

## **CENTRAL NERVOUS SYSTEM INJURY IN KENTUCKY**

Emergency Department Visits and Hospitalizations 2014

Prepared by: the Kentucky Injury Prevention and Research Center, University of Kentucky

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Department of Aging and Independent Living.

## **FOR MORE INFORMATION**

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This report presents basic data about emergency department (ED) visits, hospitalizations, and hospital deaths for the calendar year 2014 for central nervous system injuries (CNSI) that include traumatic brain injuries (TBI), acquired brain injuries (ABI), spinal cord injuries (SCI) and cerebrovascular disease (stroke). ED visits represent approximately 90% 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**

Fatigue  
Headaches  
Seizures  
Emotional disturbances  
Balance issues  
Memory loss  
Impulsive Behavior

### **Severe TBI**

Amnesia  
Paralysis  
Loss of limb, bladder and/or bowel control  
Aggressiveness  
Speech, language and/or vision problems  
Respiratory issues  
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 and SCI demographics, causes and outcomes
- TBI and ABI 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**

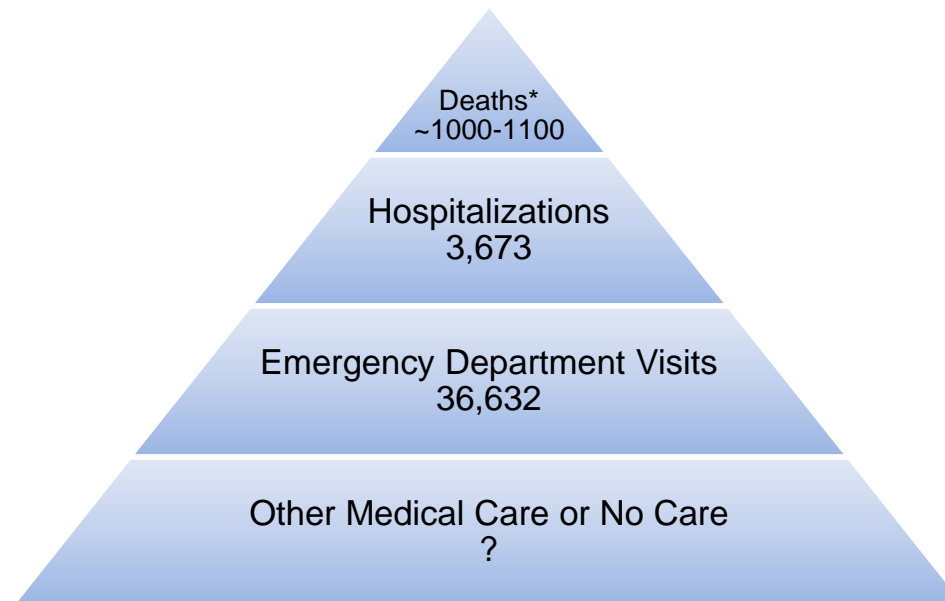
This report describes CNSI-related ED visits and hospitalizations in Kentucky for the calendar year 2014. The numbers show the magnitude of the problem, but the rates are also important. Rates show how a certain group is affected by CNSI by relating the number of CNSIs to the size of the population. 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 30,000 traumatic brain injuries and deaths occur each year. In 2014, 36,632 (90.9%) ED discharges (non-fatal) and 3,673 (9.1%) hospitalization discharges were recorded in Kentucky hospitals. Due to mortality data being several years behind available hospital discharge data, the number of deaths is only an estimate at this time and expected to be in the range of 1,000 TBI related deaths. The following figure is a pyramid depicting the estimated average annual number of TBI-related ED visits, hospitalizations, and estimated deaths in Kentucky for 2014. 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, 2014**



\*Data not currently available, will update

### **TBI in Kentucky, 2014:**

- Just over 40,000 people visited Kentucky hospitals with a TBI related injury. Of those, 36,632 were treated and released from an ED, 3,673 were hospitalized, and an estimated 1,000 died.
- 9,766 TBIs occurred among children ages 0 to 14 years; ED visits accounted for more than 97% 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 and for adults 65 years or older.
- Falls resulted in the greatest number of TBI-related hospitalizations with a rate 2.5 times motor vehicle traffic crashes.
- Adults ages 65 years or older had the highest rates of TBI-related hospitalization with a rate higher than all other ages combined.
- Falls accounted for over twice as many TBI injuries as motor vehicle traffic crashes (MVTC).
- Data indicates that TBIs led to over 110 state residents per day being treated in Kentucky hospitals (ED and hospitalization).

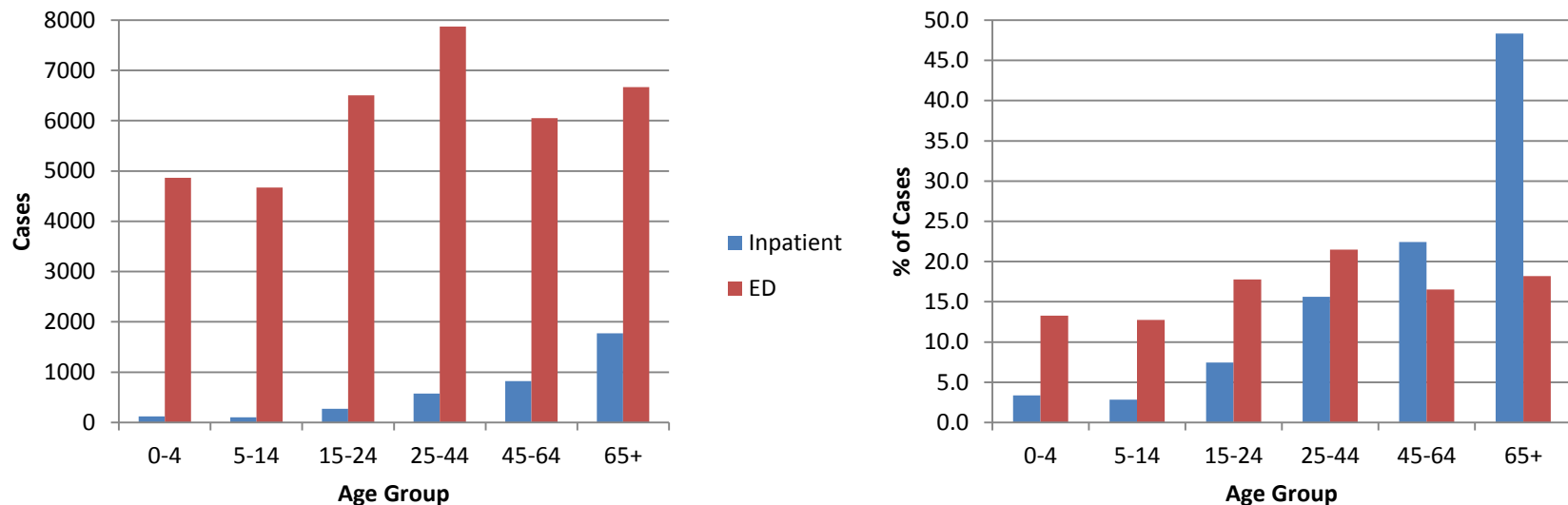
Our results indicate a need to focus prevention efforts on the following causes and target populations:

- 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 0-4

## 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, 2014**

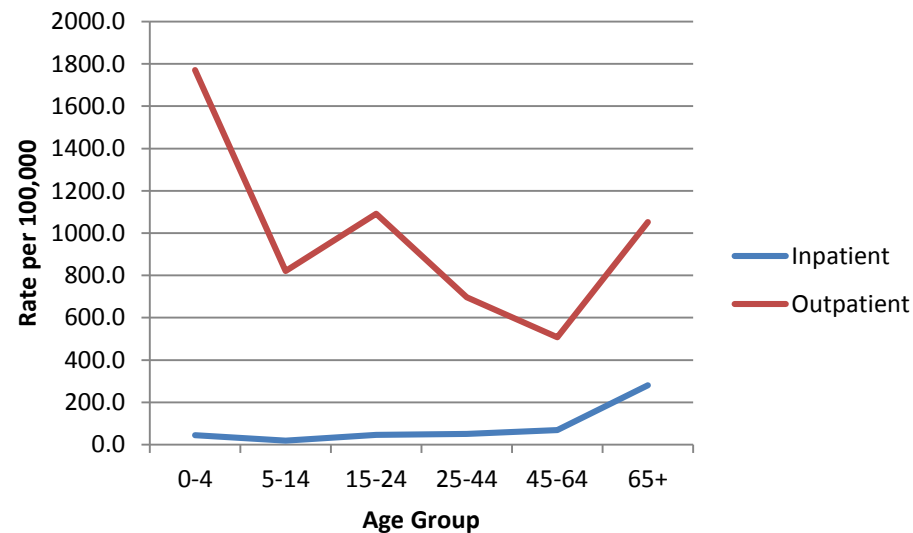
A non-fatal TBI related injury treated at a Kentucky hospital results in an *inpatient* admission for over one in five older adults (65 and older) while 97.7% of TBI related injuries in children (under the age of 15) are treated and released in the ED.



## 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 2014. The y axis represents the rate per 100,000 population. During 2014, very young children ages 0 to 4 years had the highest rate of non-fatal TBI-related ED visits, 1,771 per 100,000 population, followed by older adolescents ages 15 to 24 years, 1,091 per 100,000. 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 (280 per 100,000).

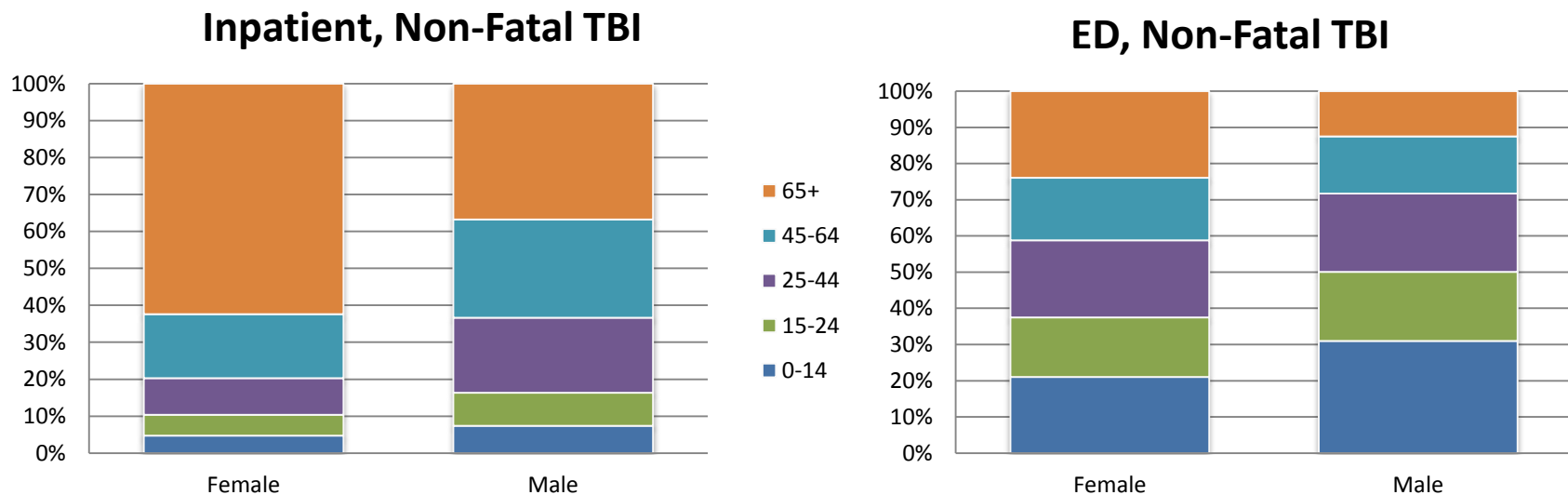
**Figure 3: Rates of Traumatic Brain Injury-Related Emergency Department Visits and Hospitalizations, by Age Group, Kentucky, 2014**



## 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 2014. Overall 20,421 non-fatal TBIs occurred among males compared with 19,882 among females.

**Figure 4: Traumatic Brain Injury-Related Emergency Department Visits and Hospitalizations, by Age Group and Gender, Kentucky, 2014**

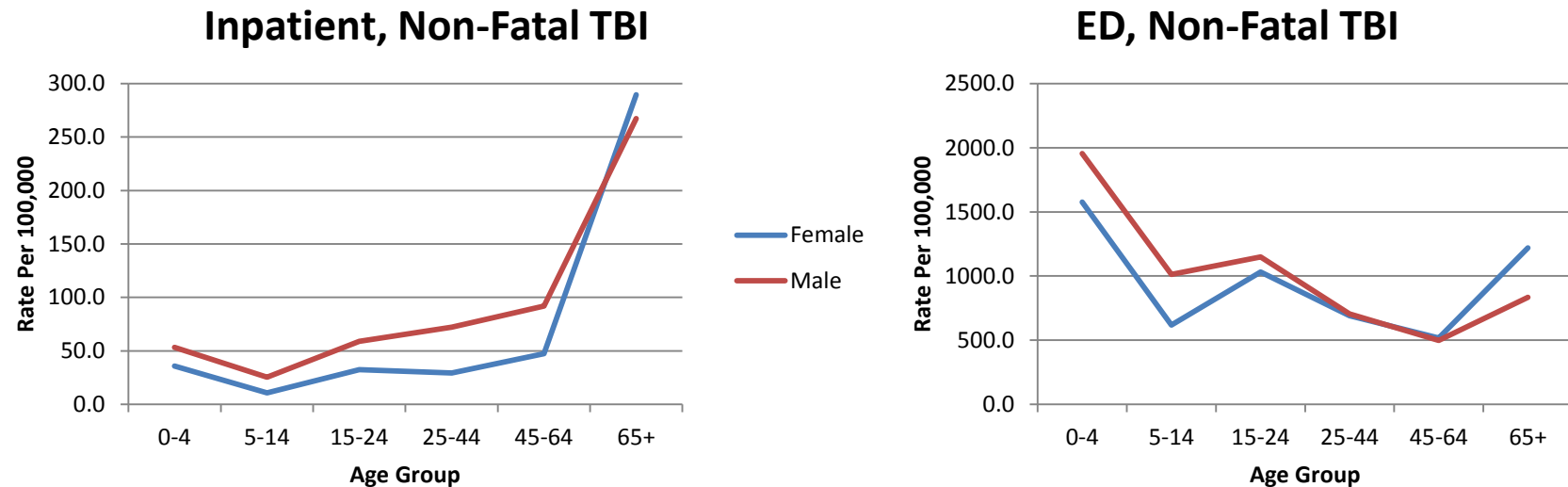


Over half of female, non-fatal TBI related inpatient admissions were over the age of 64 while men over 64 made up just over one third of non-fatal inpatient admissions for males.

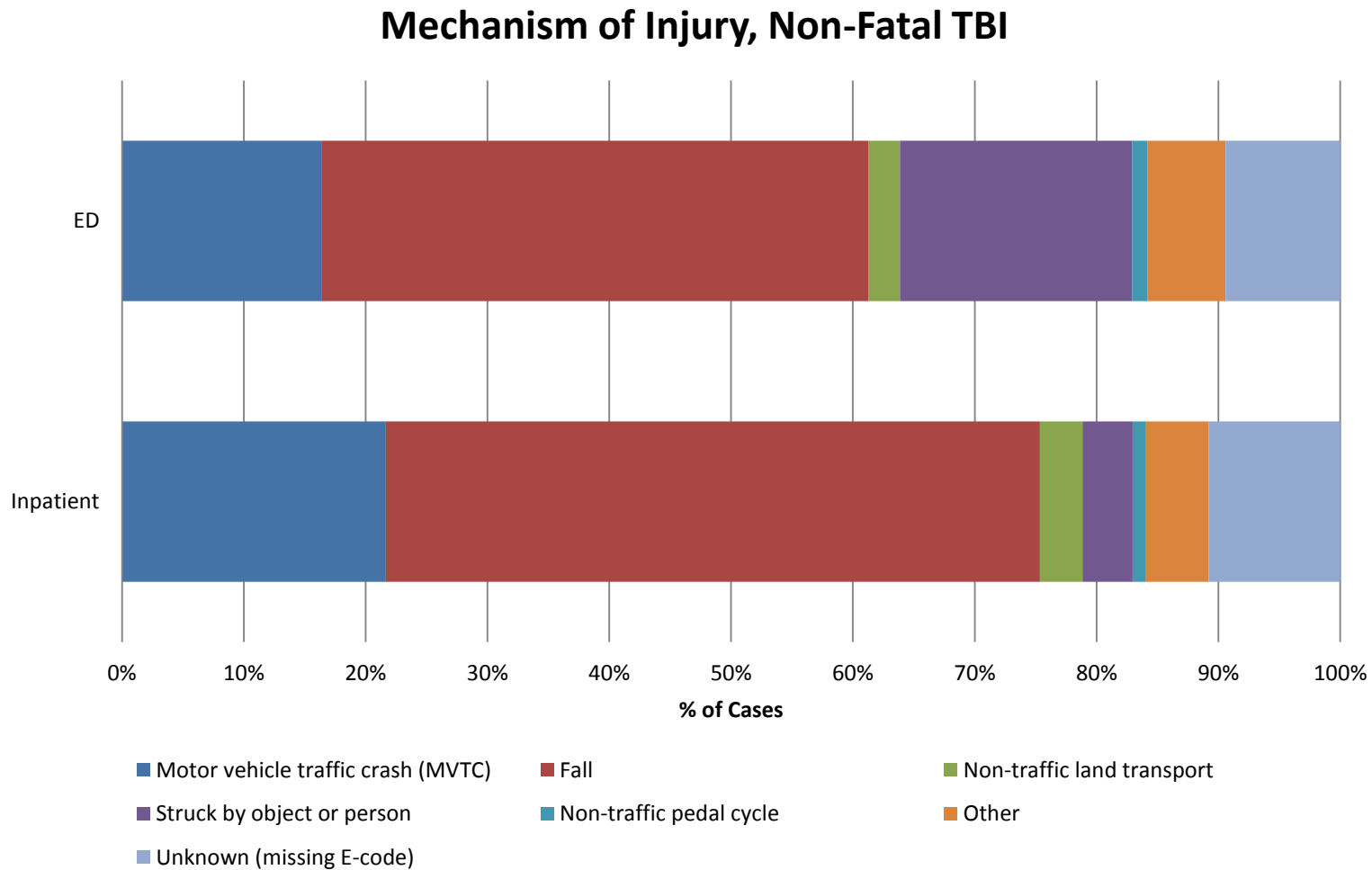
## TBI by Sex: Comparing the Rates

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 0 to 4 years of age had the highest rates for TBI-related ED visits, 1,955 per 100,000. Rates were also high for females from 0 to 4 years of age, 1,577 per 100,000. Both males and females had high rates for ages 65 and older inpatient visits, 267 per 100,000 for males and 290 per 100,000 for females.

**Figure 5: Rates of Non-Fatal Traumatic Brain Injury-Related Emergency Department Visits and Hospitalizations, by Sex, Kentucky, 2014**



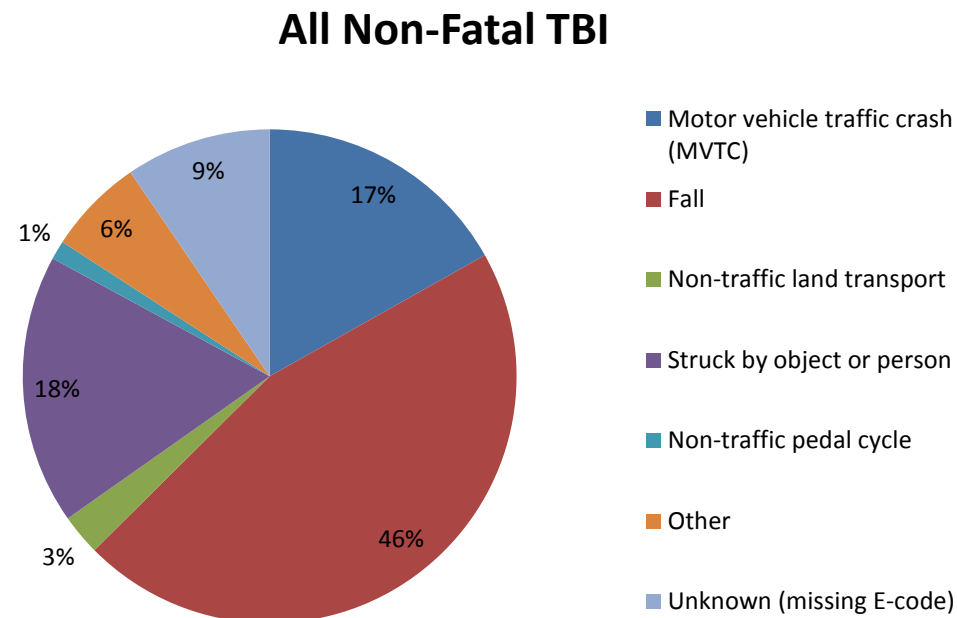
**Figure 6: Non-Fatal Traumatic Brain Injury-Related Emergency Department Visits and Hospitalizations, Kentucky, 2014**



### 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 over 4 in 10 of all non-fatal TBI in Kentucky in 2014. The second leading known cause was Struck by/Against contributing 18% of all non-fatal TBI. The third leading known cause was Motor Vehicle Traffic Crash (MVTC), and this slice is 17%. In past years, and while looking only at inpatient data, MVTC were the leading cause of TBI with Falls being a close second. In 2007, MVTC numbers were first noticed to drop below Falls as leading cause of TBI. This drop and continued lower rates are thought to be a direct result of the primary seat belt law enacted towards the end of 2006.

**Figure 7: Percentage of Traumatic Brain Injury-Combined Emergency Department Visits and Hospitalizations, by External Cause, Kentucky, 2014**

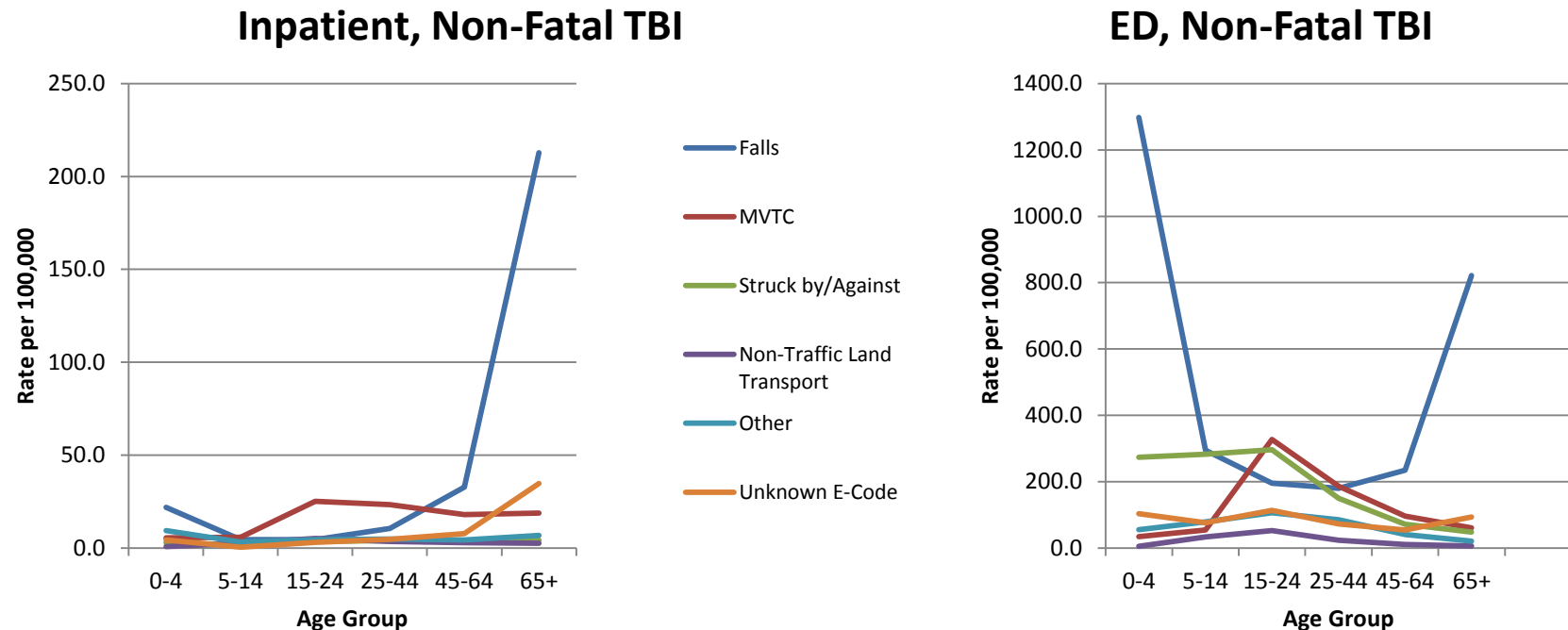




The following figure, **Figure 8**, is a graph depicting the rates of TBI-related ED visits and hospitalizations by external cause. The y axis represents the rate per 100,000 population.

The data indicate that Falls were the leading cause of TBI in Kentucky. Rates were highest among ages 0-4 years and 65 years and older. The rates for motor vehicle crash related TBI were highest among young adults ages 15 to 24 years with MVTC causing the largest proportion of TBI in this age group.

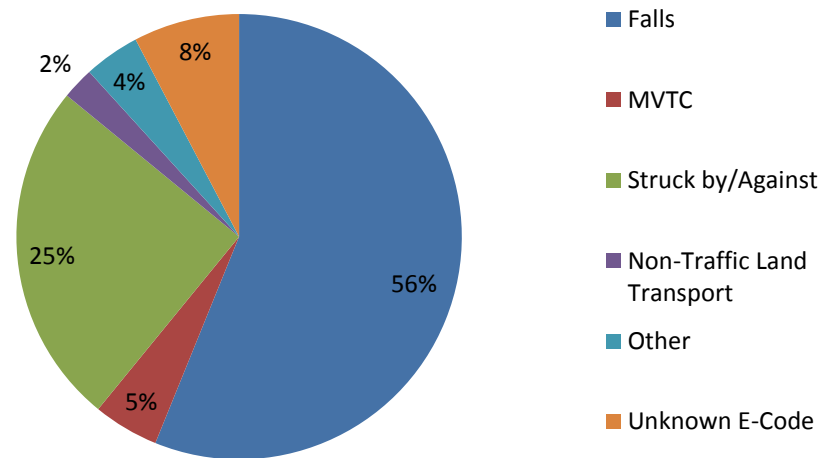
**Figure 8: Rates of Non-Fatal Traumatic Brain Injury-Related Emergency Department Visits and Hospitalizations, by External Cause, Kentucky, 2014**



## TBI by External Cause: Comparing the Percentages by Age Groups

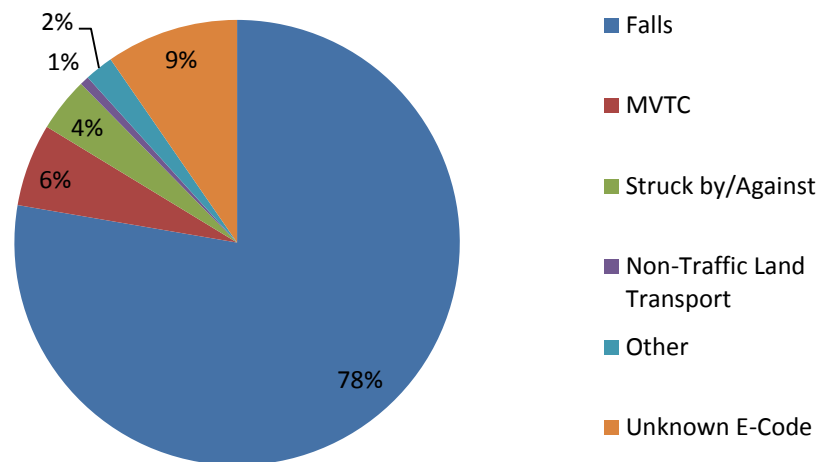
The following two figures depict the percentage of non-fatal TBI-related ED visits and hospitalizations by external cause for specific age groups. Figure 9 presents data for children ages 0 to 14 years. Figure 10 presents data for adults age 65 or older.

**Figure 9: Percentage of Traumatic Brain Injury-Combined Emergency Department Visits and Hospitalizations Among Children 0 to 14 Years, by External Cause, Kentucky, 2014**



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

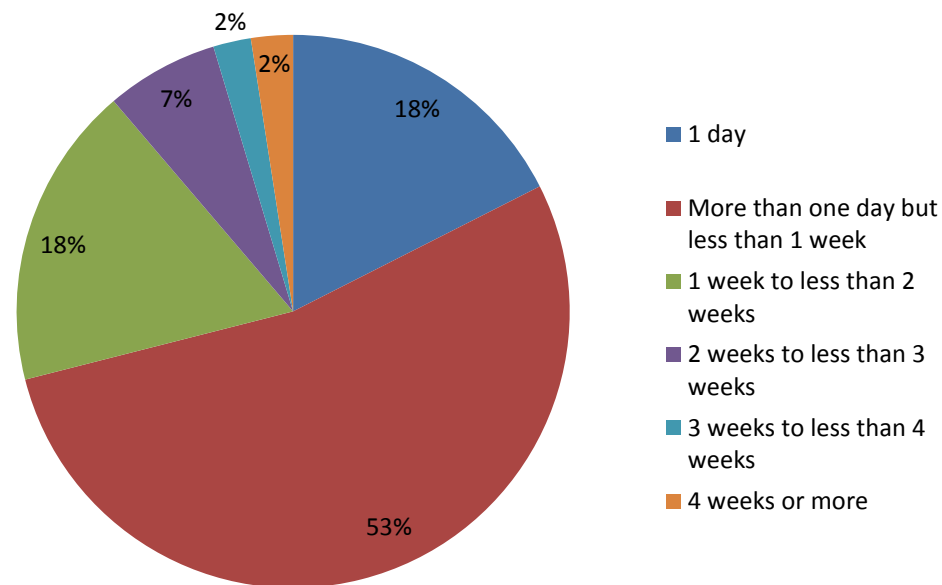
**Figure 10: Percentage of Non-Fatal Traumatic Brain Injury-Combined Emergency Department Visits and Hospitalizations Among Older Adults 65 Years or Older, by External Cause, Kentucky, 2014**



Falls were also the leading cause of non-fatal TBI for adults age 65 years or older and contributed to over 3 out of 4 non-fatal TBI injuries.

The length of stay (LOS) for hospitalized, non-fatal TBI (n=3,673) ranged from 1 day to 160 days. The mean LOS was 6.4 days with a median LOS of 4 days. Figure 11 shows the distribution of stays for those hospitalized with a TBI. Almost three quarters of admitted TBI injuries stayed for less than 1 week.

**Figure 11: Non-Fatal Traumatic Brain Injury-Hospitalization Length of Stay, Kentucky, 2014**



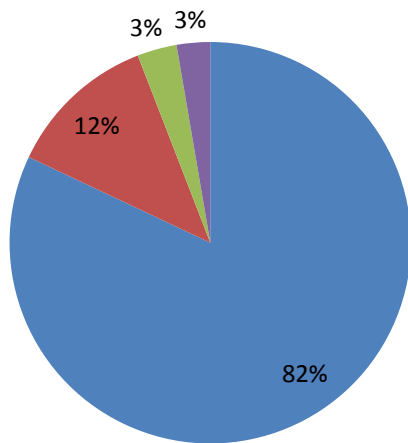
For non-fatal inpatient TBIs, 1,820 (49.6%) had a disposition other than “routine”. The three most frequent non-routine discharges were “skilled nursing facility”, “home health”, and “rehabilitation”. A total of 1,472 inpatient discharges had one of these three dispositions. ED discharges were nearly always (91.9%) to home or self care (routine) with “inpatient – other short term hospital” being the most frequent non-routine discharge.

Figure 12 presents an analysis of TBI in terms defined by the Barell Injury Diagnosis Matrix (Barell et al 2002). This typing is only assessed where TBI is the principal diagnosis. The definitions are as follows:

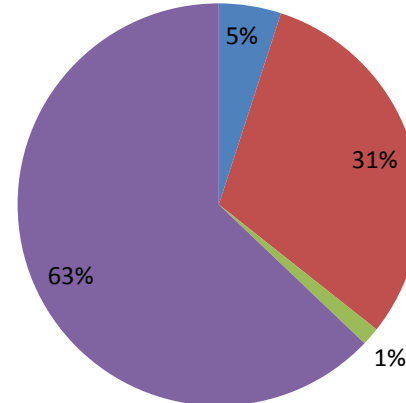
- A Type I TBI is one in which there is “recorded evidence of an intracranial injury or a moderate or a prolonged loss of consciousness (LOC), Shaken Infant Syndrome, or injuries to the optic nerve pathways.”
- A Type 2 TBI is one in which there is “no recorded evidence of intracranial injury, and LOC of less than one hour, or LOC of unknown duration, or unspecified level of consciousness.”
- A Type 3 TBI is one in which there is “no evidence of intracranial injury and no LOC.”

**Figure 12: Non-Fatal Traumatic Brain Injury-Emergency Department and Hospitalizations, TBI Type, Kentucky, 2014**

**Type of TBI, Inpatient, Non-Fatal TBI**

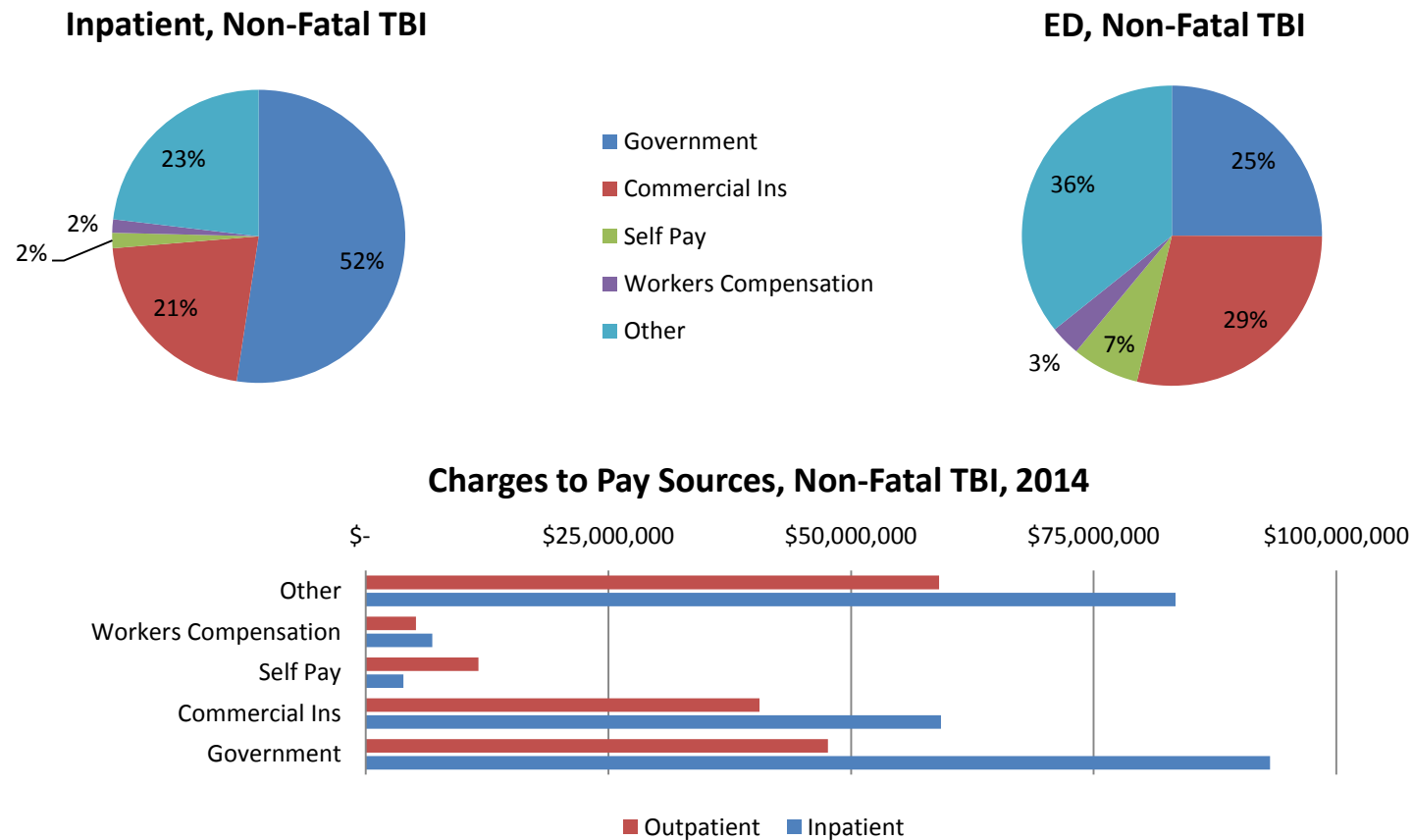


**Type of TBI, Outpatient, Non-Fatal TBI**



Government sources were the primary payers billed for inpatient care charges in just over half of non-fatal TBI. Commercial payers (29%) were the leading payers for non-fatal ED visits. Please note that the amount billed by the hospital will generally be larger than the amount actually paid after adjudication of the claim.

**Figure 13: Non-Fatal Traumatic Brain Injury-Emergency Department and Hospitalizations, Payer Source and Charges, Kentucky, 2014**

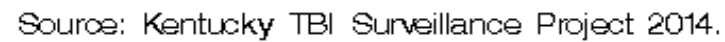


As one would expect, the incidence of TBI was highest in the larger counties. The top four in overall (inpatient and ED combined) TBI incidence (Jefferson, Fayette, Kenton and Hardin) are among the top most populous counties in Kentucky. A notable exception was Whitley county, which was 13<sup>th</sup> in TBI incidence but 30<sup>th</sup> in population. Unsurprisingly, Whitley County had the highest age-adjusted rate in the state. Clay, Grant, Estill and Livingston also stood out by being in the top 10 age-adjusted rate while ranking 53<sup>rd</sup>, 45<sup>th</sup>, 77<sup>th</sup> and 102<sup>nd</sup> 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 14 and 15) as well as the age adjusted rate of TBI in each county (Figures 16 and 17) for inpatient and outpatient TBIs. It should be noted that these mappings include ALL inpatient TBI cases (Figures 14 and 16) as well as ALL ED TBI cases (Figures 15 and 17) – 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. Due to mortality data being several years behind available hospital discharge data, accurate numbers of deaths outside those within the hospital system can only be estimated and are not included in the mapping of actual data.

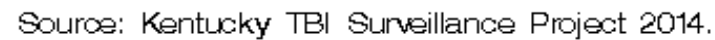
Multiple tables can be found in the Appendix detailing specific rates and frequencies by county, frequency, and age adjusted rates for both inpatient and ED TBIs.

TBI Hospitalization Cases by County, Kentucky 2014



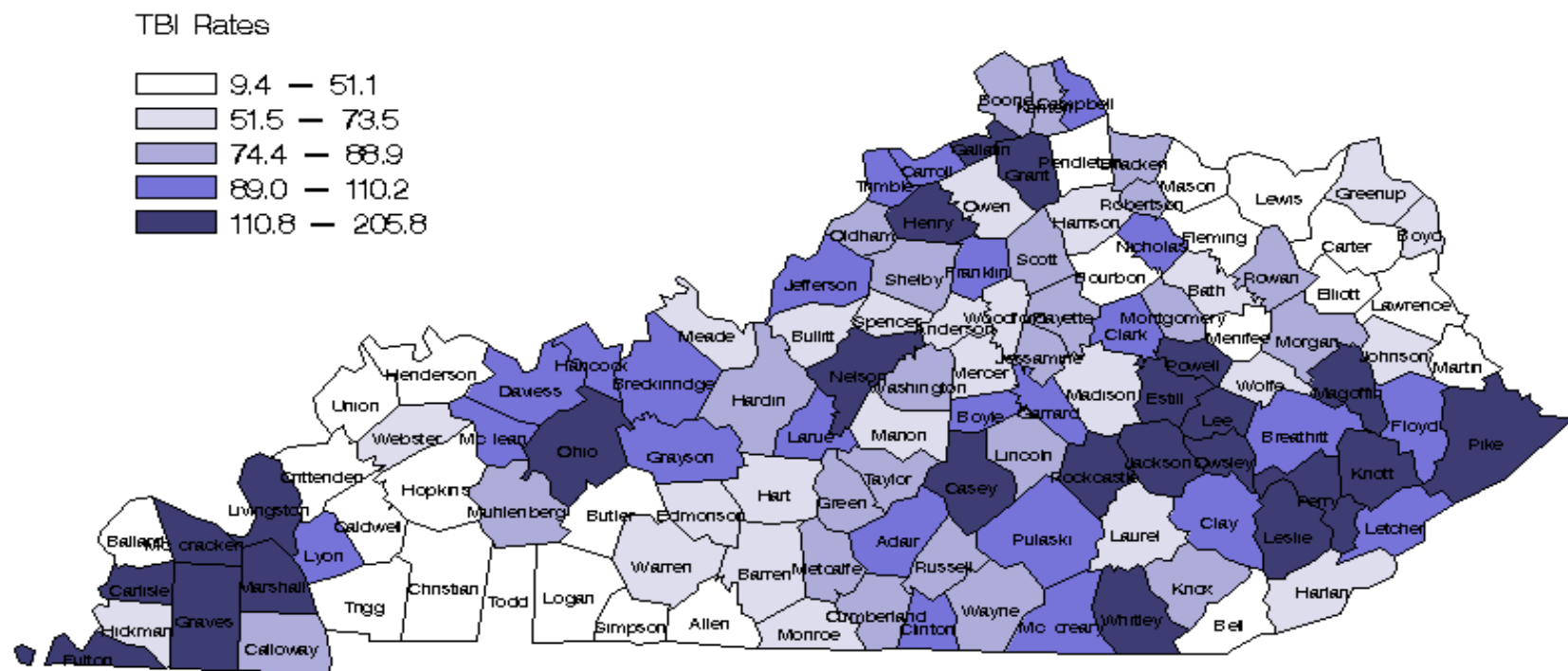


## TBI ED Cases by County, Kentucky 2014



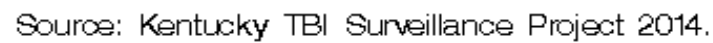
**Figure 16:**

## Age—Adjusted TBI Hospitalization Rates by County, Kentucky 2014



Source: Kentucky TBI Surveillance Project 2014.

### Age-Adjusted TBI ED Rates by County, Kentucky 2014



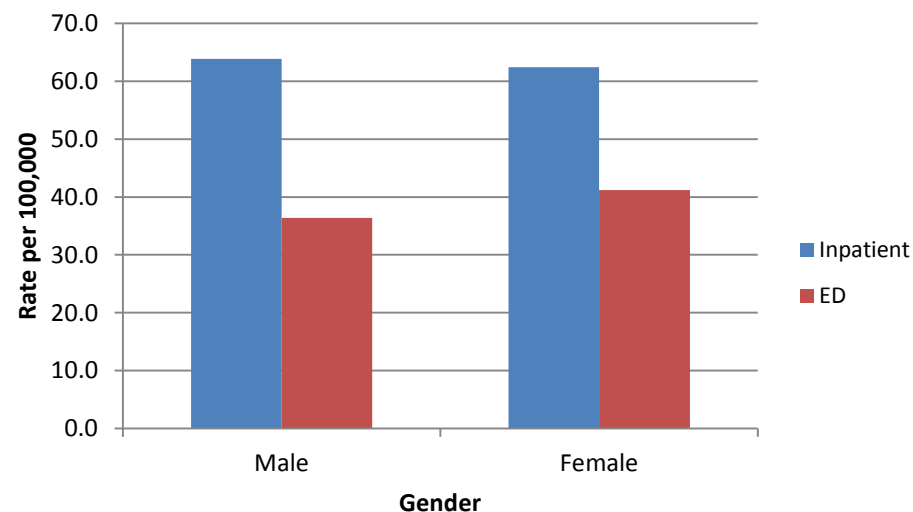
## Acquired Brain Injury in Kentucky

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 4,481 non-fatal ABI cases for Kentucky residents identified in 2014. This includes both inpatient (2,775) and ED (1,706) cases. The crude incidence rate for 2014 was 101.9 per 100,000 population.

### ABI by Sex: Comparing the Rates

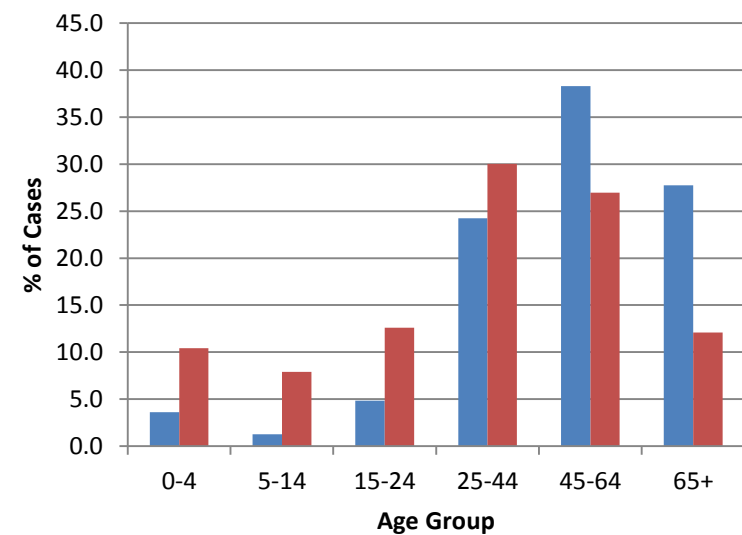
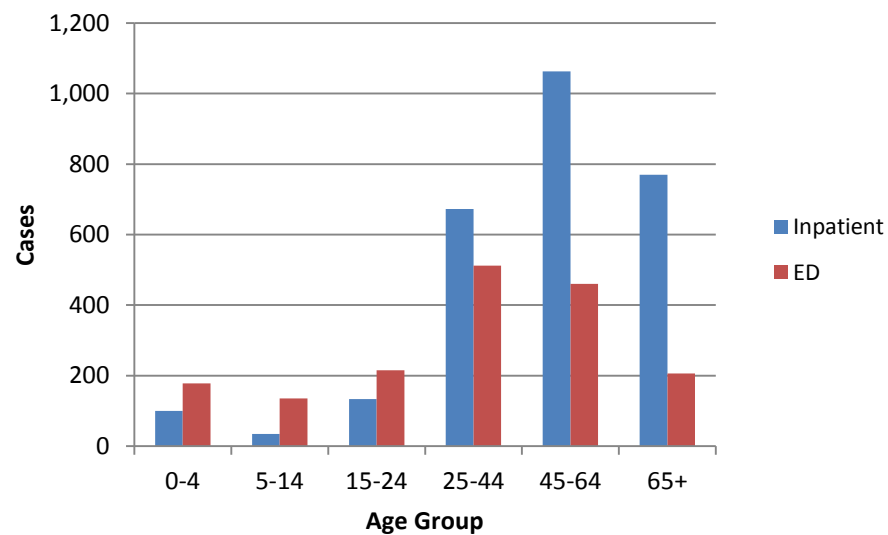
The following figure, **Figure 18**, is a graph depicting the rates of non-fatal ABI-related ED visits and hospitalizations by sex. The y axis represents the rate per 100,000 population. Rates were slightly higher for females in both ED and inpatient ABI cases.

**Figure 18: Rates of Non-Fatal Acquired Brain Injury-Related Emergency Department Visits and Hospitalizations, by Gender, Kentucky, 2014**



## ABI by Age: Comparing the Numbers

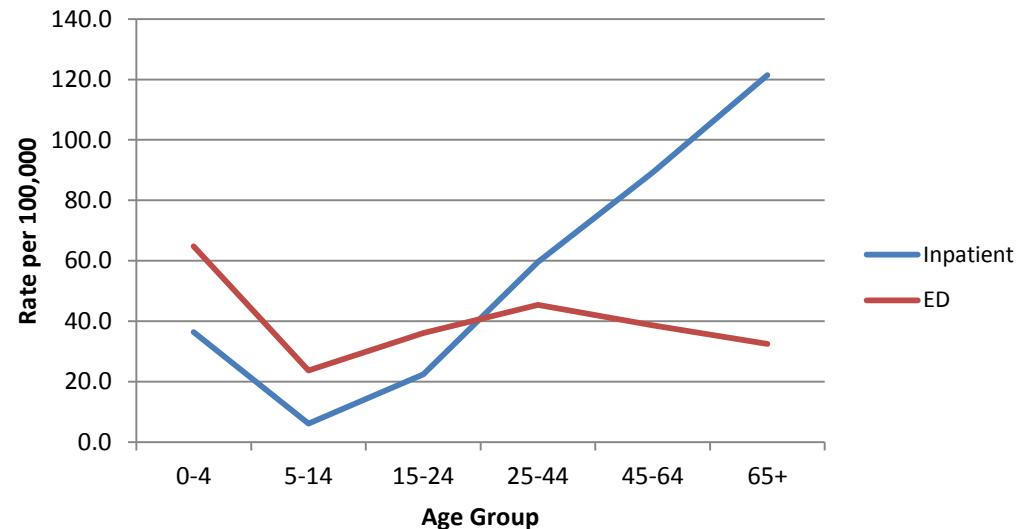
**Figure 19: Numbers of Non-Fatal Acquired Brain Injury-Related Emergency Department Visits, and Hospitalizations, by Age Group, Kentucky, 2014**



## ABI by Age: Comparing the Rates

The following figure, **Figure 20**, is a graph depicting the annual rate of ABI-related ED visits and hospitalizations by age groups in Kentucky for 2014. The y axis represents the rate per 100,000 population. During 2014, very young children ages 0 to 4 years had the highest rate of non-fatal ABI-related ED visits, 64.8 per 100,000 population.. The highest rates of non-fatal ABI-related hospitalization occurred among adults age 65 years or older (121.4 per 100,000).

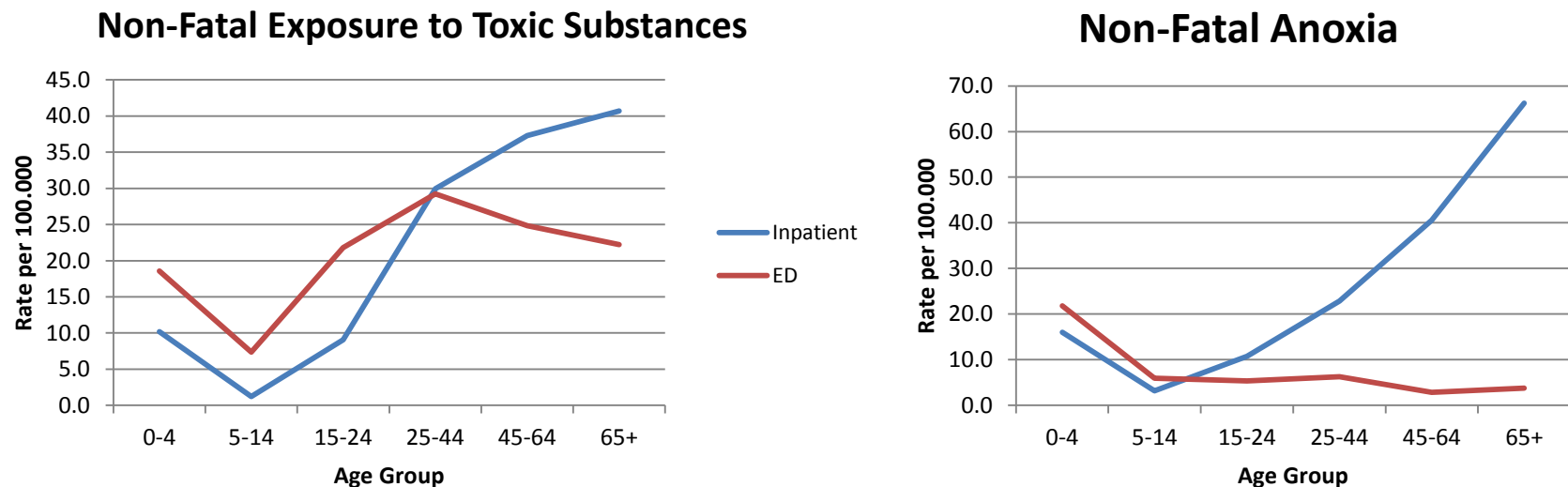
**Figure 20: Rates of Acquired Brain Injury-Related Emergency Department Visits and Hospitalizations, by Age Group, Kentucky, 2014**



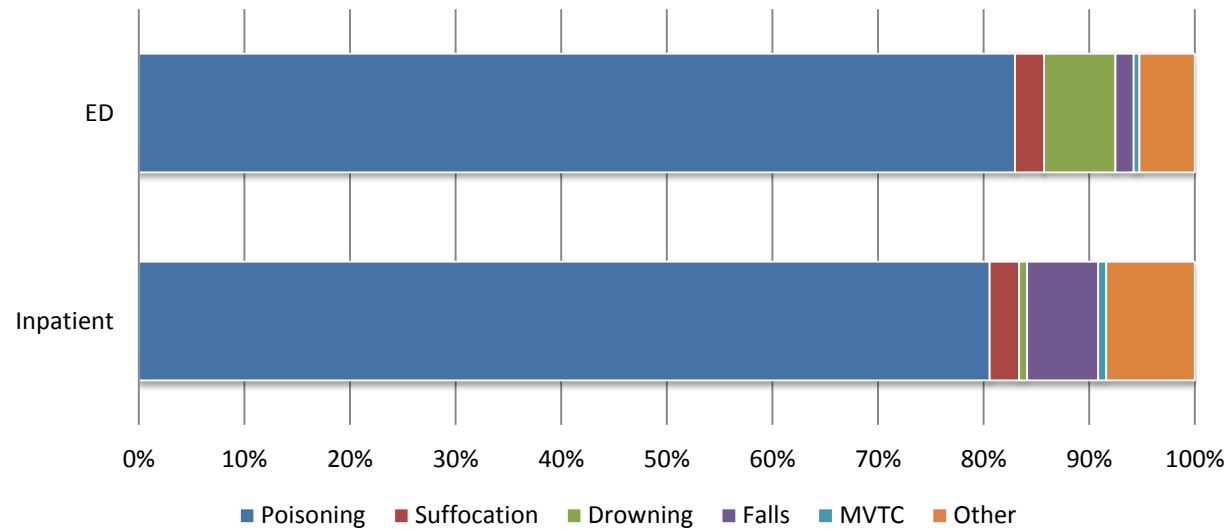
## ABI by Age and Type: Comparing the Rates

Nearly all ABI (86.9% of inpatient and 72.9% of ED) were a result of either exposure to toxic substances (ETS) or anoxia. Just under 2 out of 3 of all ETS cases included poisoning by sedatives, hypnotics, central nervous system depressants/anesthetics and toxic effects of alcohol. Over half 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, have the highest rates of non-fatal ABI related ED visits.

**Figure 21: Rates of Non-Fatal Acquired Brain Injury-Related Emergency Department Visits, and Hospitalizations, by Age Group and Type, Kentucky, 2014**



**Figure 22: Non-Fatal Acquired Brain Injury-Related Emergency Department Visits and Hospitalizations by External Cause\*, Kentucky, 2014**



Among those ABI discharges that were reported to have some relationship with an injury (i.e. included an external cause of injury code), 80.6% of inpatient and 82.9% of ED cases were related to poisonings.

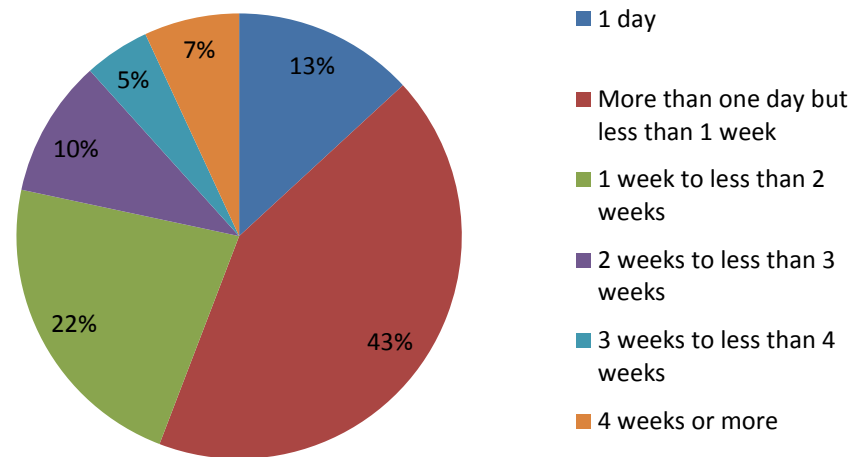
ABI is, by the statutory definition, non-traumatic, and many ABI cases do not include an external cause of injury code. Note that we are making a distinction between “injury-related” and “traumatic”, with trauma being considered one of several forms of injury. 61.4% of inpatient cases and 38.5% of ED cases did not include an external cause of injury code.

\*Where external cause was reported.



The length of stay (LOS) for hospitalized, non-fatal ABI (n=2,775) ranged from 1 day to 226 days. The mean LOS was 10.3 days with a median LOS of 5 days. Figure 23 shows the distribution of stays for those hospitalized with ABI. Over one third of admitted (inpatient) ABI injuries stayed for 1 week or longer.

**Figure 23: Non-Fatal Acquired Brain Injury-Hospitalization Length of Stay, Kentucky, 2014**

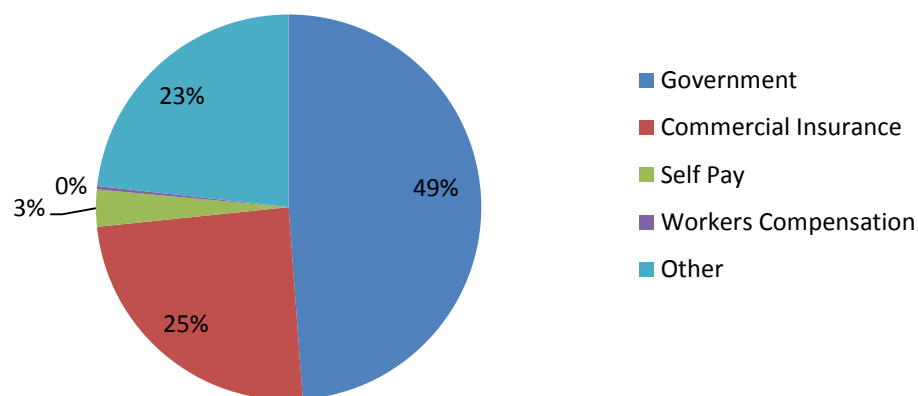


For non-fatal inpatient ABIs, 1,486 (53.5%) had a disposition other than “routine”. The three most frequent non-routine discharges were “skilled nursing facility”, “home health”, and “rehabilitation”. A total of 854 inpatient discharges had one of these three dispositions. ED discharges were most likely (80.2%) routinely discharged to home or self care (routine) with “inpatient – other short term hospital” being the most frequent non-routine discharge.

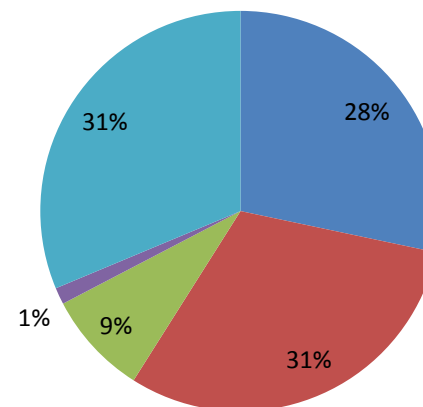
Government sources were the most often primary payers billed for inpatient (48.8%) while 28.3% of ED care charges were coded as government pay sources for non-fatal ABI. Please note that the amount billed by the hospital will generally be larger than the amount actually paid after adjudication of the claim.

**Figure 24: Non-Fatal Acquired Brain Injury-Emergency Department and Hospitalizations, Payer Source and Charges, Kentucky, 2014**

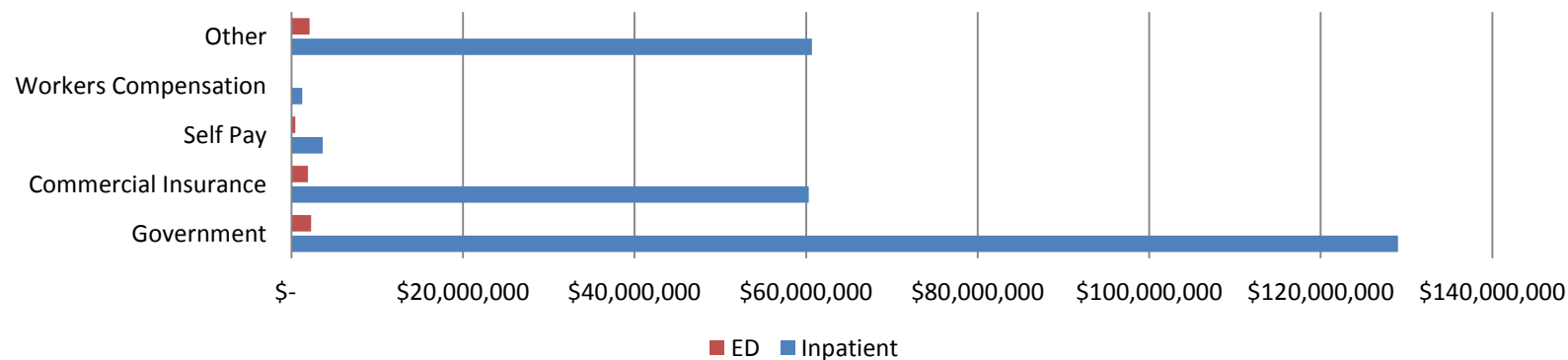
### Inpatient, Non-Fatal ABI



### ED, Non-Fatal ABI



### Charges to Pay Sources, Non-Fatal ABI



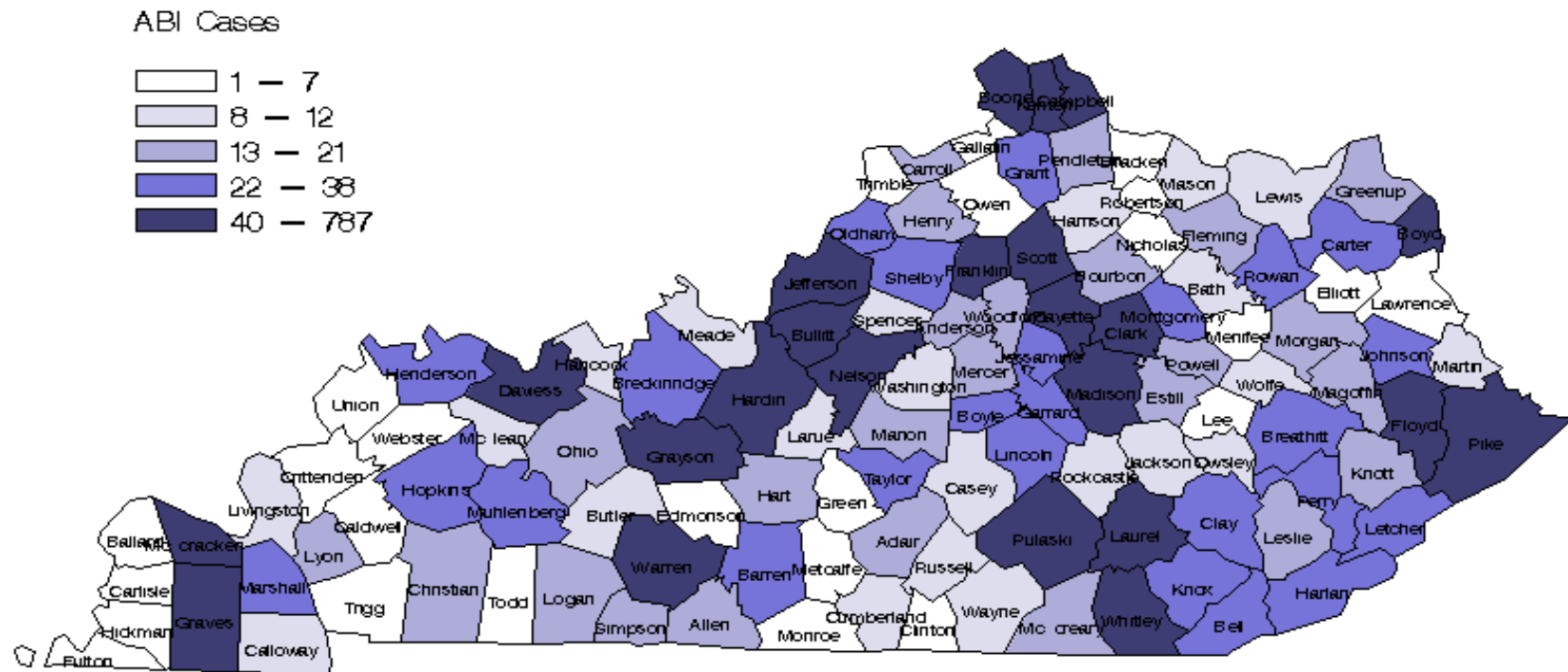
In general, as with TBI, the more populous counties had high numbers of ABI. However, once again, the ten most populous counties did not appear in the top thirty counties when ranked by age-adjusted rate for ED cases. Only Hardin County (ranked 6th in population and 25<sup>th</sup> in age adjusted rate) kept this from being true for non-fatal hospitalized ABI cases. Owsley, which ranks 119<sup>th</sup> 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 Cumberland County, the 114<sup>th</sup> county when ranked by population size. Cumberland County also had the fifth highest age adjusted rate of inpatient ABI in the state. The counties with the highest inpatient rates were concentrated in eastern Kentucky with another cluster showing in the western region (Figure 27).

The following figures map both the frequency of ABI in Kentucky counties (Figures 25 and 26) as well as the age adjusted rate of ABI in each county (Figures 27 and 28) for inpatient and outpatient ABIs. It should be noted that these mappings include ALL inpatient ABI cases (Figures 25 and 27) as well as ALL ED ABI cases (Figures 26 and 28) – 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. Due to mortality data being several years behind available hospital discharge data, accurate numbers of deaths outside those within the hospital system can only be estimated and are not included in the mapping of actual data.

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 25.

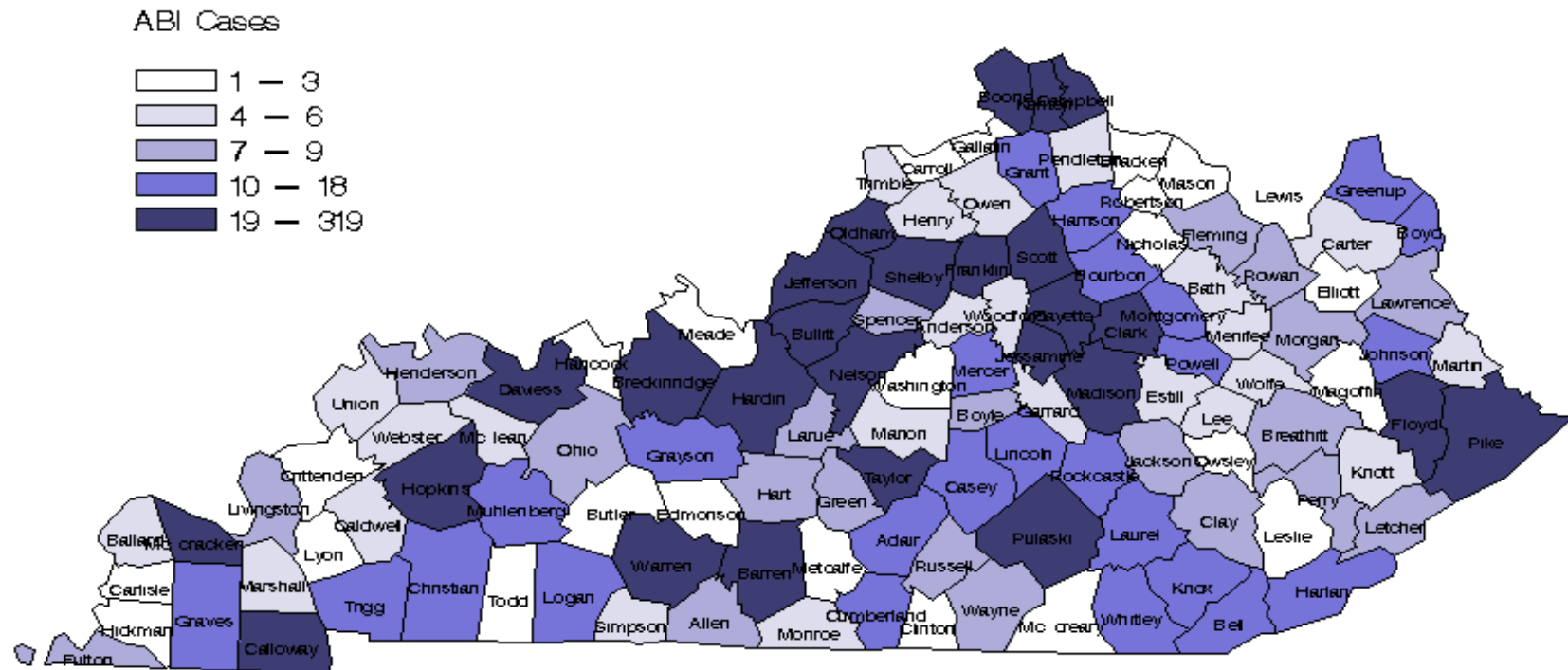
## ABI Hospitalization Cases by County, Kentucky 2014



Source: Kentucky TBI Surveillance Project 2014.

Figure 26.

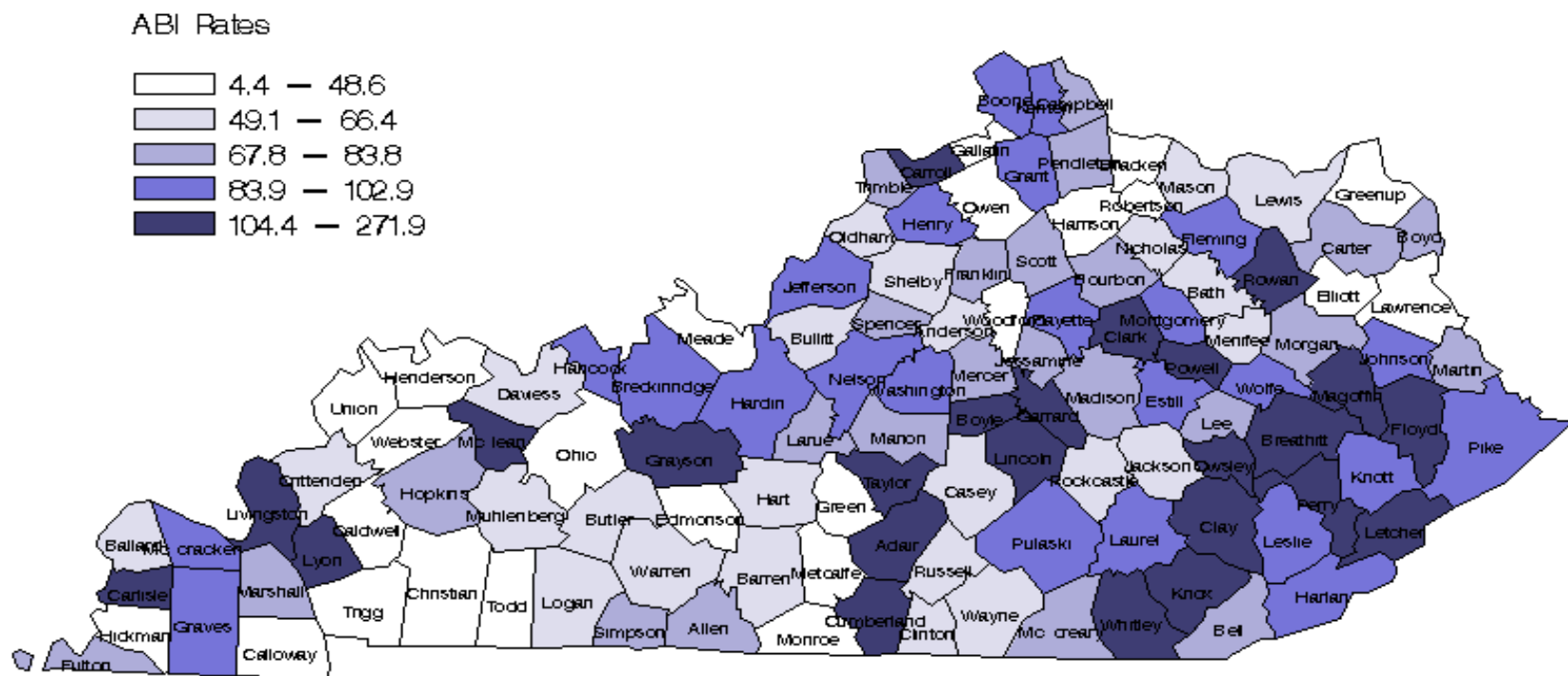
## ABI ED Cases by County, Kentucky 2014



Source: Kentucky TBI Surveillance Project 2014.

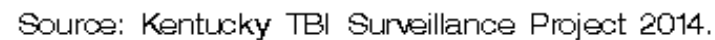
Figure 27.

## Age—Adjusted ABI Hospitalization Rates by County, Kentucky 2014



Source: Kentucky TBI Surveillance Project 2014.

Age-Adjusted ABI ED Rates by County, Kentucky 2014

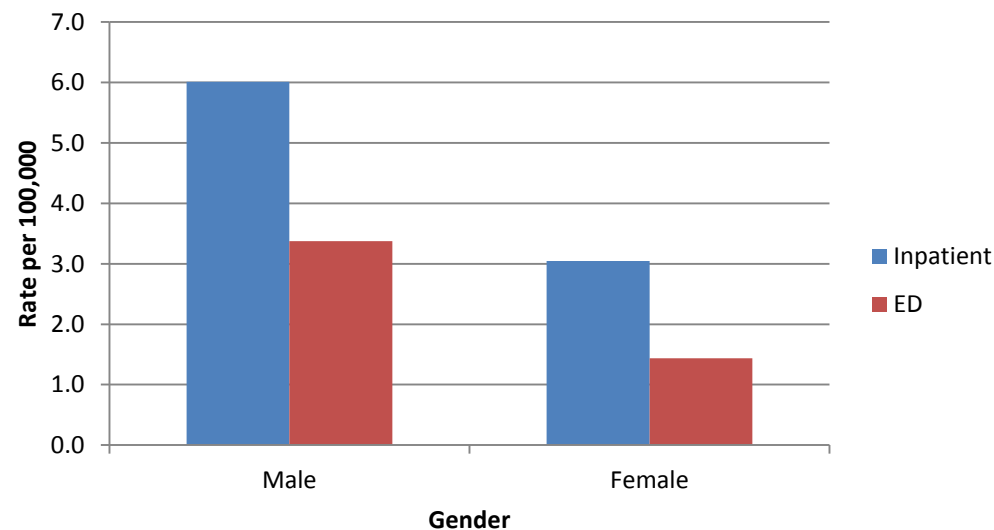


## Spinal Cord Injury in Kentucky

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 198 non-fatal inpatient SCI cases for Kentucky residents identified in 2014 as well as 105 non-fatal ED cases. The crude incidence rate of any non-fatal SCI was 6.9 per 100,000 population.

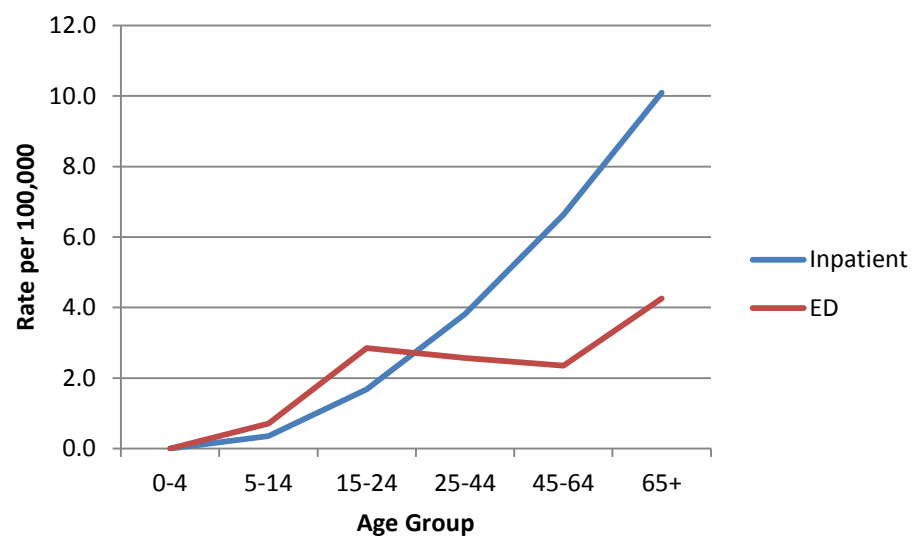
### SCI by Sex: Comparing the Rates

**Figure 29: Rates of Non-Fatal Spinal Cord Injury-Related Emergency Department Visits and Hospitalizations, by Gender, Kentucky, 2014**



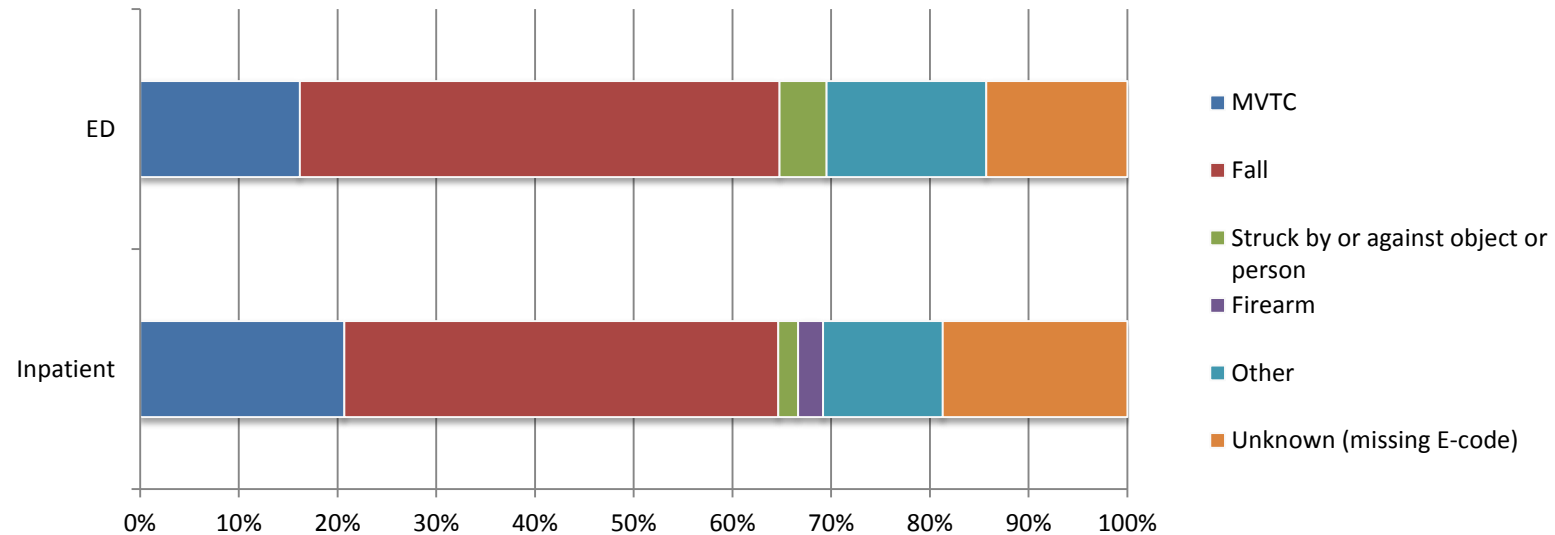


**Figure 30: Rates of Spinal Cord Injury-Related Emergency Department Visits and Hospitalizations, by Age Group, Kentucky, 2014**



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

**Figure 31: Non-Fatal Spinal Cord Injury-Related Emergency Department Visits and Hospitalizations by External Cause, Kentucky, 2014**



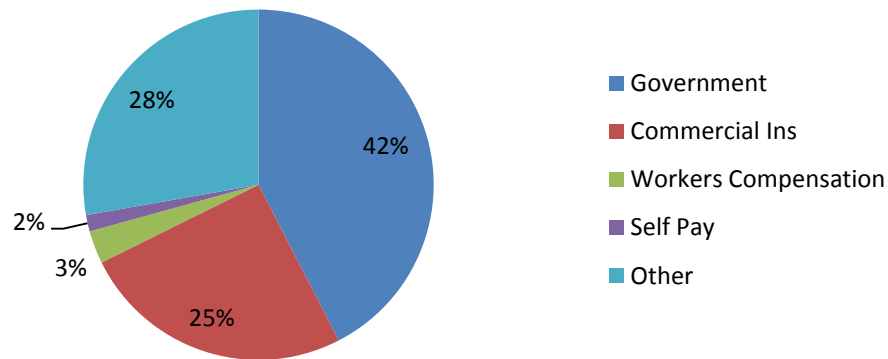
Among non-fatal SCI's for which an E-code was reported, falls were the leading mechanisms of injury for both inpatient and ED SCI visits. Unfortunately, almost one out of five of the inpatient SCI discharges had no E-code reported.

Hospitalized SCI patients had a length of stay (LOS) varying from 1 day to 53 days. The mean LOS was 10.4 days with a median of 8 days. Almost 3 out of 4 (71.7%) of the non-fatal inpatient SCI discharges had dispositions other than "routine", while 52.4% of ED discharges were non-routine. In total, over 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 over 50% of the time and TBI visits to the ED were routinely discharged over 90% of the time. Overall, almost 9 out of 10 non-fatal TBI discharges were discharged to home or self care (routine).

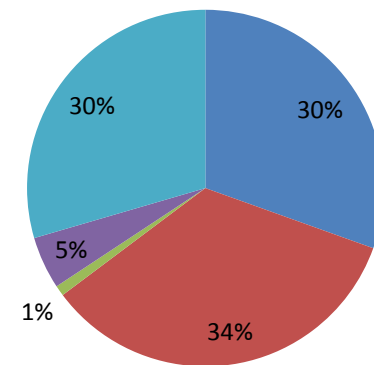
Government sources were the primary payer billed for acute care charges in over one third of all non-fatal SCI. Government payers were billed almost \$9.2 million in 2014, and commercial payers over \$6.9 million.

**Figure 32: Non-Fatal Spinal Cord Injury-Emergency Department and Hospitalizations, Payer Source and Charges, Kentucky, 2014**

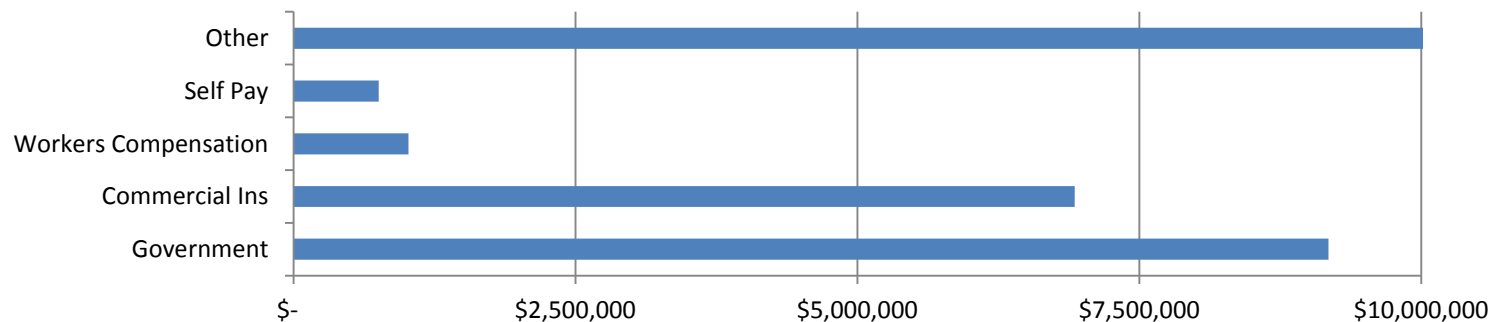
### Inpatient, Non-Fatal SCI



### ED, Non-Fatal SCI



### Charges to Pay Source, All Non-Fatal SCI

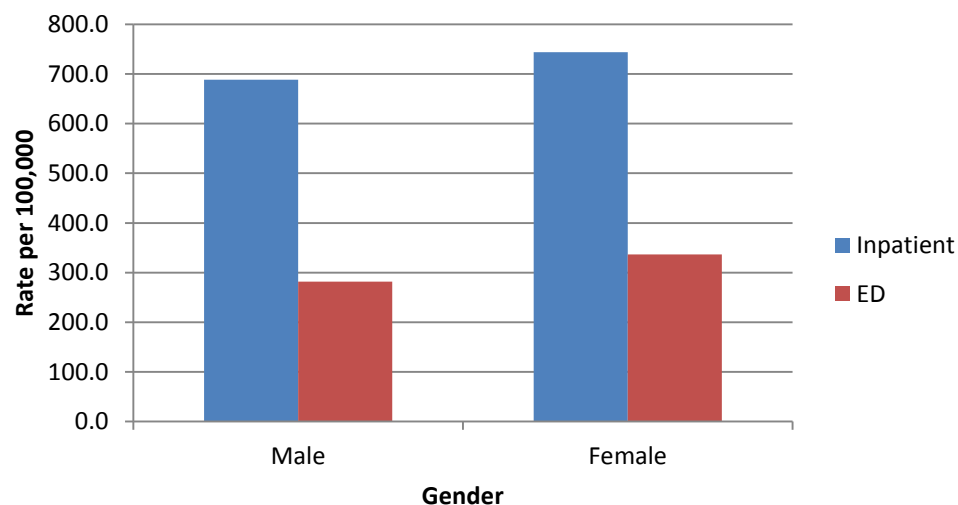


## Cerebrovascular Disease in Kentucky

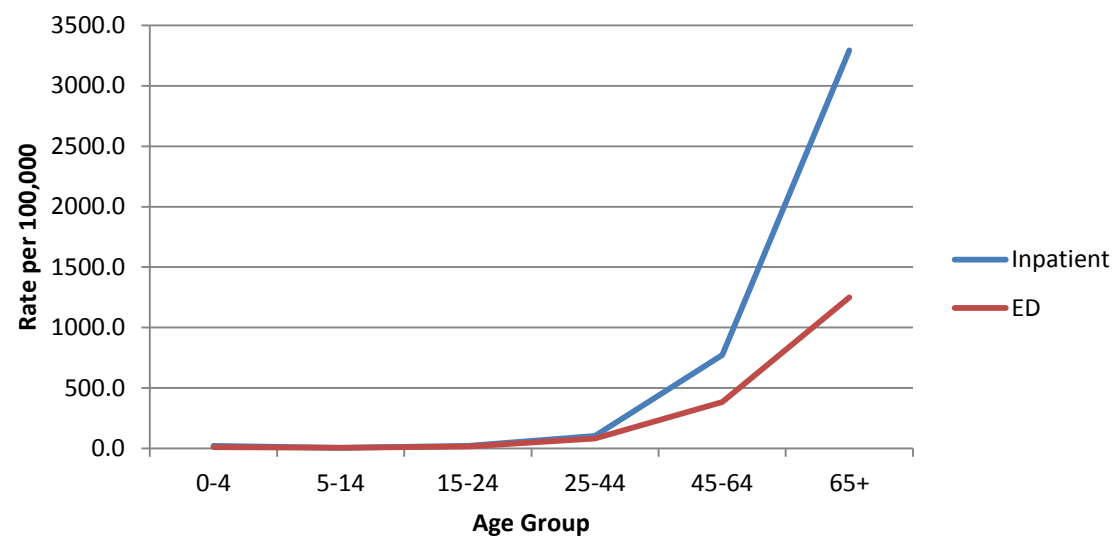
The highest death rates for cerebrovascular disease (stroke) occur in the southeastern US which has been dubbed the “stroke belt”. This region consists of a group of 11 southeastern states that have an age-adjusted stroke mortality rate more than 10% above the national average. Kentucky is included in this region. In 2014, over 45,000 non-fatal hospital visits by Kentucky residents were coded for stroke (ICD-9 codes in the 430.x-438.x range) in one or more diagnosis fields. Of these, 43% listed stroke as the principal diagnosis. There were 31,504 non-fatal inpatient stroke cases for Kentucky residents identified in 2014 as well as 13,625 non-fatal ED cases. The crude incidence rate was 1026.5 per 100,000 population.

### Stroke by Sex: Comparing the Rates

**Figure 33: Rates of Non-Fatal Stroke Related Emergency Department Visits and Hospitalizations, by Gender, Kentucky, 2014**



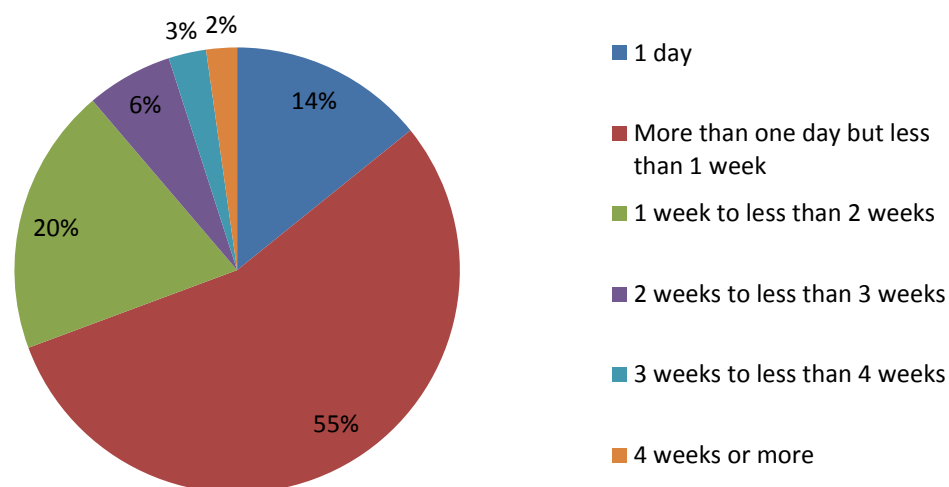
**Figure 34: Rates of Stroke Related Emergency Department Visits and Hospitalizations, by Age Group, Kentucky, 2014**



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=31,504) ranged from 1 day to 294 days. The mean LOS was 6.6 days with a median LOS of 4 days. Figure 35 shows the distribution of stays for those hospitalized with a stroke diagnosis. Almost one in three admitted (inpatient) stroke related hospitalizations stayed for 1 week or longer.

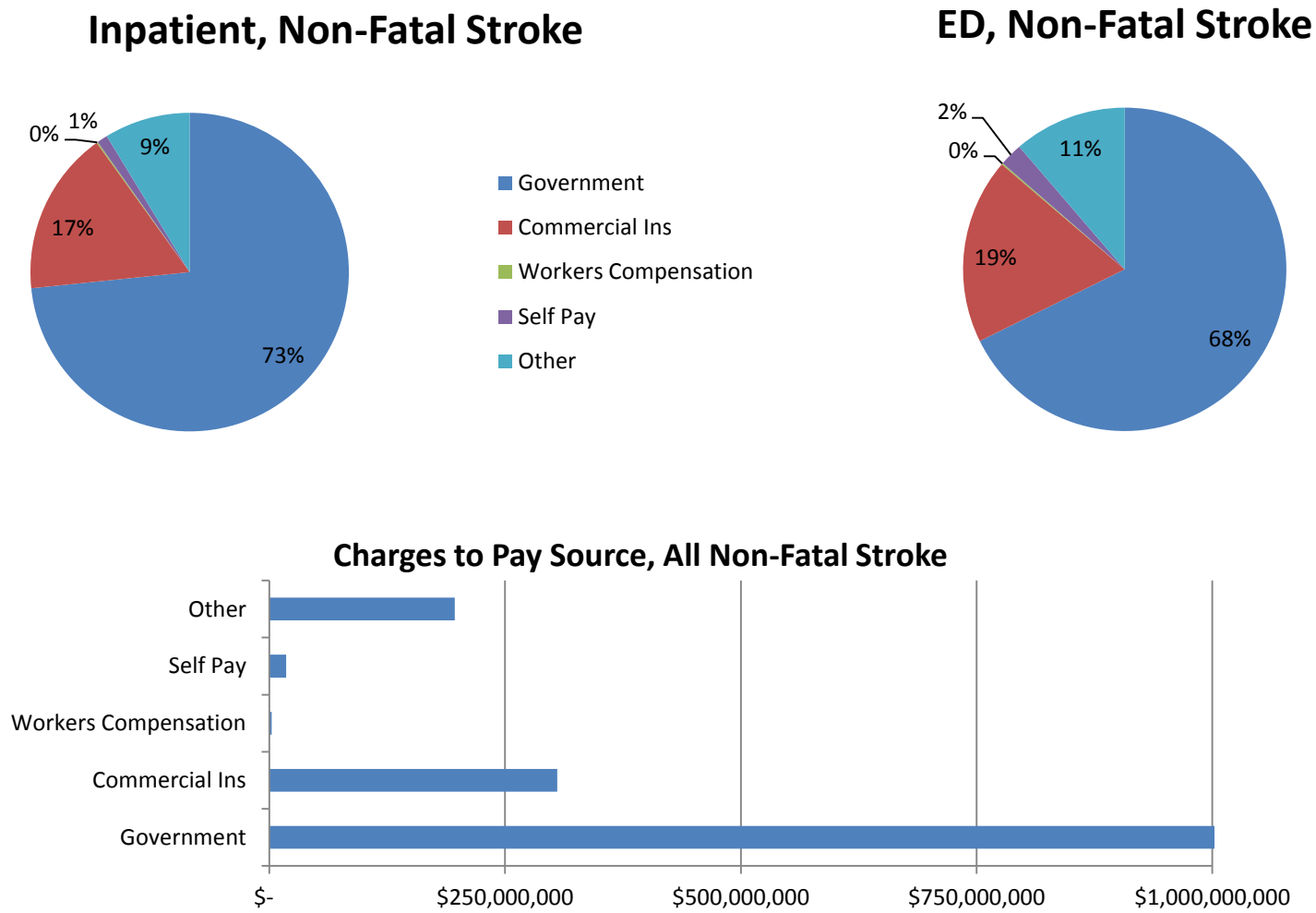
**Figure 35: Non-Fatal Stroke Related Hospitalization Length of Stay, Kentucky, 2014**



For non-fatal stroke related hospitalizations, 17,436 (55.3%) had a disposition other than “routine”. The three most frequent non-routine discharges were “skilled nursing facility”, “home health”, and “rehabilitation”. A total of 14,027 inpatient discharges had one of these three dispositions. ED discharges were more likely (63.0%) 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 three fourths of all non-fatal stroke related hospital visits. Government payers were billed over \$1 billion in 2014, and commercial payers over \$305 million.

**Figure 36: Non-Fatal Stroke Related Emergency Department Visits and Hospitalizations, Payer Source and Charges, Kentucky, 2014**



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, Kenton and Daviess) are the four of the seven most populous counties in Kentucky. A notable exception was Gallatin County, which was ranked 2<sup>nd</sup> in age adjusted rate for stroke but was 106<sup>th</sup> in population. Leslie (95<sup>th</sup> in population), Lee (111<sup>th</sup>) and Wolfe (112<sup>th</sup>) are also in the top ten 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.*

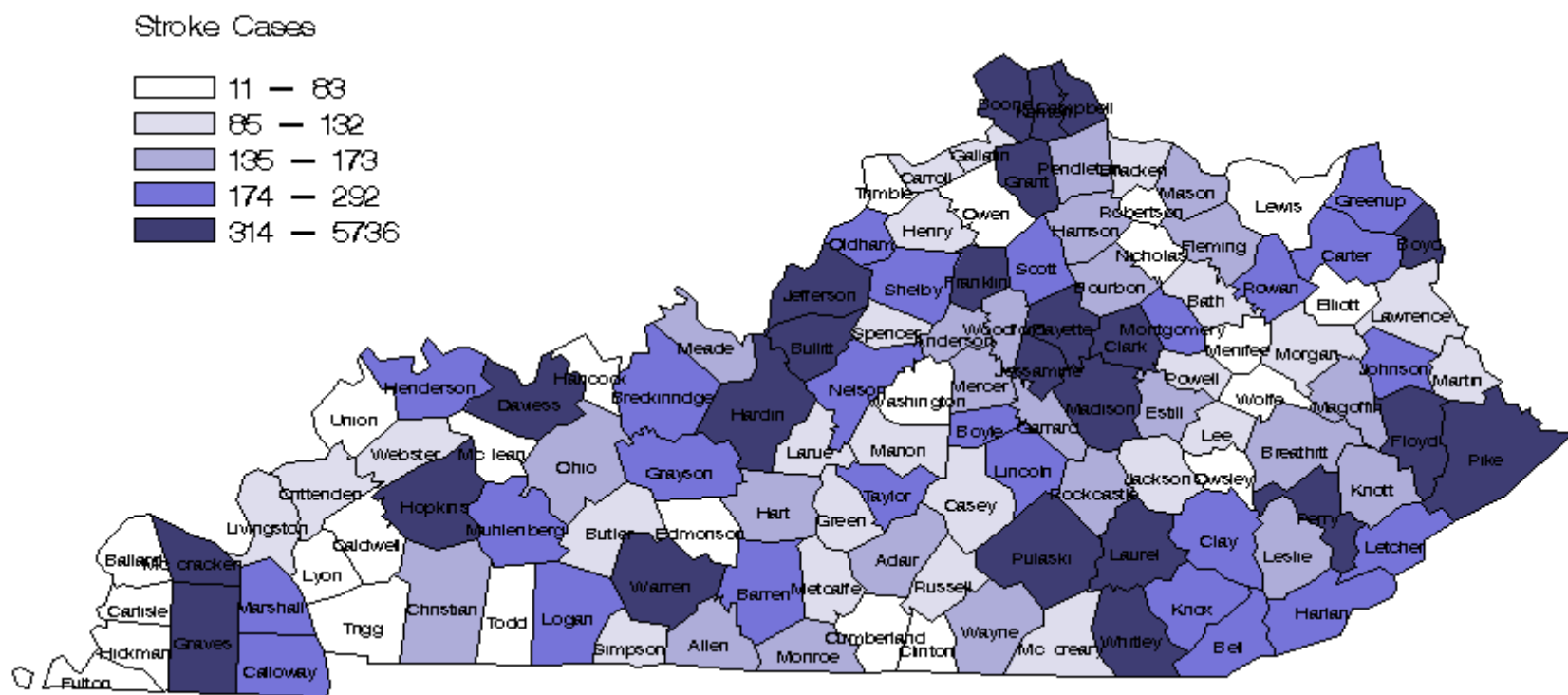
The following illustrations map both the frequency of stroke hospital visits in Kentucky counties (Figures 37 and 38) as well as the age adjusted rate of stroke in each county (Figures 39 and 40) for inpatient and outpatient stroke records. It should be noted that these mappings include ALL inpatient stroke cases (Figures 37 and 39) as well as ALL ED stroke cases (Figures 38 and 40) – 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. Due to mortality data being several years behind available hospital discharge data, accurate numbers of deaths outside those within the hospital system can only be estimated and are not included in the mapping of actual data.

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 37.

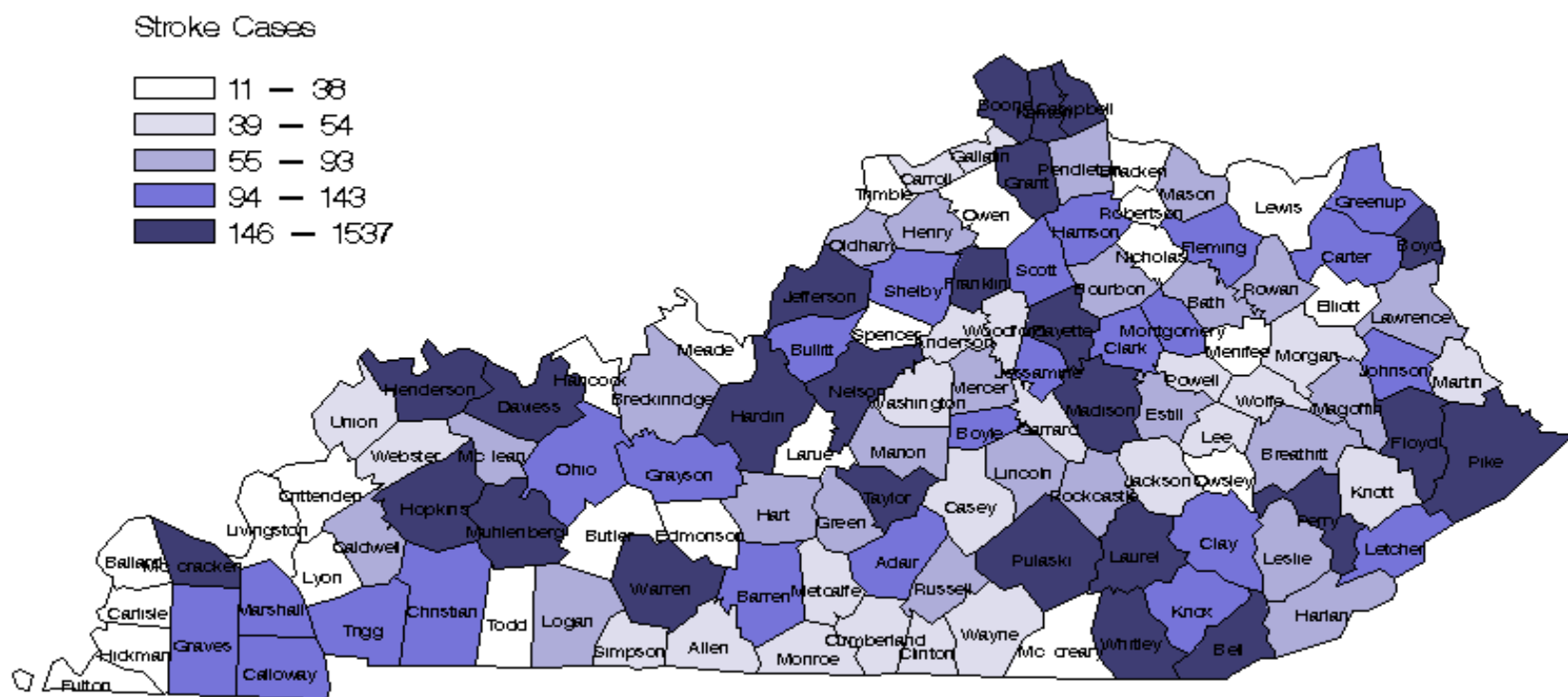
## Stroke Hospitalization Cases by County, Kentucky 2014



Source: Kentucky TBI Surveillance Project 2014.

**Figure 38.**

## Stroke ED Cases by County, Kentucky 2014



Source: Kentucky TBI Surveillance Project 2014.

## Age-Adjusted Stroke Hospitalization Rates by County, Kentucky 2014



### Age-Adjusted Stroke ED Rates by County, Kentucky 2014



## Conclusion

Over 90,000 non-fatal central nervous system injury-related ED visits and hospitalizations occurred in Kentucky in 2014. This number is larger than what had been previously estimated. 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. Many people recover from their injuries, but in 2014 alone, almost 250 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 (2013).

**Table 1: Non-Fatal TBI ED Visits and Hospitalizations by Age Group, Kentucky, 2014**

Age	Inpatient			Outpatient			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	123	2.5	44.7	4867	97.5	1770.6	4,990	100.0	1815.4
5-14	104	2.2	18.3	4672	97.8	820.0	4,776	100.0	838.2
15-24	274	4.0	46.0	6506	96.0	1091.1	6,780	100.0	1137.0
25-44	574	6.8	50.8	7870	93.2	697.2	8,444	100.0	748.0
45-64	823	12.0	69.1	6049	88.0	507.8	6,872	100.0	576.9
65+	1775	21.0	279.9	6668	79.0	1051.3	8,443	100.0	1331.2
Total	3,673	9.1	83.6	36,632	90.9	833.4	40,305	100.0	917.0

**Table 2: Non-Fatal TBI ED Visits and Hospitalizations by Gender, Kentucky, 2014**

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Male	2,013	9.9	93.0	18,408	90.1	850.9	20,421	100.0	943.9
Female	1,660	8.3	74.4	18,222	91.7	816.4	19,882	100.0	890.8
Total	3,673	9.1	83.6	36,630	90.9	833.4	40,303	100.0	917.0

**Table 3: Non-Fatal TBI ED Visits and Hospitalizations by External Cause of Injury, Kentucky, 2014**

Mechanism of Injury	Inpatient			ED			Total		
	Number	Pct.	Rate	Number	Pct.	Rate	Number	Pct.	Rate
Motor vehicle traffic crash	795	11.7	18.1	5,994	88.3	136.4	6,789	100.0	154.5
Fall	1,973	10.7	44.9	16,452	89.3	374.3	18,425	100.0	419.2
Firearm	26	63.4	0.6	15	36.6	0.3	41	100.0	0.9
Non-traffic land transport	128	11.9	2.9	951	88.1	21.6	1,079	100.0	24.5
Struck by object or person	151	2.1	3.4	6,975	97.9	158.7	7,126	100.0	162.1
Non-traffic pedal cycle	38	7.6	0.9	460	92.4	10.5	498	100.0	11.3
Machinery	7	13.5	0.2	45	86.5	1.0	52	100.0	1.2
Other	158	6.4	3.6	2,294	93.6	52.2	2,452	100.0	55.8
Unknown (missing E-code)	397	10.3	9.0	3,446	89.7	78.4	3,843	100.0	87.4
Total	3,673	9.1	83.6	36,632	90.9	833.4	40,305	100.0	917.0

**Table 4: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 00-04, Kentucky, 2014**

Mechanism of Injury	Inpatient		ED		Total	
	Number	Percent	Number	Percent	Number	Percent
Fall	60	48.8	3,569	73.3	3,629	72.7
Motor vehicle traffic crash	15	12.2	95	2.0	110	2.2
Struck by or against object or person	8	6.5	751	15.4	759	15.2
Non-traffic land transportation	2	1.6	15	0.3	17	0.3
Other (including non-specific codes)	26	21.1	153	3.1	179	3.6
Unknown (missing E-code)	12	9.8	284	5.8	296	5.9
Total	123	100.0	4,867	100.0	4,990	100.0

**Table 5: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 05-14, Kentucky, 2014**

Mechanism of Injury	Inpatient		ED		Total	
	Number	Percent	Number	Percent	Number	Percent
Motor vehicle traffic crash	33	31.7	310	6.6	343	7.2
Fall	26	25.0	1,679	35.9	1,705	35.7
Non-traffic land transportation	15	14.4	189	4.0	204	4.3
Other pedal cycle	11	10.6	253	5.4	264	5.5
Struck by or against object or person	9	8.7	1,610	34.5	1,619	33.9
Other (including non-specific codes)	7	6.7	199	4.3	206	4.3
Unknown (missing E-code)	3	2.9	432	9.2	435	9.1
Total	104	100.0	4,672	100.0	4,776	100.0

**Table 6: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 15-24, Kentucky, 2014**

Mechanism of Injury	Inpatient		ED		Total	
	Number	Percent	Number	Percent	Number	Percent
Motor vehicle traffic crash	150	54.7	1,950	30.0	2,100	31.0
Firearm	10	3.6	4	0.1	14	0.2
Non-traffic land transportation	31	11.3	316	4.9	347	5.1
Fall	27	9.9	1,166	17.9	1,193	17.6
Struck by or against object or person	21	7.7	1,767	27.2	1,788	26.4
Other (including non-specific codes)	17	6.2	628	9.7	645	9.5
Unknown (missing E-code)	18	6.6	675	10.4	693	10.2
Total	274	100.0	6,506	100.0	6,780	100.0



**Table 7: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 25-44, Kentucky, 2014**

Mechanism of Injury	Inpatient		ED		Total	
	Number	Percent	Number	Percent	Number	Percent
Motor vehicle traffic crash	264	46.0	2,106	26.8	2,370	28.1
Firearm	9	1.6	9	0.1	18	0.2
Fall	119	20.7	2,030	25.8	2,149	25.5
Struck by or against object or person	45	7.8	1,691	21.5	1,736	20.6
Non-traffic land transportation	40	7.0	268	3.4	308	3.6
Machinery	3	0.5	16	0.2	19	0.2
Other (including non-specific codes)	42	7.3	935	11.9	977	11.6
Unknown (missing E-code)	52	9.1	815	10.4	867	10.3
Total	574	100.0	7,870	100.0	8,444	100.0

**Table 8: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 45-64, Kentucky, 2014**

Mechanism of Injury	Inpatient		ED		Total	
	Number	Percent	Number	Percent	Number	Percent
Fall	391	47.5	2,799	46.3	3,190	46.4
Motor vehicle traffic crash	214	26.0	1,145	18.9	1,359	19.8
Firearm	6	0.7	2	0.0	8	0.1
Struck by or against object or person	41	5.0	851	14.1	892	13.0
Non-traffic land transportation	34	4.1	123	2.0	157	2.3
Other (including non-specific codes)	45	5.5	481	8.0	526	7.7
Unknown (missing E-code)	92	11.2	648	10.7	740	10.8
Total	823	100.0	6,049	100.0	6,872	100.0

**Table 9: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 65 or Over, Kentucky, 2014**

Mechanism of Injury	Inpatient		ED		Total	
	Number	Percent	Number	Percent	Number	Percent
Fall	1,350	76.1	5,209	78.1	6,559	77.7
Motor vehicle traffic crash	119	6.7	388	5.8	507	6.0
Firearm	1	0.1	0	0.0	1	0.0
Struck by or against object or person	27	1.5	305	4.6	332	3.9
Non-traffic land transportation	16	0.9	40	0.6	56	0.7
Other (including non-specific codes)	42	2.4	134	2.0	176	2.1
Unknown (missing E-code)	220	12.4	592	8.9	812	9.6
Total	1,775	100.0	6,668	100.0	8,443	100.0

**Table 10: Hospital Discharges by Disposition for Non-Fatal TBI ED Visits and Hospitalizations, Kentucky, 2014**

Discharge Disposition	Number	Percent	Number	Percent
Routine discharge (home/self care)	1,853	50.4	33666	91.9
Skilled nursing facility (SNF)	675	18.4	289	0.8
Home health	328	8.9	41	0.1
Inpatient-other short-term hospital	65	1.8	1576	4.3
Intermediate care facility (ICF)	27	0.7	50	0.1
Rehab	469	12.8	21	0.1
Other	256	7.0	987	2.7
Total	3,673	100.0	36,630	100.0

**Table 11: Incidence of All Inpatient TBI\* by County, Sorted by County, Kentucky, 2014**

\*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	19	0.5	96.1	101.4	Grant	32	0.8	155.6	129.3	McLean	11	0.3	105.5	115.8
Allen	10	0.3	42.0	49.2	Graves	57	1.5	140.2	152.2	Meade	16	0.4	62.5	54.8
Anderson	14	0.4	64.6	64.2	Grayson	26	0.7	100.0	100.0	Menifee	*	-	-	-
Ballard	*	-	-	-	Green	9	0.2	80.4	80.5	Mercer	15	0.4	67.1	70.3
Barren	26	0.7	55.0	60.4	Greenup	28	0.7	59.1	76.7	Metcalfe	10	0.3	84.6	100.2
Bath	6	0.2	51.5	50.2	Hancock	10	0.3	102.7	115.1	Monroe	7	0.2	54.3	65.5
Bell	15	0.4	49.3	53.8	Hardin	91	2.3	87.7	84.1	Montgomery	23	0.6	81.9	84.4
Boone	91	2.3	87.9	73.1	Harlan	21	0.5	70.8	73.7	Morgan	13	0.3	84.8	97.2
Bourbon	10	0.3	49.9	50.0	Harrison	11	0.3	55.8	59.4	Muhlenberg	30	0.8	84.4	96.2
Boyd	38	1.0	63.3	77.7	Hart	12	0.3	57.3	64.6	Nelson	51	1.3	118.5	114.5
Boyle	31	0.8	92.0	106.8	Henderson	15	0.4	29.5	32.4	Nicholas	7	0.2	93.9	99.4
Bracken	7	0.2	79.5	83.2	Henry	20	0.5	131.0	129.5	Ohio	29	0.7	115.9	120.9
Breathitt	12	0.3	92.7	88.6	Hickman	5	0.1	53.1	105.4	Oldham	47	1.2	85.1	75.4
Breckinridge	21	0.5	96.2	104.8	Hopkins	18	0.5	34.4	38.6	Owen	7	0.2	57.0	65.7
Bullitt	50	1.3	68.5	65.1	Jackson	15	0.4	114.4	111.7	Owsley	8	0.2	144.1	171.9
Butler	5	0.1	34.6	39.1	Jefferson	831	21.1	101.7	109.8	Pendleton	7	0.2	45.6	48.0
Caldwell	7	0.2	39.8	54.6	Jessamine	39	1.0	79.2	77.7	Perry	57	1.5	192.5	203.5
Calloway	33	0.8	78.6	87.6	Johnson	15	0.4	53.9	64.0	Pike	92	2.3	143.2	145.2
Campbell	90	2.3	93.3	98.9	Kenton	140	3.6	88.9	85.8	Powell	14	0.4	119.8	112.1
Carlisle	11	0.3	167.0	220.0	Knott	23	0.6	137.7	144.0	Pulaski	69	1.8	99.4	108.0
Carroll	11	0.3	97.2	100.4	Knox	26	0.7	78.9	81.8	Robertson	*	-	-	-
Carter	12	0.3	38.1	44.1	Larue	13	0.3	96.1	92.4	Rockcastle	22	0.6	126.8	131.8
Casey	17	0.4	110.8	105.8	Laurel	41	1.0	70.1	68.8	Rowan	16	0.4	74.4	68.0
Christian	6	0.2	9.4	8.1	Lawrence	5	0.1	29.2	31.5	Russell	16	0.4	84.9	90.1
Clark	36	0.9	93.6	101.1	Lee	16	0.4	205.8	220.4	Scott	38	1.0	82.1	76.1
Clay	20	0.5	94.4	93.6	Leslie	21	0.5	184.4	190.6	Shelby	36	0.9	84.0	81.4
Clinton	10	0.3	96.3	98.6	Letcher	23	0.6	98.9	97.4	Simpson	*	-	-	-
Crittenden	*	-	-	-	Lewis	*	-	-	-	Spencer	12	0.3	73.5	68.0
Cumberland	6	0.2	75.2	88.4	Lincoln	23	0.6	87.5	94.4	Taylor	25	0.6	85.2	101.4
Daviess	100	2.5	90.1	101.8	Livingston	15	0.4	125.0	160.3	Todd	0	0.0	0.0	0.0
Edmonson	10	0.3	68.0	82.9	Logan	11	0.3	36.3	40.9	Trigg	5	0.1	26.0	35.0
Elliott	*	-	-	-	Lyon	11	0.3	110.2	130.2	Trimble	8	0.2	89.6	90.7
Estill	20	0.5	128.7	138.0	Madison	56	1.4	67.9	65.4	Union	*	-	-	-
Fayette	228	5.8	75.9	73.9	Magoffin	15	0.4	121.9	115.8	Warren	71	1.8	63.4	60.0
Fleming	8	0.2	51.1	55.1	Marion	11	0.3	54.1	54.9	Washington	10	0.3	81.6	84.2
Floyd	42	1.1	100.9	108.4	Marshall	53	1.3	126.7	170.4	Wayne	18	0.5	86.7	87.0
Franklin	50	1.3	98.6	100.7	Martin	*	-	-	-	Webster	9	0.2	65.8	66.9
Fulton	11	0.3	152.4	172.3	Mason	6	0.2	26.9	34.7	Whitley	67	1.7	179.3	187.3
Gallatin	11	0.3	132.7	129.8	McCracken	125	3.2	151.8	191.2	Wolfe	*	-	-	-
Garrard	16	0.4	89.0	94.6	McCreary	19	0.5	99.0	105.6	Woodford	16	0.4	58.1	63.3

\* 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, 2014**

**\*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	113	0.3	611.2	603.3	Grant	311	0.8	1293.2	1256.4	McLean	78	0.2	847.8	821.4
Allen	102	0.3	520.4	502.2	Graves	399	1.1	1079.4	1065.4	Meade	107	0.3	379.8	366.3
Anderson	124	0.3	605.6	568.5	Grayson	262	0.7	1072.8	1007.8	Menifee	26	0.1	429.3	413.5
Ballard	66	0.2	829.7	792.1	Green	69	0.2	662.1	617.2	Mercer	164	0.4	818.1	768.2
Barren	323	0.9	781.8	750.7	Greenup	410	1.1	1130.5	1122.7	Metcalfe	74	0.2	739.9	741.3
Bath	86	0.2	762.5	719.0	Hancock	39	0.1	467.4	449.0	Monroe	57	0.2	562.5	533.7
Bell	260	0.7	977.0	932.4	Hardin	1167	3.2	1091.1	1078.7	Montgomery	187	0.5	699.7	686.2
Boone	964	2.6	827.1	774.7	Harlan	111	0.3	416.1	389.5	Morgan	81	0.2	629.5	605.4
Bourbon	145	0.4	779.3	725.1	Harrison	146	0.4	848.2	788.4	Muhlenberg	242	0.7	784.1	776.2
Boyd	762	2.1	1587.1	1558.7	Hart	198	0.5	1083.1	1066.1	Nelson	372	1.0	865.2	835.2
Boyle	190	0.5	676.4	654.9	Henderson	332	0.9	735.9	716.3	Nicholas	58	0.2	840.3	824.0
Bracken	90	0.2	1093.4	1069.4	Henry	154	0.4	1048.5	997.1	Ohio	141	0.4	622.8	587.8
Breathitt	81	0.2	640.3	598.0	Hickman	18	0.0	408.8	379.4	Oldham	381	1.0	687.5	610.9
Breckinridge	134	0.4	712.2	668.7	Hopkins	505	1.4	1121.9	1082.9	Owen	72	0.2	734.1	675.3
Bullitt	622	1.7	858.5	809.3	Jackson	126	0.3	1005.3	938.4	Owsley	39	0.1	899.3	838.0
Butler	57	0.2	498.4	445.6	Jefferson	7497	20.4	999.0	990.6	Pendleton	135	0.4	971.8	926.6
Caldwell	119	0.3	950.1	928.0	Jessamine	392	1.1	789.5	781.3	Perry	261	0.7	974.4	931.8
Calloway	577	1.6	1562.7	1532.3	Johnson	116	0.3	502.7	494.7	Pike	316	0.9	530.5	498.6
Campbell	803	2.2	883.7	882.5	Kenton	1250	3.4	784.6	766.2	Powell	121	0.3	1007.3	968.5
Carlisle	45	0.1	927.3	899.8	Knott	70	0.2	460.1	438.2	Pulaski	443	1.2	738.5	693.2
Carroll	94	0.3	859.8	858.2	Knox	290	0.8	956.6	912.2	Robertson	11	0.0	474.6	492.2
Carter	235	0.6	879.5	863.9	Larue	148	0.4	1160.6	1052.3	Rockcastle	92	0.3	574.6	551.1
Casey	61	0.2	391.5	379.7	Laurel	677	1.8	1192.5	1136.6	Rowan	166	0.5	744.4	705.6
Christian	429	1.2	571.7	578.4	Lawrence	100	0.3	642.4	630.7	Russell	66	0.2	394.4	371.8
Clark	410	1.1	1192.2	1151.2	Lee	60	0.2	877.7	826.5	Scott	561	1.5	1175.5	1123.2
Clay	287	0.8	1368.1	1343.4	Leslie	102	0.3	994.3	925.7	Shelby	329	0.9	770.7	744.1
Clinton	45	0.1	471.5	443.5	Letcher	117	0.3	530.5	495.4	Simpson	123	0.3	691.4	691.3
Crittenden	52	0.1	597.8	561.9	Lewis	76	0.2	590.6	550.5	Spencer	136	0.4	871.5	771.1
Cumberland	34	0.1	505.8	500.8	Lincoln	184	0.5	788.4	755.0	Taylor	230	0.6	919.6	933.1
Daviess	775	2.1	809.5	789.1	Livingston	96	0.3	1139.5	1025.8	Todd	74	0.2	577.3	591.9
Edmonson	53	0.1	501.7	439.4	Logan	179	0.5	684.3	666.0	Trigg	147	0.4	1071.9	1028.5
Elliott	31	0.1	420.3	405.9	Lyon	65	0.2	846.6	769.1	Trimble	46	0.1	543.8	521.8
Estill	164	0.4	1201.8	1132.0	Madison	765	2.1	936.7	893.8	Union	63	0.2	451.0	419.2
Fayette	1906	5.2	633.3	618.0	Magoffin	51	0.1	425.2	393.8	Warren	785	2.1	676.1	663.2
Fleming	80	0.2	580.7	551.4	Marion	128	0.3	641.9	638.6	Washington	104	0.3	874.9	875.8
Floyd	215	0.6	577.0	555.2	Marshall	282	0.8	948.3	906.6	Wayne	107	0.3	569.5	517.5
Franklin	481	1.3	1024.5	968.8	Martin	67	0.2	549.2	529.8	Webster	129	0.4	998.5	959.0
Fulton	21	0.1	360.7	328.9	Mason	162	0.4	996.4	937.6	Whitley	641	1.7	1809.9	1792.2
Gallatin	79	0.2	952.0	932.3	McCracken	855	2.3	1334.1	1307.9	Wolfe	45	0.1	635.8	620.9
Garrard	117	0.3	769.8	691.7	McCreary	94	0.3	543.1	522.5	Woodford	196	0.5	809.0	775.5

\*\*Rate per 100,000

**Table 13: Incidence of All Inpatient TBI\* by County, Sorted by Frequency, Kentucky, 2014**

**\*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	831	21.1	101.7	109.8	Montgomery	23	0.6	81.9	84.4	Lyon	11	0.3	110.2	130.2
Fayette	228	5.8	75.9	73.9	Rockcastle	22	0.6	126.8	131.8	Marion	11	0.3	54.1	54.9
Kenton	140	3.6	88.9	85.8	Breckinridge	21	0.5	96.2	104.8	McLean	11	0.3	105.5	115.8
McCracken	125	3.2	151.8	191.2	Harlan	21	0.5	70.8	73.7	Allen	10	0.3	42.0	49.2
Daviess	100	2.5	90.1	101.8	Leslie	21	0.5	184.4	190.6	Bourbon	10	0.3	49.9	50.0
Pike	92	2.3	143.2	145.2	Clay	20	0.5	94.4	93.6	Clinton	10	0.3	96.3	98.6
Boone	91	2.3	87.9	73.1	Estill	20	0.5	128.7	138.0	Edmonson	10	0.3	68.0	82.9
Hardin	91	2.3	87.7	84.1	Henry	20	0.5	131.0	129.5	Hancock	10	0.3	102.7	115.1
Campbell	90	2.3	93.3	98.9	Adair	19	0.5	96.1	101.4	Metcalfe	10	0.3	84.6	100.2
Warren	71	1.8	63.4	60.0	McCreary	19	0.5	99.0	105.6	Washington	10	0.3	81.6	84.2
Pulaski	69	1.8	99.4	108.0	Hopkins	18	0.5	34.4	38.6	Green	9	0.2	80.4	80.5
Whitley	67	1.7	179.3	187.3	Wayne	18	0.5	86.7	87.0	Webster	9	0.2	65.8	66.9
Graves	57	1.5	140.2	152.2	Casey	17	0.4	110.8	105.8	Fleming	8	0.2	51.1	55.1
Perry	57	1.5	192.5	203.5	Garrard	16	0.4	89.0	94.6	Owsley	8	0.2	144.1	171.9
Madison	56	1.4	67.9	65.4	Lee	16	0.4	205.8	220.4	Trimble	8	0.2	89.6	90.7
Marshall	53	1.3	126.7	170.4	Meade	16	0.4	62.5	54.8	Bracken	7	0.2	79.5	83.2
Nelson	51	1.3	118.5	114.5	Rowan	16	0.4	74.4	68.0	Caldwell	7	0.2	39.8	54.6
Bullitt	50	1.3	68.5	65.1	Russell	16	0.4	84.9	90.1	Monroe	7	0.2	54.3	65.5
Franklin	50	1.3	98.6	100.7	Woodford	16	0.4	58.1	63.3	Nicholas	7	0.2	93.9	99.4
Oldham	47	1.2	85.1	75.4	Bell	15	0.4	49.3	53.8	Owen	7	0.2	57.0	65.7
Floyd	42	1.1	100.9	108.4	Henderson	15	0.4	29.5	32.4	Pendleton	7	0.2	45.6	48.0
Laurel	41	1.0	70.1	68.8	Jackson	15	0.4	114.4	111.7	Bath	6	0.2	51.5	50.2
Jessamine	39	1.0	79.2	77.7	Johnson	15	0.4	53.9	64.0	Christian	6	0.2	9.4	8.1
Boyd	38	1.0	63.3	77.7	Livingston	15	0.4	125.0	160.3	Cumberland	6	0.2	75.2	88.4
Scott	38	1.0	82.1	76.1	Magoffin	15	0.4	121.9	115.8	Mason	6	0.2	26.9	34.7
Clark	36	0.9	93.6	101.1	Mercer	15	0.4	67.1	70.3	Butler	5	0.1	34.6	39.1
Shelby	36	0.9	84.0	81.4	Anderson	14	0.4	64.6	64.2	Hickman	5	0.1	53.1	105.4
Calloway	33	0.8	78.6	87.6	Powell	14	0.4	119.8	112.1	Lawrence	5	0.1	29.2	31.5
Grant	32	0.8	155.6	129.3	Larue	13	0.3	96.1	92.4	Trigg	5	0.1	26.0	35.0
Boyle	31	0.8	92.0	106.8	Morgan	13	0.3	84.8	97.2	Crittenden	*	-	-	-
Muhlenberg	30	0.8	84.4	96.2	Breathitt	12	0.3	92.7	88.6	Lewis	*	-	-	-
Ohio	29	0.7	115.9	120.9	Carter	12	0.3	38.1	44.1	Wolfe	*	-	-	-
Greenup	28	0.7	59.1	76.7	Hart	12	0.3	57.3	64.6	Ballard	*	-	-	-
Barren	26	0.7	55.0	60.4	Spencer	12	0.3	73.5	68.0	Martin	*	-	-	-
Grayson	26	0.7	100.0	100.0	Carlisle	11	0.3	167.0	220.0	Simpson	*	-	-	-
Knox	26	0.7	78.9	81.8	Carroll	11	0.3	97.2	100.4	Union	*	-	-	-
Taylor	25	0.6	85.2	101.4	Fulton	11	0.3	152.4	172.3	Elliott	*	-	-	-
Knott	23	0.6	137.7	144.0	Gallatin	11	0.3	132.7	129.8	Menifee	*	-	-	-
Letcher	23	0.6	98.9	97.4	Harrison	11	0.3	55.8	59.4	Robertson	*	-	-	-
Lincoln	23	0.6	87.5	94.4	Logan	11	0.3	36.3	40.9	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

\*\*Rate per 100,000

**Table 14: Incidence of All ED TBI\* by County, Sorted by Frequency, Kentucky, 2014**

**\*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	7497	20.4	999.0	990.6	Floyd	215	0.6	577.0	555.2	McCreary	94	0.3	543.1	522.5
Fayette	1906	5.2	633.3	618.0	Hart	198	0.5	1083.1	1066.1	Rockcastle	92	0.3	574.6	551.1
Kenton	1250	3.4	784.6	766.2	Woodford	196	0.5	809.0	775.5	Bracken	90	0.2	1093.4	1069.4
Hardin	1167	3.2	1091.1	1078.7	Boyle	190	0.5	676.4	654.9	Bath	86	0.2	762.5	719.0
Boone	964	2.6	827.1	774.7	Montgomery	187	0.5	699.7	686.2	Breathitt	81	0.2	640.3	598.0
McCracken	855	2.3	1334.1	1307.9	Lincoln	184	0.5	788.4	755.0	Morgan	81	0.2	629.5	605.4
Campbell	803	2.2	883.7	882.5	Logan	179	0.5	684.3	666.0	Fleming	80	0.2	580.7	551.4
Warren	785	2.1	676.1	663.2	Rowan	166	0.5	744.4	705.6	Gallatin	79	0.2	952.0	932.3
Daviess	775	2.1	809.5	789.1	Estill	164	0.4	1201.8	1132.0	McLean	78	0.2	847.8	821.4
Madison	765	2.1	936.7	893.8	Mercer	164	0.4	818.1	768.2	Lewis	76	0.2	590.6	550.5
Boyd	762	2.1	1587.1	1558.7	Mason	162	0.4	996.4	937.6	Metcalfe	74	0.2	739.9	741.3
Laurel	677	1.8	1192.5	1136.6	Henry	154	0.4	1048.5	997.1	Todd	74	0.2	577.3	591.9
Whitley	641	1.7	1809.9	1792.2	Larue	148	0.4	1160.6	1052.3	Owen	72	0.2	734.1	675.3
Bullitt	622	1.7	858.5	809.3	Trigg	147	0.4	1071.9	1028.5	Knott	70	0.2	460.1	438.2
Calloway	577	1.6	1562.7	1532.3	Harrison	146	0.4	848.2	788.4	Green	69	0.2	662.1	617.2
Scott	561	1.5	1175.5	1123.2	Bourbon	145	0.4	779.3	725.1	Martin	67	0.2	549.2	529.8
Hopkins	505	1.4	1121.9	1082.9	Ohio	141	0.4	622.8	587.8	Ballard	66	0.2	829.7	792.1
Franklin	481	1.3	1024.5	968.8	Spencer	136	0.4	871.5	771.1	Russell	66	0.2	394.4	371.8
Pulaski	443	1.2	738.5	693.2	Pendleton	135	0.4	971.8	926.6	Lyon	65	0.2	846.6	769.1
Christian	429	1.2	571.7	578.4	Breckinridge	134	0.4	712.2	668.7	Union	63	0.2	451.0	419.2
Clark	410	1.1	1192.2	1151.2	Webster	129	0.4	998.5	959.0	Casey	61	0.2	391.5	379.7
Greenup	410	1.1	1130.5	1122.7	Marion	128	0.3	641.9	638.6	Lee	60	0.2	877.7	826.5
Graves	399	1.1	1079.4	1065.4	Jackson	126	0.3	1005.3	938.4	Nicholas	58	0.2	840.3	824.0
Jessamine	392	1.1	789.5	781.3	Anderson	124	0.3	605.6	568.5	Butler	57	0.2	498.4	445.6
Oldham	381	1.0	687.5	610.9	Simpson	123	0.3	691.4	691.3	Monroe	57	0.2	562.5	533.7
Nelson	372	1.0	865.2	835.2	Powell	121	0.3	1007.3	968.5	Edmonson	53	0.1	501.7	439.4
Henderson	332	0.9	735.9	716.3	Caldwell	119	0.3	950.1	928.0	Crittenden	52	0.1	597.8	561.9
Shelby	329	0.9	770.7	744.1	Garrard	117	0.3	769.8	691.7	Magoffin	51	0.1	425.2	393.8
Barren	323	0.9	781.8	750.7	Letcher	117	0.3	530.5	495.4	Trimble	46	0.1	543.8	521.8
Pike	316	0.9	530.5	498.6	Johnson	116	0.3	502.7	494.7	Carlisle	45	0.1	927.3	899.8
Grant	311	0.8	1293.2	1256.4	Adair	113	0.3	611.2	603.3	Clinton	45	0.1	471.5	443.5
Knox	290	0.8	956.6	912.2	Harlan	111	0.3	416.1	389.5	Wolfe	45	0.1	635.8	620.9
Clay	287	0.8	1368.1	1343.4	Meade	107	0.3	379.8	366.3	Hancock	39	0.1	467.4	449.0
Marshall	282	0.8	948.3	906.6	Wayne	107	0.3	569.5	517.5	Owsley	39	0.1	899.3	838.0
Grayson	262	0.7	1072.8	1007.8	Washington	104	0.3	874.9	875.8	Cumberland	34	0.1	505.8	500.8
Perry	261	0.7	974.4	931.8	Allen	102	0.3	520.4	502.2	Elliott	31	0.1	420.3	405.9
Bell	260	0.7	977.0	932.4	Leslie	102	0.3	994.3	925.7	Menifee	26	0.1	429.3	413.5
Muhlenberg	242	0.7	784.1	776.2	Lawrence	100	0.3	642.4	630.7	Fulton	21	0.1	360.7	328.9
Carter	235	0.6	879.5	863.9	Livingston	96	0.3	1139.5	1025.8	Hickman	18	0.0	408.8	379.4
Taylor	230	0.6	919.6	933.1	Carroll	94	0.3	859.8	858.2	Robertson	11	0.0	474.6	492.2

\*\*Rate per 100,000

**Table 15: Incidence of All Inpatient TBI\* by County, Sorted by Age Adjusted Rate, Kentucky, 2014**

**\*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
Lee	16	0.4	205.8	220.4	Nicholas	7	0.2	93.9	99.4	Anderson	14	0.4	64.6	64.2
Perry	57	1.5	192.5	203.5	Clark	36	0.9	93.6	101.1	Warren	71	1.8	63.4	60.0
Leslie	21	0.5	184.4	190.6	Campbell	90	2.3	93.3	98.9	Boyd	38	1.0	63.3	77.7
Whitley	67	1.7	179.3	187.3	Breathitt	12	0.3	92.7	88.6	Meade	16	0.4	62.5	54.8
Carlisle	11	0.3	167.0	220.0	Boyle	31	0.8	92.0	106.8	Greenup	28	0.7	59.1	76.7
Grant	32	0.8	155.6	129.3	Daviess	100	2.5	90.1	101.8	Woodford	16	0.4	58.1	63.3
Fulton	11	0.3	152.4	172.3	Trimble	8	0.2	89.6	90.7	Hart	12	0.3	57.3	64.6
McCracken	125	3.2	151.8	191.2	Garrard	16	0.4	89.0	94.6	Owen	7	0.2	57.0	65.7
Owsley	8	0.2	144.1	171.9	Kenton	140	3.6	88.9	85.8	Harrison	11	0.3	55.8	59.4
Pike	92	2.3	143.2	145.2	Robertson	*	-	-	-	Wolfe	*	-	-	-
Graves	57	1.5	140.2	152.2	Boone	91	2.3	87.9	73.1	Barren	26	0.7	55.0	60.4
Knott	23	0.6	137.7	144.0	Hardin	91	2.3	87.7	84.1	Monroe	7	0.2	54.3	65.5
Gallatin	11	0.3	132.7	129.8	Lincoln	23	0.6	87.5	94.4	Marion	11	0.3	54.1	54.9
Henry	20	0.5	131.0	129.5	Wayne	18	0.5	86.7	87.0	Johnson	15	0.4	53.9	64.0
Estill	20	0.5	128.7	138.0	Taylor	25	0.6	85.2	101.4	Hickman	5	0.1	53.1	105.4
Rockcastle	22	0.6	126.8	131.8	Oldham	47	1.2	85.1	75.4	Bath	6	0.2	51.5	50.2
Marshall	53	1.3	126.7	170.4	Russell	16	0.4	84.9	90.1	Fleming	8	0.2	51.1	55.1
Livingston	15	0.4	125.0	160.3	Morgan	13	0.3	84.8	97.2	Bourbon	10	0.3	49.9	50.0
Magoffin	15	0.4	121.9	115.8	Metcalfe	10	0.3	84.6	100.2	Bell	15	0.4	49.3	53.8
Powell	14	0.4	119.8	112.1	Muhlenberg	30	0.8	84.4	96.2	Elliott	*	-	-	-
Nelson	51	1.3	118.5	114.5	Shelby	36	0.9	84.0	81.4	Pendleton	7	0.2	45.6	48.0
Ohio	29	0.7	115.9	120.9	Scott	38	1.0	82.1	76.1	Crittenden	*	-	-	-
Jackson	15	0.4	114.4	111.7	Montgomery	23	0.6	81.9	84.4	Allen	10	0.3	42.0	49.2
Casey	17	0.4	110.8	105.8	Washington	10	0.3	81.6	84.2	Caldwell	7	0.2	39.8	54.6
Lyon	11	0.3	110.2	130.2	Green	9	0.2	80.4	80.5	Carter	12	0.3	38.1	44.1
McLean	11	0.3	105.5	115.8	Bracken	7	0.2	79.5	83.2	Logan	11	0.3	36.3	40.9
Hancock	10	0.3	102.7	115.1	Jessamine	39	1.0	79.2	77.7	Butler	5	0.1	34.6	39.1
Jefferson	831	21.1	101.7	109.8	Knox	26	0.7	78.9	81.8	Hopkins	18	0.5	34.4	38.6
Floyd	42	1.1	100.9	108.4	Calloway	33	0.8	78.6	87.6	Henderson	15	0.4	29.5	32.4
Grayson	26	0.7	100.0	100.0	Fayette	228	5.8	75.9	73.9	Lawrence	5	0.1	29.2	31.5
Pulaski	69	1.8	99.4	108.0	Cumberland	6	0.2	75.2	88.4	Mason	6	0.2	26.9	34.7
McCreary	19	0.5	99.0	105.6	Rowan	16	0.4	74.4	68.0	Trigg	5	0.1	26.0	35.0
Letcher	23	0.6	98.9	97.4	Spencer	12	0.3	73.5	68.0	Ballard	*	-	-	-
Franklin	50	1.3	98.6	100.7	Harlan	21	0.5	70.8	73.7	Lewis	*	-	-	-
Carroll	11	0.3	97.2	100.4	Laurel	41	1.0	70.1	68.8	Menifee	*	-	-	-
Clinton	10	0.3	96.3	98.6	Bullitt	50	1.3	68.5	65.1	Martin	*	-	-	-
Breckinridge	21	0.5	96.2	104.8	Edmonson	10	0.3	68.0	82.9	Union	*	-	-	-
Larue	13	0.3	96.1	92.4	Madison	56	1.4	67.9	65.4	Simpson	*	-	-	-
Adair	19	0.5	96.1	101.4	Mercer	15	0.4	67.1	70.3	Christian	6	0.2	9.4	8.1
Clay	20	0.5	94.4	93.6	Webster	9	0.2	65.8	66.9	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

\*\*Rate per 100,000

**Table 16: Incidence of All ED TBI\* by County, Sorted by Age Adjusted Rate, Kentucky, 2014**

**\*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
Whitley	641	1.7	1809.9	1792.2	Carter	235	0.6	879.5	863.9	Breathitt	81	0.2	640.3	598.0
Boyd	762	2.1	1587.1	1558.7	Lee	60	0.2	877.7	826.5	Wolfe	45	0.1	635.8	620.9
Calloway	577	1.6	1562.7	1532.3	Washington	104	0.3	874.9	875.8	Fayette	1906	5.2	633.3	618.0
Clay	287	0.8	1368.1	1343.4	Spencer	136	0.4	871.5	771.1	Morgan	81	0.2	629.5	605.4
McCracken	855	2.3	1334.1	1307.9	Nelson	372	1.0	865.2	835.2	Ohio	141	0.4	622.8	587.8
Grant	311	0.8	1293.2	1256.4	Carroll	94	0.3	859.8	858.2	Adair	113	0.3	611.2	603.3
Estill	164	0.4	1201.8	1132.0	Bullitt	622	1.7	858.5	809.3	Anderson	124	0.3	605.6	568.5
Laurel	677	1.8	1192.5	1136.6	Harrison	146	0.4	848.2	788.4	Crittenden	52	0.1	597.8	561.9
Clark	410	1.1	1192.2	1151.2	McLean	78	0.2	847.8	821.4	Lewis	76	0.2	590.6	550.5
Scott	561	1.5	1175.5	1123.2	Lyon	65	0.2	846.6	769.1	Fleming	80	0.2	580.7	551.4
Larue	148	0.4	1160.6	1052.3	Nicholas	58	0.2	840.3	824.0	Todd	74	0.2	577.3	591.9
Livingston	96	0.3	1139.5	1025.8	Ballard	66	0.2	829.7	792.1	Floyd	215	0.6	577.0	555.2
Greenup	410	1.1	1130.5	1122.7	Boone	964	2.6	827.1	774.7	Rockcastle	92	0.3	574.6	551.1
Hopkins	505	1.4	1121.9	1082.9	Mercer	164	0.4	818.1	768.2	Christian	429	1.2	571.7	578.4
Bracken	90	0.2	1093.4	1069.4	Daviess	775	2.1	809.5	789.1	Wayne	107	0.3	569.5	517.5
Hardin	1167	3.2	1091.1	1078.7	Woodford	196	0.5	809.0	775.5	Monroe	57	0.2	562.5	533.7
Hart	198	0.5	1083.1	1066.1	Jessamine	392	1.1	789.5	781.3	Martin	67	0.2	549.2	529.8
Graves	399	1.1	1079.4	1065.4	Lincoln	184	0.5	788.4	755.0	Trimble	46	0.1	543.8	521.8
Grayson	262	0.7	1072.8	1007.8	Kenton	1250	3.4	784.6	766.2	McCreary	94	0.3	543.1	522.5
Trigg	147	0.4	1071.9	1028.5	Muhlenberg	242	0.7	784.1	776.2	Pike	316	0.9	530.5	498.6
Henry	154	0.4	1048.5	997.1	Barren	323	0.9	781.8	750.7	Letcher	117	0.3	530.5	495.4
Franklin	481	1.3	1024.5	968.8	Bourbon	145	0.4	779.3	725.1	Allen	102	0.3	520.4	502.2
Powell	121	0.3	1007.3	968.5	Shelby	329	0.9	770.7	744.1	Cumberland	34	0.1	505.8	500.8
Jackson	126	0.3	1005.3	938.4	Garrard	117	0.3	769.8	691.7	Johnson	116	0.3	502.7	494.7
Jefferson	7497	20.4	999.0	990.6	Bath	86	0.2	762.5	719.0	Edmonson	53	0.1	501.7	439.4
Webster	129	0.4	998.5	959.0	Rowan	166	0.5	744.4	705.6	Butler	57	0.2	498.4	445.6
Mason	162	0.4	996.4	937.6	Metcalfe	74	0.2	739.9	741.3	Robertson	11	0.0	474.6	492.2
Leslie	102	0.3	994.3	925.7	Pulaski	443	1.2	738.5	693.2	Clinton	45	0.1	471.5	443.5
Bell	260	0.7	977.0	932.4	Henderson	332	0.9	735.9	716.3	Hancock	39	0.1	467.4	449.0
Perry	261	0.7	974.4	931.8	Owen	72	0.2	734.1	675.3	Knott	70	0.2	460.1	438.2
Pendleton	135	0.4	971.8	926.6	Breckinridge	134	0.4	712.2	668.7	Union	63	0.2	451.0	419.2
Knox	290	0.8	956.6	912.2	Montgomery	187	0.5	699.7	686.2	Menifee	26	0.1	429.3	413.5
Gallatin	79	0.2	952.0	932.3	Simpson	123	0.3	691.4	691.3	Magoffin	51	0.1	425.2	393.8
Caldwell	119	0.3	950.1	928.0	Oldham	381	1.0	687.5	610.9	Elliott	31	0.1	420.3	405.9
Marshall	282	0.8	948.3	906.6	Logan	179	0.5	684.3	666.0	Harlan	111	0.3	416.1	389.5
Madison	765	2.1	936.7	893.8	Boyle	190	0.5	676.4	654.9	Hickman	18	0.0	408.8	379.4
Carlisle	45	0.1	927.3	899.8	Warren	785	2.1	676.1	663.2	Russell	66	0.2	394.4	371.8
Taylor	230	0.6	919.6	933.1	Green	69	0.2	662.1	617.2	Casey	61	0.2	391.5	379.7
Owsley	39	0.1	899.3	838.0	Lawrence	100	0.3	642.4	630.7	Meade	107	0.3	379.8	366.3
Campbell	803	2.2	883.7	882.5	Marion	128	0.3	641.9	638.6	Fulton	21	0.1	360.7	328.9

\*\*Rate per 100,000



**Table 17: Barrell Matrix TBI Type I/II/III by Mechanism for Non-Fatal Inpatient TBI, Kentucky, 2014**

Injury Mechanism	Type of TBI								Total
	Type I		Type II		Type III		Other		
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Motor vehicle traffic crash	299	17.6	55	21.9	13	19.7	7	12.5	374
Falls	1,031	60.6	126	50.2	30	45.5	44	78.6	1,231
Non-traffic land transportation	62	3.6	15	6.0	5	7.6	0	0.0	82
Struck by or against object or person	74	4.4	13	5.2	10	15.2	4	7.1	101
Non-traffic pedal cycle	18	1.1	8	3.2	2	3.0	0	0.0	28
Firearm	17	1.0	0	0.0	1	1.5	0	0.0	18
Other	61	3.6	19	7.6	3	4.5	0	0.0	83
Unknown	139	8.2	15	6.0	2	3.0	1	1.8	157
Total	1,701	100.0	251	100.0	66	100.0	56	100.0	2,074

**Table 18: Barrell Matrix TBI Type I/II/III by Mechanism for Non-Fatal ED TBI, Kentucky, 2014**

Injury Mechanism	Type of TBI								Total
	Type I		Type II		Type III		Other		
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Motor vehicle traffic crash	208	16.0	1,505	18.9	27	7.2	2,205	13.5	3,945
Falls	655	50.4	2,774	34.9	203	53.8	8,350	51.2	11,982
Non-traffic land transportation	52	4.0	273	3.4	7	1.9	277	1.7	609
Struck by or against object or person	145	11.2	2,053	25.8	79	21.0	3,063	18.8	5,340
Non-traffic pedal cycle	21	1.6	132	1.7	7	1.9	186	1.1	346
Firearm	9	0.7	1	0.0	0	0.0	0	0.0	10
Other	88	6.8	517	6.5	35	9.3	839	5.1	1,479
Unknown	121	9.3	698	8.8	19	5.0	1,400	8.6	2,238
Total	1,299	100.0	7,953	100.0	377	100.0	16,320	100.0	25,949

**Table 19: Length of Stay for Non-Fatal Inpatient TBI, Kentucky, 2014**

Length of Stay	Number	Percent*
1 day	644	17.5
More than one day but less than 1 week	1965	53.5
1 week to less than 2 weeks	651	17.7
2 weeks to less than 3 weeks	242	6.6
3 weeks to less than 4 weeks	81	2.2
4 weeks or more	90	2.5
Total	3673	100.0

\*Percent of hospitalized TBI

**Table 20: Work Related Non-Fatal TBI, Kentucky 2014**

Inpatient Work TBI (n=54)	LOS Days	Cost
Mean	9.1	\$126,956
Median	4.5	\$61,439
Min, Max	1, 86	\$7,213, \$897,952
Sum of Charges		\$6,855,620

ED Work TBI (n=1,195)	Cost
Mean	\$4,329
Median	\$3,195
Min, Max	\$135, \$46,821
Sum of Charges	\$5,173,151

**Table 21: Primary Payer and Charges for Non-Fatal Inpatient TBI, Kentucky, 2014**

Payer	Number of Discharges	Percent of Discharges	Total Hospital Charges
Government	1,925	52.4	\$ 93,181,247
Commercial Ins	782	21.3	\$ 59,281,418
Self Pay	62	1.7	\$ 3,871,106
Workers Compensation	54	1.5	\$ 6,855,620
Other	850	23.1	\$ 83,448,553
Total	3,673	100.0	\$ 246,637,944

**Table 22: Primary Payer and Charges for Non-Fatal ED TBI, Kentucky, 2014**

Payer	Number of Discharges	Percent of Discharges	Total Hospital Charges
Government	9,184	25.1	\$ 47,627,781
Commercial Ins	10,509	28.7	\$ 40,563,335
Self Pay	2,654	7.2	\$ 11,589,382
Workers Compensation	1,195	3.3	\$ 5,173,151
Other	13,090	35.7	\$ 59,086,106
Total	36,632	100.0	\$ 164,039,755

**Table 23: Non-Fatal ABI by Age Group, Kentucky, 2014**

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	100	36.0	36.4	178	64.0	64.8	278	100.0	101.1
5-14	35	20.6	6.1	135	79.4	23.7	170	100.0	29.8
15-24	134	38.4	22.5	215	61.6	36.1	349	100.0	58.5
25-44	673	56.8	59.6	512	43.2	45.4	1,185	100.0	105.0
45-64	1,063	69.8	89.2	460	30.2	38.6	1,523	100.0	127.8
65+	770	78.9	121.4	206	21.1	32.5	976	100.0	153.9
Total	2,775	61.9	63.1	1,706	38.1	38.8	4,481	100.0	101.9

**Table 24: Non-Fatal ABI by Gender, Kentucky, 2014**

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Male	1,382	63.7	63.9	787	36.3	36.4	2,169	100.0	100.3
Female	1,393	60.3	62.4	919	39.7	41.2	2,312	100.0	103.6
Total	2,775	61.9	63.1	1,706	38.1	38.8	4,481	100.0	101.9

**Table 25: Incidence of All Inpatient ABI\* by County, Sorted by County, Kentucky, 2014**

\*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	21	0.5	107.0	112.1	Grant	24	0.6	96.9	97.0	McLean	12	0.3	118.9	126.4
Allen	16	0.4	70.4	78.8	Graves	40	1.0	92.5	106.8	Meade	11	0.3	33.1	37.7
Anderson	15	0.4	66.3	68.8	Grayson	41	1.1	143.0	157.7	Menifee	5	0.1	63.9	79.5
Ballard	5	0.1	55.5	60.0	Green	7	0.2	39.9	62.6	Mercer	18	0.5	68.2	84.3
Barren	29	0.7	60.8	67.4	Greenup	19	0.5	46.5	52.0	Metcalfe	*	-	-	-
Bath	8	0.2	56.0	66.9	Hancock	8	0.2	91.3	92.1	Monroe	5	0.1	30.6	46.8
Bell	25	0.6	81.4	89.7	Hardin	114	2.9	102.9	105.4	Montgomery	33	0.8	102.0	121.1
Boone	108	2.8	89.4	86.8	Harlan	27	0.7	93.8	94.7	Morgan	13	0.3	78.4	97.2
Bourbon	19	0.5	80.1	95.0	Harrison	9	0.2	39.9	48.6	Muhlenberg	23	0.6	64.1	73.8
Boyd	42	1.1	79.1	85.9	Hart	13	0.3	64.3	70.0	Nelson	45	1.2	100.7	101.0
Boyle	36	0.9	113.7	124.1	Henderson	25	0.6	45.4	53.9	Nicholas	5	0.1	58.3	71.0
Bracken	2	0.1	21.0	23.8	Henry	15	0.4	83.9	97.1	Ohio	13	0.3	46.3	54.2
Breathitt	23	0.6	159.8	169.8	Hickman	*	-	-	-	Oldham	38	1.0	65.3	60.9
Breckinridge	22	0.6	88.1	109.8	Hopkins	38	1.0	78.0	81.5	Owen	5	0.1	44.2	46.9
Bullitt	44	1.1	52.8	57.3	Jackson	8	0.2	61.2	59.6	Owsley	12	0.3	271.9	257.8
Butler	9	0.2	52.9	70.4	Jefferson	787	20.2	95.2	104.0	Pendleton	14	0.4	80.8	96.1
Caldwell	*	-	-	-	Jessamine	37	1.0	75.0	73.7	Perry	33	0.8	107.9	117.8
Calloway	10	0.3	22.2	26.6	Johnson	23	0.6	88.0	98.1	Pike	69	1.8	97.4	108.9
Campbell	77	2.0	79.0	84.6	Kenton	143	3.7	85.5	87.7	Powell	21	0.5	154.8	168.1
Carlisle	*	-	-	-	Knott	16	0.4	89.4	100.2	Pulaski	64	1.6	88.2	100.1
Carroll	13	0.3	111.0	118.7	Knox	37	1.0	104.4	116.4	Robertson	*	-	-	-
Carter	24	0.6	82.7	88.2	Larue	12	0.3	71.5	85.3	Rockcastle	11	0.3	63.0	65.9
Casey	11	0.3	50.3	68.5	Laurel	66	1.7	100.4	110.8	Rowan	28	0.7	124.9	119.0
Christian	20	0.5	30.1	27.0	Lawrence	7	0.2	42.9	44.1	Russell	11	0.3	52.6	62.0
Clark	49	1.3	122.0	137.6	Lee	6	0.2	68.2	82.6	Scott	42	1.1	83.5	84.1
Clay	28	0.7	125.7	131.1	Leslie	13	0.3	90.9	118.0	Shelby	28	0.7	63.5	63.3
Clinton	7	0.2	66.4	69.0	Letcher	38	1.0	144.4	160.9	Simpson	13	0.3	69.1	73.1
Crittenden	*	-	-	-	Lewis	9	0.2	58.7	65.2	Spencer	12	0.3	83.8	68.0
Cumberland	10	0.3	144.1	147.3	Lincoln	27	0.7	106.0	110.8	Taylor	30	0.8	122.8	121.7
Daviess	69	1.8	66.0	70.3	Livingston	12	0.3	120.7	128.2	Todd	*	-	-	-
Edmonson	5	0.1	29.7	41.5	Logan	15	0.4	49.1	55.8	Trigg	5	0.1	22.3	35.0
Elliott	*	-	-	-	Lyon	13	0.3	134.4	153.8	Trimble	7	0.2	68.9	79.4
Estill	17	0.4	98.7	117.3	Madison	61	1.6	69.6	71.3	Union	*	-	-	-
Fayette	267	6.9	89.4	86.6	Magoffin	16	0.4	118.5	123.6	Warren	70	1.8	62.7	59.1
Fleming	16	0.4	98.3	110.3	Marion	16	0.4	74.9	79.8	Washington	12	0.3	100.9	101.1
Floyd	57	1.5	135.5	147.2	Marshall	28	0.7	67.8	90.0	Wayne	12	0.3	60.7	58.0
Franklin	45	1.2	78.2	90.6	Martin	12	0.3	79.9	94.9	Webster	*	-	-	-
Fulton	*	-	-	-	Mason	12	0.3	51.6	69.5	Whitley	50	1.3	126.3	139.8
Gallatin	*	-	-	-	McCracken	77	2.0	102.4	117.8	Wolfe	9	0.2	101.7	124.2
Garrard	26	0.7	142.7	153.7	McCreary	15	0.4	76.2	83.4	Woodford	16	0.4	48.6	63.3

\* At least one but fewer than five

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

\*\*Rate per 100,000

**Table 26: Incidence of All ED ABI\* by County, Sorted by County, Kentucky, 2014**

**\*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	16	0.9	78.5	85.4	Grant	10	0.6	41.4	40.4	McLean	*	-	-	-
Allen	7	0.4	30.3	34.5	Graves	17	1.0	44.1	45.4	Meade	*	-	-	-
Anderson	*	-	-	-	Grayson	12	0.7	43.8	46.2	Menifee	*	-	-	-
Ballard	*	-	-	-	Green	7	0.4	61.6	62.6	Mercer	14	0.8	61.0	65.6
Barren	30	1.7	72.8	69.7	Greenup	12	0.7	34.2	32.9	Metcalfe	3	0.2	32.7	30.1
Bath	*	-	-	-	Hancock	*	-	-	-	Monroe	5	0.3	47.5	46.8
Bell	11	0.6	43.1	39.4	Hardin	32	1.8	30.7	29.6	Montgomery	16	0.9	57.0	58.7
Boone	38	2.2	31.1	30.5	Harlan	14	0.8	48.9	49.1	Morgan	9	0.5	57.7	67.3
Bourbon	11	0.6	58.3	55.0	Harrison	10	0.6	60.3	54.0	Muhlenberg	14	0.8	50.1	44.9
Boyd	17	1.0	35.5	34.8	Hart	7	0.4	36.7	37.7	Nelson	20	1.2	44.7	44.9
Boyle	9	0.5	29.9	31.0	Henderson	9	0.5	20.0	19.4	Nicholas	*	-	-	-
Bracken	*	-	-	-	Henry	5	0.3	33.1	32.4	Ohio	9	0.5	41.8	37.5
Breathitt	8	0.5	44.5	59.1	Hickman	*	-	-	-	Oldham	25	1.4	41.3	40.1
Breckinridge	20	1.2	95.4	99.8	Hopkins	20	1.2	45.0	42.9	Owen	*	-	-	-
Bullitt	26	1.5	34.1	33.8	Jackson	7	0.4	54.9	52.1	Owsley	*	-	-	-
Butler	*	-	-	-	Jefferson	319	18.4	43.1	42.1	Pendleton	6	0.3	46.2	41.2
Caldwell	6	0.3	48.1	46.8	Jessamine	28	1.6	58.9	55.8	Perry	7	0.4	26.1	25.0
Calloway	23	1.3	63.8	61.1	Johnson	11	0.6	45.3	46.9	Pike	29	1.7	42.3	45.8
Campbell	41	2.4	43.9	45.1	Kenton	56	3.2	34.3	34.3	Powell	10	0.6	84.5	80.0
Carlisle	*	-	-	-	Knott	6	0.3	40.0	37.6	Pulaski	19	1.1	32.0	29.7
Carroll	*	-	-	-	Knox	10	0.6	31.5	31.5	Robertson	0	0.0	0.0	0.0
Carter	*	-	-	-	Larue	7	0.4	55.6	49.8	Rockcastle	10	0.6	59.5	59.9
Casey	14	0.8	81.5	87.1	Laurel	12	0.7	18.9	20.1	Rowan	8	0.5	37.1	34.0
Christian	10	0.6	15.0	13.5	Lawrence	7	0.4	42.5	44.1	Russell	8	0.5	46.6	45.1
Clark	22	1.3	58.0	61.8	Lee	*	-	-	-	Scott	19	1.1	39.2	38.0
Clay	9	0.5	41.9	42.1	Leslie	*	-	-	-	Shelby	22	1.3	49.0	49.8
Clinton	*	-	-	-	Letcher	9	0.5	44.1	38.1	Simpson	6	0.3	32.7	33.7
Crittenden	*	-	-	-	Lewis	0	0.0	0.0	0.0	Spencer	7	0.4	40.7	39.7
Cumberland	10	0.6	149.9	147.3	Lincoln	10	0.6	42.0	41.0	Taylor	20	1.2	88.6	81.1
Daviess	34	2.0	36.6	34.6	Livingston	7	0.4	85.4	74.8	Todd	*	-	-	-
Edmonson	0	0.0	0.0	0.0	Logan	17	1.0	60.3	63.3	Trigg	10	0.6	62.5	70.0
Elliott	*	-	-	-	Lyon	*	-	-	-	Trimble	*	-	-	-
Estill	5	0.3	37.4	34.5	Madison	36	2.1	44.5	42.1	Union	5	0.3	34.5	33.3
Fayette	104	6.0	33.3	33.7	Magoffin	*	-	-	-	Warren	34	2.0	28.5	28.7
Fleming	8	0.5	57.9	55.1	Marion	5	0.3	23.2	24.9	Washington	*	-	-	-
Floyd	20	1.2	47.0	51.6	Marshall	*	-	-	-	Wayne	8	0.5	41.7	38.7
Franklin	20	1.2	37.7	40.3	Martin	*	-	-	-	Webster	6	0.3	43.7	44.6
Fulton	7	0.4	111.4	109.6	Mason	*	-	-	-	Whitley	18	1.0	47.6	50.3
Gallatin	*	-	-	-	McCracken	30	1.7	43.4	45.9	Wolfe	6	0.3	88.1	82.8
Garrard	*	-	-	-	McCreary	*	-	-	-	Woodford	*	-	-	-

\* At least one but fewer than five

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

\*\*Rate per 100,000

**Table 27: Incidence of All Inpatient ABI\* by County, Sorted by Frequency, Kentucky, 2014**

**\*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	787	20.2	95.2	104.0	Bell	25	0.6	81.4	89.7	Washington	12	0.3	100.9	101.1
Fayette	267	6.9	89.4	86.6	Henderson	25	0.6	45.4	53.9	Wayne	12	0.3	60.7	58.0
Kenton	143	3.7	85.5	87.7	Carter	24	0.6	82.7	88.2	Casey	11	0.3	50.3	68.5
Hardin	114	2.9	102.9	105.4	Grant	24	0.6	96.9	97.0	Meade	11	0.3	33.1	37.7
Boone	108	2.8	89.4	86.8	Breathitt	23	0.6	159.8	169.8	Rockcastle	11	0.3	63.0	65.9
Campbell	77	2.0	79.0	84.6	Johnson	23	0.6	88.0	98.1	Russell	11	0.3	52.6	62.0
McCracken	77	2.0	102.4	117.8	Muhlenberg	23	0.6	64.1	73.8	Calloway	10	0.3	22.2	26.6
Warren	70	1.8	62.7	59.1	Breckinridge	22	0.6	88.1	109.8	Cumberland	10	0.3	144.1	147.3
Daviess	69	1.8	66.0	70.3	Adair	21	0.5	107.0	112.1	Butler	9	0.2	52.9	70.4
Pike	69	1.8	97.4	108.9	Powell	21	0.5	154.8	168.1	Harrison	9	0.2	39.9	48.6
Laurel	66	1.7	100.4	110.8	Christian	20	0.5	30.1	27.0	Lewis	9	0.2	58.7	65.2
Pulaski	64	1.6	88.2	100.1	Bourbon	19	0.5	80.1	95.0	Wolfe	9	0.2	101.7	124.2
Madison	61	1.6	69.6	71.3	Greenup	19	0.5	46.5	52.0	Bath	8	0.2	56.0	66.9
Floyd	57	1.5	135.5	147.2	Mercer	18	0.5	68.2	84.3	Hancock	8	0.2	91.3	92.1
Whitley	50	1.3	126.3	139.8	Estill	17	0.4	98.7	117.3	Jackson	8	0.2	61.2	59.6
Clark	49	1.3	122.0	137.6	Allen	16	0.4	70.4	78.8	Clinton	7	0.2	66.4	69.0
Franklin	45	1.2	78.2	90.6	Fleming	16	0.4	98.3	110.3	Green	7	0.2	39.9	62.6
Nelson	45	1.2	100.7	101.0	Knott	16	0.4	89.4	100.2	Lawrence	7	0.2	42.9	44.1
Bullitt	44	1.1	52.8	57.3	Magoffin	16	0.4	118.5	123.6	Trimble	7	0.2	68.9	79.4
Boyd	42	1.1	79.1	85.9	Marion	16	0.4	74.9	79.8	Lee	6	0.2	68.2	82.6
Scott	42	1.1	83.5	84.1	Woodford	16	0.4	48.6	63.3	Ballard	5	0.1	55.5	60.0
Grayson	41	1.1	143.0	157.7	Anderson	15	0.4	66.3	68.8	Carlisle	5	0.1	106.1	100.0
Graves	40	1.0	92.5	106.8	Henry	15	0.4	83.9	97.1	Edmonson	5	0.1	29.7	41.5
Hopkins	38	1.0	78.0	81.5	Logan	15	0.4	49.1	55.8	Menifee	5	0.1	63.9	79.5
Letcher	38	1.0	144.4	160.9	McCreary	15	0.4	76.2	83.4	Monroe	5	0.1	30.6	46.8
Oldham	38	1.0	65.3	60.9	Pendleton	14	0.4	80.8	96.1	Nicholas	5	0.1	58.3	71.0
Jessamine	37	1.0	75.0	73.7	Carroll	13	0.3	111.0	118.7	Owen	5	0.1	44.2	46.9
Knox	37	1.0	104.4	116.4	Hart	13	0.3	64.3	70.0	Trigg	5	0.1	22.3	35.0
Boyle	36	0.9	113.7	124.1	Leslie	13	0.3	90.9	118.0	Crittenden	*	-	-	-
Montgomery	33	0.8	102.0	121.1	Lyon	13	0.3	134.4	153.8	Fulton	*	-	-	-
Perry	33	0.8	107.9	117.8	Morgan	13	0.3	78.4	97.2	Todd	*	-	-	-
Taylor	30	0.8	122.8	121.7	Ohio	13	0.3	46.3	54.2	Caldwell	*	-	-	-
Barren	29	0.7	60.8	67.4	Simpson	13	0.3	69.1	73.1	Gallatin	*	-	-	-
Clay	28	0.7	125.7	131.1	Larue	12	0.3	71.5	85.3	Metcalfe	*	-	-	-
Marshall	28	0.7	67.8	90.0	Livingston	12	0.3	120.7	128.2	Webster	*	-	-	-
Rowan	28	0.7	124.9	119.0	Martin	12	0.3	79.9	94.9	Bracken	*	-	-	-
Shelby	28	0.7	63.5	63.3	Mason	12	0.3	51.6	69.5	Elliott	*	-	-	-
Harlan	27	0.7	93.8	94.7	McLean	12	0.3	118.9	126.4	Hickman	*	-	-	-
Lincoln	27	0.7	106.0	110.8	Owsley	12	0.3	271.9	257.8	Robertson	*	-	-	-
Garrard	26	0.7	142.7	153.7	Spencer	12	0.3	83.8	68.0	Union	*	-	-	-

\* At least one but fewer than five

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

\*\*Rate per 100,000

**Table 28: Incidence of All ED ABI\* by County, Sorted by Frequency, Kentucky, 2014**

**\*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	319	18.4	43.1	42.1	Bourbon	11	0.6	58.3	55.0	Marion	5	0.3	23.2	24.9
Fayette	104	6.0	33.3	33.7	Johnson	11	0.6	45.3	46.9	Monroe	5	0.3	47.5	46.8
Kenton	56	3.2	34.3	34.3	Christian	10	0.6	15.0	13.5	Union	5	0.3	34.5	33.3
Campbell	41	2.4	43.9	45.1	Cumberland	10	0.6	149.9	147.3	Anderson	*	-	-	-
Boone	38	2.2	31.1	30.5	Grant	10	0.6	41.4	40.4	Ballard	*	-	-	-
Madison	36	2.1	44.5	42.1	Harrison	10	0.6	60.3	54.0	Bath	*	-	-	-
Daviess	34	2.0	36.6	34.6	Knox	10	0.6	31.5	31.5	Carter	*	-	-	-
Warren	34	2.0	28.5	28.7	Lincoln	10	0.6	42.0	41.0	Garrard	*	-	-	-
Hardin	32	1.8	30.7	29.6	Powell	10	0.6	84.5	80.0	Lee	*	-	-	-
Barren	30	1.7	72.8	69.7	Rockcastle	10	0.6	59.5	59.9	Marshall	*	-	-	-
McCracken	30	1.7	43.4	45.9	Trigg	10	0.6	62.5	70.0	Martin	*	-	-	-
Pike	29	1.7	42.3	45.8	Boyle	9	0.5	29.9	31.0	McLean	*	-	-	-
Jessamine	28	1.6	58.9	55.8	Clay	9	0.5	41.9	42.1	Menifee	*	-	-	-
Bullitt	26	1.5	34.1	33.8	Henderson	9	0.5	20.0	19.4	Owen	*	-	-	-
Oldham	25	1.4	41.3	40.1	Letcher	9	0.5	44.1	38.1	Trimble	*	-	-	-
Calloway	23	1.3	63.8	61.1	Morgan	9	0.5	57.7	67.3	Woodford	*	-	-	-
Clark	22	1.3	58.0	61.8	Ohio	9	0.5	41.8	37.5	Butler	*	-	-	-
Shelby	22	1.3	49.0	49.8	Breathitt	8	0.5	44.5	59.1	Carlisle	*	-	-	-
Breckinridge	20	1.2	95.4	99.8	Fleming	8	0.5	57.9	55.1	Carroll	*	-	-	-
Floyd	20	1.2	47.0	51.6	Rowan	8	0.5	37.1	34.0	Clinton	*	-	-	-
Franklin	20	1.2	37.7	40.3	Russell	8	0.5	46.6	45.1	Gallatin	*	-	-	-
Hopkins	20	1.2	45.0	42.9	Wayne	8	0.5	41.7	38.7	Magoffin	*	-	-	-
Nelson	20	1.2	44.7	44.9	Allen	7	0.4	30.3	34.5	McCreary	*	-	-	-
Taylor	20	1.2	88.6	81.1	Fulton	7	0.4	111.4	109.6	Meade	*	-	-	-
Pulaski	19	1.1	32.0	29.7	Green	7	0.4	61.6	62.6	Metcalfe	*	-	-	-
Scott	19	1.1	39.2	38.0	Hart	7	0.4	36.7	37.7	Todd	*	-	-	-
Whitley	18	1.0	47.6	50.3	Jackson	7	0.4	54.9	52.1	Bracken	*	-	-	-
Boyd	17	1.0	35.5	34.8	Larue	7	0.4	55.6	49.8	Crittenden	*	-	-	-
Graves	17	1.0	44.1	45.4	Lawrence	7	0.4	42.5	44.1	Elliott	*	-	-	-
Logan	17	1.0	60.3	63.3	Livingston	7	0.4	85.4	74.8	Hancock	*	-	-	-
Adair	16	0.9	78.5	85.4	Perry	7	0.4	26.1	25.0	Hickman	*	-	-	-
Montgomery	16	0.9	57.0	58.7	Spencer	7	0.4	40.7	39.7	Leslie	*	-	-	-
Casey	14	0.8	81.5	87.1	Caldwell	6	0.3	48.1	46.8	Mason	*	-	-	-
Harlan	14	0.8	48.9	49.1	Knott	6	0.3	40.0	37.6	Owsley	*	-	-	-
Mercer	14	0.8	61.0	65.6	Pendleton	6	0.3	46.2	41.2	Washington	*	-	-	-
Muhlenberg	14	0.8	50.1	44.9	Simpson	6	0.3	32.7	33.7	Lyon	*	-	-	-
Grayson	12	0.7	43.8	46.2	Webster	6	0.3	43.7	44.6	Nicholas	*	-	-	-
Greenup	12	0.7	34.2	32.9	Wolfe	6	0.3	88.1	82.8	Edmonson	*	-	-	-
Laurel	12	0.7	18.9	20.1	Estill	5	0.3	37.4	34.5	Lewis	*	-	-	-
Bell	11	0.6	43.1	39.4	Henry	5	0.3	33.1	32.4	Robertson	*	-	-	-

\* At least one but fewer than five

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

\*\*Rate per 100,000

**Table 29: Incidence of All Inpatient ABI\* by County, Sorted by Age Adjusted Rate, Kentucky, 2014**

\*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
Owsley	12	0.3	271.9	257.8	Boone	108	2.8	89.4	86.8	Rockcastle	11	0.3	63.0	65.9
Breathitt	23	0.6	159.8	169.8	Fayette	267	6.9	89.4	86.6	Warren	70	1.8	62.7	59.1
Powell	21	0.5	154.8	168.1	Knott	16	0.4	89.4	100.2	Jackson	8	0.2	61.2	59.6
Letcher	38	1.0	144.4	160.9	Pulaski	64	1.6	88.2	100.1	Barren	29	0.7	60.8	67.4
Cumberland	10	0.3	144.1	147.3	Breckinridge	22	0.6	88.1	109.8	Wayne	12	0.3	60.7	58.0
Grayson	41	1.1	143.0	157.7	Johnson	23	0.6	88.0	98.1	Lewis	9	0.2	58.7	65.2
Garrard	26	0.7	142.7	153.7	Kenton	143	3.7	85.5	87.7	Nicholas	5	0.1	58.3	71.0
Floyd	57	1.5	135.5	147.2	Henry	15	0.4	83.9	97.1	Bath	8	0.2	56.0	66.9
Lyon	13	0.3	134.4	153.8	Spencer	12	0.3	83.8	68.0	Ballard	5	0.1	55.5	60.0
Whitley	50	1.3	126.3	139.8	Scott	42	1.1	83.5	84.1	Butler	9	0.2	52.9	70.4
Clay	28	0.7	125.7	131.1	Carter	24	0.6	82.7	88.2	Bullitt	44	1.1	52.8	57.3
Rowan	28	0.7	124.9	119.0	Bell	25	0.6	81.4	89.7	Russell	11	0.3	52.6	62.0
Taylor	30	0.8	122.8	121.7	Pendleton	14	0.4	80.8	96.1	Crittenden	*	-	-	-
Clark	49	1.3	122.0	137.6	Bourbon	19	0.5	80.1	95.0	Mason	12	0.3	51.6	69.5
Livingston	12	0.3	120.7	128.2	Martin	12	0.3	79.9	94.9	Casey	11	0.3	50.3	68.5
McLean	12	0.3	118.9	126.4	Boyd	42	1.1	79.1	85.9	Logan	15	0.4	49.1	55.8
Magoffin	16	0.4	118.5	123.6	Campbell	77	2.0	79.0	84.6	Woodford	16	0.4	48.6	63.3
Boyle	36	0.9	113.7	124.1	Morgan	13	0.3	78.4	97.2	Greenup	19	0.5	46.5	52.0
Carroll	13	0.3	111.0	118.7	Franklin	45	1.2	78.2	90.6	Ohio	13	0.3	46.3	54.2
Perry	33	0.8	107.9	117.8	Hopkins	38	1.0	78.0	81.5	Henderson	25	0.6	45.4	53.9
Adair	21	0.5	107.0	112.1	McCreary	15	0.4	76.2	83.4	Owen	5	0.1	44.2	46.9
Carlisle	5	0.1	106.1	100.0	Jessamine	37	1.0	75.0	73.7	Lawrence	7	0.2	42.9	44.1
Lincoln	27	0.7	106.0	110.8	Marion	16	0.4	74.9	79.8	Harrison	9	0.2	39.9	48.6
Knox	37	1.0	104.4	116.4	Fulton	*	-	-	-	Green	7	0.2	39.9	62.6
Hardin	114	2.9	102.9	105.4	Larue	12	0.3	71.5	85.3	Meade	11	0.3	33.1	37.7
McCracken	77	2.0	102.4	117.8	Allen	16	0.4	70.4	78.8	Hickman	*	-	-	-
Montgomery	33	0.8	102.0	121.1	Madison	61	1.6	69.6	71.3	Monroe	5	0.1	30.6	46.8
Wolfe	9	0.2	101.7	124.2	Simpson	13	0.3	69.1	73.1	Christian	20	0.5	30.1	27.0
Washington	12	0.3	100.9	101.1	Trimble	7	0.2	68.9	79.4	Robertson	*	-	-	-
Nelson	45	1.2	100.7	101.0	Mercer	18	0.5	68.2	84.3	Gallatin	*	-	-	-
Laurel	66	1.7	100.4	110.8	Lee	6	0.2	68.2	82.6	Edmonson	5	0.1	29.7	41.5
Estill	17	0.4	98.7	117.3	Marshall	28	0.7	67.8	90.0	Todd	*	-	-	-
Fleming	16	0.4	98.3	110.3	Clinton	7	0.2	66.4	69.0	Metcalfe	*	-	-	-
Pike	69	1.8	97.4	108.9	Anderson	15	0.4	66.3	68.8	Trigg	5	0.1	22.3	35.0
Grant	24	0.6	96.9	97.0	Daviess	69	1.8	66.0	70.3	Calloway	10	0.3	22.2	26.6
Jefferson	787	20.2	95.2	104.0	Oldham	38	1.0	65.3	60.9	Caldwell	*	-	-	-
Harlan	27	0.7	93.8	94.7	Hart	13	0.3	64.3	70.0	Bracken	*	-	-	-
Graves	40	1.0	92.5	106.8	Muhlenberg	23	0.6	64.1	73.8	Elliott	*	-	-	-
Hancock	8	0.2	91.3	92.1	Menifee	5	0.1	63.9	79.5	Webster	*	-	-	-
Leslie	13	0.3	90.9	118.0	Shelby	28	0.7	63.5	63.3	Union	*	-	-	-

\* At least one but fewer than five

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

\*\*Rate per 100,000



**Table 30: Causes of Non-Fatal ABI, Kentucky, 2014**

ABI Category	Inpatient		ED	
	Number	Percent	Number	Percent
Anoxia	1291	46.1	255	14.9
Exposure to toxic substances	1144	40.8	990	58.0
Allergy/anaphylaxis	190	6.8	452	26.5
Acute medical clinical incidents	178	6.4	11	0.6

\* 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 31: Injury-Related Causes of Non-Fatal ABI, Kentucky, 2014**

Mechanism of Injury	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Poisoning	862	49.7	19.6	871	50.3	19.8	1,733	100.0	39.4
Suffocation	30	50.8	0.7	29	49.2	0.7	59	100.0	1.3
Drowning	8	10.1	0.2	71	89.9	1.6	79	100.0	1.8
Falls	72	80.0	1.6	18	20.0	0.4	90	100.0	2.0
Motor vehicle traffic crash	8	57.1	0.2	6	42.9	0.1	14	100.0	0.3
Fire/burn	6	60.0	0.1	4	40.0	0.1	10	100.0	0.2
Other	84	62.2	1.9	51	37.8	1.2	135	100.0	3.1
Unknown or Non-Injury Related	1,705	72.2	38.8	656	27.8	14.9	2,361	100.0	53.7
Total	2,775	61.9	63.1	1,706	38.1	38.8	4,481	100.0	101.9

**Table 32: Non-Fatal Anoxia by Age Group, Kentucky, 2014**

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	44	42.3	16.0	60	57.7	21.8	104	100.0	37.8
5-14	18	34.6	3.2	34	65.4	6.0	52	100.0	9.1
15-24	64	66.7	10.7	32	33.3	5.4	96	100.0	16.1
25-44	258	78.4	22.9	71	21.6	6.3	329	100.0	29.1
45-64	483	93.4	40.5	34	6.6	2.9	517	100.0	43.4
65+	420	94.6	66.2	24	5.4	3.8	444	100.0	70.0
Total	1,287	83.5	29.3	255	16.5	5.8	1,542	100.0	35.1

**Table 33: Diagnosis Distribution for Non-Fatal Anoxia, Kentucky, 2014**

Diagnosis	Description	Inpatient		ED	
		Number	Percent	Number	Percent
348.1	Anoxic brain damage (related to hereditary and degenerative diseases of the central nervous system)	778	60.3	80	31.4
997.0	Nervous system complications (related to medical care)	398	30.8	34	13.3
	- Anoxic brain damage				0.0
	- Cerebral hypoxia				0.0
	- Postoperative stroke				0.0
	- Other				0.0
669.4	Cerebral anoxia following cesarean	64	5.0	13	5.1
994.1	Drowning and nonfatal submersion	10	0.8	83	32.5
768					
(.1,.5,.6,.9)	Birth asphyxia	17	1.3	1	0.0
799.0, 994.7	Asphyxia	24	1.9	44	17.3
Total		1,291	100.0	255	100.0

**Table 34: Non-Fatal Exposure to Toxic Substances by Age Group, Kentucky, 2014**

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	28	35.4	10.2	51	64.6	18.6	79	100.0	28.7
5-14	7	14.3	1.2	42	85.7	7.4	49	100.0	8.6
15-24	54	29.3	9.1	130	70.7	21.8	184	100.0	30.9
25-44	338	50.6	29.9	330	49.4	29.2	668	100.0	59.2
45-64	444	60.0	37.3	296	40.0	24.8	740	100.0	62.1
65+	258	64.7	40.7	141	35.3	22.2	399	100.0	62.9
Total	1,129	53.3	25.7	990	46.7	22.5	2,119	100.0	48.2

**Table 35: Diagnosis Distribution for Non-Fatal Exposure to Toxic Substances, Kentucky, 2014**

Diagnosis	Description	Inpatient		ED	
		Number	Percent	Number	Percent
967	Poisoning by sedatives and hypnotics	415	36.3	394	28.8
980	Toxic effect of alcohol	264	23.1	197	13.3
968	Poisoning by other central nervous system depressants and anesthetics	68	5.9	75	8.9
964.2	Poisoning by anticoagulants	88	7.7	104	5.0
998	Post-operative shock	254	22.2	0	0.2
986	Toxic effect of carbon monoxide	38	3.3	166	14.6
985	Toxic effect of other metals	13	1.1	29	1.0
988.0-988.2	Toxic effect of noxious substances eaten as food	3	0.3	24	3.0
995.4	Shock due to anesthesia	1	0.1	1	0.1
Total		1144	100.0	990	100.0

**Table 36: Length of Stay for Non-Fatal Inpatient ABI, Kentucky, 2014**

Length of Stay	Number	Percent*
1 day	365	13.2
More than one day but less than 1 week	1184	42.7
1 week to less than 2 weeks	625	22.5
2 weeks to less than 3 weeks	277	10.0
3 weeks to less than 4 weeks	132	4.8
4 weeks or more	192	6.9
Total	2775	100.0

\*Percent of hospitalized ABI

**Table 37: Discharge Disposition for Non-Fatal ABI, Kentucky, 2014**

Discharge Disposition	Inpatient		ED	
	Number	Percent	Number	Percent
Routine discharge (home/self care)	1,289	46.5	1,367	80.2
Skilled nursing facility (SNF)	361	13.0	17	1.0
Home health	298	10.7	4	0.2
Inpatient-other type facility	17	0.6	20	1.2
Inpatient-other short-term hospital	135	4.9	165	9.7
Intermediate care facility (ICF)	12	0.4	2	0.1
Rehab	195	7.0	0	0.0
Other	468	16.9	130	7.6
Total	2,775	100.0	1,705	100.0

**Table 38: Primary Payer and Charges for Non-Fatal Inpatient ABI, Kentucky, 2014**

Payer	Number of Discharges	Percent of Discharges	Total Hospital Charges
Government	1,355	48.8	\$ 129,026,284
Commercial Insurance	681	24.5	\$ 60,297,941
Self Pay	86	3.1	\$ 3,643,642
Workers Compensation	8	0.3	\$ 1,259,532
Other	645	23.2	\$ 60,676,435
Total	2,775	100.0	\$ 254,903,834

**Table 39: Primary Payer and Charges for Non-Fatal ED ABI, Kentucky, 2014**

Payer	Number of Discharges	Percent of Discharges	Total Hospital Charges
Government	483	28.3	\$ 2,303,995
Commercial Insurance	523	30.7	\$ 1,907,010
Self Pay	143	8.4	\$ 449,262
Workers Compensation	23	1.3	\$ 38,638
Other	534	31.3	\$ 2,090,888
Total	1,706	100.0	\$ 6,789,793

**Table 40: Non-Fatal SCI by Age Group, Kentucky, 2014**

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	0	0.0	0.0	0	0.0	0.0	0	100.0	0.0
5-14	2	50.0	0.4	4	66.7	0.7	6	100.0	1.1
15-24	10	37.0	1.7	17	63.0	2.9	27	100.0	4.5
25-44	43	59.7	3.8	29	40.3	2.6	72	100.0	6.4
45-64	79	73.8	6.6	28	26.2	2.4	107	100.0	9.0
65+	64	70.3	10.1	27	29.7	4.3	91	100.0	14.3
Total	198	65.3	4.5	105	34.7	2.4	303	100.0	6.9

**Table 41: Non-Fatal SCI by Gender, Kentucky, 2014**

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Male	130	64.0	6.0	73	36.0	3.4	203	100.0	9.4
Female	68	68.0	3.0	32	32.0	1.4	100	100.0	4.5
Total	198	65.3	4.5	105	34.7	2.4	303	100.0	6.9

**Table 42: Leading Causes of Non-Fatal SCI, Kentucky, 2014**

Mechanism of Injury	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Motor vehicle traffic crash	41	70.7	0.9	17	29.3	0.4	58	100.0	1.3
Fall	87	63.0	2.0	51	37.0	1.2	138	100.0	3.1
Non-traffic land transportation	3	60.0	0.1	2	40.0	0.0	5	100.0	0.1
Struck by or against object or person	4	44.4	0.1	5	55.6	0.1	9	100.0	0.2
Firearm	5	100.0	0.1	0	0.0	0.0	5	100.0	0.1
Other	21	58.3	0.5	15	41.7	0.3	36	100.0	0.8
Unknown (missing E-code)	37	71.2	0.8	15	28.8	0.3	52	100.0	1.2
Total	198	65.3	4.5	105	34.7	2.4	303	100.0	6.9

**Table 43: Length of Stay for Non-Fatal Inpatient SCI, Kentucky, 2014**

Length of Stay	Number	Percent*
1 day	16	8.1
More than one day but less than 1 week	67	33.8
1 week to less than 2 weeks	61	30.8
2 weeks to less than 3 weeks	37	18.7
3 weeks to less than 4 weeks	5	2.5
4 weeks or more	12	6.1
Total	198	100.0

\*Percent of hospitalized SCI

**Table 44: Discharge Disposition for Non-Fatal SCI, Kentucky, 2014**

Discharge Disposition	Inpatient		ED	
	Number	Percent	Number	Percent
Routine discharge (home/self care)	56	28.3	50	47.6
Home health	12	6.1	1	1.0
Skilled nursing facility (SNF)	24	12.1	1	1.0
Inpatient-other	10	5.1	41	39.0
Rehab	87	43.9	0	0.0
Other	9	4.5	12	11.4
Total	198	100.0	105	100.0

**Table 45: Primary Payer and Charges for Non-Fatal Inpatient SCI, Kentucky, 2014**

Payer	Number of Discharges	Percent of Discharges	Total Hospital Discharges
Government	84	42.4	\$ 8,944,055
Commercial Ins	50	25.3	\$ 6,665,773
Workers Compensation	6	3.0	\$ 1,017,645
Self Pay	3	1.5	\$ 738,041
Other	55	27.8	\$ 9,809,076
Total	198	100.0	\$27,174,590

**Table 46: Primary Payer and Charges for Non-Fatal ED SCI, Kentucky, 2014**

Payer	Number of Discharges	Percent of Discharges	Total Hospital Discharges
Government	32	30.5	\$ 233,079
Commercial Ins	36	34.3	\$ 260,870
Workers Compensation	1	1.0	\$ 2,945
Self Pay	5	4.8	\$ 17,398
Other	31	29.5	\$ 240,397
Total	105	100.0	\$754,689

**Table 47: Non-Fatal Stroke by Age Group, Kentucky, 2014**

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	59	0.0	21.5	30	0.0	10.9	89	100.0	32.4
5-14	37	119.4	6.5	31	45.6	5.4	68	100.0	11.9
15-24	119	53.8	20.0	102	46.2	17.1	221	100.0	37.1
25-44	1,174	55.5	104.0	940	44.5	83.3	2,114	100.0	187.3
45-64	9,221	66.8	774.0	4,588	33.2	385.1	13,809	100.0	1159.2
65+	20,894	72.5	3294.3	7,924	27.5	1249.3	28,818	100.0	4543.6
Total	31,504	69.8	716.8	13,615	30.2	309.8	45,119	100.0	1026.5

**Table 48: Non-Fatal Stroke by Gender, Kentucky, 2014**

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Male	14,890	70.9	688.3	6,101	29.1	282.0	20,991	100.0	970.3
Female	16,613	68.9	744.3	7,514	31.1	336.7	24,127	100.0	1081.0
Total	31,503	69.8	716.7	13,615	30.2	309.8	45,118	100.0	1026.5

**Table 49: Length of Stay for Non-Fatal Inpatient Stroke, Kentucky, 2014**

Length of Stay	Number	Percent*
1 day	4474	14.2
More than one day but less than 1 week	17368	55.1
1 week to less than 2 weeks	6122	19.4
2 weeks to less than 3 weeks	1975	6.3
3 weeks to less than 4 weeks	861	2.7
4 weeks or more	704	2.2
Total	31504	100.0

\*Percent of hospitalized SCI



**Table 50: Discharge Disposition for Non-Fatal Stroke, Kentucky, 2014**

Discharge Disposition	Inpatient		ED	
	Number	Percent	Number	Percent
Routine discharge (home/self care)	14,068	44.7	8576	55.6
Home health	4,766	15.1	230	0.0
Skilled nursing facility (SNF)	6,597	20.9	408	0.0
Inpatient-other	1,101	3.5	3381	38.3
Intermediate Care Facility	293	0.9	49	2.5
Rehab	2,664	8.5	77	0.6
Other	2,015	6.4	892	3.7
Total	31,504	100.0	13613	100.0

**Table 51: Primary Payer and Charges for Non-Fatal Inpatient Stroke, Kentucky, 2014**

Payer	Number of Discharges	Percent of Discharges	Total Hospital Discharges
Government	23117	73.4	\$ 972,985,897
Commercial Ins	5260	16.7	\$ 282,069,316
Workers Compensation	43	0.1	\$ 2,391,001
Self Pay	338	1.1	\$ 15,520,059
Other	2746	8.7	\$ 183,491,317
Total	31,504	100.0	\$1,456,457,590

**Table 52: Primary Payer and Charges for Non-Fatal ED Stroke, Kentucky, 2014**

Payer	Number of Discharges	Percent of Discharges	Total Hospital Discharges
Government	9216	67.7	\$ 77,441,781
Commercial Ins	2527	18.6	\$ 23,168,651
Workers Compensation	20	0.1	\$ 123,856
Self Pay	313	2.3	\$ 2,270,381
Other	1539	11.3	\$ 13,113,453
Total	13,615	100.0	\$116,118,122

**Table 53: Incidence of All Inpatient Stroke\* by County, Sorted by County, Kentucky, 2014**

**\*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	156	0.5	683.5	832.8	Grant	314	0.9	1347.3	1268.5	McLean	83	0.2	635.6	874.1
Allen	161	0.5	662.3	792.7	Graves	390	1.2	808.6	1041.4	Meade	137	0.4	484.4	469.0
Anderson	142	0.4	584.5	651.1	Grayson	279	0.8	870.0	1073.2	Menifee	56	0.2	650.2	890.6
Ballard	59	0.2	496.2	708.1	Green	92	0.3	591.2	822.9	Mercer	166	0.5	611.0	777.6
Barren	240	0.7	445.5	557.8	Greenup	214	0.6	416.7	586.0	Metcalfe	85	0.3	644.9	851.5
Bath	85	0.3	593.7	710.6	Hancock	63	0.2	630.5	725.2	Monroe	146	0.4	1035.6	1366.9
Bell	262	0.8	734.5	939.6	Hardin	647	1.9	617.7	598.0	Montgomery	174	0.5	573.4	638.5
Boone	979	2.9	932.2	786.7	Harlan	190	0.6	550.5	666.7	Morgan	95	0.3	609.1	710.0
Bourbon	171	0.5	709.0	855.1	Harrison	161	0.5	676.4	869.4	Muhlenberg	264	0.8	635.0	846.7
Boyd	352	1.1	539.4	720.0	Hart	162	0.5	748.2	872.2	Nelson	265	0.8	563.9	595.0
Boyle	239	0.7	632.5	823.8	Henderson	271	0.8	501.6	584.7	Nicholas	63	0.2	687.0	895.0
Bracken	92	0.3	913.6	1093.2	Henry	113	0.3	584.6	731.6	Ohio	173	0.5	548.8	721.2
Breathitt	150	0.5	966.9	1107.4	Hickman	29	0.1	341.4	611.2	Oldham	261	0.8	476.8	418.5
Breckinridge	194	0.6	784.5	968.1	Hopkins	329	1.0	539.2	705.5	Owen	56	0.2	427.6	525.2
Bullitt	409	1.2	537.4	532.2	Jackson	127	0.4	806.1	945.9	Owsley	56	0.2	901.0	1203.3
Butler	86	0.3	525.3	672.2	Jefferson	5736	17.3	663.6	757.9	Pendleton	139	0.4	846.1	954.0
Caldwell	75	0.2	418.0	584.9	Jessamine	319	1.0	617.6	635.8	Perry	399	1.2	1202.9	1424.5
Calloway	234	0.7	528.6	621.4	Johnson	240	0.7	829.3	1023.5	Pike	593	1.8	762.4	935.6
Campbell	824	2.5	820.2	905.6	Kenton	1484	4.5	900.7	909.6	Powell	131	0.4	911.4	1048.5
Carlisle	58	0.2	744.4	1159.8	Knott	149	0.4	780.9	932.7	Pulaski	594	1.8	721.5	929.5
Carroll	87	0.3	705.2	794.3	Knox	219	0.7	586.4	688.9	Robertson	11	0.0	300.2	492.2
Carter	183	0.6	577.4	672.7	Larue	132	0.4	710.0	938.6	Rockcastle	139	0.4	725.3	832.7
Casey	125	0.4	612.5	778.0	Laurel	518	1.6	789.5	869.7	Rowan	174	0.5	730.7	739.6
Christian	159	0.5	246.1	214.4	Lawrence	112	0.3	607.8	706.4	Russell	130	0.4	570.0	732.3
Clark	337	1.0	759.1	946.3	Lee	86	0.3	970.2	1184.6	Scott	288	0.9	662.0	576.6
Clay	249	0.7	1113.8	1165.5	Leslie	139	0.4	1015.5	1261.5	Shelby	248	0.7	541.8	560.9
Clinton	72	0.2	533.7	709.6	Letcher	292	0.9	978.0	1236.3	Simpson	108	0.3	509.4	607.0
Crittenden	88	0.3	681.6	950.8	Lewis	55	0.2	311.8	398.4	Spencer	93	0.3	580.9	527.3
Cumberland	71	0.2	729.5	1045.8	Lincoln	196	0.6	654.2	804.3	Taylor	289	0.9	925.1	1172.5
Daviess	765	2.3	627.9	778.9	Livingston	108	0.3	802.4	1154.0	Todd	36	0.1	248.8	287.9
Edmonson	82	0.2	487.6	679.8	Logan	191	0.6	582.1	710.7	Trigg	54	0.2	244.4	377.8
Elliott	36	0.1	343.3	471.4	Lyon	70	0.2	539.5	828.3	Trimble	48	0.1	460.2	544.5
Estill	154	0.5	871.3	1063.0	Madison	448	1.3	527.2	523.4	Union	42	0.1	238.5	279.5
Fayette	1855	5.6	635.2	601.4	Magoffin	138	0.4	983.7	1065.6	Warren	747	2.2	658.4	631.1
Fleming	169	0.5	1002.2	1164.9	Marion	91	0.3	402.5	454.0	Washington	78	0.2	516.7	656.8
Floyd	403	1.2	880.2	1040.6	Marshall	287	0.9	626.7	922.6	Wayne	141	0.4	520.0	681.9
Franklin	341	1.0	558.9	686.8	Martin	95	0.3	719.0	751.2	Webster	98	0.3	590.6	728.5
Fulton	56	0.2	616.2	877.1	Mason	141	0.4	646.5	816.1	Whitley	499	1.5	1210.1	1395.2
Gallatin	106	0.3	1303.6	1250.9	McCracken	648	2.0	721.9	991.2	Wolfe	78	0.2	879.7	1076.2
Garrard	135	0.4	669.8	798.1	McCreary	119	0.4	620.5	661.5	Woodford	137	0.4	465.9	542.0

\*\*Rate per 100,000

**Table 54: Incidence of All ED Stroke\* by County, Sorted by County, Kentucky, 2014**

**\*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	104	0.8	473.7	555.2	Grant	179	1.3	738.5	723.1	McLean	57	0.4	443.4	600.3
Allen	40	0.3	169.8	196.9	Graves	122	0.9	264.1	325.8	Meade	35	0.3	120.0	119.8
Anderson	48	0.4	205.8	220.1	Grayson	109	0.8	357.3	419.3	Menifee	21	0.2	253.1	334.0
Ballard	11	0.1	102.8	132.0	Green	69	0.5	470.5	617.2	Mercer	91	0.7	339.8	426.2
Barren	143	1.0	270.1	332.3	Greenup	118	0.9	237.4	323.1	Metcalfe	44	0.3	343.3	440.7
Bath	55	0.4	415.4	459.8	Hancock	38	0.3	388.7	437.4	Monroe	52	0.4	346.6	486.8
Bell	153	1.1	433.2	548.7	Hardin	183	1.3	170.3	169.1	Montgomery	126	0.9	415.1	462.4
Boone	346	2.5	326.6	278.0	Harlan	93	0.7	267.2	326.3	Morgan	46	0.3	293.5	343.8
Bourbon	81	0.6	337.1	405.0	Harrison	139	1.0	593.6	750.6	Muhlenberg	146	1.1	369.6	468.3
Boyd	215	1.6	337.0	439.8	Hart	88	0.6	414.7	473.8	Nelson	176	1.3	385.2	395.2
Boyle	112	0.8	305.9	386.0	Henderson	160	1.2	288.8	345.2	Nicholas	30	0.2	339.5	426.2
Bracken	30	0.2	302.0	356.5	Henry	56	0.4	307.2	362.6	Ohio	95	0.7	318.1	396.0
Breathitt	70	0.5	454.6	516.8	Hickman	15	0.1	200.2	316.1	Oldham	77	0.6	134.7	123.5
Breckinridge	69	0.5	273.9	344.3	Hopkins	239	1.7	413.6	512.5	Owen	29	0.2	239.5	272.0
Bullitt	126	0.9	159.0	163.9	Jackson	51	0.4	337.0	379.8	Owsley	19	0.1	315.8	408.3
Butler	13	0.1	83.7	101.6	Jefferson	1537	11.2	180.4	203.1	Pendleton	57	0.4	355.4	391.2
Caldwell	56	0.4	329.0	436.7	Jessamine	107	0.8	203.7	213.3	Perry	146	1.1	452.9	521.2
Calloway	139	1.0	343.6	369.1	Johnson	120	0.9	443.9	511.7	Pike	191	1.4	245.9	301.4
Campbell	358	2.6	355.6	393.5	Kenton	618	4.5	371.2	378.8	Powell	52	0.4	377.3	416.2
Carlisle	21	0.2	276.6	419.9	Knott	52	0.4	263.9	325.5	Pulaski	146	1.1	182.1	228.5
Carroll	48	0.4	408.6	438.2	Knox	112	0.8	303.6	352.3	Robertson	11	0.1	342.4	492.2
Carter	99	0.7	304.0	363.9	Larue	33	0.2	181.1	234.6	Rockcastle	56	0.4	279.5	335.5
Casey	50	0.4	235.1	311.2	Laurel	211	1.5	328.6	354.2	Rowan	85	0.6	372.0	361.3
Christian	115	0.8	182.8	155.1	Lawrence	83	0.6	444.4	523.5	Russell	71	0.5	311.4	400.0
Clark	112	0.8	264.5	314.5	Lee	49	0.4	579.9	674.9	Scott	108	0.8	246.2	216.2
Clay	133	1.0	578.3	622.5	Leslie	78	0.6	568.1	707.9	Shelby	133	1.0	282.0	300.8
Clinton	39	0.3	291.8	384.4	Letcher	138	1.0	494.6	584.3	Simpson	52	0.4	264.1	292.3
Crittenden	34	0.2	272.2	367.4	Lewis	31	0.2	184.3	224.5	Spencer	26	0.2	151.0	147.4
Cumberland	54	0.4	607.5	795.4	Lincoln	87	0.6	298.9	357.0	Taylor	169	1.2	558.1	685.6
Daviess	656	4.8	554.6	667.9	Livingston	36	0.3	274.7	384.7	Todd	18	0.1	123.1	144.0
Edmonson	14	0.1	98.8	116.1	Logan	87	0.6	272.9	323.7	Trigg	96	0.7	486.5	671.7
Elliott	16	0.1	149.0	209.5	Lyon	35	0.3	270.6	414.2	Trimble	16	0.1	167.9	181.5
Estill	66	0.5	380.5	455.5	Madison	245	1.8	290.4	286.2	Union	54	0.4	314.9	359.3
Fayette	481	3.5	162.5	156.0	Magoffin	55	0.4	383.0	424.7	Warren	178	1.3	154.6	150.4
Fleming	94	0.7	530.3	647.9	Marion	67	0.5	299.4	334.2	Washington	47	0.3	312.8	395.8
Floyd	186	1.4	407.7	480.3	Marshall	110	0.8	246.9	353.6	Wayne	54	0.4	210.7	261.1
Franklin	156	1.1	261.0	314.2	Martin	42	0.3	301.5	332.1	Webster	47	0.3	271.1	349.4
Fulton	30	0.2	349.2	469.9	Mason	82	0.6	377.9	474.6	Whitley	151	1.1	372.7	422.2
Gallatin	46	0.3	565.1	542.8	McCracken	177	1.3	203.5	270.8	Wolfe	54	0.4	625.6	745.0
Garrard	52	0.4	261.1	307.4	McCreary	38	0.3	193.7	211.2	Woodford	54	0.4	190.1	213.7

\*\*Rate per 100,000

**Table 55: Incidence of All Inpatient Stroke\* by County, Sorted by Frequency, Kentucky, 2014**

**\*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	5736	17.3	663.6	757.9	Knox	219	0.7	586.4	688.9	Livingston	108	0.3	802.4	1154.0
Fayette	1855	5.6	635.2	601.4	Greenup	214	0.6	416.7	586.0	Simpson	108	0.3	509.4	607.0
Kenton	1484	4.5	900.7	909.6	Lincoln	196	0.6	654.2	804.3	Gallatin	106	0.3	1303.6	1250.9
Boone	979	2.9	932.2	786.7	Breckinridge	194	0.6	784.5	968.1	Webster	98	0.3	590.6	728.5
Campbell	824	2.5	820.2	905.6	Logan	191	0.6	582.1	710.7	Martin	95	0.3	719.0	751.2
Daviess	765	2.3	627.9	778.9	Harlan	190	0.6	550.5	666.7	Morgan	95	0.3	609.1	710.0
Warren	747	2.2	658.4	631.1	Carter	183	0.6	577.4	672.7	Spencer	93	0.3	580.9	527.3
McCracken	648	2.0	721.9	991.2	Montgomery	174	0.5	573.4	638.5	Bracken	92	0.3	913.6	1093.2
Hardin	647	1.9	617.7	598.0	Rowan	174	0.5	730.7	739.6	Green	92	0.3	591.2	822.9
Pulaski	594	1.8	721.5	929.5	Ohio	173	0.5	548.8	721.2	Marion	91	0.3	402.5	454.0
Pike	593	1.8	762.4	935.6	Bourbon	171	0.5	709.0	855.1	Crittenden	88	0.3	681.6	950.8
Laurel	518	1.6	789.5	869.7	Fleming	169	0.5	1002.2	1164.9	Carroll	87	0.3	705.2	794.3
Whitley	499	1.5	1210.1	1395.2	Mercer	166	0.5	611.0	777.6	Butler	86	0.3	525.3	672.2
Madison	448	1.3	527.2	523.4	Hart	162	0.5	748.2	872.2	Lee	86	0.3	970.2	1184.6
Bullitt	409	1.2	537.4	532.2	Allen	161	0.5	662.3	792.7	Bath	85	0.3	593.7	710.6
Floyd	403	1.2	880.2	1040.6	Harrison	161	0.5	676.4	869.4	Metcalfe	85	0.3	644.9	851.5
Perry	399	1.2	1202.9	1424.5	Christian	159	0.5	246.1	214.4	McLean	83	0.2	635.6	874.1
Graves	390	1.2	808.6	1041.4	Adair	156	0.5	683.5	832.8	Edmonson	82	0.2	487.6	679.8
Boyd	352	1.1	539.4	720.0	Estill	154	0.5	871.3	1063.0	Washington	78	0.2	516.7	656.8
Franklin	341	1.0	558.9	686.8	Breathitt	150	0.5	966.9	1107.4	Wolfe	78	0.2	879.7	1076.2
Clark	337	1.0	759.1	946.3	Knott	149	0.4	780.9	932.7	Caldwell	75	0.2	418.0	584.9
Hopkins	329	1.0	539.2	705.5	Monroe	146	0.4	1035.6	1366.9	Clinton	72	0.2	533.7	709.6
Jessamine	319	1.0	617.6	635.8	Anderson	142	0.4	584.5	651.1	Cumberland	71	0.2	729.5	1045.8
Grant	314	0.9	1347.3	1268.5	Mason	141	0.4	646.5	816.1	Lyon	70	0.2	539.5	828.3
Letcher	292	0.9	978.0	1236.3	Wayne	141	0.4	520.0	681.9	Hancock	63	0.2	630.5	725.2
Taylor	289	0.9	925.1	1172.5	Leslie	139	0.4	1015.5	1261.5	Nicholas	63	0.2	687.0	895.0
Scott	288	0.9	662.0	576.6	Pendleton	139	0.4	846.1	954.0	Ballard	59	0.2	496.2	708.1
Marshall	287	0.9	626.7	922.6	Rockcastle	139	0.4	725.3	832.7	Carlisle	58	0.2	744.4	1159.8
Grayson	279	0.8	870.0	1073.2	Magoffin	138	0.4	983.7	1065.6	Fulton	56	0.2	616.2	877.1
Henderson	271	0.8	501.6	584.7	Meade	137	0.4	484.4	469.0	Menifee	56	0.2	650.2	890.6
Nelson	265	0.8	563.9	595.0	Woodford	137	0.4	465.9	542.0	Owen	56	0.2	427.6	525.2
Muhlenberg	264	0.8	635.0	846.7	Garrard	135	0.4	669.8	798.1	Owsley	56	0.2	901.0	1203.3
Bell	262	0.8	734.5	939.6	Larue	132	0.4	710.0	938.6	Lewis	55	0.2	311.8	398.4
Oldham	261	0.8	476.8	418.5	Powell	131	0.4	911.4	1048.5	Trigg	54	0.2	244.4	377.8
Clay	249	0.7	1113.8	1165.5	Russell	130	0.4	570.0	732.3	Trimble	48	0.1	460.2	544.5
Shelby	248	0.7	541.8	560.9	Jackson	127	0.4	806.1	945.9	Union	42	0.1	238.5	279.5
Barren	240	0.7	445.5	557.8	Casey	125	0.4	612.5	778.0	Elliott	36	0.1	343.3	471.4
Johnson	240	0.7	829.3	1023.5	McCreary	119	0.4	620.5	661.5	Todd	36	0.1	248.8	287.9
Boyle	239	0.7	632.5	823.8	Henry	113	0.3	584.6	731.6	Hickman	29	0.1	341.4	611.2
Calloway	234	0.7	528.6	621.4	Lawrence	112	0.3	607.8	706.4	Robertson	11	0.0	300.2	492.2

\* At least one but fewer than five

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

\*\*Rate per 100,000

**Table 56: Incidence of All ED Stroke\* by County, Sorted by Frequency, Kentucky, 2014**

**\*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	1537	11.2	180.4	203.1	Marshall	110	0.8	246.9	353.6	Simpson	52	0.4	264.1	292.3
Daviess	656	4.8	554.6	667.9	Grayson	109	0.8	357.3	419.3	Knott	52	0.4	263.9	325.5
Kenton	618	4.5	371.2	378.8	Scott	108	0.8	246.2	216.2	Garrard	52	0.4	261.1	307.4
Fayette	481	3.5	162.5	156.0	Jessamine	107	0.8	203.7	213.3	Jackson	51	0.4	337.0	379.8
Campbell	358	2.6	355.6	393.5	Adair	104	0.8	473.7	555.2	Casey	50	0.4	235.1	311.2
Boone	346	2.5	326.6	278.0	Carter	99	0.7	304.0	363.9	Lee	49	0.4	579.9	674.9
Madison	245	1.8	290.4	286.2	Trigg	96	0.7	486.5	671.7	Carroll	48	0.4	408.6	438.2
Hopkins	239	1.7	413.6	512.5	Ohio	95	0.7	318.1	396.0	Anderson	48	0.4	205.8	220.1
Boyd	215	1.6	337.0	439.8	Fleming	94	0.7	530.3	647.9	Washington	47	0.3	312.8	395.8
Laurel	211	1.5	328.6	354.2	Harlan	93	0.7	267.2	326.3	Webster	47	0.3	271.1	349.4
Pike	191	1.4	245.9	301.4	Mercer	91	0.7	339.8	426.2	Gallatin	46	0.3	565.1	542.8
Floyd	186	1.4	407.7	480.3	Hart	88	0.6	414.7	473.8	Morgan	46	0.3	293.5	343.8
Hardin	183	1.3	170.3	169.1	Lincoln	87	0.6	298.9	357.0	Metcalf	44	0.3	343.3	440.7
Grant	179	1.3	738.5	723.1	Logan	87	0.6	272.9	323.7	Martin	42	0.3	301.5	332.1
Warren	178	1.3	154.6	150.4	Rowan	85	0.6	372.0	361.3	Allen	40	0.3	169.8	196.9
McCracken	177	1.3	203.5	270.8	Lawrence	83	0.6	444.4	523.5	Clinton	39	0.3	291.8	384.4
Nelson	176	1.3	385.2	395.2	Mason	82	0.6	377.9	474.6	Hancock	38	0.3	388.7	437.4
Taylor	169	1.2	558.1	685.6	Bourbon	81	0.6	337.1	405.0	McCreary	38	0.3	193.7	211.2
Henderson	160	1.2	288.8	345.2	Leslie	78	0.6	568.1	707.9	Livingston	36	0.3	274.7	384.7
Franklin	156	1.1	261.0	314.2	Oldham	77	0.6	134.7	123.5	Lyon	35	0.3	270.6	414.2
Bell	153	1.1	433.2	548.7	Russell	71	0.5	311.4	400.0	Meade	35	0.3	120.0	119.8
Whitley	151	1.1	372.7	422.2	Breathitt	70	0.5	454.6	516.8	Crittenden	34	0.2	272.2	367.4
Perry	146	1.1	452.9	521.2	Green	69	0.5	470.5	617.2	Larue	33	0.2	181.1	234.6
Muhlenberg	146	1.1	369.6	468.3	Breckinridge	69	0.5	273.9	344.3	Lewis	31	0.2	184.3	224.5
Pulaski	146	1.1	182.1	228.5	Marion	67	0.5	299.4	334.2	Fulton	30	0.2	349.2	469.9
Barren	143	1.0	270.1	332.3	Estill	66	0.5	380.5	455.5	Nicholas	30	0.2	339.5	426.2
Harrison	139	1.0	593.6	750.6	McLean	57	0.4	443.4	600.3	Bracken	30	0.2	302.0	356.5
Calloway	139	1.0	343.6	369.1	Pendleton	57	0.4	355.4	391.2	Owen	29	0.2	239.5	272.0
Letcher	138	1.0	494.6	584.3	Caldwell	56	0.4	329.0	436.7	Spencer	26	0.2	151.0	147.4
Clay	133	1.0	578.3	622.5	Henry	56	0.4	307.2	362.6	Carlisle	21	0.2	276.6	419.9
Shelby	133	1.0	282.0	300.8	Rockcastle	56	0.4	279.5	335.5	Menifee	21	0.2	253.1	334.0
Montgomery	126	0.9	415.1	462.4	Bath	55	0.4	415.4	459.8	Owsley	19	0.1	315.8	408.3
Bullitt	126	0.9	159.0	163.9	Magoffin	55	0.4	383.0	424.7	Todd	18	0.1	123.1	144.0
Graves	122	0.9	264.1	325.8	Wolfe	54	0.4	625.6	745.0	Trimble	16	0.1	167.9	181.5
Johnson	120	0.9	443.9	511.7	Cumberland	54	0.4	607.5	795.4	Elliott	16	0.1	149.0	209.5
Greenup	118	0.9	237.4	323.1	Union	54	0.4	314.9	359.3	Hickman	15	0.1	200.2	316.1
Christian	115	0.8	182.8	155.1	Wayne	54	0.4	210.7	261.1	Edmonson	14	0.1	98.8	116.1
Boyle	112	0.8	305.9	386.0	Woodford	54	0.4	190.1	213.7	Butler	13	0.1	83.7	101.6
Knox	112	0.8	303.6	352.3	Powell	52	0.4	377.3	416.2	Robertson	11	0.1	342.4	492.2
Clark	112	0.8	264.5	314.5	Monroe	52	0.4	346.6	486.8	Ballard	11	0.1	102.8	132.0

\* At least one but fewer than five

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

\*\*Rate per 100,000

## **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.

Crude incidence rates were calculated for each injury type by dividing the number of injuries by 4,369,356, 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 commonly use ICD-9 codes for injury coding. For death certificates, state and federal authorities use ICD-10 codes. The following ICD-9 diagnosis codes (n-codes) were used for identifying TBI in HDD:

- Fracture of vault or base of skull: 800.0-801.9
- Other, unqualified, and multiple fractures of skull: 803.0-804.9
- Intracranial injury, including concussion, cerebral laceration, subdural hemorrhage, unspecified intracranial injury, etc: 850.0-854.1
- Head injury, unspecified: 959.01

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-9 diagnosis codes, as follows:

- Anoxia: 348.1, 668.2, 669.4, 768.1, 768.5, 768.6, 768.9, 799.01, 994.1, 994.7, 997.0
- Allergy/Anaphylaxis: 995.0, 999.4, 999.5
- Acute Medical Clinical Incidents: 320.0-320.9, 321.0-321.8
- Toxic Substances: 964.2, 967.0-967.9, 968.0-968.9, 980.0-980.9, 985, 986, 988.0-988.2, 989.0, 995.4, 995.55, 998.0

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***

The CDC defines SCI by the following ICD-9 diagnosis codes (CDC, 1995):

- Fracture of vertebral column with spinal cord injury: 806.0-806.9
- Spinal cord injury without evidence of spinal bone injury: 952.0-952.9

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-9 diagnosis codes (n-codes) were used for identifying stroke cases in HDD:

- Hemorrhages (subarachnoid, intracerebral and other/unspecified): 430.0-432.9
- Occlusion (and stenosis) of cerebral and precerebral arteries: 433.0-434.9
- Transient cerebral ischemia: 435.0-435.9
- Acute, ill defined or late effects of cerebrovascular disease: 436.0-438.9

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.



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