.8	357.4	336.5	Bath	41	0.3	318.3	332.6	Ballard	14	0.1	191.8	173.8
Shelby	92	0.8	203.0	198.2	Mason	40	0.3	224.8	232.7	Gallatin	13	0.1	160.9	151.0
Grayson	91	0.8	366.1	347.5	Lawrence	39	0.3	264.4	245.9	Carlisle	12	0.1	278.2	247.2
Jessamine	85	0.7	164.9	162.3	Knott	38	0.3	243.1	244.5	Fulton	*	-	-	-
Logan	85	0.7	339.2	319.6	Spencer	38	0.3	215.1	207.9	Hickman	*	-	-	-
Bullitt	83	0.7	110.6	104.9	McLean	37	0.3	409.8	390.5	Robertson	*	-	-	-

* At least one but fewer than five

\- Percentage or rate suppressed to prevent disclosure of the value on which it was based

Table 15: Incidence of All Inpatient TBI* by County, Sorted by Age Adjusted Rate, Kentucky, 2016
***Includes inpatient deaths as well as non-fatal inpatient cases**

County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate
Perry	61	1.6	214.8	223.1	Pendleton	13	0.3	91.8	89.3	Mason	13	0.3	61.0	75.6
Magoffin	22	0.6	168.2	173.4	Nelson	42	1.1	91.7	92.2	Graves	28	0.7	60.3	75.3
Menifee	10	0.3	166.8	156.1	Hart	17	0.4	91.7	91.3	Owsley	3	0.1	58.3	66.8
Letcher	36	0.9	159.5	158.1	Grayson	26	0.7	87.7	99.3	Calloway	24	0.6	57.6	62.4
Livingston	19	0.5	159.0	205.0	Wayne	19	0.5	87.1	92.9	Robertson	2	0.1	56.6	92.8
Leslie	18	0.5	151.2	170.8	Harlan	25	0.7	86.6	92.0	McCreary	11	0.3	55.5	62.8
Fleming	23	0.6	146.8	158.5	Madison	71	1.8	85.7	79.3	Bell	16	0.4	54.9	59.0
Casey	24	0.6	146.4	151.8	Garrard	16	0.4	84.6	92.5	Warren	66	1.7	54.5	52.6
Henry	25	0.7	145.5	158.0	Pulaski	59	1.5	84.4	92.3	Elliott	*	-	-	-
Estill	19	0.5	143.3	132.8	Oldham	48	1.3	83.9	73.2	Campbell	57	1.5	54.3	61.8
Pike	90	2.3	140.7	148.6	Breckinridge	18	0.5	83.7	90.2	Kenton	97	2.5	54.0	58.8
Russell	24	0.6	134.1	135.4	Lincoln	21	0.5	82.6	86.2	Edmonson	8	0.2	52.6	66.0
Martin	17	0.4	133.3	141.6	Woodford	25	0.7	82.1	95.7	Montgomery	15	0.4	52.5	54.0
Trimble	11	0.3	131.2	127.6	Jessamine	46	1.2	81.4	87.9	Morgan	7	0.2	52.3	52.6
Hancock	11	0.3	129.5	124.9	Grant	20	0.5	80.9	80.2	Nicholas	*	-	-	-
McLean	14	0.4	127.5	147.8	Cumberland	6	0.2	80.7	89.0	Rockcastle	9	0.2	48.3	53.4
Whitley	45	1.2	121.2	124.7	Bracken	6	0.2	79.1	71.4	Rowan	11	0.3	47.8	45.0
Powell	14	0.4	120.1	113.7	Franklin	41	1.1	77.5	81.1	Hopkins	21	0.5	46.6	45.7
Breathitt	15	0.4	120.0	112.9	Crittenden	9	0.2	77.4	98.0	Boone	55	1.4	46.3	42.8
Spencer	19	0.5	115.0	104.0	Clark	31	0.8	76.7	86.5	Lee	*	-	-	-
Johnson	29	0.8	109.9	126.2	Larue	12	0.3	76.6	85.1	Carter	12	0.3	44.4	44.4
McCracken	88	2.3	109.6	135.0	Anderson	19	0.5	76.6	85.7	Owen	5	0.1	40.7	47.0
Jefferson	889	23.2	106.8	116.2	Harrison	14	0.4	76.5	75.1	Allen	9	0.2	37.3	43.6
Marshall	44	1.1	104.9	140.3	Fayette	239	6.2	76.2	75.1	Barren	19	0.5	37.3	43.2
Floyd	44	1.1	103.0	118.6	Wolfe	5	0.1	75.6	69.8	Boyd	21	0.5	36.5	43.6
Ballard	10	0.3	103.0	124.2	Muhlenberg	27	0.7	71.9	87.0	Lewis	5	0.1	32.1	37.2
Carroll	11	0.3	102.9	103.0	Bath	11	0.3	71.9	89.2	Logan	11	0.3	32.0	41.4
Daviess	115	3.0	102.4	115.4	Shelby	33	0.9	71.3	71.1	Union	*	-	-	-
Boyle	32	0.8	101.4	106.6	Marion	14	0.4	70.1	72.9	Greenup	14	0.4	27.3	39.0
Carlisle	6	0.2	100.7	123.6	Monroe	8	0.2	68.8	75.6	Trigg	6	0.2	26.7	42.1
Hardin	107	2.8	100.1	99.7	Metcalfe	7	0.2	68.6	69.9	Henderson	13	0.3	25.6	28.1
Taylor	29	0.8	99.3	114.2	Green	8	0.2	68.6	72.3	Simpson	5	0.1	23.8	27.7
Knott	14	0.4	99.1	90.1	Washington	8	0.2	68.5	65.6	Caldwell	*	-	-	-
Clay	21	0.5	98.5	101.1	Clinton	7	0.2	68.0	68.8	Hickman	*	-	-	-
Mercer	22	0.6	97.9	102.4	Ohio	20	0.5	66.7	82.0	Lawrence	*	-	-	-
Bourbon	22	0.6	97.3	109.8	Scott	33	0.9	66.0	61.1	Butler	*	-	-	-
Adair	20	0.5	95.5	103.7	Jackson	10	0.3	65.1	74.8	Webster	*	-	-	-
Gallatin	7	0.2	94.3	81.3	Knox	23	0.6	64.7	72.6	Christian	7	0.2	10.6	9.7
Bullitt	73	1.9	92.6	92.2	Lyon	6	0.2	63.2	74.4	Fulton	0	0.0	0.0	0.0
Laurel	60	1.6	92.1	99.6	Meade	18	0.5	62.0	64.0	Todd	0	0.0	0.0	0.0

* At least one but fewer than five

- Percentage or rate suppressed to prevent disclosure of the value on which it was based

Table 16: Incidence of All ED TBI* by County, Sorted by Age Adjusted Rate, Kentucky, 2016
***Includes ED deaths as well as non-fatal ED cases**

County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate
Clay	138	1.2	682.3	664.5	Monroe	32	0.3	328.4	302.2	Lyon	20	0.2	257.5	247.9
Owsley	24	0.2	583.4	534.4	Leslie	31	0.3	328.2	294.2	Pike	141	1.2	247.9	232.8
Larue	77	0.7	550.3	546.3	Rowan	80	0.7	328.1	327.2	Breathitt	31	0.3	245.1	233.4
Harrison	96	0.8	545.6	514.9	Marshall	98	0.8	327.9	312.5	Crittenden	21	0.2	244.3	228.6
Menifee	32	0.3	535.7	499.4	Clark	112	1.0	326.3	312.7	Knott	38	0.3	243.1	244.5
Ohio	122	1.0	525.4	500.5	Anderson	69	0.6	324.8	311.4	Madison	217	1.9	242.8	242.3
Fleming	71	0.6	511.4	489.4	Webster	42	0.4	324.7	315.4	Owen	22	0.2	241.1	206.7
Whitley	185	1.6	508.2	512.5	Henry	48	0.4	322.8	303.5	Floyd	81	0.7	232.9	218.3
Hardin	526	4.5	497.1	490.1	Marion	57	0.5	319.2	296.8	Pulaski	131	1.1	228.4	204.8
Calloway	179	1.5	486.5	465.7	Bath	41	0.3	318.3	332.6	Carroll	23	0.2	227.3	215.4
Nicholas	30	0.3	453.5	423.5	Russell	55	0.5	316.4	310.3	Clinton	21	0.2	226.2	206.3
Wayne	83	0.7	453.1	405.8	Woodford	75	0.6	316.1	287.1	Lewis	28	0.2	226.1	208.3
Simpson	82	0.7	452.0	453.5	Hancock	25	0.2	313.1	283.8	Todd	29	0.2	226.0	235.9
Franklin	211	1.8	443.9	417.3	Adair	58	0.5	311.7	300.8	Mason	40	0.3	224.8	232.7
McCracken	271	2.3	441.2	415.9	Knox	92	0.8	310.6	290.3	Warren	289	2.5	222.9	230.2
Daviess	421	3.6	438.8	422.4	Garrard	50	0.4	309.2	289.2	Greenup	76	0.6	219.0	211.7
Wolfe	32	0.3	437.2	447.0	Laurel	185	1.6	308.2	307.1	Spencer	38	0.3	215.1	207.9
Hart	80	0.7	435.9	429.5	Jackson	36	0.3	292.5	269.3	Washington	26	0.2	212.0	213.3
Trigg	57	0.5	432.7	399.6	Montgomery	78	0.7	289.9	280.9	Henderson	92	0.8	207.1	198.9
Green	43	0.4	425.4	388.8	Morgan	37	0.3	289.4	278.2	Shelby	92	0.8	203.0	198.2
McLean	37	0.3	409.8	390.5	Bracken	22	0.2	288.8	261.9	Jefferson	1526	13.0	202.2	199.4
Livingston	31	0.3	406.4	334.4	Butler	35	0.3	288.8	272.5	Trimble	17	0.1	201.5	197.2
Casey	63	0.5	406.3	398.4	Rockcastle	47	0.4	285.8	278.9	Meade	54	0.5	199.1	192.0
Taylor	99	0.8	380.1	389.8	Metcalfe	27	0.2	281.3	269.5	Union	29	0.2	197.6	194.9
Barren	162	1.4	379.7	368.2	Martin	33	0.3	280.9	275.0	Elliott	16	0.1	196.2	210.9
Magoffin	44	0.4	371.0	346.9	Bourbon	53	0.5	279.3	264.6	Ballard	14	0.1	191.8	173.8
Bell	101	0.9	369.9	372.5	Caldwell	32	0.3	278.5	254.6	Edmonson	22	0.2	186.6	181.6
Nelson	160	1.4	369.7	351.2	Carlisle	12	0.1	278.2	247.2	Oldham	108	0.9	169.1	164.7
Grayson	91	0.8	366.1	347.5	Scott	146	1.2	277.5	270.5	Jessamine	85	0.7	164.9	162.3
Estill	47	0.4	360.7	328.5	Graves	102	0.9	277.2	274.3	Pendleton	22	0.2	161.4	151.1
Boyd	166	1.4	360.3	344.9	Lee	20	0.2	274.5	304.0	Gallatin	13	0.1	160.9	151.0
Mercer	71	0.6	358.5	330.6	Breckinridge	50	0.4	272.0	250.5	McCreary	24	0.2	140.8	137.1
Perry	92	0.8	357.4	336.5	Grant	66	0.6	271.3	264.8	Harlan	33	0.3	127.5	121.5
Lincoln	83	0.7	345.7	340.6	Carter	70	0.6	270.1	258.8	Boone	156	1.3	125.1	121.4
Muhlenberg	106	0.9	343.3	341.6	Fayette	839	7.2	265.7	263.5	Kenton	197	1.7	124.1	119.4
Letcher	69	0.6	343.0	303.0	Lawrence	39	0.3	264.4	245.9	Campbell	105	0.9	117.7	113.9
Allen	64	0.5	341.0	310.2	Boyle	82	0.7	264.3	273.2	Bullitt	83	0.7	110.6	104.9
Logan	85	0.7	339.2	319.6	Cumberland	19	0.2	260.8	282.0	Robertson	*	-	-	-
Hopkins	149	1.3	336.9	324.6	Christian	185	1.6	259.4	255.7	Fulton	*	-	-	-
Johnson	73	0.6	335.6	317.7	Powell	30	0.3	259.4	243.7	Hickman	*	-	-	-

* At least one but fewer than five

\- Percentage or rate suppressed to prevent disclosure of the value on which it was based

Table 17: Length of Stay for Non-Fatal Inpatient TBI, Kentucky, 2016

Length of Stay	Number	Percent*
1 day	567	16.1
More than one day but less than 1 week	1788	50.8
1 week to less than 2 weeks	688	19.5
2 weeks to less than 3 weeks	243	6.9
3 weeks to less than 4 weeks	118	3.4
4 weeks or more	118	3.4
Total	3522	100.0

*Percent of hospitalized TBI

Table 18: Work Related Non-Fatal TBI, Kentucky 2016

Inpatient Work TBI (n=63)	LOS Days	Cost
Mean	6.1	$89,557
Median	4	$46,114
Min, Max	1, 32	$296, $401,106
Sum of Charges		$5,263,390

ED Work TBI (n=405)	Cost
Mean	$4,856
Median	$3,178
Min, Max	$2, $46,426
Sum of Charges	$1,966,820

Table 19: Primary Payer and Charges for Non-Fatal Inpatient TBI, Kentucky, 2016

Payer	Number of Discharges	Percent of Discharges	Total Hospital Charges
Government	2,551	72.4	$ 194,766,640
Commercial Ins	625	17.7	$ 55,892,907
Self Pay	55	1.6	$ 2,869,733
Workers Compensation	63	1.8	$ 5,263,390
Other	228	6.5	$ 23,958,218
Total	3,522	100.0	$ 282,750,887

Table 20: Primary Payer and Charges for Non-Fatal ED TBI, Kentucky, 2016

Payer	Number of Discharges	Percent of Discharges	Total Hospital Charges
Government	6,184	53.0	$ 33,277,490
Commercial Ins	3,297	28.2	$ 14,706,936
Self Pay	713	6.1	$ 3,405,239
Workers Compensation	405	3.5	$ 1,966,820
Other	1,074	9.2	$ 7,331,022
Total	11,673	100.0	$ 60,687,508

Table 21: Non-Fatal ABI by Age Group, Kentucky, 2016

	Inpatient			ED			Total		
Age	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	134	20.8	48.6	510	79.2	184.9	644	100.0	233.5
5-14	85	20.3	15.1	334	79.7	59.5	419	100.0	74.7
15-24	361	25.7	60.8	1,046	74.3	176.2	1,407	100.0	237.0
25-44	1,470	40.4	130.3	2,172	59.6	192.5	3,642	100.0	322.8
45-64	2,483	60.6	209.1	1,616	39.4	136.1	4,099	100.0	345.2
65+	2,731	75.1	395.4	904	24.9	130.9	3,635	100.0	526.3
Total	7,264	52.5	163.7	6,582	47.5	148.3	13,846	100.0	312.1

Table 22: Non-Fatal ABI by Gender, Kentucky, 2016

	Inpatient			ED			Total		
Age	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Male	3,337	53.7	152.6	2,874	46.3	131.4	6,211	100.0	284.1
Female	3,927	51.4	174.5	3,708	48.6	164.8	7,635	100.0	339.3
Total	7,264	52.5	163.7	6,582	47.5	148.3	13,846	100.0	312.1

Table 23: Incidence of All Inpatient ABI* by County, Sorted by County, Kentucky, 2016
***Includes inpatient deaths as well as non-fatal inpatient cases**

County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate
Adair	30	0.4	147.3	155.6	Grant	52	0.6	206.6	208.6	McLean	18	0.2	173.8	190.0
Allen	31	0.4	139.4	150.3	Graves	72	0.8	164.8	193.6	Meade	25	0.3	85.5	88.9
Anderson	38	0.4	158.3	171.5	Grayson	56	0.7	195.6	213.9	Menifee	15	0.2	176.8	234.1
Ballard	21	0.2	206.9	260.7	Green	25	0.3	158.0	226.0	Mercer	33	0.4	119.5	153.7
Barren	84	1.0	163.8	190.9	Greenup	46	0.5	102.1	128.2	Metcalfe	23	0.3	199.8	229.6
Bath	26	0.3	195.7	210.9	Hancock	17	0.2	163.2	193.0	Monroe	21	0.2	153.6	198.3
Bell	88	1.0	297.9	324.5	Hardin	217	2.6	195.5	202.2	Montgomery	42	0.5	134.5	151.2
Boone	162	1.9	129.4	126.0	Harlan	83	1.0	275.2	305.5	Morgan	32	0.4	209.4	240.6
Bourbon	39	0.5	169.3	194.7	Harrison	18	0.2	81.8	96.5	Muhlenberg	71	0.8	183.2	228.8
Boyd	114	1.3	204.1	236.8	Hart	27	0.3	131.5	145.0	Nelson	70	0.8	150.1	153.6
Boyle	44	0.5	134.9	146.6	Henderson	43	0.5	76.1	93.0	Nicholas	8	0.1	109.0	112.9
Bracken	10	0.1	98.7	119.0	Henry	32	0.4	165.5	202.3	Ohio	45	0.5	171.3	184.6
Breathitt	36	0.4	218.5	271.0	Hickman	11	0.1	178.2	237.7	Oldham	83	1.0	131.8	126.6
Breckinridge	28	0.3	124.6	140.3	Hopkins	87	1.0	163.7	189.5	Owen	11	0.1	77.8	103.4
Bullitt	118	1.4	143.6	149.1	Jackson	30	0.4	205.3	224.4	Owsley	19	0.2	360.9	423.1
Butler	27	0.3	191.2	210.2	Jefferson	1738	20.5	206.3	227.1	Pendleton	16	0.2	95.7	109.9
Caldwell	25	0.3	168.5	198.9	Jessamine	107	1.3	194.7	204.4	Perry	105	1.2	363.1	384.0
Calloway	46	0.5	122.5	119.7	Johnson	67	0.8	262.4	291.6	Pike	151	1.8	230.7	249.4
Campbell	135	1.6	133.7	146.4	Kenton	278	3.3	162.8	168.5	Powell	37	0.4	276.9	300.6
Carlisle	10	0.1	170.1	206.0	Knott	35	0.4	223.5	225.2	Pulaski	119	1.4	167.9	186.1
Carroll	18	0.2	157.1	168.6	Knox	57	0.7	170.3	179.9	Robertson	*	-	-	-
Carter	54	0.6	172.9	199.7	Larue	23	0.3	129.5	163.2	Rockcastle	38	0.4	201.5	225.5
Casey	27	0.3	141.0	170.7	Laurel	168	2.0	244.8	278.8	Rowan	73	0.9	316.4	298.6
Christian	82	1.0	126.4	113.3	Lawrence	42	0.5	249.8	264.8	Russell	21	0.2	99.0	118.5
Clark	67	0.8	161.5	187.1	Lee	9	0.1	130.3	136.8	Scott	67	0.8	130.5	124.1
Clay	73	0.9	327.4	351.5	Leslie	26	0.3	197.2	246.7	Shelby	74	0.9	154.2	159.5
Clinton	8	0.1	62.2	78.6	Letcher	84	1.0	329.8	368.9	Simpson	28	0.3	143.6	154.8
Crittenden	8	0.1	65.0	87.1	Lewis	8	0.1	40.8	59.5	Spencer	30	0.4	154.1	164.2
Cumberland	16	0.2	222.1	237.5	Lincoln	45	0.5	162.7	184.6	Taylor	54	0.6	173.3	212.6
Daviess	226	2.7	212.0	226.7	Livingston	24	0.3	249.3	258.9	Todd	11	0.1	81.9	89.5
Edmonson	16	0.2	86.4	132.1	Logan	28	0.3	94.5	105.3	Trigg	12	0.1	66.6	84.1
Elliott	12	0.1	135.4	158.1	Lyon	14	0.2	122.7	173.5	Trimble	9	0.1	94.2	104.4
Estill	36	0.4	215.0	251.6	Madison	129	1.5	146.2	144.1	Union	17	0.2	108.4	114.2
Fayette	501	5.9	156.6	157.3	Magoffin	62	0.7	433.7	488.8	Warren	186	2.2	150.7	148.2
Fleming	40	0.5	242.2	275.7	Marion	33	0.4	158.0	171.8	Washington	22	0.3	165.4	180.5
Floyd	110	1.3	270.0	296.4	Marshall	76	0.9	200.5	242.3	Wayne	29	0.3	134.0	141.8
Franklin	91	1.1	152.9	180.0	Martin	32	0.4	228.5	266.6	Webster	24	0.3	170.1	180.2
Fulton	9	0.1	105.9	145.7	Mason	15	0.2	76.5	87.3	Whitley	100	1.2	262.3	277.0
Gallatin	16	0.2	187.0	185.9	McCracken	183	2.2	245.5	280.8	Wolfe	23	0.3	277.1	321.3
Garrard	22	0.3	115.9	127.2	McCreary	37	0.4	197.2	211.3	Woodford	29	0.3	106.5	111.0

* At least one but fewer than five

\- Percentage or rate suppressed to prevent disclosure of the value on which it was based

Table 24: Incidence of All ED ABI* by County, Sorted by County, Kentucky, 2016
***Includes ED deaths as well as non-fatal ED cases**

County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate
Adair	40	0.6	206.8	207.5	Grant	44	0.7	180.8	176.5	McLean	18	0.3	216.4	190.0
Allen	22	0.3	102.7	106.6	Graves	63	1.0	175.9	169.4	Meade	20	0.3	70.4	71.1
Anderson	25	0.4	119.3	112.8	Grayson	57	0.9	227.1	217.7	Menifee	18	0.3	266.7	280.9
Ballard	12	0.2	165.5	149.0	Green	24	0.4	198.5	217.0	Mercer	46	0.7	210.6	214.2
Barren	68	1.0	160.3	154.6	Greenup	35	0.5	110.5	97.5	Metcalfe	13	0.2	142.3	129.8
Bath	17	0.3	141.6	137.9	Hancock	5	0.1	59.1	56.8	Monroe	19	0.3	192.6	179.4
Bell	75	1.1	306.0	276.6	Hardin	154	2.3	143.4	143.5	Montgomery	35	0.5	131.2	126.0
Boone	102	1.5	78.7	79.4	Harlan	51	0.8	195.4	187.7	Morgan	33	0.5	236.1	248.2
Bourbon	27	0.4	148.6	134.8	Harrison	41	0.6	222.4	219.9	Muhlenberg	73	1.1	234.0	235.3
Boyd	83	1.3	176.2	172.4	Hart	31	0.5	178.2	166.4	Nelson	81	1.2	189.8	177.8
Boyle	38	0.6	134.8	126.6	Henderson	68	1.0	153.2	147.0	Nicholas	8	0.1	121.0	112.9
Bracken	12	0.2	159.7	142.9	Henry	24	0.4	158.6	151.7	Ohio	61	0.9	260.5	250.2
Breathitt	19	0.3	148.3	143.0	Hickman	3	0.0	43.0	64.8	Oldham	55	0.8	89.4	83.9
Breckinridge	23	0.3	127.0	115.2	Hopkins	58	0.9	128.9	126.4	Owen	21	0.3	228.5	197.3
Bullitt	62	0.9	81.4	78.3	Jackson	21	0.3	163.8	157.1	Owsley	9	0.1	225.9	200.4
Butler	15	0.2	130.6	116.8	Jefferson	1178	17.8	157.6	153.9	Pendleton	16	0.2	111.9	109.9
Caldwell	22	0.3	187.1	175.0	Jessamine	40	0.6	79.5	76.4	Perry	48	0.7	175.7	175.5
Calloway	73	1.1	192.8	189.9	Johnson	37	0.6	151.7	161.0	Pike	79	1.2	136.5	130.5
Campbell	80	1.2	85.8	86.8	Kenton	108	1.6	63.0	65.5	Powell	26	0.4	221.6	211.2
Carlisle	4	0.1	89.0	82.4	Knott	24	0.4	183.0	154.4	Pulaski	87	1.3	144.7	136.0
Carroll	22	0.3	209.0	206.0	Knox	83	1.3	270.7	261.9	Robertson	2	0.0	84.0	92.8
Carter	36	0.5	128.6	133.1	Larue	23	0.3	161.4	163.2	Rockcastle	34	0.5	205.0	201.8
Casey	33	0.5	209.5	208.7	Laurel	89	1.3	149.0	147.7	Rowan	67	1.0	263.0	274.0
Christian	66	1.0	91.3	91.2	Lawrence	31	0.5	207.3	195.4	Russell	32	0.5	182.6	180.6
Clark	78	1.2	226.3	217.8	Lee	10	0.2	162.3	152.0	Scott	82	1.2	154.5	151.9
Clay	53	0.8	251.5	255.2	Leslie	41	0.6	383.0	389.1	Shelby	63	1.0	139.7	135.8
Clinton	20	0.3	155.4	196.5	Letcher	56	0.8	282.7	245.9	Simpson	35	0.5	203.9	193.6
Crittenden	12	0.2	147.9	130.6	Lewis	15	0.2	121.6	111.6	Spencer	21	0.3	125.3	114.9
Cumberland	19	0.3	293.0	282.0	Lincoln	35	0.5	148.9	143.6	Taylor	89	1.3	336.3	350.4
Daviess	169	2.6	172.6	169.6	Livingston	17	0.3	204.9	183.4	Todd	14	0.2	127.2	113.9
Edmonson	12	0.2	104.9	99.1	Logan	59	0.9	214.9	221.9	Trigg	31	0.5	219.8	217.3
Elliott	10	0.2	123.3	131.8	Lyon	16	0.2	256.0	198.3	Trimble	6	0.1	64.9	69.6
Estill	10	0.2	74.3	69.9	Madison	137	2.1	155.8	153.0	Union	27	0.4	190.2	181.5
Fayette	376	5.7	117.4	118.1	Magoffin	23	0.3	179.1	181.3	Warren	165	2.5	137.9	131.4
Fleming	27	0.4	179.7	186.1	Marion	31	0.5	175.0	161.4	Washington	25	0.4	214.5	205.1
Floyd	90	1.4	261.6	242.5	Marshall	35	0.5	115.9	111.6	Wayne	28	0.4	157.4	136.9
Franklin	87	1.3	180.0	172.1	Martin	21	0.3	172.6	175.0	Webster	13	0.2	94.8	97.6
Fulton	4	0.1	69.6	64.7	Mason	24	0.4	160.1	139.6	Whitley	87	1.3	250.5	241.0
Gallatin	16	0.2	181.3	185.9	McCracken	151	2.3	256.7	231.7	Wolfe	22	0.3	296.1	307.3
Garrard	30	0.5	173.7	173.5	McCreary	19	0.3	107.8	108.5	Woodford	41	0.6	167.5	156.9

* At least one but fewer than five

\- Percentage or rate suppressed to prevent disclosure of the value on which it was based

Table 25: Incidence of All Inpatient ABI* by County, Sorted by Frequency, Kentucky, 2016
***Includes inpatient deaths as well as non-fatal inpatient cases**

County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate
Jefferson	1738	20.5	206.3	227.1	Carter	54	0.6	172.9	199.7	Green	25	0.3	158.0	226.0
Fayette	501	5.9	156.6	157.3	Taylor	54	0.6	173.3	212.6	Meade	25	0.3	85.5	88.9
Kenton	278	3.3	162.8	168.5	Grant	52	0.6	206.6	208.6	Livingston	24	0.3	249.3	258.9
Daviess	226	2.7	212.0	226.7	Callow ay	46	0.5	122.5	119.7	Webster	24	0.3	170.1	180.2
Hardin	217	2.6	195.5	202.2	Greenup	46	0.5	102.1	128.2	Larue	23	0.3	129.5	163.2
Warren	186	2.2	150.7	148.2	Lincoln	45	0.5	162.7	184.6	Metcalfe	23	0.3	199.8	229.6
McCracken	183	2.2	245.5	280.8	Ohio	45	0.5	171.3	184.6	Wolfe	23	0.3	277.1	321.3
Laurel	168	2.0	244.8	278.8	Boyle	44	0.5	134.9	146.6	Garrard	22	0.3	115.9	127.2
Boone	162	1.9	129.4	126.0	Henderson	43	0.5	76.1	93.0	Washington	22	0.3	165.4	180.5
Pike	151	1.8	230.7	249.4	Law rence	42	0.5	249.8	264.8	Ballard	21	0.2	206.9	260.7
Campbell	135	1.6	133.7	146.4	Montgomery	42	0.5	134.5	151.2	Monroe	21	0.2	153.6	198.3
Madison	129	1.5	146.2	144.1	Fleming	40	0.5	242.2	275.7	Russell	21	0.2	99.0	118.5
Pulaski	119	1.4	167.9	186.1	Bourbon	39	0.5	169.3	194.7	Ow sley	19	0.2	360.9	423.1
Bullitt	118	1.4	143.6	149.1	Anderson	38	0.4	158.3	171.5	Carroll	18	0.2	157.1	168.6
Boyd	114	1.3	204.1	236.8	Rockcastle	38	0.4	201.5	225.5	Harrison	18	0.2	81.8	96.5
Floyd	110	1.3	270.0	296.4	McCreary	37	0.4	197.2	211.3	McLean	18	0.2	173.8	190.0
Jessamine	107	1.3	194.7	204.4	Pow ell	37	0.4	276.9	300.6	Hancock	17	0.2	163.2	193.0
Perry	105	1.2	363.1	384.0	Breathitt	36	0.4	218.5	271.0	Union	17	0.2	108.4	114.2
Whitley	100	1.2	262.3	277.0	Estill	36	0.4	215.0	251.6	Cumberland	16	0.2	222.1	237.5
Franklin	91	1.1	152.9	180.0	Knott	35	0.4	223.5	225.2	Edmonson	16	0.2	86.4	132.1
Bell	88	1.0	297.9	324.5	Marion	33	0.4	158.0	171.8	Gallatin	16	0.2	187.0	185.9
Hopkins	87	1.0	163.7	189.5	Mercer	33	0.4	119.5	153.7	Pendleton	16	0.2	95.7	109.9
Barren	84	1.0	163.8	190.9	Henry	32	0.4	165.5	202.3	Mason	15	0.2	76.5	87.3
Letcher	84	1.0	329.8	368.9	Martin	32	0.4	228.5	266.6	Menifee	15	0.2	176.8	234.1
Harlan	83	1.0	275.2	305.5	Morgan	32	0.4	209.4	240.6	Lyon	14	0.2	122.7	173.5
Oldham	83	1.0	131.8	126.6	Allen	31	0.4	139.4	150.3	Elliott	12	0.1	135.4	158.1
Christian	82	1.0	126.4	113.3	Adair	30	0.4	147.3	155.6	Trigg	12	0.1	66.6	84.1
Marshall	76	0.9	200.5	242.3	Jackson	30	0.4	205.3	224.4	Hickman	11	0.1	178.2	237.7
Shelby	74	0.9	154.2	159.5	Spencer	30	0.4	154.1	164.2	Ow en	11	0.1	77.8	103.4
Clay	73	0.9	327.4	351.5	Wayne	29	0.3	134.0	141.8	Todd	11	0.1	81.9	89.5
Row an	73	0.9	316.4	298.6	Woodford	29	0.3	106.5	111.0	Bracken	10	0.1	98.7	119.0
Graves	72	0.8	164.8	193.6	Breckinridge	28	0.3	124.6	140.3	Carlisle	10	0.1	170.1	206.0
Muhlenberg	71	0.8	183.2	228.8	Logan	28	0.3	94.5	105.3	Fulton	9	0.1	105.9	145.7
Nelson	70	0.8	150.1	153.6	Simpson	28	0.3	143.6	154.8	Lee	9	0.1	130.3	136.8
Clark	67	0.8	161.5	187.1	Butler	27	0.3	191.2	210.2	Trimble	9	0.1	94.2	104.4
Johnson	67	0.8	262.4	291.6	Casey	27	0.3	141.0	170.7	Clinton	8	0.1	62.2	78.6
Scott	67	0.8	130.5	124.1	Hart	27	0.3	131.5	145.0	Crittenden	8	0.1	65.0	87.1
Magoffin	62	0.7	433.7	488.8	Bath	26	0.3	195.7	210.9	Lew is	8	0.1	40.8	59.5
Knox	57	0.7	170.3	179.9	Leslie	26	0.3	197.2	246.7	Nicholas	8	0.1	109.0	112.9
Grayson	56	0.7	195.6	213.9	Caldw ell	25	0.3	168.5	198.9	Robertson	*	-	-	-

* At least one but few er than five

\- Percentage or rate suppressed to prevent disclosure of the value on w hich it w as based

Table 26: Incidence of All ED ABI* by County, Sorted by Frequency, Kentucky, 2016
***Includes ED deaths as well as non-fatal ED cases**

County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate
Jefferson	1178	17.8	157.6	153.9	Perry	48	0.7	175.7	175.5	Caldwell	22	0.3	187.1	175.0
Fayette	376	5.7	117.4	118.1	Mercer	46	0.7	210.6	214.2	Carroll	22	0.3	209.0	206.0
Daviess	169	2.6	172.6	169.6	Grant	44	0.7	180.8	176.5	Wolfe	22	0.3	296.1	307.3
Warren	165	2.5	137.9	131.4	Harrison	41	0.6	222.4	219.9	Jackson	21	0.3	163.8	157.1
Hardin	154	2.3	143.4	143.5	Leslie	41	0.6	383.0	389.1	Martin	21	0.3	172.6	175.0
McCracken	151	2.3	256.7	231.7	Woodford	41	0.6	167.5	156.9	Owen	21	0.3	228.5	197.3
Madison	137	2.1	155.8	153.0	Adair	40	0.6	206.8	207.5	Spencer	21	0.3	125.3	114.9
Kenton	108	1.6	63.0	65.5	Jessamine	40	0.6	79.5	76.4	Clinton	20	0.3	155.4	196.5
Boone	102	1.5	78.7	79.4	Boyle	38	0.6	134.8	126.6	Meade	20	0.3	70.4	71.1
Floyd	90	1.4	261.6	242.5	Johnson	37	0.6	151.7	161.0	Breathitt	19	0.3	148.3	143.0
Laurel	89	1.3	149.0	147.7	Carter	36	0.5	128.6	133.1	Cumberland	19	0.3	293.0	282.0
Taylor	89	1.3	336.3	350.4	Greenup	35	0.5	110.5	97.5	McCreary	19	0.3	107.8	108.5
Franklin	87	1.3	180.0	172.1	Lincoln	35	0.5	148.9	143.6	Monroe	19	0.3	192.6	179.4
Pulaski	87	1.3	144.7	136.0	Marshall	35	0.5	115.9	111.6	McLean	18	0.3	216.4	190.0
Whitley	87	1.3	250.5	241.0	Montgomery	35	0.5	131.2	126.0	Menifee	18	0.3	266.7	280.9
Boyd	83	1.3	176.2	172.4	Simpson	35	0.5	203.9	193.6	Bath	17	0.3	141.6	137.9
Knox	83	1.3	270.7	261.9	Rockcastle	34	0.5	205.0	201.8	Livingston	17	0.3	204.9	183.4
Scott	82	1.2	154.5	151.9	Casey	33	0.5	209.5	208.7	Gallatin	16	0.2	181.3	185.9
Nelson	81	1.2	189.8	177.8	Morgan	33	0.5	236.1	248.2	Lyon	16	0.2	256.0	198.3
Campbell	80	1.2	85.8	86.8	Russell	32	0.5	182.6	180.6	Pendleton	16	0.2	111.9	109.9
Pike	79	1.2	136.5	130.5	Hart	31	0.5	178.2	166.4	Butler	15	0.2	130.6	116.8
Clark	78	1.2	226.3	217.8	Lawrence	31	0.5	207.3	195.4	Lewis	15	0.2	121.6	111.6
Bell	75	1.1	306.0	276.6	Marion	31	0.5	175.0	161.4	Todd	14	0.2	127.2	113.9
Calloway	73	1.1	192.8	189.9	Trigg	31	0.5	219.8	217.3	Metcalfe	13	0.2	142.3	129.8
Muhlenberg	73	1.1	234.0	235.3	Garrard	30	0.5	173.7	173.5	Webster	13	0.2	94.8	97.6
Barren	68	1.0	160.3	154.6	Wayne	28	0.4	157.4	136.9	Ballard	12	0.2	165.5	149.0
Henderson	68	1.0	153.2	147.0	Bourbon	27	0.4	148.6	134.8	Bracken	12	0.2	159.7	142.9
Rowan	67	1.0	263.0	274.0	Fleming	27	0.4	179.7	186.1	Crittenden	12	0.2	147.9	130.6
Christian	66	1.0	91.3	91.2	Union	27	0.4	190.2	181.5	Edmonson	12	0.2	104.9	99.1
Graves	63	1.0	175.9	169.4	Powell	26	0.4	221.6	211.2	Elliott	10	0.2	123.3	131.8
Shelby	63	1.0	139.7	135.8	Anderson	25	0.4	119.3	112.8	Estill	10	0.2	74.3	69.9
Bullitt	62	0.9	81.4	78.3	Washington	25	0.4	214.5	205.1	Lee	10	0.2	162.3	152.0
Ohio	61	0.9	260.5	250.2	Green	24	0.4	198.5	217.0	Owsley	9	0.1	225.9	200.4
Logan	59	0.9	214.9	221.9	Henry	24	0.4	158.6	151.7	Nicholas	8	0.1	121.0	112.9
Hopkins	58	0.9	128.9	126.4	Knott	24	0.4	183.0	154.4	Trimble	6	0.1	64.9	69.6
Grayson	57	0.9	227.1	217.7	Mason	24	0.4	160.1	139.6	Hancock	5	0.1	59.1	56.8
Letcher	56	0.8	282.7	245.9	Breckinridge	23	0.3	127.0	115.2	Carlisle	*	-	-	-
Oldham	55	0.8	89.4	83.9	Larue	23	0.3	161.4	163.2	Fulton	*	-	-	-
Clay	53	0.8	251.5	255.2	Magoffin	23	0.3	179.1	181.3	Hickman	*	-	-	-
Harlan	51	0.8	195.4	187.7	Allen	22	0.3	102.7	106.6	Robertson	*	-	-	-

* At least one but fewer than five

\- Percentage or rate suppressed to prevent disclosure of the value on which it was based

Table 27: Incidence of All Inpatient ABI* by County, Sorted by Age Adjusted Rate, Kentucky, 2016
***Includes inpatient deaths as well as non-fatal inpatient cases**

County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate
Magoffin	62	0.7	433.7	488.8	Butler	27	0.3	191.2	210.2	Casey	27	0.3	141.0	170.7
Perry	105	1.2	363.1	384.0	Gallatin	16	0.2	187.0	185.9	Allen	31	0.4	139.4	150.3
Owsley	19	0.2	360.9	423.1	Muhlenberg	71	0.8	183.2	228.8	Elliott	12	0.1	135.4	158.1
Letcher	84	1.0	329.8	368.9	Hickman	11	0.1	178.2	237.7	Boyle	44	0.5	134.9	146.6
Clay	73	0.9	327.4	351.5	Menifee	15	0.2	176.8	234.1	Montgomery	42	0.5	134.5	151.2
Rowan	73	0.9	316.4	298.6	McLean	18	0.2	173.8	190.0	Wayne	29	0.3	134.0	141.8
Bell	88	1.0	297.9	324.5	Taylor	54	0.6	173.3	212.6	Campbell	135	1.6	133.7	146.4
Wolfe	23	0.3	277.1	321.3	Carter	54	0.6	172.9	199.7	Oldham	83	1.0	131.8	126.6
Powell	37	0.4	276.9	300.6	Ohio	45	0.5	171.3	184.6	Hart	27	0.3	131.5	145.0
Harlan	83	1.0	275.2	305.5	Knox	57	0.7	170.3	179.9	Scott	67	0.8	130.5	124.1
Floyd	110	1.3	270.0	296.4	Webster	24	0.3	170.1	180.2	Lee	9	0.1	130.3	136.8
Johnson	67	0.8	262.4	291.6	Carlisle	10	0.1	170.1	206.0	Larue	23	0.3	129.5	163.2
Whitley	100	1.2	262.3	277.0	Bourbon	39	0.5	169.3	194.7	Boone	162	1.9	129.4	126.0
Lawrence	42	0.5	249.8	264.8	Caldwell	25	0.3	168.5	198.9	Christian	82	1.0	126.4	113.3
Livingston	24	0.3	249.3	258.9	Pulaski	119	1.4	167.9	186.1	Breckinridge	28	0.3	124.6	140.3
McCracken	183	2.2	245.5	280.8	Henry	32	0.4	165.5	202.3	Lyon	14	0.2	122.7	173.5
Laurel	168	2.0	244.8	278.8	Washington	22	0.3	165.4	180.5	Calloway	46	0.5	122.5	119.7
Fleming	40	0.5	242.2	275.7	Graves	72	0.8	164.8	193.6	Mercer	33	0.4	119.5	153.7
Pike	151	1.8	230.7	249.4	Barren	84	1.0	163.8	190.9	Garrard	22	0.3	115.9	127.2
Martin	32	0.4	228.5	266.6	Hopkins	87	1.0	163.7	189.5	Nicholas	8	0.1	109.0	112.9
Knott	35	0.4	223.5	225.2	Hancock	17	0.2	163.2	193.0	Union	17	0.2	108.4	114.2
Cumberland	16	0.2	222.1	237.5	Kenton	278	3.3	162.8	168.5	Woodford	29	0.3	106.5	111.0
Breathitt	36	0.4	218.5	271.0	Lincoln	45	0.5	162.7	184.6	Fulton	9	0.1	105.9	145.7
Estill	36	0.4	215.0	251.6	Clark	67	0.8	161.5	187.1	Greenup	46	0.5	102.1	128.2
Daviess	226	2.7	212.0	226.7	Robertson	*	-	-	-	Russell	21	0.2	99.0	118.5
Morgan	32	0.4	209.4	240.6	Anderson	38	0.4	158.3	171.5	Bracken	10	0.1	98.7	119.0
Ballard	21	0.2	206.9	260.7	Green	25	0.3	158.0	226.0	Pendleton	16	0.2	95.7	109.9
Grant	52	0.6	206.6	208.6	Marion	33	0.4	158.0	171.8	Logan	28	0.3	94.5	105.3
Jefferson	1738	20.5	206.3	227.1	Carroll	18	0.2	157.1	168.6	Trimble	9	0.1	94.2	104.4
Jackson	30	0.4	205.3	224.4	Fayette	501	5.9	156.6	157.3	Edmonson	16	0.2	86.4	132.1
Boyd	114	1.3	204.1	236.8	Shelby	74	0.9	154.2	159.5	Meade	25	0.3	85.5	88.9
Rockcastle	38	0.4	201.5	225.5	Spencer	30	0.4	154.1	164.2	Todd	11	0.1	81.9	89.5
Marshall	76	0.9	200.5	242.3	Monroe	21	0.2	153.6	198.3	Harrison	18	0.2	81.8	96.5
Metcalfe	23	0.3	199.8	229.6	Franklin	91	1.1	152.9	180.0	Owen	11	0.1	77.8	103.4
Leslie	26	0.3	197.2	246.7	Warren	186	2.2	150.7	148.2	Mason	15	0.2	76.5	87.3
McCreary	37	0.4	197.2	211.3	Nelson	70	0.8	150.1	153.6	Henderson	43	0.5	76.1	93.0
Bath	26	0.3	195.7	210.9	Adair	30	0.4	147.3	155.6	Trigg	12	0.1	66.6	84.1
Grayson	56	0.7	195.6	213.9	Madison	129	1.5	146.2	144.1	Crittenden	8	0.1	65.0	87.1
Hardin	217	2.6	195.5	202.2	Bullitt	118	1.4	143.6	149.1	Clinton	8	0.1	62.2	78.6
Jessamine	107	1.3	194.7	204.4	Simpson	28	0.3	143.6	154.8	Lewis	8	0.1	40.8	59.5

* At least one but fewer than five

\- Percentage or rate suppressed to prevent disclosure of the value on which it was based

Table 28: Incidence of All ED ABI* by County, Sorted by Age Adjusted Rate, Kentucky, 2016
***Includes inpatient deaths as well as non-fatal inpatient cases**

County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate
Leslie	41	0.6	383.0	389.1	Nelson	81	1.2	189.8	177.8	Metcalfe	13	0.2	142.3	129.8
Taylor	89	1.3	336.3	350.4	Caldwell	22	0.3	187.1	175.0	Bath	17	0.3	141.6	137.9
Bell	75	1.1	306.0	276.6	Knott	24	0.4	183.0	154.4	Shelby	63	1.0	139.7	135.8
Wolfe	22	0.3	296.1	307.3	Russell	32	0.5	182.6	180.6	Warren	165	2.5	137.9	131.4
Cumberland	19	0.3	293.0	282.0	Gallatin	16	0.2	181.3	185.9	Pike	79	1.2	136.5	130.5
Letcher	56	0.8	282.7	245.9	Grant	44	0.7	180.8	176.5	Boyle	38	0.6	134.8	126.6
Knox	83	1.3	270.7	261.9	Franklin	87	1.3	180.0	172.1	Montgomery	35	0.5	131.2	126.0
Menifee	18	0.3	266.7	280.9	Fleming	27	0.4	179.7	186.1	Butler	15	0.2	130.6	116.8
Rowan	67	1.0	263.0	274.0	Magoffin	23	0.3	179.1	181.3	Hopkins	58	0.9	128.9	126.4
Floyd	90	1.4	261.6	242.5	Hart	31	0.5	178.2	166.4	Carter	36	0.5	128.6	133.1
Ohio	61	0.9	260.5	250.2	Boyd	83	1.3	176.2	172.4	Todd	14	0.2	127.2	113.9
McCracken	151	2.3	256.7	231.7	Graves	63	1.0	175.9	169.4	Breckinridge	23	0.3	127.0	115.2
Lyon	16	0.2	256.0	198.3	Perry	48	0.7	175.7	175.5	Spencer	21	0.3	125.3	114.9
Clay	53	0.8	251.5	255.2	Marion	31	0.5	175.0	161.4	Elliott	10	0.2	123.3	131.8
Whitley	87	1.3	250.5	241.0	Garrard	30	0.5	173.7	173.5	Lewis	15	0.2	121.6	111.6
Morgan	33	0.5	236.1	248.2	Daviess	169	2.6	172.6	169.6	Nicholas	8	0.1	121.0	112.9
Muhlenberg	73	1.1	234.0	235.3	Martin	21	0.3	172.6	175.0	Anderson	25	0.4	119.3	112.8
Owen	21	0.3	228.5	197.3	Woodford	41	0.6	167.5	156.9	Fayette	376	5.7	117.4	118.1
Grayson	57	0.9	227.1	217.7	Ballard	12	0.2	165.5	149.0	Marshall	35	0.5	115.9	111.6
Clark	78	1.2	226.3	217.8	Jackson	21	0.3	163.8	157.1	Pendleton	16	0.2	111.9	109.9
Owsley	9	0.1	225.9	200.4	Lee	10	0.2	162.3	152.0	Greenup	35	0.5	110.5	97.5
Harrison	41	0.6	222.4	219.9	Larue	23	0.3	161.4	163.2	McCreary	19	0.3	107.8	108.5
Powell	26	0.4	221.6	211.2	Barren	68	1.0	160.3	154.6	Edmonson	12	0.2	104.9	99.1
Trigg	31	0.5	219.8	217.3	Mason	24	0.4	160.1	139.6	Allen	22	0.3	102.7	106.6
McLean	18	0.3	216.4	190.0	Bracken	12	0.2	159.7	142.9	Webster	13	0.2	94.8	97.6
Logan	59	0.9	214.9	221.9	Henry	24	0.4	158.6	151.7	Christian	66	1.0	91.3	91.2
Washington	25	0.4	214.5	205.1	Jefferson	1178	17.8	157.6	153.9	Oldham	55	0.8	89.4	83.9
Mercer	46	0.7	210.6	214.2	Wayne	28	0.4	157.4	136.9	Carlisle	*	-	-	-
Casey	33	0.5	209.5	208.7	Madison	137	2.1	155.8	153.0	Campbell	80	1.2	85.8	86.8
Carroll	22	0.3	209.0	206.0	Clinton	20	0.3	155.4	196.5	Robertson	*	-	-	-
Lawrence	31	0.5	207.3	195.4	Scott	82	1.2	154.5	151.9	Bullitt	62	0.9	81.4	78.3
Adair	40	0.6	206.8	207.5	Henderson	68	1.0	153.2	147.0	Jessamine	40	0.6	79.5	76.4
Rockcastle	34	0.5	205.0	201.8	Johnson	37	0.6	151.7	161.0	Boone	102	1.5	78.7	79.4
Livingston	17	0.3	204.9	183.4	Laurel	89	1.3	149.0	147.7	Estill	10	0.2	74.3	69.9
Simpson	35	0.5	203.9	193.6	Lincoln	35	0.5	148.9	143.6	Meade	20	0.3	70.4	71.1
Green	24	0.4	198.5	217.0	Bourbon	27	0.4	148.6	134.8	Fulton	*	-	-	-
Harlan	51	0.8	195.4	187.7	Breathitt	19	0.3	148.3	143.0	Trimble	6	0.1	64.9	69.6
Calloway	73	1.1	192.8	189.9	Crittenden	12	0.2	147.9	130.6	Kenton	108	1.6	63.0	65.5
Monroe	19	0.3	192.6	179.4	Pulaski	87	1.3	144.7	136.0	Hancock	5	0.1	59.1	56.8
Union	27	0.4	190.2	181.5	Hardin	154	2.3	143.4	143.5	Hickman	*	-	-	-

* At least one but fewer than five

\- Percentage or rate suppressed to prevent disclosure of the value on which it was based

Table 29: Causes of Non-Fatal ABI, Kentucky, 2016

	Inpatient		ED	
ABI Category	Number	Percent	Number	Percent
Anoxia	803	10.6	151	2.3
Exposure to toxic substances	6406	84.9	5465	84.5
Allergy/anaphylaxis	206	2.7	842	13.0
Acute medical clinical incidents	129	1.7	7	0.1

* Because there are multiple diagnoses and/or causes of death listed for each individual, it is possible for the same case to fall into more than one ABI category. Therefore, the column sums in this table are slightly higher than the total number of ABI cases shown in previous tables.

Table 30: Non-Fatal Anoxia by Age Group, Kentucky, 2016

	Inpatient			ED			Total		
Age	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	21	27.3	7.6	56	72.7	20.3	77	100.0	27.9
5-14	17	58.6	3.0	12	41.4	2.1	29	100.0	5.2
15-24	36	81.8	6.1	8	18.2	1.3	44	100.0	7.4
25-44	172	85.6	15.2	29	14.4	2.6	201	100.0	17.8
45-64	303	89.6	25.5	35	10.4	2.9	338	100.0	28.5
65+	254	95.8	36.8	11	4.2	1.6	265	100.0	38.4
Total	803	84.2	18.1	151	15.8	3.4	954	100.0	21.5

Table 31: Diagnosis Distribution for Non-Fatal Anoxia, Kentucky, 2016

		Inpatient		ED	
Diagnosis	Description	Number	Percent	Number	Percent
G931	Anoxic brain damage (related to hereditary and degenerative diseases of the central nervous system)	749	93.3	68	45.0
O754	Cerebral anoxia following cesarean	49	6.1	7	4.6
T751	Drowning and nonfatal submersion	5	0.6	76	50.3
Total		803	100.0	151	100.0

Table 32: Non-Fatal Exposure to Toxic Substances by Age Group, Kentucky, 2016

	Inpatient			ED			Total		
Age	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	91	22.5	33.0	313	77.5	113.5	404	100.0	146.5
5-14	48	19.8	8.6	194	80.2	34.6	242	100.0	43.1
15-24	313	26.6	52.7	864	73.4	145.5	1,177	100.0	198.3
25-44	1,270	40.3	112.6	1,885	59.7	167.1	3,155	100.0	279.6
45-64	2,142	60.8	180.4	1,382	39.2	116.4	3,524	100.0	296.8
65+	2,542	75.5	368.0	827	24.5	119.7	3,369	100.0	487.8
Total	6,406	54.0	144.4	5,465	46.0	123.2	11,871	100.0	267.5

Table 33: Diagnosis Distribution for Non-Fatal Exposure to Toxic Substances, Kentucky, 2016

		Inpatient		ED	
Diagnosis	Description	Number	Percent	Number	Percent
967, T42	Poisoning by sedatives and hypnotics	2461	38.4	2023	28.8
980, T51	Toxic effect of alcohol	277	4.3	250	13.3
968, T41	Poisoning by other central nervous system depressants and anesthetics	222	3.5	59	8.9
964.2, T455	Poisoning by anticoagulants	2157	33.7	682	5.0
998, T81.1	Post-operative shock	275	4.3	7	0.2
986, T58	Toxic effect of carbon monoxide	34	0.5	202	14.6
985, T56, T57	Toxic effect of other metals	42	0.7	23	1.0
988.0-988.2, T62	Toxic effect of noxious substances eaten as food	25	0.4	280	3.0
995.4, T88.2	Shock due to anesthesia	2	0.0	1	0.1
Other*	Includes meningitis, reaction to lumbar puncture, poisoning by cocaine, other substances	911	14.2	1938	0.1
Total		6406	100.0	5465	100.0

Table 34: Length of Stay for Non-Fatal Inpatient ABI, Kentucky, 2016

Length of Stay	Number	Percent*
1 day	1031	14.2
More than one day but less than 1 week	3945	54.3
1 week to less than 2 weeks	1408	19.4
2 weeks to less than 3 weeks	426	5.9
3 weeks to less than 4 weeks	205	2.8
4 weeks or more	249	3.4
Total	7264	100.0

*Percent of hospitalized ABI

Table 35: Discharge Disposition for Non-Fatal ABI, Kentucky, 2016

	Inpatient		ED	
Discharge Disposition	Number	Percent	Number	Percent
Routine discharge (home/self care)	3,952	54.4	5,453	82.8
Skilled nursing facility (SNF)	927	12.8	47	0.7
Home health	780	10.7	27	0.4
Inpatient-other type facility	30	0.4	42	0.6
Inpatient-other short-term hospital	230	3.2	399	6.1
Intermediate care facility (ICF)	36	0.5	8	0.1
Rehab	322	4.4	8	0.1
Other	987	13.6	598	9.1
Total	7,264	100.0	6,582	100.0

Table 36: Primary Payer and Charges for Non-Fatal Inpatient ABI, Kentucky, 2016

Payer	Number of Discharges	Percent of Discharges	Total Hospital Charges
Government	5,643	77.7	$ 307,488,707
Commercial Insurance	1,461	20.1	$ 93,227,416
Self Pay	103	1.4	$ 3,358,349
Workers Compensation	17	0.2	$ 1,252,043
Other	40	0.6	$ 2,444,637
Total	7,264	100.0	$ 407,771,152

Table 37: Primary Payer and Charges for Non-Fatal ED ABI, Kentucky, 2016

Payer	Number of Discharges	Percent of Discharges	Total Hospital Charges
Government	4,230	64.3	$ 15,972,457
Commercial Insurance	1,835	27.9	$ 6,343,025
Self Pay	343	5.2	$ 975,284
Workers Compensation	105	1.6	$ 160,183
Other	69	1.0	$ 256,397
Total	6,582	100.0	$ 23,707,346

Table 38: Non-Fatal SCI by Age Group, Kentucky, 2016

	Inpatient			ED			Total		
Age	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	0	0.0	0.0	2	0.0	0.7	2	100.0	0.7
5-14	3	37.5	0.5	8	72.7	1.4	11	100.0	2.0
15-24	17	77.3	2.9	5	22.7	0.8	22	100.0	3.7
25-44	31	59.6	2.7	21	40.4	1.9	52	100.0	4.6
45-64	66	64.7	5.6	36	35.3	3.0	102	100.0	8.6
65+	37	71.2	5.4	15	28.8	2.2	52	100.0	7.5
Total	154	63.9	3.5	87	36.1	2.0	241	100.0	5.4

Table 39: Non-Fatal SCI by Gender, Kentucky, 2016

	Inpatient			ED			Total		
Age	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Male	111	71.2	5.1	45	28.8	2.1	156	100.0	7.1
Female	43	50.6	1.9	42	49.4	1.9	85	100.0	3.8
Total	154	63.9	3.5	87	36.1	2.0	241	100.0	5.4

Table 40: Leading Causes of Non-Fatal SCI, Kentucky, 2016

	Inpatient			ED			Total		
Mechanism of Injury	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Motor vehicle traffic crash	40	64.5	0.9	22	35.5	0.5	62	100.0	1.4
Fall	69	67.6	1.6	33	32.4	0.7	102	100.0	2.3
Non-traffic land transportation	5	50.0	0.1	5	50.0	0.1	10	100.0	0.2
Struck by or against object or person	2	66.7	0.0	1	33.3	0.0	3	100.0	0.1
Firearm	9	75.0	0.2	3	25.0	0.1	12	100.0	0.3
Other	5	38.5	0.1	8	61.5	0.2	13	100.0	0.3
Unknown (missing E-code)	24	61.5	0.5	15	38.5	0.3	39	100.0	0.9
Total	154	63.9	3.5	87	36.1	2.0	241	100.0	5.4

Table 41: Length of Stay for Non-Fatal Inpatient SCI, Kentucky, 2016

Length of Stay	Number	Percent*
1 day	11	7.1
More than one day but less than 1 week	57	37.0
1 week to less than 2 weeks	53	34.4
2 weeks to less than 3 weeks	15	9.7
3 weeks to less than 4 weeks	7	4.5
4 weeks or more	11	7.1
Total	154	100.0

*Percent of hospitalized SCI

Table 42: Discharge Disposition for Non-Fatal SCI, Kentucky, 2016

	Inpatient		ED	
Discharge Disposition	Number	Percent	Number	Percent
Routine discharge (home/self care)	45	29.2	56	64.4
Home health	11	7.1	1	1.1
Skilled nursing facility (SNF)	16	10.4	0	0.0
Inpatient-other	9	5.8	23	26.4
Rehab	64	41.6	0	0.0
Other	9	5.8	7	8.0
Total	154	100.0	87	100.0

Table 43: Primary Payer and Charges for Non-Fatal Inpatient SCI, Kentucky, 2016

Payer	Number of Discharges	Percent of Discharges	Total Hospital Discharges
Government	97	63.0	$ 13,136,372
Commercial Ins	38	24.7	$ 7,076,035
Workers Compensation	2	1.3	$ 347,022
Self Pay	1	0.6	$ 264,054
Other	16	10.4	$ 1,879,905
Total	154	100.0	$22,703,389

Table 44: Primary Payer and Charges for Non-Fatal ED SCI, Kentucky, 2016

Payer	Number of Discharges	Percent of Discharges	Total Hospital Discharges
Government	52	59.8	$ 339,518
Commercial Ins	18	20.7	$ 100,116
Workers Compensation	2	2.3	$ 1,794
Self Pay	4	4.6	$ 12,227
Other	11	12.6	$ 59,081
Total	87	100.0	$512,735

Table 45: Non-Fatal Stroke by Age Group, Kentucky, 2016

	Inpatient			ED			Total		
Age	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	23	0.0	8.3	7	0.0	2.5	30	100.0	10.9
5-14	8	88.9	1.4	9	52.9	1.6	17	100.0	3.0
15-24	50	42.7	8.4	67	57.3	11.3	117	100.0	19.7
25-44	695	55.4	61.6	559	44.6	49.5	1,254	100.0	111.1
45-64	4,064	59.9	342.3	2,717	40.1	228.8	6,781	100.0	571.1
65+	8,292	65.4	1200.5	4,388	34.6	635.3	12,680	100.0	1835.8
Total	13,132	62.9	296.0	7,747	37.1	174.6	20,879	100.0	470.6

Table 46: Non-Fatal Stroke by Gender, Kentucky, 2016

	Inpatient			ED			Total		
Age	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Male	6,129	62.8	280.3	3,633	37.2	166.2	9,762	100.0	446.5
Female	7,003	63.0	311.2	4,114	37.0	182.8	11,117	100.0	494.0
Total	13,132	62.9	296.0	7,747	37.1	174.6	20,879	100.0	470.6

Table 47: Length of Stay for Non-Fatal Inpatient Stroke, Kentucky, 2016

Length of Stay	Number	Percent*
1 day	1901	14.5
More than one day but less than 1 week	7708	58.7
1 week to less than 2 weeks	2388	18.2
2 weeks to less than 3 weeks	636	4.8
3 weeks to less than 4 weeks	255	1.9
4 weeks or more	244	1.9
Total	13132	100.0

*Percent of hospitalized Stroke

Table 48: Discharge Disposition for Non-Fatal Stroke, Kentucky, 2016

	Inpatient		ED	
Discharge Disposition	Number	Percent	Number	Percent
Routine discharge (home/self care)	5,754	43.8	4,046	55.6
Home health	1,385	10.5	95	0.0
Skilled nursing facility (SNF)	2,371	18.1	162	0.0
Inpatient-other	387	2.9	2,696	38.3
Intermediate Care Facility	57	0.4	24	2.5
Rehab	2,050	15.6	14	0.2
Other	1,128	8.6	710	3.7
Total	13,132	100.0	7747	100.0

Table 49: Primary Payer and Charges for Non-Fatal Inpatient Stroke, Kentucky, 2016

Payer	Number of Discharges	Percent of Discharges	Total Hospital Discharges
Government	10575	80.5	$ 549,795,238
Commercial Ins	2354	17.9	$ 152,022,866
Workers Compensation	5	0.0	$ 415,963
Self Pay	135	1.0	$ 5,807,215
Other	63	0.5	$ 3,865,029
Total	13,132	100.0	$711,906,312

Table 50: Primary Payer and Charges for Non-Fatal ED Stroke, Kentucky, 2016

Payer	Number of Discharges	Percent of Discharges	Total Hospital Discharges
Government	5937	76.6	$ 54,949,471
Commercial Ins	1617	20.9	$ 17,490,545
Workers Compensation	6	0.1	$ 69,051
Self Pay	140	1.8	$ 1,301,995
Other	47	0.6	$ 473,037
Total	7,747	100.0	$74,284,099

Table 51: Incidence of All Inpatient Stroke* by County, Sorted by County, Kentucky, 2016
***Includes inpatient deaths as well as non-fatal inpatient cases**

County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate
Adair	68	0.5	277.7	352.7	Grant	102	0.7	410.3	409.3	McLean	36	0.3	281.7	379.9
Allen	82	0.6	316.3	397.5	Graves	117	0.8	241.4	314.7	Meade	56	0.4	185.3	199.1
Anderson	68	0.5	249.9	306.9	Grayson	125	0.9	383.0	477.4	Menifee	33	0.2	402.8	515.0
Ballard	32	0.2	288.1	397.3	Green	41	0.3	245.7	370.7	Mercer	100	0.7	344.2	465.6
Barren	145	1.0	256.2	329.6	Greenup	95	0.7	193.4	264.7	Metcalfe	39	0.3	294.2	389.3
Bath	64	0.4	429.1	519.2	Hancock	31	0.2	298.3	351.9	Monroe	72	0.5	493.6	680.0
Bell	120	0.8	350.9	442.5	Hardin	324	2.3	283.2	301.9	Montgomery	79	0.6	246.1	284.5
Boone	276	1.9	227.4	214.7	Harlan	112	0.8	323.9	412.3	Morgan	33	0.2	209.3	248.2
Bourbon	68	0.5	267.9	339.5	Harrison	74	0.5	304.1	396.9	Muhlenberg	103	0.7	252.6	332.0
Boyd	174	1.2	270.5	361.5	Hart	59	0.4	268.0	316.7	Nelson	150	1.1	309.4	329.2
Boyle	98	0.7	240.5	326.5	Henderson	84	0.6	141.3	181.6	Nicholas	35	0.2	382.5	494.1
Bracken	27	0.2	281.6	321.4	Henry	55	0.4	270.1	347.7	Ohio	68	0.5	220.6	278.9
Breathitt	57	0.4	336.8	429.1	Hickman	15	0.1	217.1	324.2	Oldham	123	0.9	203.8	187.6
Breckinridge	52	0.4	195.1	260.5	Hopkins	98	0.7	154.4	213.5	Owen	27	0.2	189.4	253.7
Bullitt	189	1.3	213.0	238.8	Jackson	41	0.3	258.5	306.7	Owsley	19	0.1	342.6	423.1
Butler	51	0.4	307.0	397.0	Jefferson	2846	19.9	317.1	371.9	Pendleton	46	0.3	249.9	315.9
Caldwell	35	0.2	196.3	278.5	Jessamine	131	0.9	231.1	250.2	Perry	191	1.3	567.6	698.5
Calloway	98	0.7	214.8	255.0	Johnson	81	0.6	294.0	352.5	Pike	254	1.8	329.3	419.5
Campbell	242	1.7	224.3	262.4	Kenton	389	2.7	222.5	235.8	Powell	58	0.4	399.7	471.2
Carlisle	24	0.2	316.5	494.3	Knott	86	0.6	428.1	553.3	Pulaski	233	1.6	287.7	364.3
Carroll	44	0.3	340.6	412.0	Knox	104	0.7	265.4	328.2	Robertson	6	0.0	174.0	278.4
Carter	107	0.7	327.7	395.6	Larue	60	0.4	294.8	425.7	Rockcastle	41	0.3	190.0	243.3
Casey	51	0.4	235.5	322.5	Laurel	172	1.2	242.2	285.5	Rowan	104	0.7	408.2	425.3
Christian	123	0.9	188.5	170.0	Lawrence	45	0.3	221.8	283.7	Russell	47	0.3	199.2	265.2
Clark	120	0.8	263.6	335.0	Lee	17	0.1	203.3	258.4	Scott	125	0.9	257.3	231.6
Clay	84	0.6	366.4	404.5	Leslie	72	0.5	545.5	683.2	Shelby	103	0.7	204.6	221.9
Clinton	31	0.2	203.5	304.6	Letcher	122	0.9	408.1	535.7	Simpson	78	0.5	362.2	431.3
Crittenden	29	0.2	209.7	315.6	Lewis	37	0.3	224.7	275.3	Spencer	42	0.3	226.4	229.8
Cumberland	33	0.2	300.3	489.8	Lincoln	101	0.7	330.0	414.4	Taylor	109	0.8	349.7	429.2
Daviess	346	2.4	281.9	347.1	Livingston	63	0.4	466.6	679.7	Todd	27	0.2	187.1	219.6
Edmonson	31	0.2	183.3	255.9	Logan	87	0.6	258.4	327.2	Trigg	38	0.3	174.2	266.4
Elliott	19	0.1	181.3	250.4	Lyon	26	0.2	200.0	322.2	Trimble	16	0.1	147.4	185.6
Estill	56	0.4	319.7	391.4	Madison	220	1.5	242.6	245.7	Union	24	0.2	137.2	161.3
Fayette	778	5.4	248.1	244.3	Magoffin	35	0.2	239.8	275.9	Warren	368	2.6	300.0	293.2
Fleming	69	0.5	372.9	475.6	Marion	59	0.4	254.9	307.2	Washington	31	0.2	197.5	254.3
Floyd	172	1.2	366.4	463.5	Marshall	122	0.9	256.9	389.0	Wayne	57	0.4	214.1	278.7
Franklin	168	1.2	260.1	332.3	Martin	33	0.2	233.1	275.0	Webster	33	0.2	217.7	247.8
Fulton	20	0.1	213.4	323.7	Mason	47	0.3	218.1	273.4	Whitley	177	1.2	427.7	490.4
Gallatin	40	0.3	521.8	464.6	McCracken	249	1.7	269.0	382.1	Wolfe	44	0.3	512.5	614.6
Garrard	45	0.3	198.2	260.2	McCreary	56	0.4	303.5	319.8	Woodford	82	0.6	245.9	313.9

* At least one but fewer than five

\- Percentage or rate suppressed to prevent disclosure of the value on which it was based

Table 52: Incidence of All ED Stroke* by County, Sorted by County, Kentucky, 2016
***Includes ED deaths as well as non-fatal ED cases**

County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate
Adair	85	1.1	357.2	440.9	Grant	46	0.6	159.7	184.6	McLean	11	0.1	92.3	116.1
Allen	63	0.8	252.1	305.4	Graves	70	0.9	142.8	188.3	Meade	14	0.2	44.8	49.8
Anderson	30	0.4	111.0	135.4	Grayson	79	1.0	241.7	301.7	Menifee	20	0.3	252.5	312.1
Ballard	12	0.2	132.1	149.0	Green	44	0.6	285.6	397.8	Mercer	69	0.9	253.5	321.3
Barren	112	1.4	206.3	254.6	Greenup	74	0.9	154.2	206.2	Metcalfe	48	0.6	370.4	479.1
Bath	47	0.6	305.7	381.3	Hancock	3	0.0	30.9	34.1	Monroe	41	0.5	273.3	387.2
Bell	116	1.5	331.5	427.8	Hardin	138	1.8	115.7	128.6	Montgomery	72	0.9	226.4	259.3
Boone	75	1.0	59.0	58.3	Harlan	106	1.4	322.5	390.2	Morgan	46	0.6	294.5	345.9
Bourbon	54	0.7	213.9	269.6	Harrison	82	1.1	336.5	439.8	Muhlenberg	85	1.1	205.1	273.9
Boyd	101	1.3	158.0	209.8	Hart	57	0.7	245.2	306.0	Nelson	114	1.5	240.6	250.2
Boyle	60	0.8	156.4	199.9	Henderson	95	1.2	164.0	205.4	Nicholas	21	0.3	218.1	296.4
Bracken	23	0.3	241.4	273.8	Henry	37	0.5	193.3	233.9	Ohio	42	0.5	138.1	172.3
Breathitt	47	0.6	284.2	353.8	Hickman	5	0.1	73.2	108.1	Oldham	51	0.7	82.0	77.8
Breckinridge	38	0.5	149.5	190.4	Hopkins	157	2.0	273.9	342.0	Owen	8	0.1	63.0	75.2
Bullitt	49	0.6	54.0	61.9	Jackson	38	0.5	258.3	284.3	Owsley	13	0.2	235.6	289.5
Butler	22	0.3	141.3	171.3	Jefferson	805	10.3	89.7	105.2	Pendleton	18	0.2	100.9	123.6
Caldwell	44	0.6	274.3	350.1	Jessamine	43	0.6	74.4	82.1	Perry	115	1.5	365.1	420.6
Calloway	106	1.4	232.8	275.8	Johnson	76	1.0	278.1	330.8	Pike	109	1.4	141.2	180.0
Campbell	56	0.7	57.0	60.7	Kenton	72	0.9	41.5	43.7	Powell	57	0.7	414.6	463.1
Carlisle	5	0.1	71.6	103.0	Knott	39	0.5	198.7	250.9	Pulaski	123	1.6	151.8	192.3
Carroll	25	0.3	187.0	234.1	Knox	108	1.4	269.6	340.8	Robertson	7	0.1	209.7	324.8
Carter	60	0.8	181.1	221.8	Larue	11	0.1	61.7	78.0	Rockcastle	53	0.7	241.9	314.5
Casey	35	0.4	173.3	221.3	Laurel	130	1.7	185.3	215.8	Rowan	80	1.0	317.9	327.2
Christian	120	1.5	187.5	165.9	Lawrence	60	0.8	326.4	378.2	Russell	49	0.6	223.9	276.5
Clark	85	1.1	186.8	237.3	Lee	12	0.2	152.2	182.4	Scott	74	0.9	144.8	137.1
Clay	81	1.0	346.3	390.1	Leslie	49	0.6	385.8	465.0	Shelby	64	0.8	132.0	137.9
Clinton	27	0.3	204.9	265.3	Letcher	67	0.9	241.6	294.2	Simpson	53	0.7	251.1	293.1
Crittenden	11	0.1	81.9	119.7	Lewis	26	0.3	164.3	193.4	Spencer	14	0.2	68.0	76.6
Cumberland	25	0.3	243.6	371.0	Lincoln	85	1.1	298.3	348.8	Taylor	94	1.2	308.8	370.1
Daviess	88	1.1	72.8	88.3	Livingston	19	0.2	143.9	205.0	Todd	19	0.2	135.6	154.5
Edmonson	18	0.2	103.5	148.6	Logan	64	0.8	193.7	240.7	Trigg	69	0.9	356.2	483.7
Elliott	12	0.2	119.6	158.1	Lyon	14	0.2	110.4	173.5	Trimble	9	0.1	90.1	104.4
Estill	40	0.5	214.9	279.6	Madison	141	1.8	155.7	157.5	Union	42	0.5	231.7	282.3
Fayette	225	2.9	72.1	70.7	Magoffin	27	0.3	170.1	212.9	Warren	162	2.1	129.9	129.1
Fleming	81	1.0	465.5	558.4	Marion	69	0.9	287.2	359.3	Washington	30	0.4	203.3	246.1
Floyd	141	1.8	312.7	380.0	Marshall	82	1.1	187.4	261.4	Wayne	51	0.7	199.1	249.4
Franklin	102	1.3	154.5	201.7	Martin	34	0.4	240.5	283.3	Webster	30	0.4	171.2	225.3
Fulton	2	0.0	20.3	32.4	Mason	46	0.6	211.6	267.6	Whitley	172	2.2	412.4	476.5
Gallatin	5	0.1	59.9	58.1	McCracken	101	1.3	114.1	155.0	Wolfe	31	0.4	376.8	433.0
Garrard	26	0.3	118.1	150.4	McCreary	25	0.3	125.8	142.8	Woodford	23	0.3	68.1	88.0

* At least one but fewer than five

\- Percentage or rate suppressed to prevent disclosure of the value on which it was based

Table 53: Incidence of All Inpatient Stroke* by County, Sorted by Frequency, Kentucky, 2016
***Includes inpatient deaths as well as non-fatal inpatient cases**

County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate
Jefferson	2846	19.9	317.1	371.9	Mercer	100	0.7	344.2	465.6	Garrard	45	0.3	198.2	260.2
Fayette	778	5.4	248.1	244.3	Boyle	98	0.7	240.5	326.5	Lawrence	45	0.3	221.8	283.7
Kenton	389	2.7	222.5	235.8	Calloway	98	0.7	214.8	255.0	Carroll	44	0.3	340.6	412.0
Warren	368	2.6	300.0	293.2	Hopkins	98	0.7	154.4	213.5	Wolfe	44	0.3	512.5	614.6
Daviess	346	2.4	281.9	347.1	Greenup	95	0.7	193.4	264.7	Spencer	42	0.3	226.4	229.8
Hardin	324	2.3	283.2	301.9	Logan	87	0.6	258.4	327.2	Green	41	0.3	245.7	370.7
Boone	276	1.9	227.4	214.7	Knott	86	0.6	428.1	553.3	Jackson	41	0.3	258.5	306.7
Pike	254	1.8	329.3	419.5	Clay	84	0.6	366.4	404.5	Rockcastle	41	0.3	190.0	243.3
McCracken	249	1.7	269.0	382.1	Henderson	84	0.6	141.3	181.6	Gallatin	40	0.3	521.8	464.6
Campbell	242	1.7	224.3	262.4	Allen	82	0.6	316.3	397.5	Metcalfe	39	0.3	294.2	389.3
Pulaski	233	1.6	287.7	364.3	Woodford	82	0.6	245.9	313.9	Trigg	38	0.3	174.2	266.4
Madison	220	1.5	242.6	245.7	Johnson	81	0.6	294.0	352.5	Lewis	37	0.3	224.7	275.3
Perry	191	1.3	567.6	698.5	Montgomery	79	0.6	246.1	284.5	McLean	36	0.3	281.7	379.9
Bullitt	189	1.3	213.0	238.8	Simpson	78	0.5	362.2	431.3	Caldwell	35	0.2	196.3	278.5
Whitley	177	1.2	427.7	490.4	Harrison	74	0.5	304.1	396.9	Magoffin	35	0.2	239.8	275.9
Boyd	174	1.2	270.5	361.5	Leslie	72	0.5	545.5	683.2	Nicholas	35	0.2	382.5	494.1
Floyd	172	1.2	366.4	463.5	Monroe	72	0.5	493.6	680.0	Cumberland	33	0.2	300.3	489.8
Laurel	172	1.2	242.2	285.5	Fleming	69	0.5	372.9	475.6	Martin	33	0.2	233.1	275.0
Franklin	168	1.2	260.1	332.3	Adair	68	0.5	277.7	352.7	Menifee	33	0.2	402.8	515.0
Nelson	150	1.1	309.4	329.2	Anderson	68	0.5	249.9	306.9	Morgan	33	0.2	209.3	248.2
Barren	145	1.0	256.2	329.6	Bourbon	68	0.5	267.9	339.5	Webster	33	0.2	217.7	247.8
Jessamine	131	0.9	231.1	250.2	Ohio	68	0.5	220.6	278.9	Ballard	32	0.2	288.1	397.3
Grayson	125	0.9	383.0	477.4	Bath	64	0.4	429.1	519.2	Clinton	31	0.2	203.5	304.6
Scott	125	0.9	257.3	231.6	Livingston	63	0.4	466.6	679.7	Edmonson	31	0.2	183.3	255.9
Christian	123	0.9	188.5	170.0	Larue	60	0.4	294.8	425.7	Hancock	31	0.2	298.3	351.9
Oldham	123	0.9	203.8	187.6	Hart	59	0.4	268.0	316.7	Washington	31	0.2	197.5	254.3
Letcher	122	0.9	408.1	535.7	Marion	59	0.4	254.9	307.2	Crittenden	29	0.2	209.7	315.6
Marshall	122	0.9	256.9	389.0	Powell	58	0.4	399.7	471.2	Bracken	27	0.2	281.6	321.4
Bell	120	0.8	350.9	442.5	Breathitt	57	0.4	336.8	429.1	Owen	27	0.2	189.4	253.7
Clark	120	0.8	263.6	335.0	Wayne	57	0.4	214.1	278.7	Todd	27	0.2	187.1	219.6
Graves	117	0.8	241.4	314.7	Estill	56	0.4	319.7	391.4	Lyon	26	0.2	200.0	322.2
Harlan	112	0.8	323.9	412.3	McCreary	56	0.4	303.5	319.8	Carlisle	24	0.2	316.5	494.3
Taylor	109	0.8	349.7	429.2	Meade	56	0.4	185.3	199.1	Union	24	0.2	137.2	161.3
Carter	107	0.7	327.7	395.6	Henry	55	0.4	270.1	347.7	Fulton	20	0.1	213.4	323.7
Knox	104	0.7	265.4	328.2	Breckinridge	52	0.4	195.1	260.5	Elliott	19	0.1	181.3	250.4
Rowan	104	0.7	408.2	425.3	Butler	51	0.4	307.0	397.0	Owsley	19	0.1	342.6	423.1
Muhlenberg	103	0.7	252.6	332.0	Casey	51	0.4	235.5	322.5	Lee	17	0.1	203.3	258.4
Shelby	103	0.7	204.6	221.9	Mason	47	0.3	218.1	273.4	Trimble	16	0.1	147.4	185.6
Grant	102	0.7	410.3	409.3	Russell	47	0.3	199.2	265.2	Hickman	15	0.1	217.1	324.2
Lincoln	101	0.7	330.0	414.4	Pendleton	46	0.3	249.9	315.9	Robertson	6	0.0	174.0	278.4

* At least one but fewer than five

\- Percentage or rate suppressed to prevent disclosure of the value on which it was based

Table 54: Incidence of All ED Stroke* by County, Sorted by Frequency, Kentucky, 2016
***Includes ED deaths as well as non-fatal ED cases**

County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate	County	Freq	Percent	Age-Adjusted Rate	Crude Rate
Jefferson	805	10.3	89.7	105.2	Montgomery	72	0.9	226.4	259.3	Casey	35	0.4	173.3	221.3
Fayette	225	2.9	72.1	70.7	Graves	70	0.9	142.8	188.3	Martin	34	0.4	240.5	283.3
Whitley	172	2.2	412.4	476.5	Marion	69	0.9	287.2	359.3	Wolfe	31	0.4	376.8	433.0
Warren	162	2.1	129.9	129.1	Mercer	69	0.9	253.5	321.3	Anderson	30	0.4	111.0	135.4
Hopkins	157	2.0	273.9	342.0	Trigg	69	0.9	356.2	483.7	Washington	30	0.4	203.3	246.1
Floyd	141	1.8	312.7	380.0	Letcher	67	0.9	241.6	294.2	Webster	30	0.4	171.2	225.3
Madison	141	1.8	155.7	157.5	Logan	64	0.8	193.7	240.7	Clinton	27	0.3	204.9	265.3
Hardin	138	1.8	115.7	128.6	Shelby	64	0.8	132.0	137.9	Magoffin	27	0.3	170.1	212.9
Laurel	130	1.7	185.3	215.8	Allen	63	0.8	252.1	305.4	Garrard	26	0.3	118.1	150.4
Pulaski	123	1.6	151.8	192.3	Boyle	60	0.8	156.4	199.9	Lewis	26	0.3	164.3	193.4
Christian	120	1.5	187.5	165.9	Carter	60	0.8	181.1	221.8	Carroll	25	0.3	187.0	234.1
Bell	116	1.5	331.5	427.8	Lawrence	60	0.8	326.4	378.2	Cumberland	25	0.3	243.6	371.0
Perry	115	1.5	365.1	420.6	Hart	57	0.7	245.2	306.0	McCreary	25	0.3	125.8	142.8
Nelson	114	1.5	240.6	250.2	Powell	57	0.7	414.6	463.1	Bracken	23	0.3	241.4	273.8
Barren	112	1.4	206.3	254.6	Campbell	56	0.7	57.0	60.7	Woodford	23	0.3	68.1	88.0
Pike	109	1.4	141.2	180.0	Bourbon	54	0.7	213.9	269.6	Butler	22	0.3	141.3	171.3
Knox	108	1.4	269.6	340.8	Rockcastle	53	0.7	241.9	314.5	Nicholas	21	0.3	218.1	296.4
Calloway	106	1.4	232.8	275.8	Simpson	53	0.7	251.1	293.1	Menifee	20	0.3	252.5	312.1
Harlan	106	1.4	322.5	390.2	Oldham	51	0.7	82.0	77.8	Livingston	19	0.2	143.9	205.0
Franklin	102	1.3	154.5	201.7	Wayne	51	0.7	199.1	249.4	Todd	19	0.2	135.6	154.5
Boyd	101	1.3	158.0	209.8	Bullitt	49	0.6	54.0	61.9	Edmonson	18	0.2	103.5	148.6
McCracken	101	1.3	114.1	155.0	Leslie	49	0.6	385.8	465.0	Pendleton	18	0.2	100.9	123.6
Henderson	95	1.2	164.0	205.4	Russell	49	0.6	223.9	276.5	Lyon	14	0.2	110.4	173.5
Taylor	94	1.2	308.8	370.1	Metcalfe	48	0.6	370.4	479.1	Meade	14	0.2	44.8	49.8
Daviess	88	1.1	72.8	88.3	Bath	47	0.6	305.7	381.3	Spencer	14	0.2	68.0	76.6
Adair	85	1.1	357.2	440.9	Breathitt	47	0.6	284.2	353.8	Owsley	13	0.2	235.6	289.5
Clark	85	1.1	186.8	237.3	Grant	46	0.6	159.7	184.6	Ballard	12	0.2	132.1	149.0
Lincoln	85	1.1	298.3	348.8	Mason	46	0.6	211.6	267.6	Elliott	12	0.2	119.6	158.1
Muhlenberg	85	1.1	205.1	273.9	Morgan	46	0.6	294.5	345.9	Lee	12	0.2	152.2	182.4
Harrison	82	1.1	336.5	439.8	Caldwell	44	0.6	274.3	350.1	Crittenden	11	0.1	81.9	119.7
Marshall	82	1.1	187.4	261.4	Green	44	0.6	285.6	397.8	Larue	11	0.1	61.7	78.0
Clay	81	1.0	346.3	390.1	Jessamine	43	0.6	74.4	82.1	McLean	11	0.1	92.3	116.1
Fleming	81	1.0	465.5	558.4	Ohio	42	0.5	138.1	172.3	Trimble	9	0.1	90.1	104.4
Rowan	80	1.0	317.9	327.2	Union	42	0.5	231.7	282.3	Owen	8	0.1	63.0	75.2
Grayson	79	1.0	241.7	301.7	Monroe	41	0.5	273.3	387.2	Robertson	7	0.1	209.7	324.8
Johnson	76	1.0	278.1	330.8	Estill	40	0.5	214.9	279.6	Carlisle	5	0.1	71.6	103.0
Boone	75	1.0	59.0	58.3	Knott	39	0.5	198.7	250.9	Gallatin	5	0.1	59.9	58.1
Greenup	74	0.9	154.2	206.2	Breckinridge	38	0.5	149.5	190.4	Hickman	5	0.1	73.2	108.1
Scott	74	0.9	144.8	137.1	Jackson	38	0.5	258.3	284.3	Hancock	*	-	-	-
Kenton	72	0.9	41.5	43.7	Henry	37	0.5	193.3	233.9	Fulton	*	-	-	-

* At least one but fewer than five

\- Percentage or rate suppressed to prevent disclosure of the value on which it was based

Appendix B: Methods, Abbreviations, Definitions and Data

Methods

Data used for surveillance were received electronically. Hospital Discharge Data (HDD) files from the Kentucky Office of Health Policy are routinely received by the Kentucky Injury Prevention and Research Center (KIPRC) for surveillance purposes. These files now include both emergency department billing data as well as inpatient hospitalization billing data. The calendar year of 2015 marks the initial use of new ICD-10-CM coding on hospital medical records. This new coding began 10/2015, leaving the year with three quarters of the old coding and a final quarter with the new coding. General equivalency mappings (GEMs) have been used to translate ICD-9 coding to ICD-10 coding but further discussion and exploration is needed to ascertain the coding going forward.

Crude incidence rates were calculated for each injury type by dividing the number of injuries by 4,425,092, the most recent estimated population of Kentucky according to the Kentucky State Data Center, and then multiplying by 100,000. This figure represents the number of TBI, ABI, SCI or stroke that occurred per 100,000 residents of Kentucky. Age-adjusted rates were calculated using the Year 2000 Standard Population. Data analysis, including mapping, was performed using SAS Version 9.2.

Abbreviations

- TBI – Traumatic Brain Injury
- ABI – Acquired Brain Injury
- SCI – Spinal Cord Injury
- CNSI – Central Nervous System Injury
- MVTC – Motor Vehicle Traffic Crash
- ETS – Exposure to Toxic Substances
- KIPRC – Kentucky Injury Prevention and Research Center

Identification of Cases

Traumatic brain injury case definition

The Centers for Disease Control and Prevention (CDC) have established standards for TBI case identification (CDC, 1995). Hospitals are currently using ICD-10 codes for injury coding. Definitions are being developed using the new ICD-10 coding. The following ICD-10 codes were used to identify TBI records:

- Fracture of vault or base of skull: S02.0 - S02.1
- Fractures of other specified skull and facial bones or unspecified fracture of skull: S02.8, S02.91
- Intracranial injury, including concussion, cerebral edema, diffuse and focal traumatic brain injury, epidural/subdural/subarachnoid hemorrhage and unspecified intracranial injury: S06.0-S06.9
- Crushing injury of skull: S07.1
- Shaken infant syndrome: T74.4

If one or more of these codes was found in any of the diagnosis code fields in the HDD, the record was determined to be a TBI.

Acquired brain injury case definition

In addition to CDC-defined TBI, there are many brain injuries that have non-traumatic etiologies. These we have classified as ABI. Because these diagnoses are not included in the CDC definition of TBI, they have been linked and analyzed separately. These conditions were also identified by ICD-10 diagnosis codes, as follows:

- Anoxia: G93, O29.1, O74.3, O75.4, O89.2, P21.0, P21.1, P21.9, T71, T751
- Allergy/Anaphylaxis: T78.0, T78.2, T80.5, T80.6, T88.1, T88.6
- Acute Medical Clinical Incidents: G00.0-G00.3, G00.8, G01, G07, G02.0, G02.1, G02.8, G04.2, G04.8, G05.0, G05.1, G06.2
- Toxic Substances: G03.8, G03.9, G97.1, G97.2, G97.8, G97.9, N14.3, R29.1, T40.5, T41.0-T41.4, T42.3, T42.4, T42.6, T42.7, T45.5, T49.0, T51.0-T51.3, T51.8, T51.9, T56.1-T56.8, T57.0, T57.2, T57.3, T57.8, T58, T60.4, T61.9, T62.0-T62.2, T62.8, T62.9, T64, T65.0, T65.8, T65.9, T81.1, T88.2, T88.5

Anoxia includes but is not limited to:

- brain damage related to hereditary and degenerative diseases of the central nervous system
- nervous system complications (related to medical care)
- drowning and nonfatal submersion
- asphyxia

If one or more of these codes was found in any of the diagnosis code fields in the HDD, the record was classified as an ABI.

Spinal cord injury case definition

SCI was defined by the following ICD-10 diagnosis codes:

- Concussion and edema of cervical/thoracic/lumbar and sacral spinal cord or other and unspecified injuries: S14.0, S14.1, S24.0, S24.1, S34.0, S34.1
- Injury of cauda equina: S34.3

For this report, SCI records had to contain one of these codes in one of the first three diagnosis code fields in the HDD.

Stroke case definition

The following ICD-10 diagnosis codes (n-codes) were used for identifying stroke cases in HDD:

- Hemorrhages (subarachnoid, intracerebral): I60, I61
- Cerebral infarction: I63
- Occlusion and stenosis of precerebral arteries (not resulting in cerebral infarction): I65
- Transient cerebral ischemic attacks: G45

If one or more of these codes was found in any of the diagnosis code fields in the HDD, the record was determined to be a stroke related hospital visit. It is anticipated that this definition will be fine tuned in future reports.