

CENTRAL NERVOUS SYSTEM INJURY IN KENTUCKY

Emergency Department Visits and Hospitalizations 2012

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

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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 2012 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.

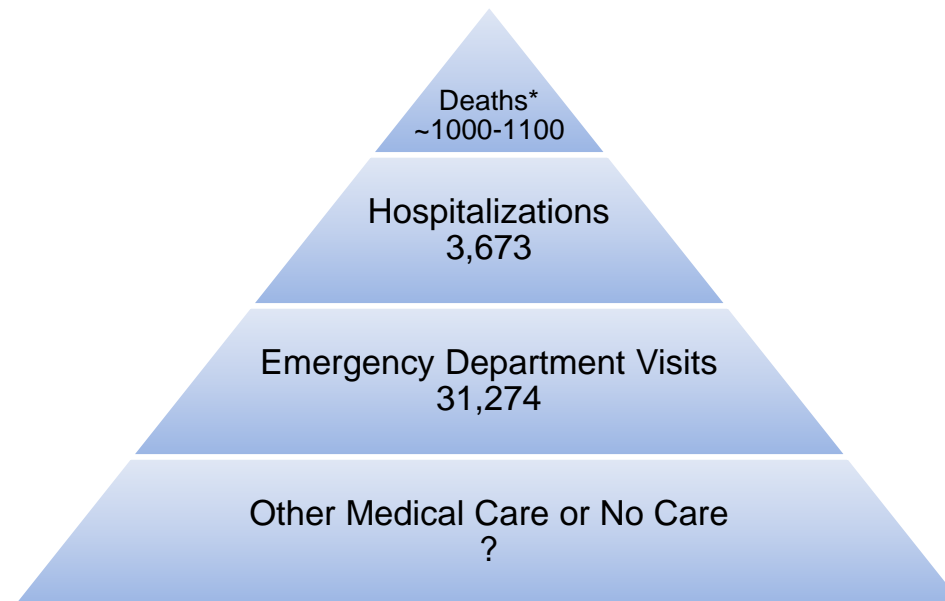
Contents and Organization

This report describes CNSI-related ED visits and hospitalizations in Kentucky for the calendar year 2012. 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 2012, 31,274 (89.5%) ED discharges (non-fatal) and 3,673 (10.5%) 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 1,100 range. The following figure is a pyramid depicting the estimated average annual number of TBI-related ED visits, hospitalizations, and estimated deaths in Kentucky for 2012. 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, 2012



*Data not currently available, will update

TBI in Kentucky, 2012:

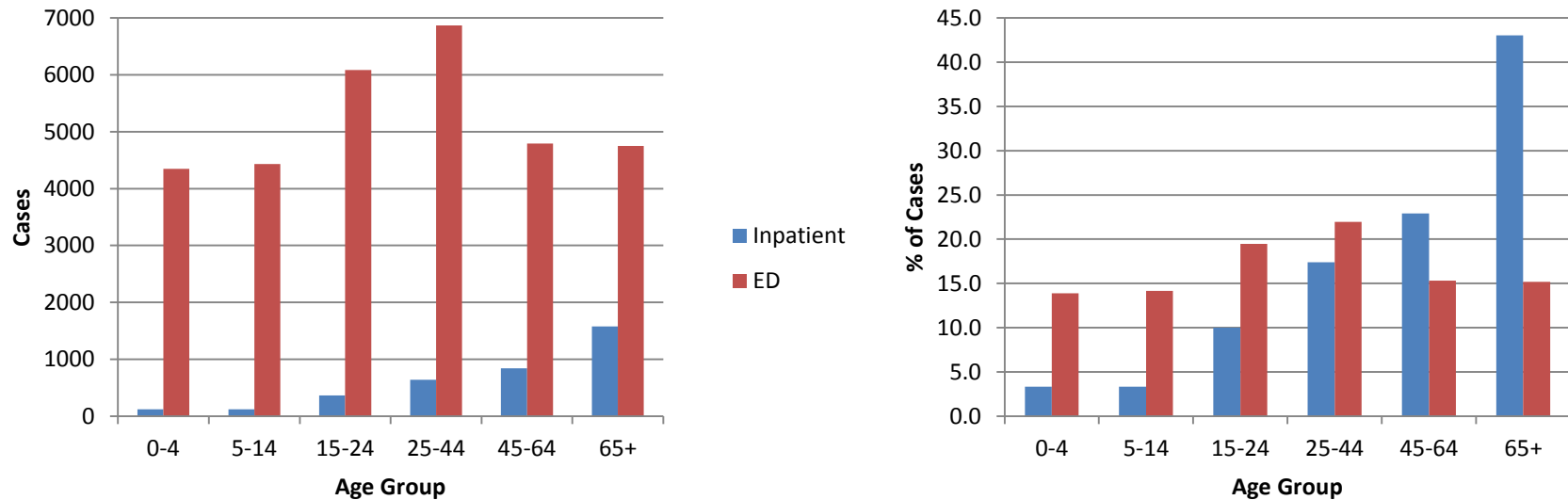
- Almost 35,000 people visited Kentucky hospitals with a TBI related injury. Of those, 31,274 were treated and released from an ED, 3,673 were hospitalized, and an estimated 1,100 died.
- 9,023 TBIs occurred among children ages 0 to 14 years; ED visits accounted for more than 97% of the TBIs in this 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 almost 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 96 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, 2012

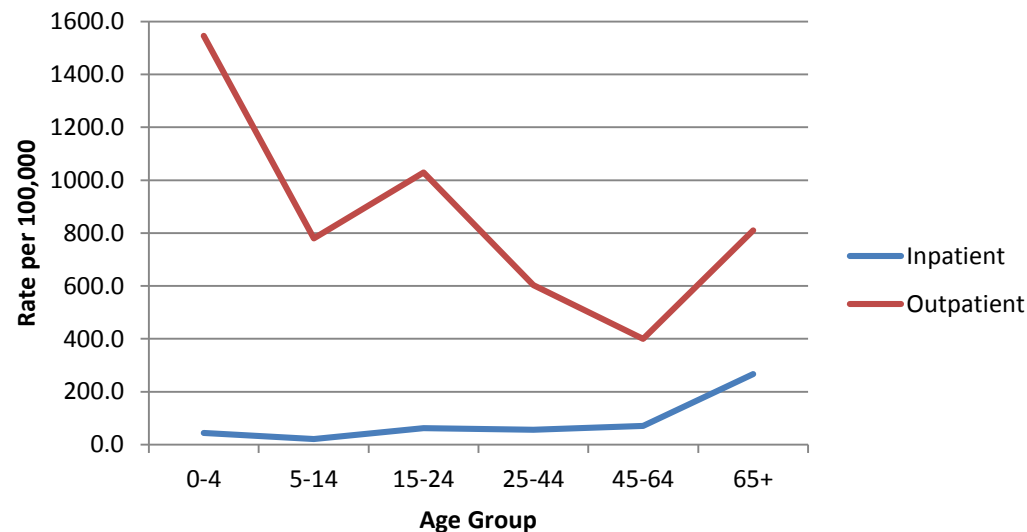


A non-fatal TBI related injury treated at a Kentucky hospital results in an *inpatient* admission for a quarter (25.0%) of older adults (65 and older) while 97.3% of TBI related injuries in children (under the age of 15) are treated and released in the ED.

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 2012. The y axis represents the rate per 100,000 population. During 2012, very young children ages 0 to 4 years had the highest rate of non-fatal TBI-related ED visits, 1,546 per 100,000 population, followed by older adolescents ages 15 to 24 years, 1,029 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 (267 per 100,000).

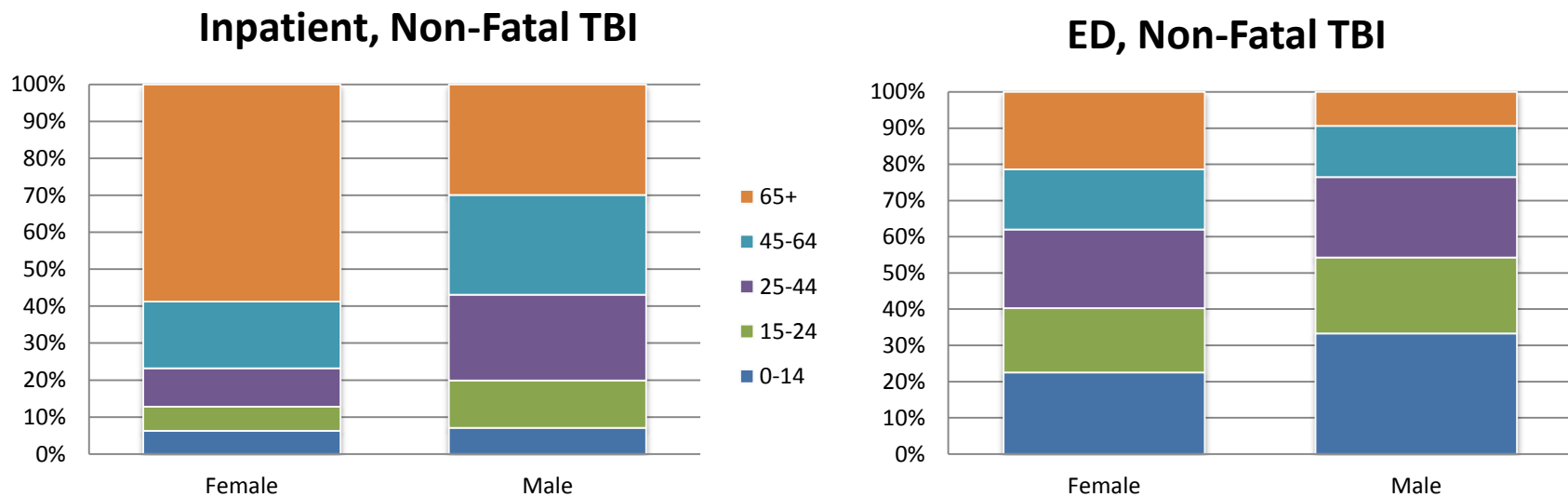
Figure 3: Rates of Traumatic Brain Injury-Related Emergency Department Visits and Hospitalizations, by Age Group, Kentucky, 2012



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 2012. Overall 18,128 non-fatal TBIs occurred among males compared with 16,817 among females.

Figure 4: Traumatic Brain Injury-Related Emergency Department Visits and Hospitalizations, by Age Group and Gender, Kentucky, 2012



Over half of female, non-fatal TBI related inpatient admissions were over the age of 64 while men over 64 made up less than 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, 1,757 per 100,000. Rates were also high for females from 0 to 4 years of age, 1,326 per 100,000. Both males and females had high rates for ages 65 and older inpatient visits, 235 per 100,000 for males and 292 per 100,000 for females.

Figure 5: Rates of Non-Fatal Traumatic Brain Injury-Related Emergency Department Visits and Hospitalizations, by Sex, Kentucky, 2012

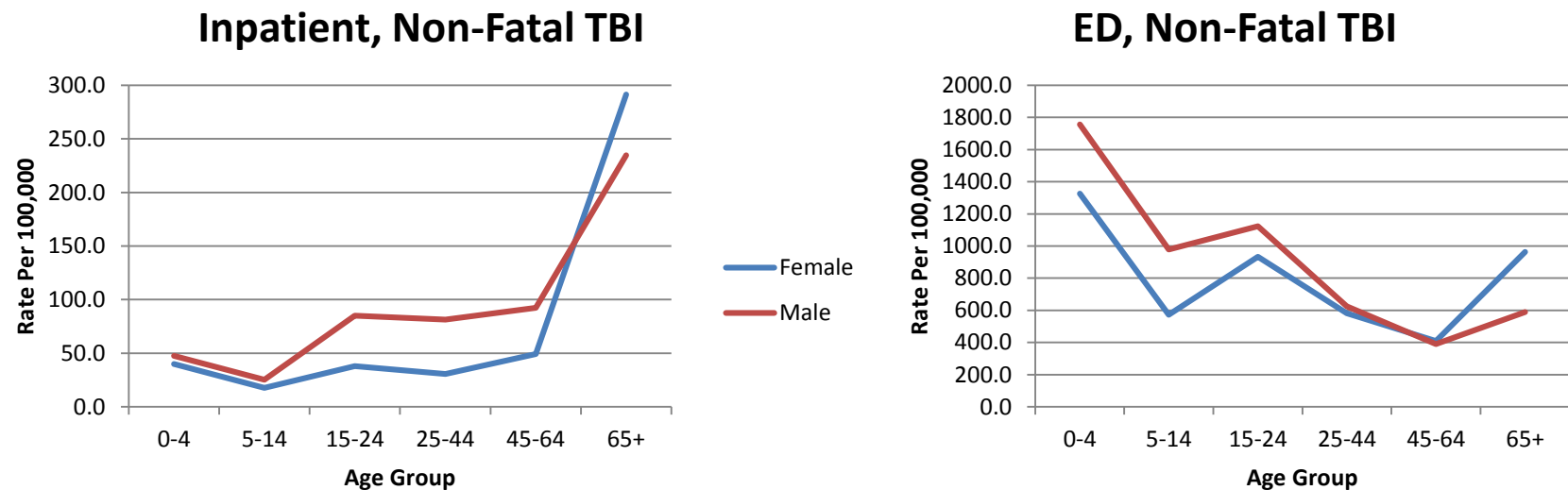
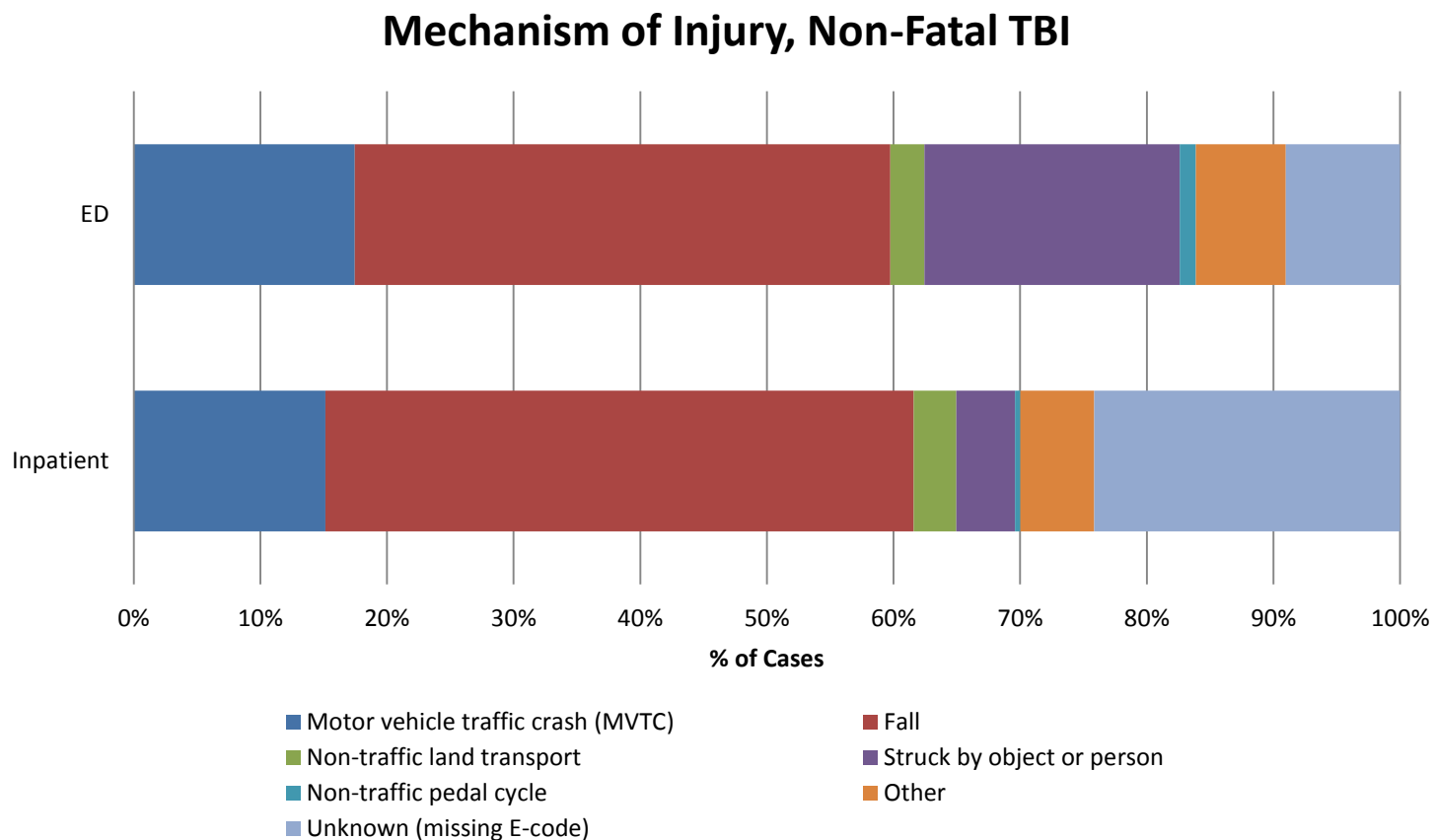


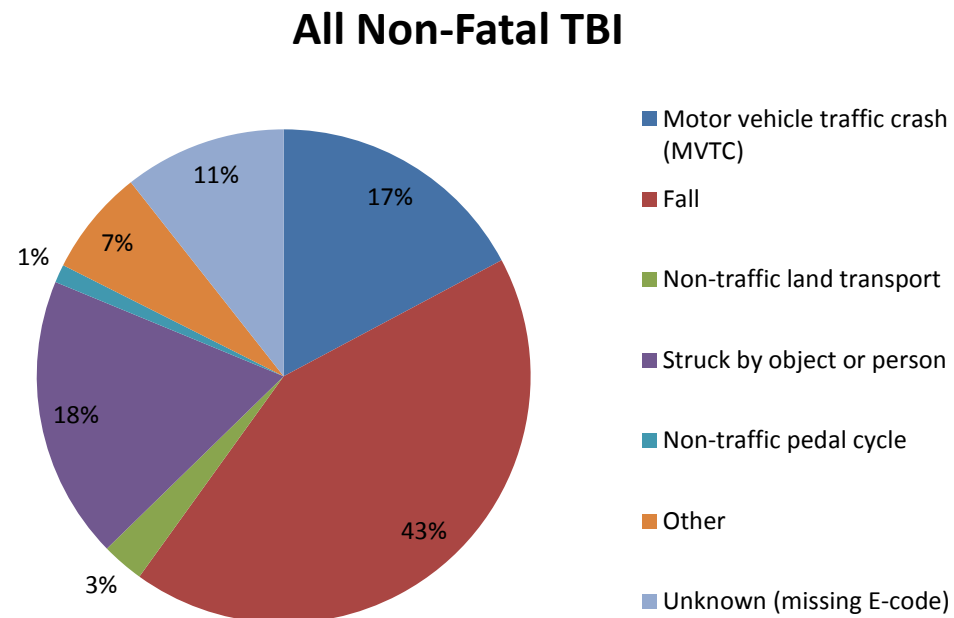
Figure 6: Non-Fatal Traumatic Brain Injury-Related Emergency Department Visits and Hospitalizations, Kentucky, 2012



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 40% of all non-fatal TBI in Kentucky in 2012. 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.

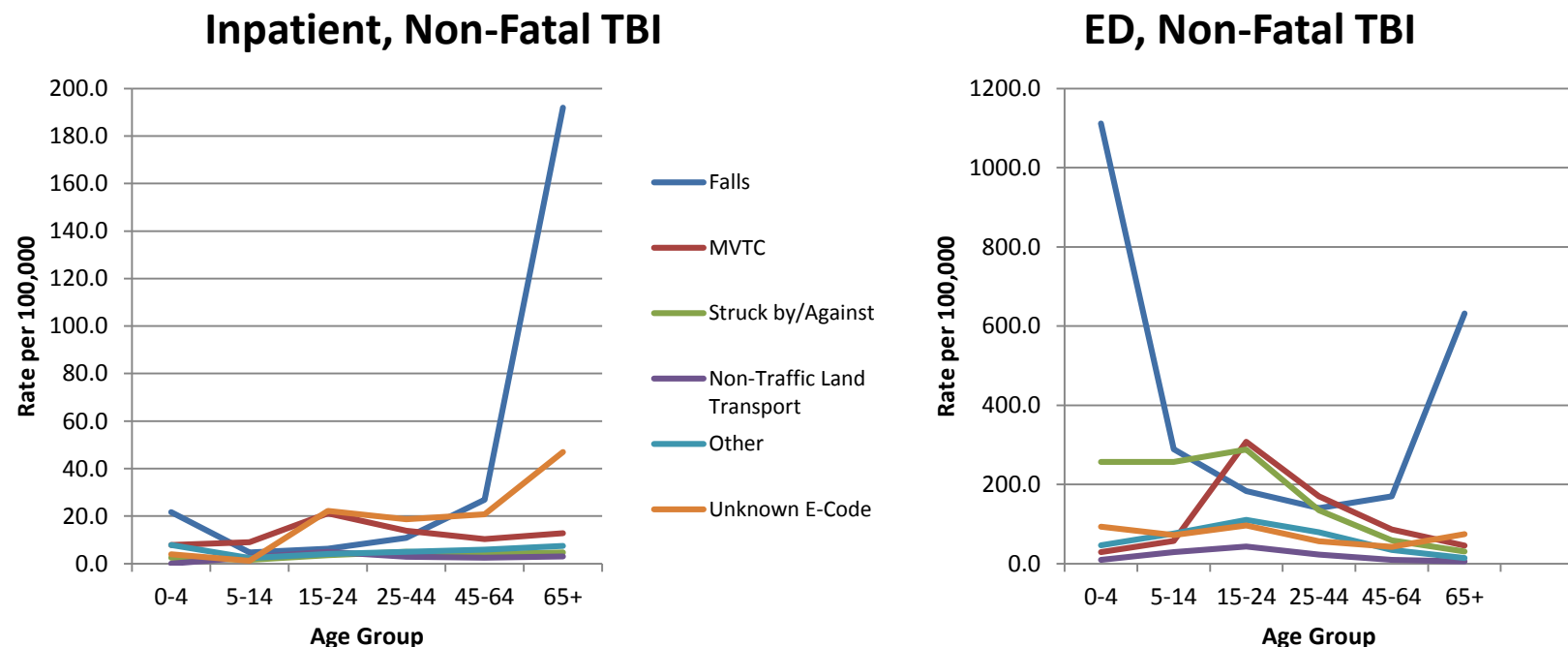
Figure 7: Percentage of Traumatic Brain Injury-Combined Emergency Department Visits and Hospitalizations, by External Cause, Kentucky, 2012



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 rate of fall-related TBI was highest among children 0 to 4 years and adults ages 65 years or older in both ED visits as well as inpatient admissions. 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.

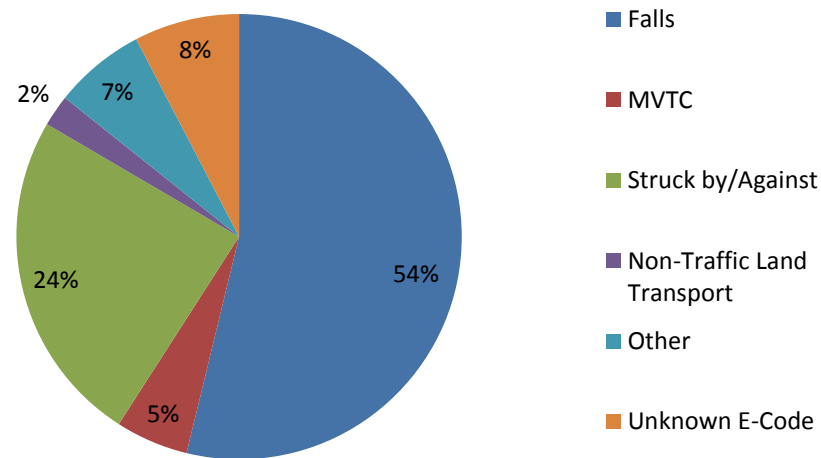
Figure 8: Rates of Non-Fatal Traumatic Brain Injury-Related Emergency Department Visits and Hospitalizations, by External Cause, Kentucky, 2012



TBI by External Cause: Comparing the Percentages by Age Groups

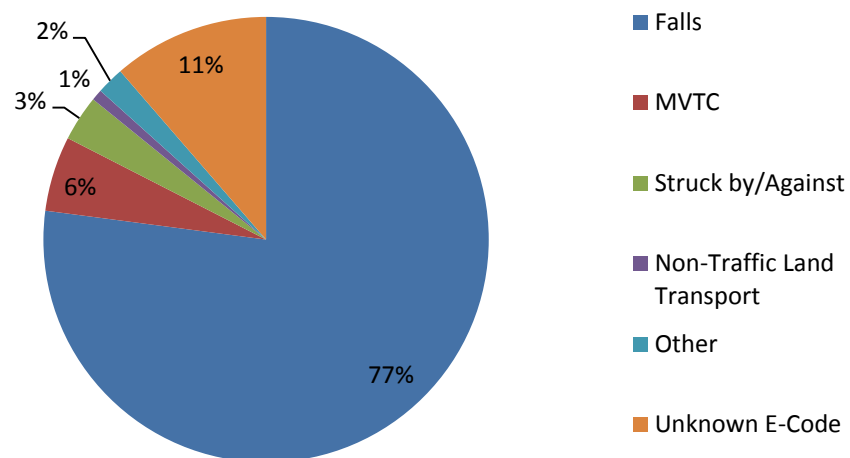
The following two figures depict the percentage of non-fatal TBI-related ED visits and hospitalizations by external cause for specific age groups. Figure 9 presents data for children ages 0 to 14 years. Figure 10 presents data for adults age 65 or older.

Figure 9: Percentage of Traumatic Brain Injury-Combined Emergency Department Visits and Hospitalizations Among Children 0 to 14 Years, by External Cause, Kentucky, 2012



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.

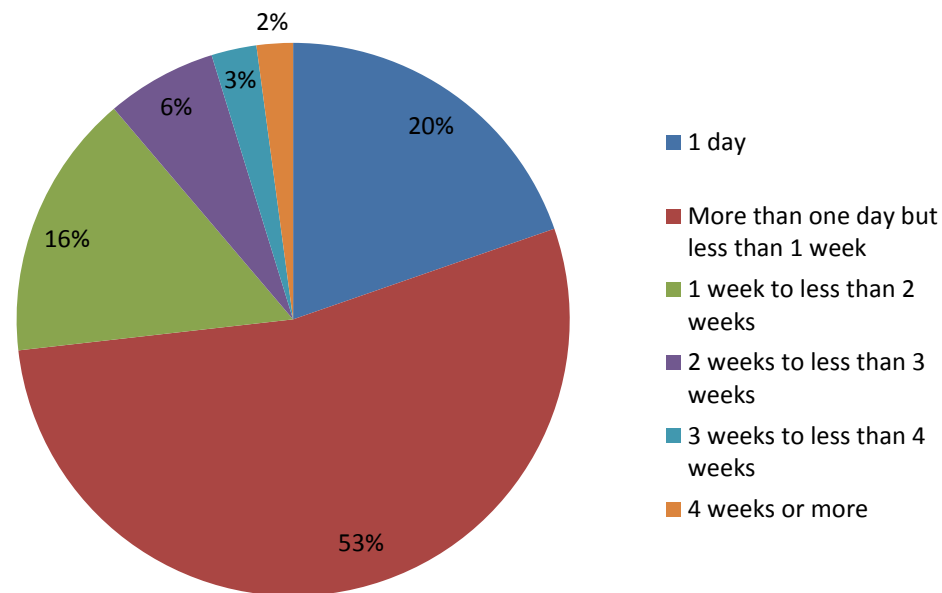
Figure 10: Percentage of Non-Fatal Traumatic Brain Injury-Combined Emergency Department Visits and Hospitalizations Among Older Adults 65 Years or Older, by External Cause, Kentucky, 2012



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 133 days. The mean LOS was 6.1 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, 2012



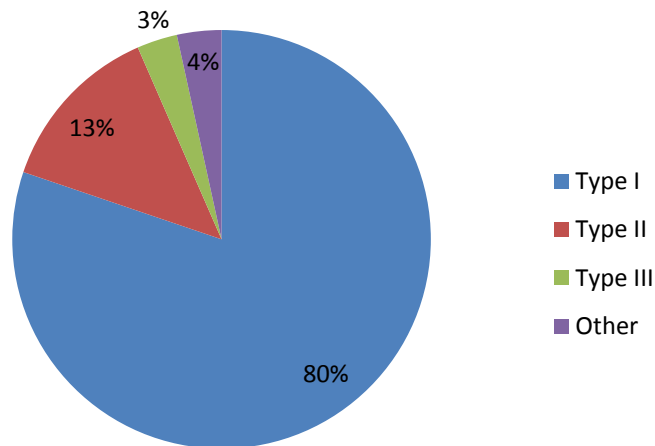
For non-fatal inpatient TBIs, 1,436 (43%) had a disposition other than “routine”. The three most frequent non-routine discharges were “skilled nursing facility”, “home health”, and “rehabilitation”. A total of 1,316 inpatient discharges had one of these three dispositions. ED discharges were nearly always (93%) 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). The definitions are as follows:

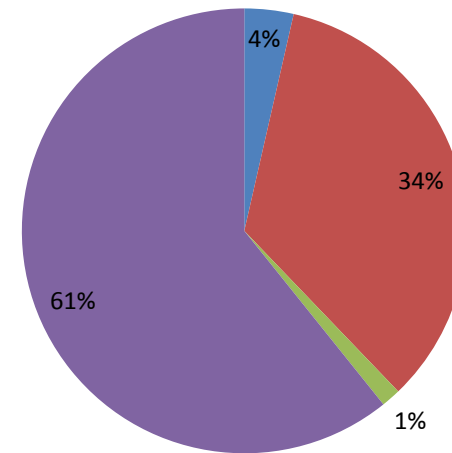
- A Type I TBI is one in which there is “recorded evidence of an intracranial injury or a moderate or a prolonged loss of consciousness (LOC), Shaken Infant Syndrome, or injuries to the optic nerve pathways.”
- A Type 2 TBI is one in which there is “no recorded evidence of intracranial injury, and LOC 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, 2012

Type of TBI, Inpatient, Non-Fatal TBI

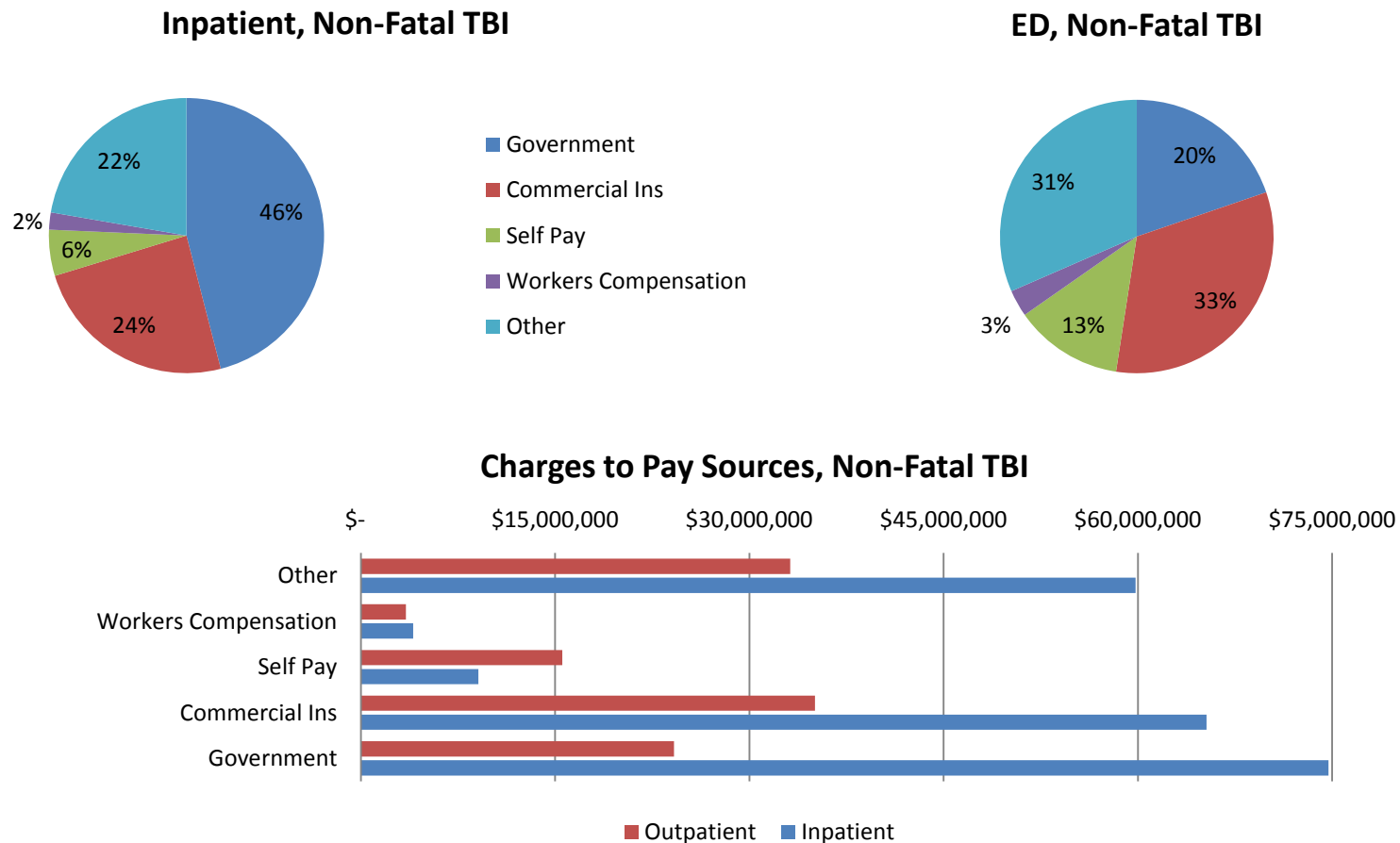


Type of TBI, Outpatient, Non-Fatal TBI



Government sources were the primary payers billed for inpatient care charges in 46% of non-fatal TBI. Commercial payers (33%) 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, 2012

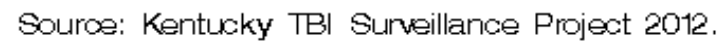


As one would expect, the incidence of TBI was highest in the larger counties. The top four in overall (inpatient and ED combined) TBI incidence (Jefferson, Fayette, Kenton and Hardin) are among the top most populous counties in Kentucky. A notable exception was Whitley county, which was 12th in TBI incidence but 30th in population. Unsurprisingly, Whitley County had the highest age-adjusted rate in the state. Clay, Jackson and Powell also stood out by being in the top 5 age-adjusted rate while ranking 52nd, 84th and 89th 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.*

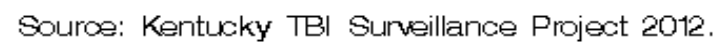
The following illustrations map both the frequency of TBI in Kentucky counties (Figures 14 and 15) as well as the age adjusted rate of TBI in each county (Figures 16 and 17) for inpatient and outpatient TBIs. It should be noted that these mappings include ALL inpatient TBI cases (Figures 14 and 16) as 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.

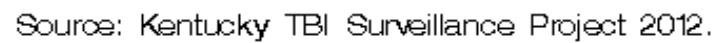
TBI Inpatient Cases by County, Kentucky 2012



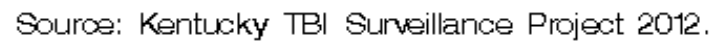
TBI ED Cases by County, Kentucky 2012



Age-Adjusted TBI Inpatient Rates by County, Kentucky 2012



Age-Adjusted TBI ED Rates by County, Kentucky 2012



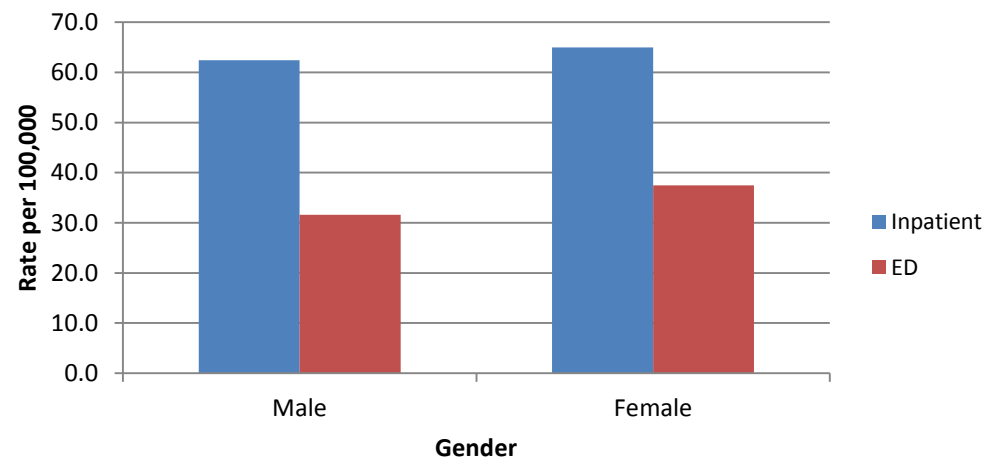
Acquired Brain Injury in Kentucky

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 4,295 non-fatal ABI cases for Kentucky residents identified in 2012. This includes both inpatient (2,784) and ED (1,511) cases. The crude incidence rate for 2012 was 98.3 per 100,000 population.

ABI by Sex: Comparing the Rates

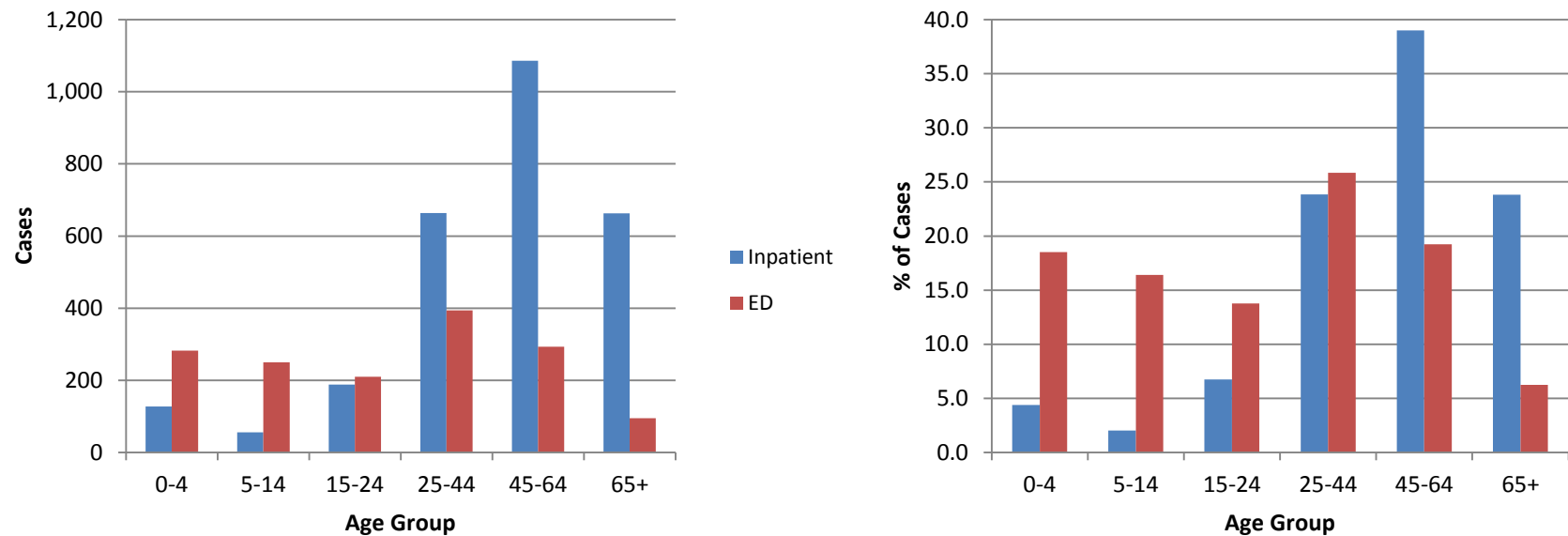
The following figure, **Figure 18**, is a graph depicting the rates of non-fatal ABI-related ED visits and hospitalizations by sex. The y axis represents the rate per 100,000 population. Rates were slightly higher for females in both ED and inpatient ABI cases.

Figure 18: Rates of Non-Fatal Acquired Brain Injury-Related Emergency Department Visits and Hospitalizations, by Gender, Kentucky, 2012



ABI by Age: Comparing the Numbers

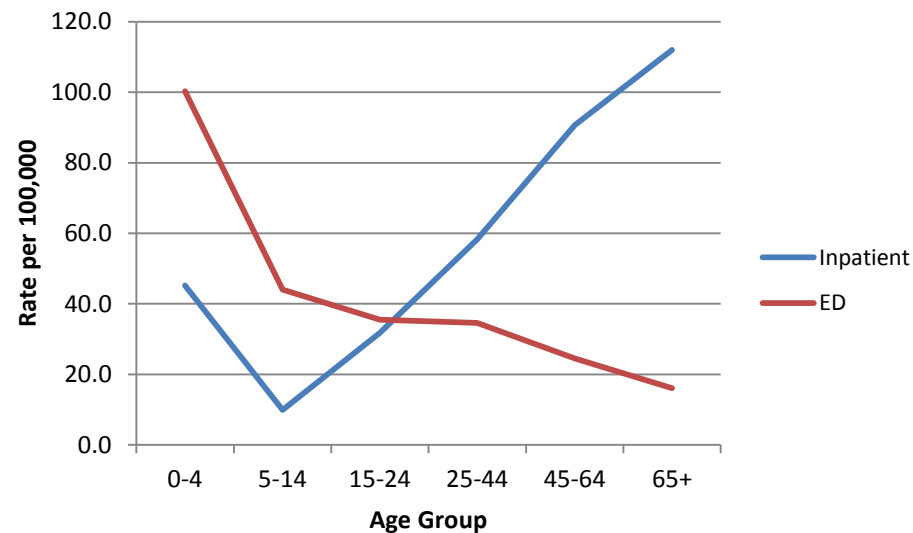
Figure 19: Numbers of Non-Fatal Acquired Brain Injury-Related Emergency Department Visits, and Hospitalizations, by Age Group, Kentucky, 2012



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 2012. The y axis represents the rate per 100,000 population. During 2012, very young children ages 0 to 4 years had the highest rate of non-fatal ABI-related ED visits, 100 per 100,000 population, followed by older children ages 5 to 14 years (44 per 100,000). The highest rates of non-fatal ABI-related hospitalization occurred among adults age 65 years or older (112 per 100,000).

Figure 20: Rates of Acquired Brain Injury-Related Emergency Department Visits and Hospitalizations, by Age Group, Kentucky, 2012



ABI by Age and Type: Comparing the Rates

Nearly all ABI (97% of inpatient and 83% of ED) were a result of either exposure to toxic substances (ETS) or anoxia. Nearly 6 out of 10 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, where as ETS affects persons 15 and older. 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, 2012

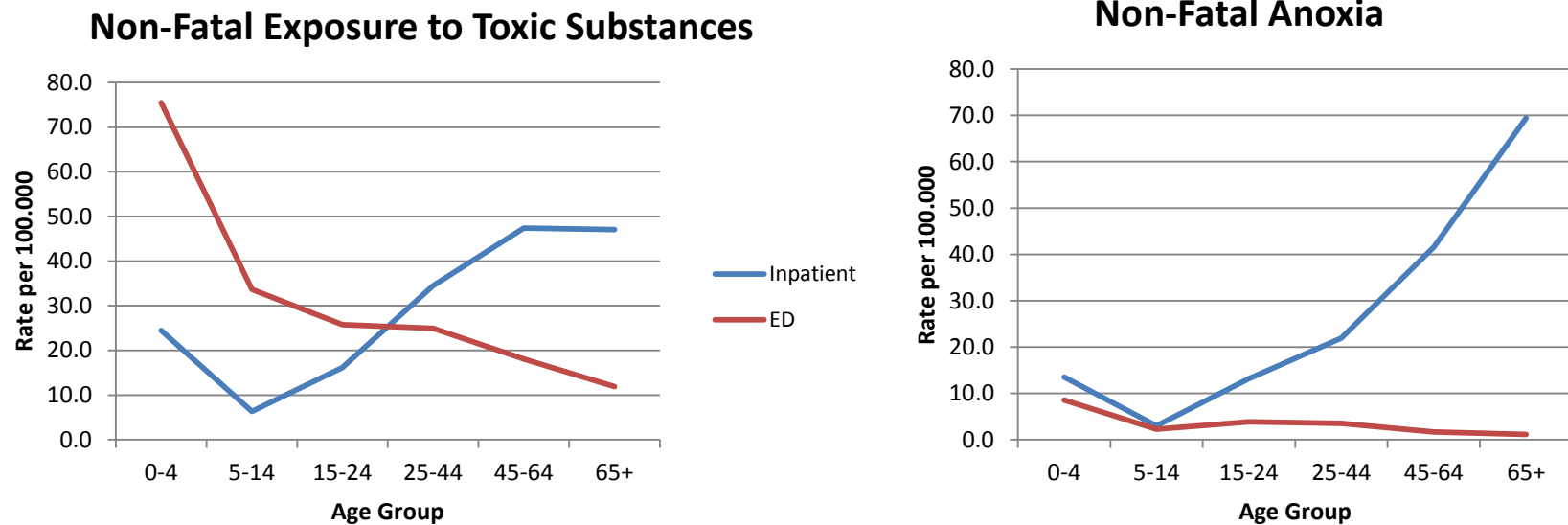
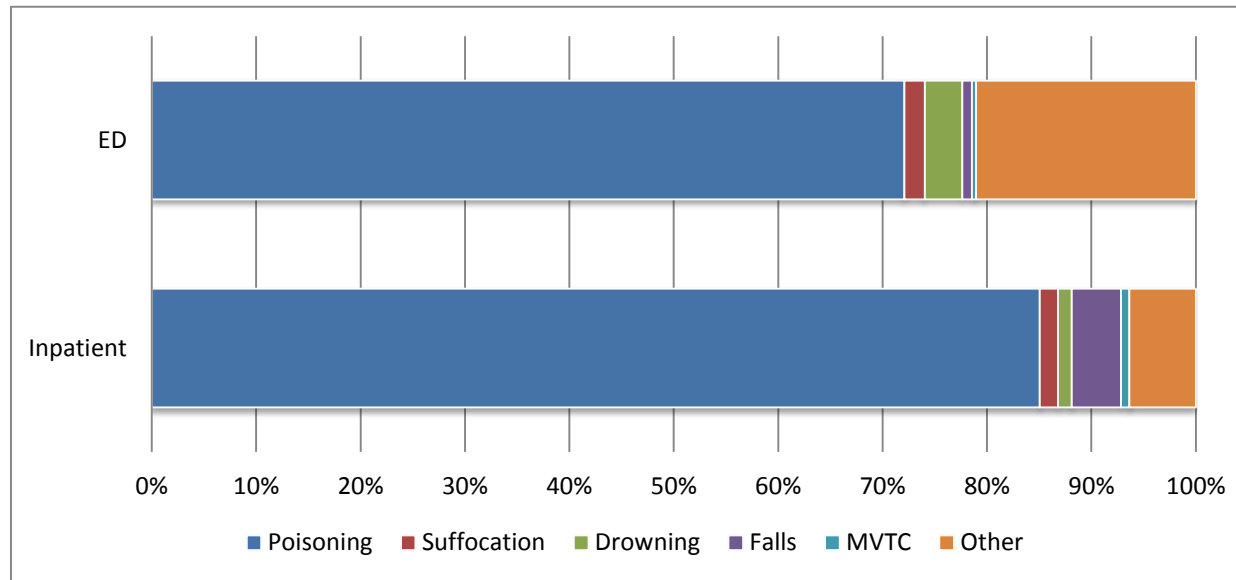


Figure 22: Non-Fatal Acquired Brain Injury-Related Emergency Department Visits and Hospitalizations by External Cause*, Kentucky, 2012



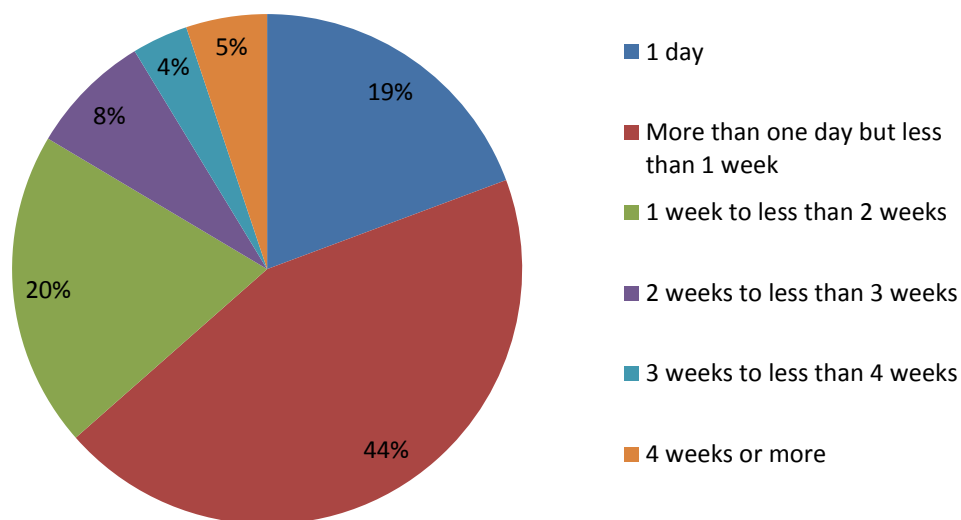
Among those ABI discharges that were reported to have some relationship with an injury (i.e. included an external cause of injury code), 85% of inpatient and 72% of ED cases were related to poisonings.

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. 59% of inpatient cases and 33% 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=2,784) ranged from 1 day to 464 days. The mean LOS was 8.6 days with a median LOS of 4 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, 2012

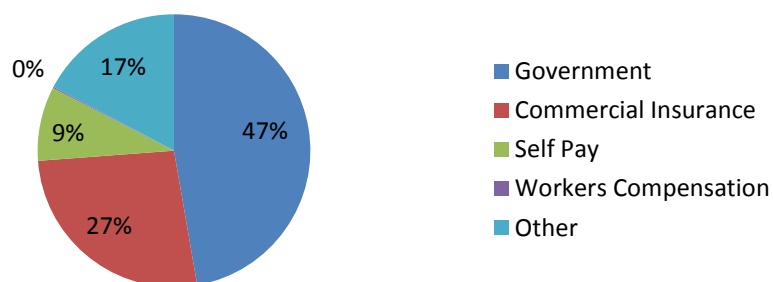


For non-fatal inpatient ABIs, 1,317 (47%) had a disposition other than “routine”. The three most frequent non-routine discharges were “skilled nursing facility”, “home health”, and “inpatient – other short term hospital”. A total of 680 inpatient discharges had one of these three dispositions. ED discharges were most likely (86%) routinely discharged to home or self care (routine) with “inpatient – other short term hospital” being the most frequent non-routine discharge.

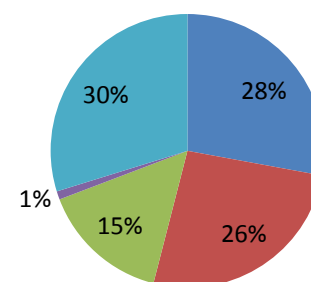
Government sources were the most often primary payers billed for inpatient (47%) while 28% of ED care charges were coded as government pay sources for non-fatal ABI. Please note that the amount billed by the hospital will generally be larger than the amount actually paid after adjudication of the claim.

Figure 24: Non-Fatal Acquired Brain Injury-Emergency Department and Hospitalizations, Payer Source and Charges, Kentucky, 2012

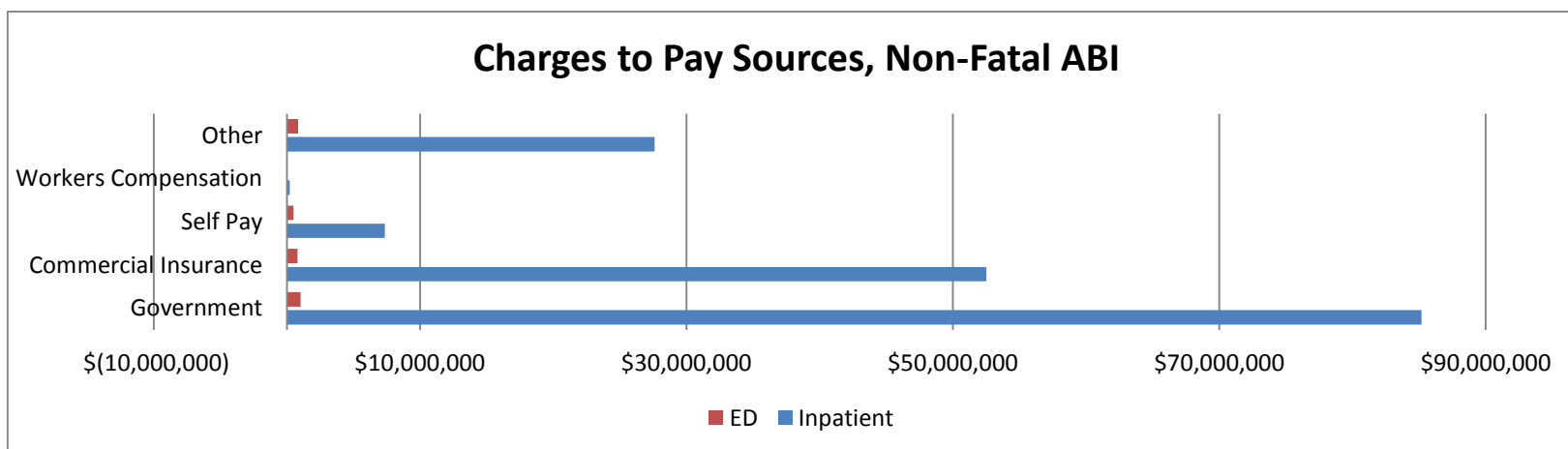
Inpatient, Non-Fatal ABI



ED, Non-Fatal ABI



Charges to Pay Sources, Non-Fatal ABI



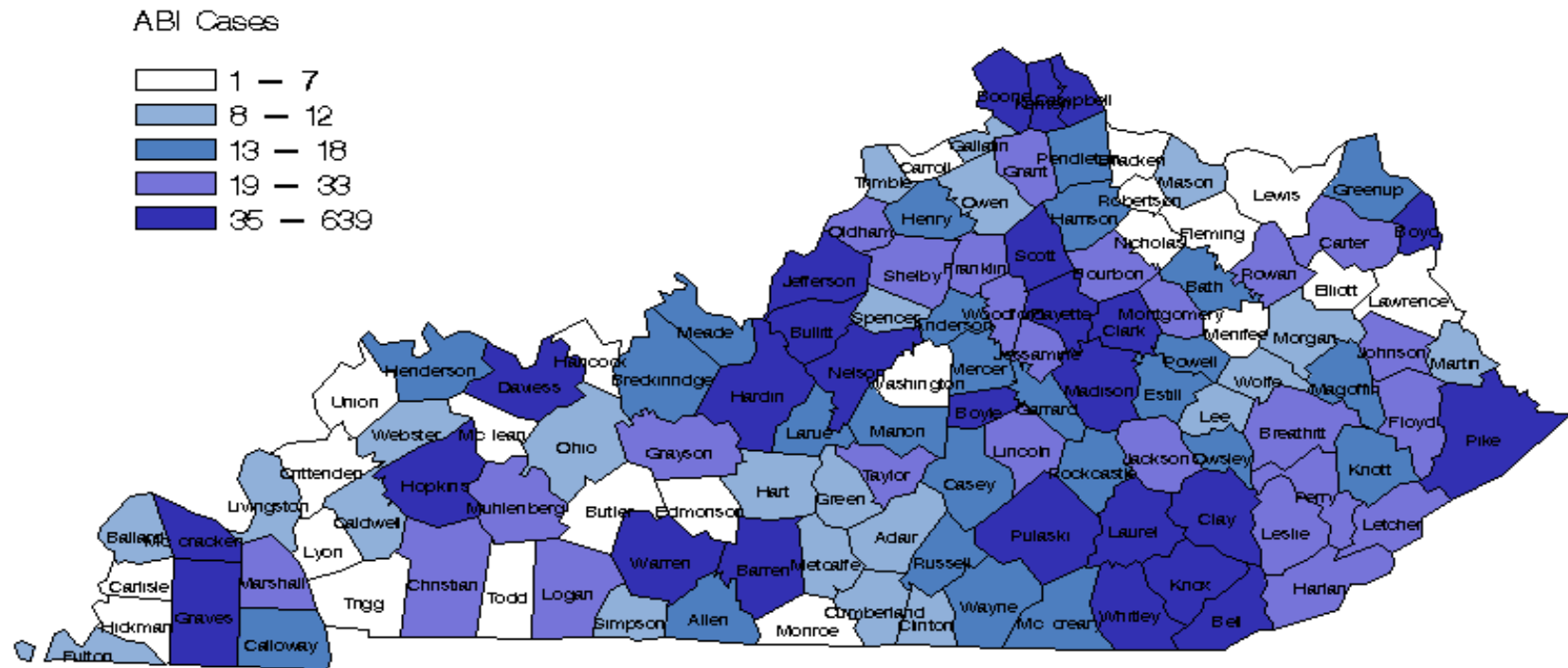
In general, as with TBI, the more populous counties had high numbers of stroke. However, the ten most populous counties did not appear in the top thirty counties when ranked by age-adjusted rate for inpatient cases. Only Jefferson County (ranked 1st in population and 27th in age adjusted rate) kept this from being true for non-fatal ED ABI cases. Owsley, which ranks 118th 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 114th county when ranked by population size. 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.

Source: Kentucky TBI Surveillance Project 2012.

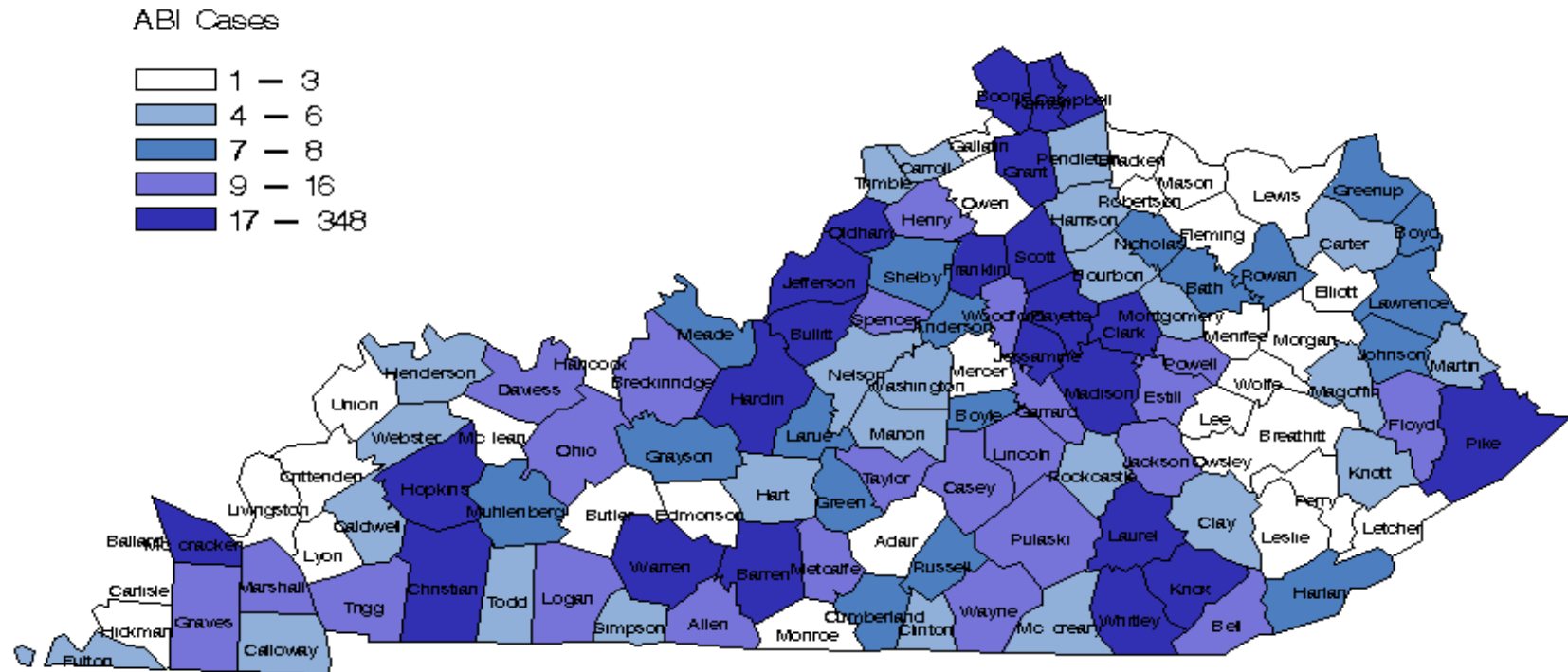
ABI Inpatient Cases by County, Kentucky 2012



Source: Kentucky TBI Surveillance Project 2012.

Figure 26.

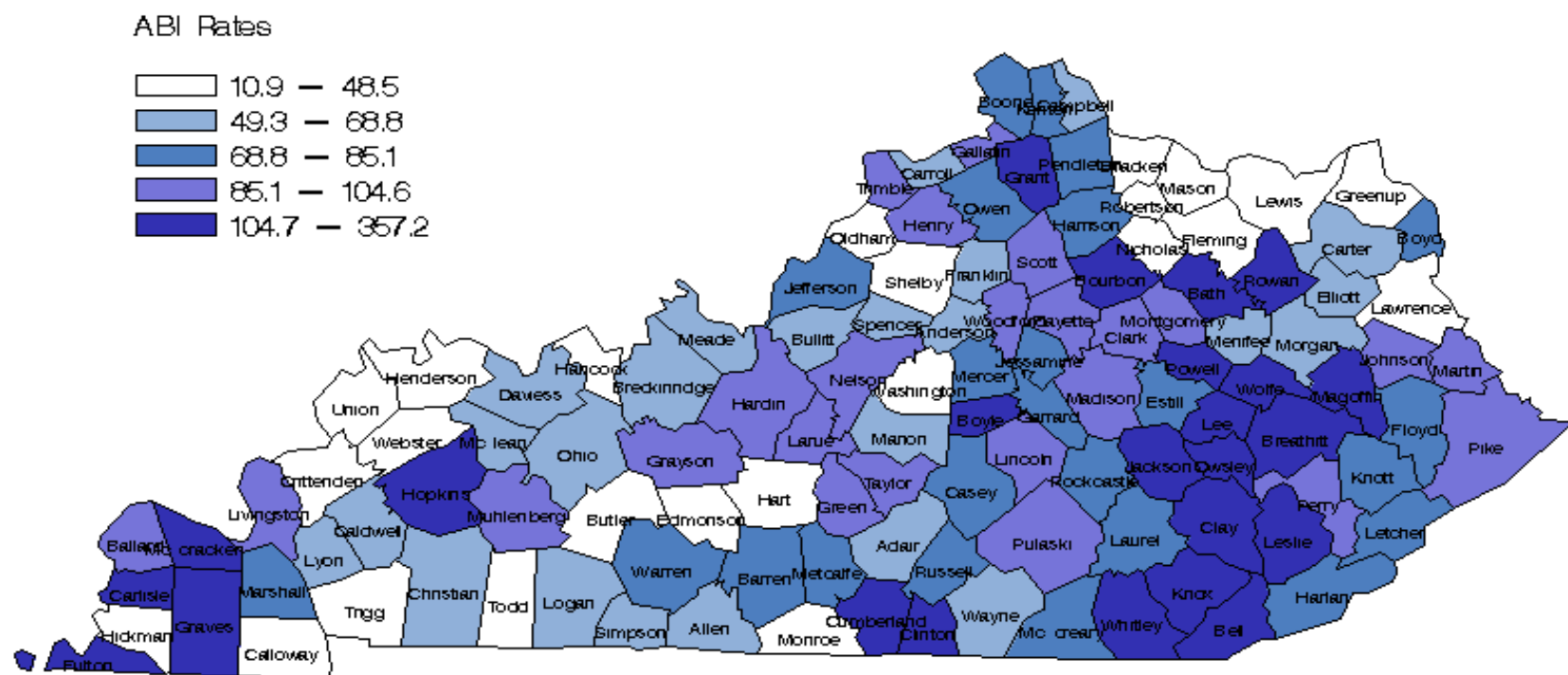
ABI ED Cases by County, Kentucky 2012



Source: Kentucky TBI Surveillance Project 2012.

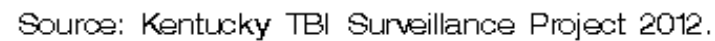
Figure 27.

Age-Adjusted ABI Inpatient Rates by County, Kentucky 2012



Source: Kentucky TBI Surveillance Project 2012.

Age-Adjusted ABI ED Rates by County, Kentucky 2012



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 191 non-fatal inpatient SCI cases for Kentucky residents identified in 2012 as well as 80 non-fatal ED cases. The crude incidence rate of any non-fatal SCI was 6.2 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, 2012

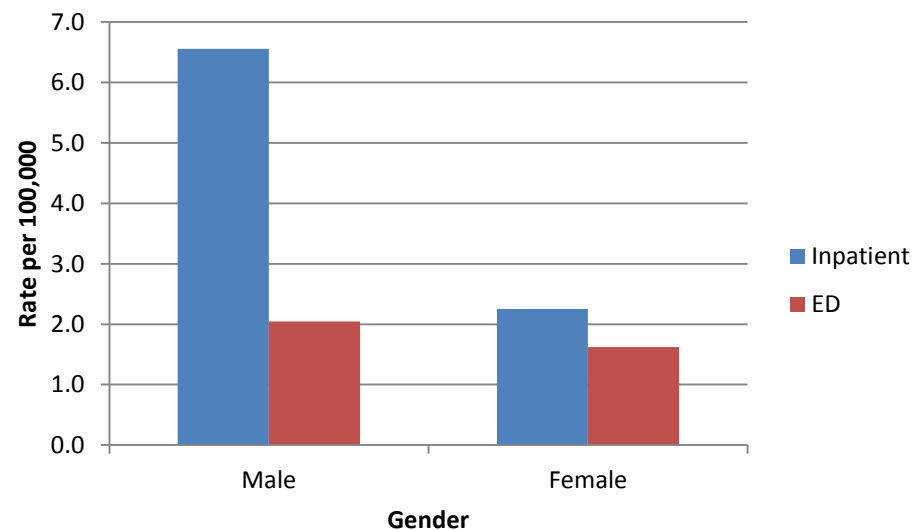
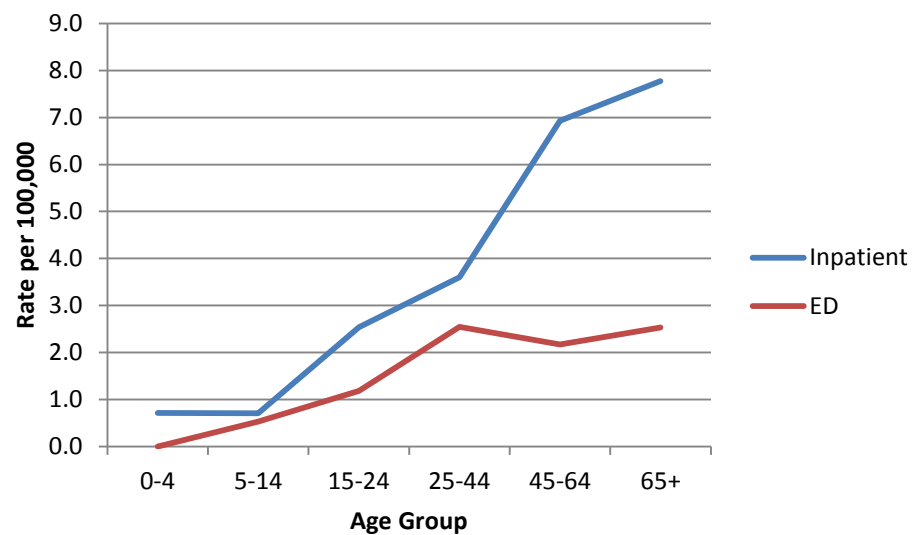
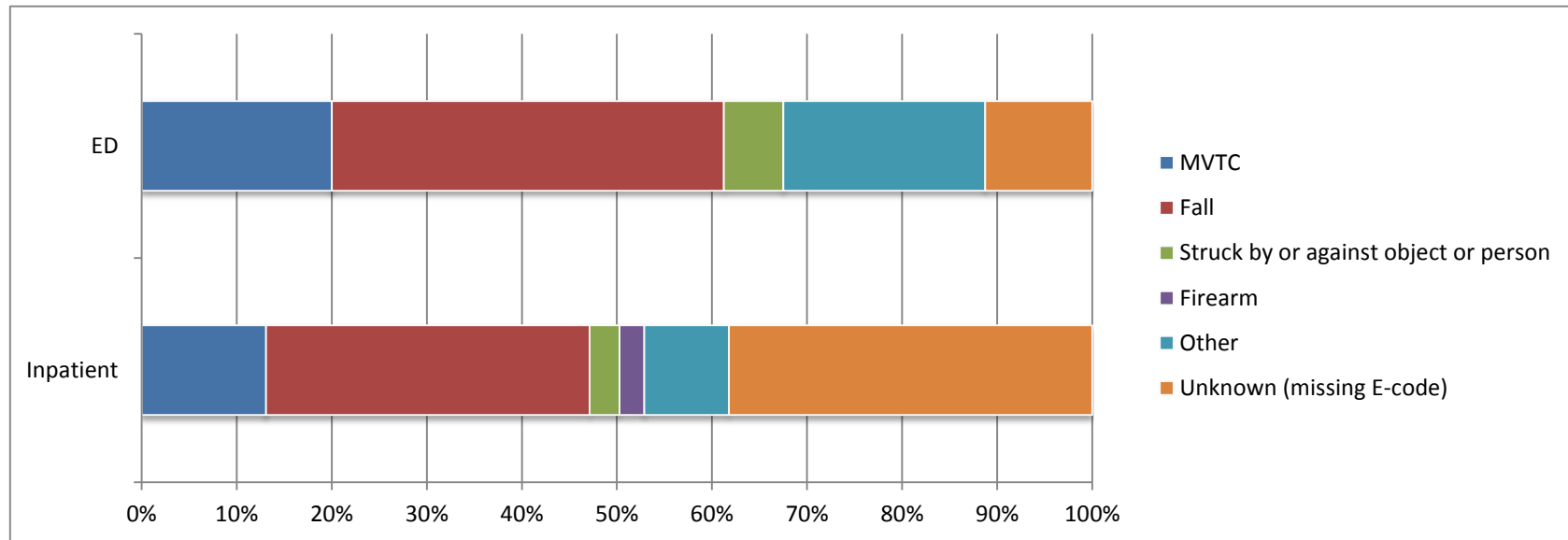


Figure 30: Rates of Spinal Cord Injury-Related Emergency Department Visits and Hospitalizations, by Age Group, Kentucky, 2012



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, 2012



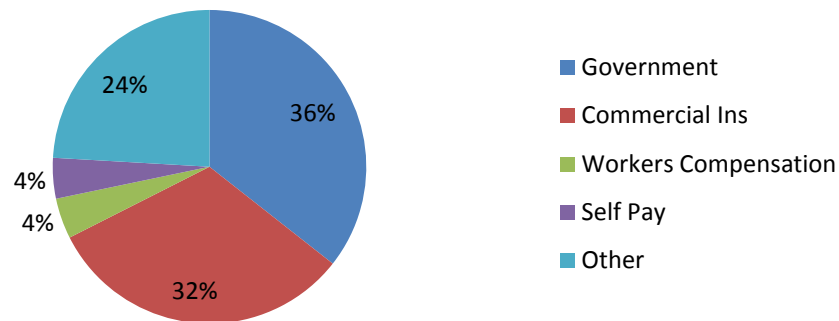
Among non-fatal SCI's for which an E-code was reported, falls were the leading mechanisms of injury for both inpatient and ED SCI visits. Unfortunately, almost one out of three of the inpatient SCI discharges had no E-code reported.

Hospitalized SCI patients had a length of stay (LOS) varying from 1 day to 98 days. The mean LOS was 12.3 days with a median of 9 days. Over 7 out of 10 (73%) of the non-fatal inpatient SCI discharges had dispositions other than "routine", while 51% of ED discharges were non-routine. In total, two thirds of all SCI non-fatal discharges went on to receive further care. In comparison, non-fatal TBI inpatient visits were routinely discharged almost 60% 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).

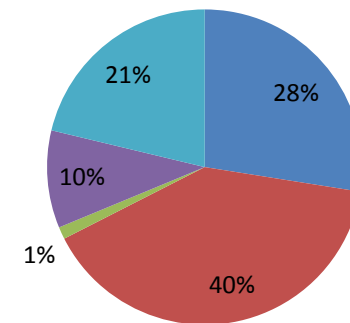
Government sources were the primary payer billed for acute care charges in one third of all non-fatal SCI. Government payers were billed over \$6.6 million in 2012, and commercial payers almost \$9.4 million.

Figure 32: Non-Fatal Spinal Cord Injury-Emergency Department and Hospitalizations, Payer Source and Charges, Kentucky, 2012

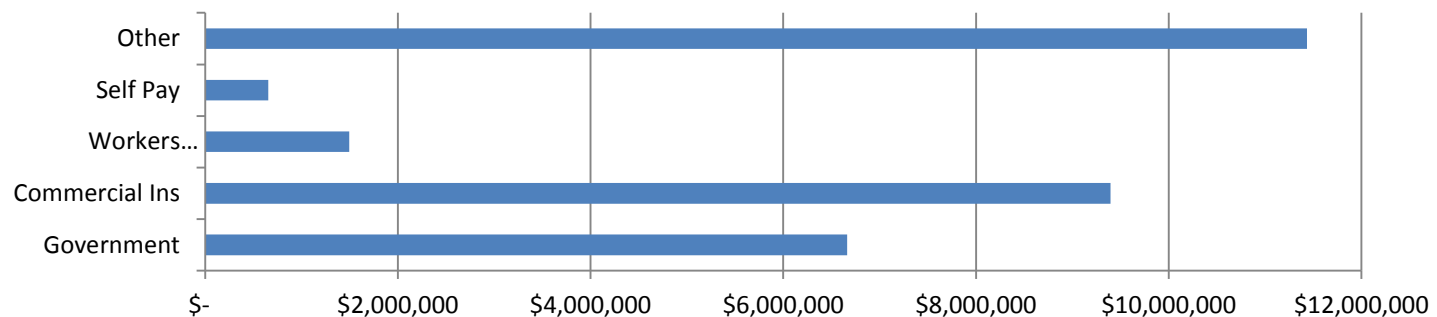
Inpatient, Non-Fatal SCI



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 2012, over 40,000 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 32,532 non-fatal inpatient stroke cases for Kentucky residents identified in 2012 as well as 7,612 non-fatal ED cases. The crude incidence rate was 918.8 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, 2012

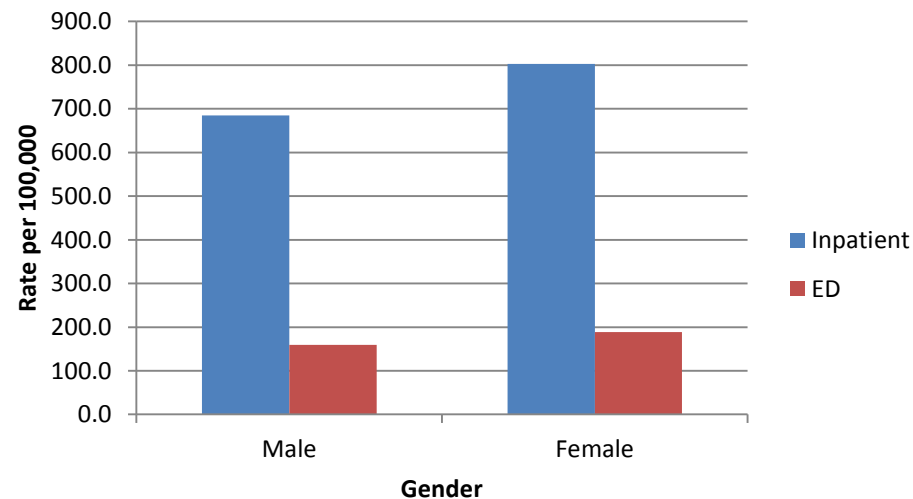
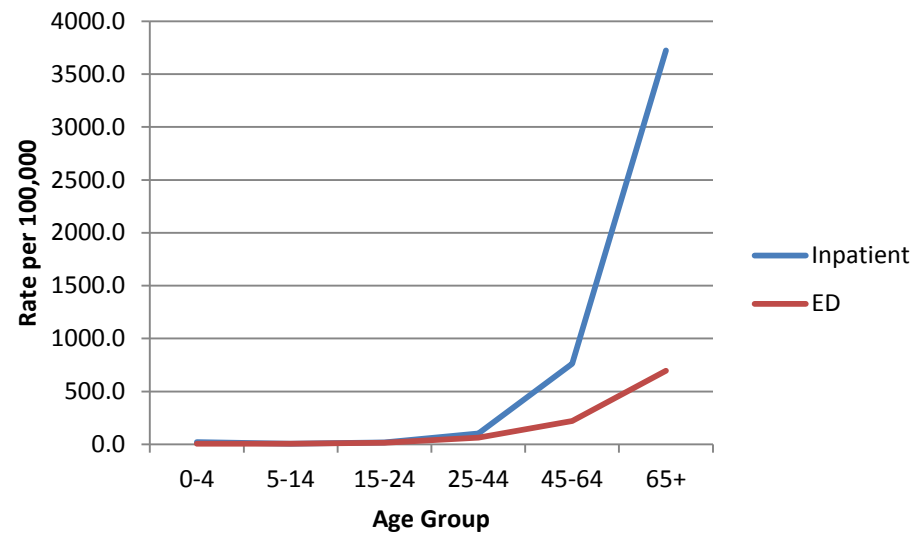


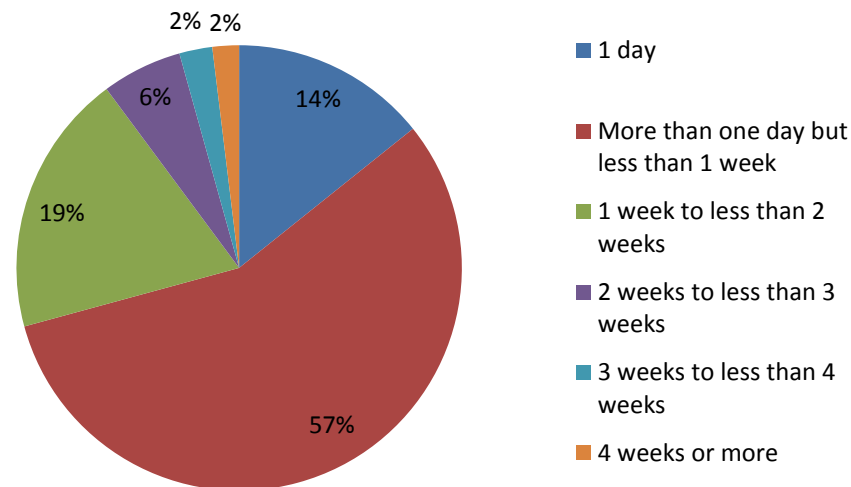
Figure 34: Rates of Stroke Related Emergency Department Visits and Hospitalizations, by Age Group, Kentucky, 2012



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=32,532) ranged from 1 day to 342 days. The mean LOS was 6.2 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, 2012

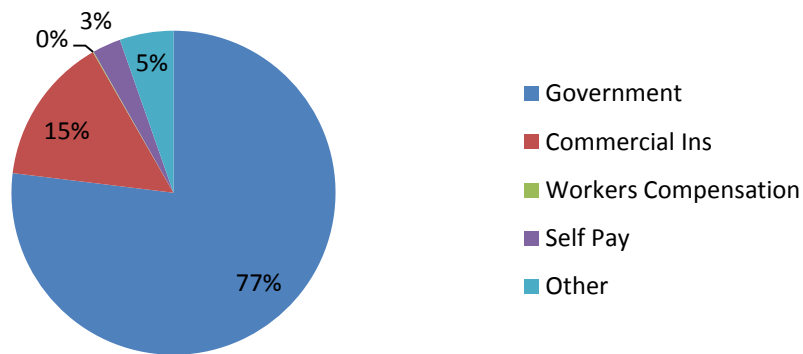


For non-fatal stroke related hospitalizations, 17,455 (54%) had a disposition other than “routine”. The three most frequent non-routine discharges were “skilled nursing facility”, “home health”, and “rehab”. A total of 14,016 inpatient discharges had one of these three dispositions. ED discharges were more likely (59.3%) routinely discharged to home or self care (routine) with “inpatient – other” being the most frequent non-routine discharge.

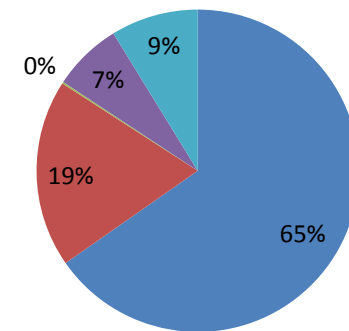
Government sources were the primary payer billed for acute care charges in three fourths of all non-fatal stroke related hospital visits. Government payers were billed over \$900 million in 2012, and commercial payers over \$200 million.

Figure 36: Non-Fatal Stroke Related Emergency Department Visits and Hospitalizations, Payer Source and Charges, Kentucky, 2012

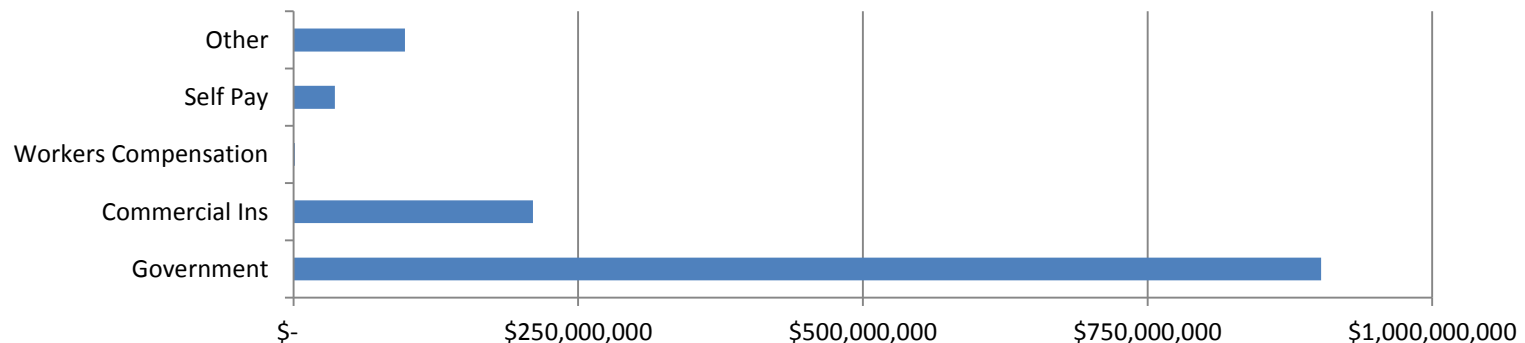
Inpatient, Non-Fatal Stroke



ED, Non-Fatal Stroke



Charges to Pay Source, All Non-Fatal Stroke



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 Boone) are the four most populous counties in Kentucky. A notable exception was Gallatin county, which was ranked 1st in age adjusted rate for stroke but was 105th in population. Owsley follows closely as the 2nd highest age adjusted rate in the state and is the 118th most populous county. 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

Stroke Inpatient Cases by County, Kentucky 2012

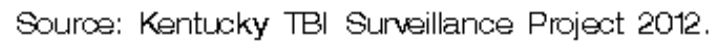
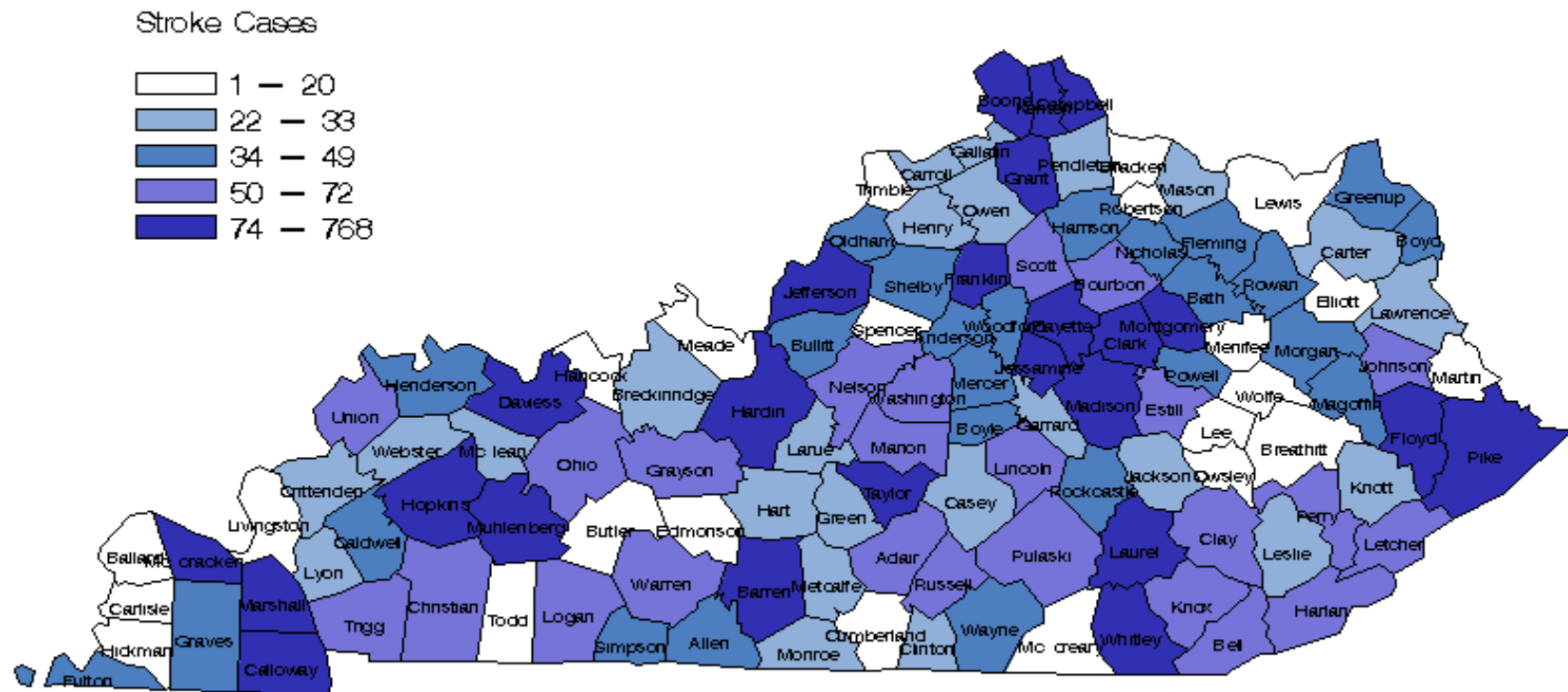


Figure 38.

Stroke ED Cases by County, Kentucky 2012



Source: Kentucky TBI Surveillance Project 2012.

Age-Adjusted Stroke Inpatient Rates by County, Kentucky 2012

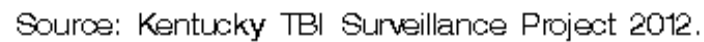
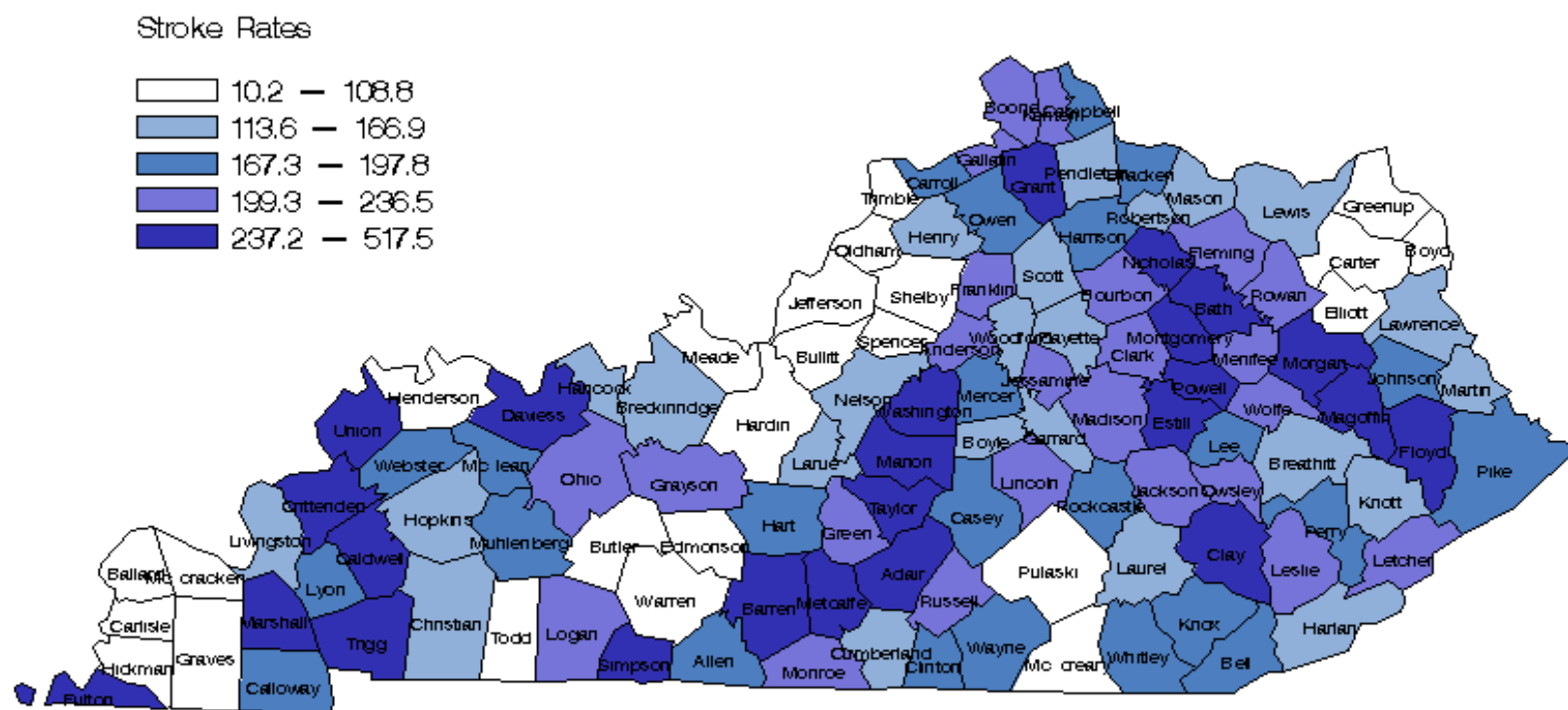


Figure 40.

Age—Adjusted Stroke ED Rates by County, Kentucky 2012



Source: Kentucky TBI Surveillance Project 2012.

Conclusion

Almost 80,000 non-fatal central nervous system injury-related ED visits and hospitalizations occurred in Kentucky in 2012. 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 2012 alone, over 218 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 (2010).

Table 1: Non-Fatal TBI ED Visits and Hospitalizations by Age Group, Kentucky, 2012

Age	Inpatient			Outpatient			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	123	2.8	43.7	4348	97.2	1546.4	4,471	100.0	1590.2
5-14	122	2.7	21.5	4430	97.3	780.0	4,552	100.0	801.5
15-24	367	5.7	62.1	6085	94.3	1029.3	6,452	100.0	1091.4
25-44	639	8.5	56.1	6868	91.5	602.9	7,507	100.0	659.0
45-64	842	14.9	70.3	4794	85.1	400.2	5,636	100.0	470.4
65+	1580	25.0	267.0	4749	75.0	802.4	6,329	100.0	1069.4
Total	3,673	10.5	84.1	31,274	89.5	715.8	34,947	100.0	799.8

Table 2: Non-Fatal TBI ED Visits and Hospitalizations by Gender, Kentucky, 2012

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Male	2,003	11.0	93.2	16,125	89.0	750.0	18,128	100.0	843.2
Female	1,670	9.9	75.2	15,147	90.1	682.5	16,817	100.0	757.7
Total	3,673	10.5	84.1	31,272	89.5	715.7	34,945	100.0	799.8

Table 3: Non-Fatal TBI ED Visits and Hospitalizations by External Cause of Injury, Kentucky, 2012

Mechanism of Injury	Inpatient			ED			Total		
	Number	Pct.	Rate	Number	Pct.	Rate	Number	Pct.	Rate
Motor vehicle traffic crash	556	9.2	12.7	5,459	90.8	124.9	6,015	100.0	137.7
Fall	1,706	11.4	39.0	13,224	88.6	302.7	14,930	100.0	341.7
Firearm	19	67.9	0.4	9	32.1	0.2	28	100.0	0.6
Non-traffic land transport	124	12.8	2.8	844	87.2	19.3	968	100.0	22.2
Struck by object or person	170	2.6	3.9	6,305	97.4	144.3	6,475	100.0	148.2
Non-traffic pedal cycle	16	3.8	0.4	401	96.2	9.2	417	100.0	9.5
Machinery	4	8.3	0.1	44	91.7	1.0	48	100.0	1.1
Other	191	8.1	4.4	2,163	91.9	49.5	2,354	100.0	53.9
Unknown (missing E-code)	887	23.9	20.3	2,825	76.1	64.7	3,712	100.0	85.0
Total	3,673	10.5	84.1	31,274	89.5	715.8	34,947	100.0	799.8

Table 4: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 00-04, Kentucky, 2012

Mechanism of Injury	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Fall	61	49.6	21.7	3,125	71.9	1111.5	3,186	71.3	1133.2
Motor vehicle traffic crash	22	17.9	7.8	81	1.9	28.8	103	2.3	36.6
Struck by or against object or person	7	5.7	2.5	723	16.6	257.1	730	16.3	259.6
Non-traffic land transportation	0	0.0	0.0	26	0.6	9.2	26	0.6	9.2
Other (including non-specific codes)	22	17.9	7.8	131	3.0	46.6	153	3.4	54.4
Unknown (missing E-code)	11	8.9	3.9	262	6.0	93.2	273	6.1	97.1
Total	123	100.0	43.7	4,348	100.0	1546.4	4,471	100.0	1590.2

Table 5: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 05-14, Kentucky, 2012

Mechanism of Injury	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Motor vehicle traffic crash	51	41.8	9.0	323	7.3	56.9	374	8.2	65.9
Fall	27	22.1	4.8	1,641	37.0	288.9	1,668	36.6	293.7
Non-traffic land transportation	15	12.3	2.6	165	3.7	29.1	180	4.0	31.7
Other pedal cycle	7	5.7	1.2	233	5.3	41.0	240	5.3	42.3
Struck by or against object or person	9	7.4	1.6	1,458	32.9	256.7	1,467	32.2	258.3
Other (including non-specific codes)	6	4.9	1.1	200	4.5	35.2	206	4.5	36.3
Unknown (missing E-code)	7	5.7	1.2	410	9.3	72.2	417	9.2	73.4
Total	122	100.0	21.5	4,430	100.0	780.0	4,552	100.0	801.5

Table 6: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 15-24, Kentucky, 2012

Mechanism of Injury	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Motor vehicle traffic crash	125	34.1	21.1	1,821	29.9	308.0	1,946	30.2	329.2
Firearm	3	0.8	0.5	2	0.0	0.3	5	0.1	0.8
Non-traffic land transportation	29	7.9	4.9	253	4.2	42.8	282	4.4	47.7
Fall	37	10.1	6.3	1,083	17.8	183.2	1,120	17.4	189.4
Struck by or against object or person	21	5.7	3.6	1,703	28.0	288.1	1,724	26.7	291.6
Other (including non-specific codes)	21	5.7	3.6	652	10.7	110.3	673	10.4	113.8
Unknown (missing E-code)	131	35.7	22.2	571	9.4	96.6	702	10.9	118.7
Total	367	100.0	62.1	6,085	100.0	1029.3	6,452	100.0	1091.4

Table 7: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 25-44, Kentucky, 2012

Mechanism of Injury	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Motor vehicle traffic crash	158	24.7	13.9	1,937	28.2	170.0	2,095	27.9	183.9
Firearm	8	1.3	0.7	6	0.1	0.5	14	0.2	1.2
Fall	123	19.2	10.8	1,596	23.2	140.1	1,719	22.9	150.9
Struck by or against object or person	56	8.8	4.9	1,536	22.4	134.8	1,592	21.2	139.7
Non-traffic land transportation	33	5.2	2.9	259	3.8	22.7	292	3.9	25.6
Machinery	2	0.3	0.2	27	0.4	2.4	29	0.4	2.5
Other (including non-specific codes)	47	7.4	4.1	868	12.6	76.2	915	12.2	80.3
Unknown (missing E-code)	212	33.2	18.6	639	9.3	56.1	851	11.3	74.7
Total	639	100.0	56.1	6,868	100.0	602.9	7,507	100.0	659.0

Table 8: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 45-64, Kentucky, 2012

Mechanism of Injury	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Fall	322	38.2	26.9	2,037	42.5	170.0	2,359	41.9	196.9
Motor vehicle traffic crash	124	14.7	10.4	1,028	21.4	85.8	1,152	20.4	96.2
Firearm	5	0.6	0.4	1	0.0	0.1	6	0.1	0.5
Struck by or against object or person	49	5.8	4.1	703	14.7	58.7	752	13.3	62.8
Non-traffic land transportation	29	3.4	2.4	108	2.3	9.0	137	2.4	11.4
Other (including non-specific codes)	65	7.7	5.4	415	8.7	34.6	480	8.5	40.1
Unknown (missing E-code)	248	29.5	20.7	502	10.5	41.9	750	13.3	62.6
Total	842	100.0	70.3	4,794	100.0	400.2	5,636	100.0	470.4

Table 9: Leading Causes of Non-Fatal TBI ED Visits and Hospitalizations for Ages 65 or Over, Kentucky, 2012

Mechanism of Injury	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Fall	1,136	71.9	191.9	3,742	78.8	632.3	4,878	77.1	824.2
Motor vehicle traffic crash	76	4.8	12.8	269	5.7	45.5	345	5.5	58.3
Firearm	2	0.1	0.3	0	0.0	0.0	2	0.0	0.3
Struck by or against object or person	28	1.8	4.7	182	3.8	30.8	210	3.3	35.5
Non-traffic land transportation	18	1.1	3.0	33	0.7	5.6	51	0.8	8.6
Other (including non-specific codes)	42	2.7	7.1	82	1.7	13.9	124	2.0	21.0
Unknown (missing E-code)	278	17.6	47.0	441	9.3	74.5	719	11.4	121.5
Total	1,580	100.0	267.0	4,749	100.0	802.4	6,329	100.0	1069.4

Table 10: Hospital Discharges by Disposition for Non-Fatal TBI ED Visits and Hospitalizations, Kentucky, 2012

Discharge Disposition	Inpatient		ED	
	Number	Percent	Number	Percent
Routine discharge (home/self care)	2,088	56.8	29157	93.2
Skilled nursing facility (SNF)	557	15.2	231	0.7
Home health	299	8.1	9	0.0
Inpatient-other short-term hospital	65	1.8	1128	3.6
Intermediate care facility (ICF)	15	0.4	44	0.1
Rehab	460	12.5	6	0.0
Other	189	5.1	699	2.2
Total	3,673	100.0	31,274	100.0

Table 11: Incidence of All Inpatient TBI* by County, Sorted by County, Kentucky, 2012

***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	28	0.7	141.4	149.8	Grant	20	0.5	92.0	80.6	McLean	6	0.2	59.2	63.0
Allen	6	0.2	25.4	29.8	Graves	50	1.3	121.4	133.3	Meade	14	0.4	53.4	47.4
Anderson	15	0.4	69.8	69.3	Grayson	34	0.9	122.4	131.0	Menifee	7	0.2	114.4	110.8
Ballard	5	0.1	53.1	60.6	Green	13	0.3	106.9	115.9	Mercer	16	0.4	63.0	75.2
Barren	31	0.8	67.3	73.3	Greenup	9	0.2	18.8	24.4	Metcalfe	*	-	-	-
Bath	14	0.4	129.4	119.2	Hancock	6	0.2	70.9	70.0	Monroe	10	0.3	85.0	91.4
Bell	21	0.5	72.0	73.1	Hardin	130	3.3	131.6	121.0	Montgomery	21	0.5	79.2	78.5
Boone	79	2.0	79.2	64.9	Harlan	18	0.5	61.6	61.9	Morgan	12	0.3	87.0	86.1
Bourbon	23	0.6	116.6	115.0	Harrison	20	0.5	97.0	106.5	Muhlenberg	21	0.5	59.6	67.2
Boyd	49	1.2	77.8	99.1	Hart	24	0.6	118.5	131.6	Nelson	55	1.4	127.2	125.1
Boyle	23	0.6	76.2	80.6	Henderson	11	0.3	22.6	23.7	Nicholas	6	0.2	83.3	84.9
Bracken	*	-	-	-	Henry	21	0.5	141.9	136.0	Ohio	15	0.4	67.0	62.2
Breathitt	17	0.4	128.2	122.8	Hickman	*	-	-	-	Oldham	49	1.2	102.7	80.8
Breckinridge	15	0.4	66.4	74.1	Hopkins	25	0.6	47.6	53.3	Owen	7	0.2	68.3	64.5
Bullitt	52	1.3	74.5	69.2	Jackson	24	0.6	181.6	178.5	Owsley	15	0.4	316.8	311.2
Butler	8	0.2	55.5	62.4	Jefferson	810	20.5	102.2	108.4	Pendleton	14	0.4	94.0	95.3
Caldwell	5	0.1	32.7	38.5	Jessamine	43	1.1	92.6	87.7	Perry	67	1.7	228.8	233.0
Calloway	29	0.7	73.3	77.2	Johnson	15	0.4	66.5	64.1	Pike	73	1.9	111.7	112.5
Campbell	88	2.2	93.1	96.8	Kenton	106	2.7	68.9	66.1	Powell	20	0.5	167.8	158.1
Carlisle	5	0.1	101.0	99.0	Knott	22	0.6	129.0	135.1	Pulaski	72	1.8	106.7	113.1
Carroll	16	0.4	148.5	145.3	Knox	21	0.5	63.7	65.9	Robertson	*	-	-	-
Carter	10	0.3	34.8	36.3	Larue	18	0.5	115.2	125.7	Rockcastle	27	0.7	162.1	158.2
Casey	11	0.3	64.7	69.1	Laurel	58	1.5	100.1	97.7	Rowan	10	0.3	46.3	42.4
Christian	16	0.4	24.0	21.7	Lawrence	10	0.3	55.7	62.4	Russell	17	0.4	97.4	96.5
Clark	44	1.1	114.9	123.8	Lee	15	0.4	190.7	191.9	Scott	46	1.2	105.7	95.5
Clay	38	1.0	170.5	175.0	Leslie	11	0.3	96.3	97.9	Shelby	52	1.3	127.0	120.7
Clinton	20	0.5	191.6	196.1	Letcher	12	0.3	45.9	49.1	Simpson	*	-	-	-
Crittenden	8	0.2	57.6	85.7	Lewis	8	0.2	58.3	57.6	Spencer	21	0.5	128.0	120.8
Cumberland	*	-	-	-	Lincoln	36	0.9	144.7	145.6	Taylor	34	0.9	130.0	137.5
Daviess	87	2.2	80.1	89.5	Livingston	18	0.5	193.7	188.9	Todd	*	-	-	-
Edmonson	*	-	-	-	Logan	5	0.1	17.0	18.7	Trigg	*	-	-	-
Elliott	*	-	-	-	Lyon	5	0.1	51.0	60.1	Trimble	9	0.2	111.9	103.2
Estill	15	0.4	94.3	102.3	Madison	71	1.8	86.2	84.3	Union	6	0.2	38.3	39.8
Fayette	245	6.2	84.3	81.2	Magoffin	8	0.2	62.4	60.5	Warren	61	1.5	55.7	52.8
Fleming	15	0.4	107.6	103.4	Marion	18	0.5	90.3	90.1	Washington	7	0.2	51.6	59.1
Floyd	19	0.5	45.6	48.5	Marshall	39	1.0	103.0	124.6	Wayne	19	0.5	80.7	90.6
Franklin	45	1.1	86.9	91.1	Martin	6	0.2	51.0	47.1	Webster	5	0.1	33.1	36.6
Fulton	7	0.2	81.8	103.6	Mason	13	0.3	74.3	73.6	Whitley	48	1.2	129.8	134.0
Gallatin	7	0.2	88.9	81.3	McCracken	103	2.6	130.1	156.4	Wolfe	13	0.3	184.0	177.1
Garrard	12	0.3	59.1	71.1	McCreary	16	0.4	88.7	87.5	Woodford	20	0.5	79.0	80.2

* 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, 2012

***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	66	0.2	341.1	353.2	Grant	269	0.9	1108.4	1084.0	McLean	85	0.3	962.2	892.2
Allen	83	0.3	425.8	412.1	Graves	189	0.6	522.1	503.7	Meade	99	0.3	347.0	334.9
Anderson	140	0.4	673.1	646.8	Grayson	235	0.7	960.8	905.3	Menifee	37	0.1	617.7	585.7
Ballard	54	0.2	721.5	654.3	Green	42	0.1	416.7	374.3	Mercer	158	0.5	777.5	742.4
Barren	307	1.0	763.8	726.3	Greenup	317	1.0	886.9	859.9	Metcalfe	71	0.2	762.0	704.9
Bath	90	0.3	818.5	766.5	Hancock	32	0.1	392.7	373.3	Monroe	69	0.2	699.1	630.9
Bell	111	0.4	415.2	386.4	Hardin	904	2.9	852.3	841.3	Montgomery	165	0.5	645.8	617.0
Boone	896	2.9	781.4	736.0	Harlan	244	0.8	881.6	839.6	Morgan	73	0.2	552.3	523.6
Bourbon	131	0.4	716.3	655.1	Harrison	146	0.5	855.5	777.6	Muhlenberg	141	0.4	486.5	450.9
Boyd	712	2.3	1486.2	1439.4	Hart	128	0.4	755.9	702.0	Nelson	264	0.8	620.0	600.4
Boyle	176	0.6	637.1	616.5	Henderson	236	0.8	535.0	508.6	Nicholas	41	0.1	608.2	579.8
Bracken	62	0.2	754.7	728.3	Henry	140	0.4	978.4	906.6	Ohio	126	0.4	557.4	522.8
Breathitt	63	0.2	492.2	455.1	Hickman	7	0.0	169.3	146.3	Oldham	317	1.0	585.2	522.7
Breckinridge	88	0.3	480.6	434.4	Hopkins	496	1.6	1133.1	1057.4	Owen	69	0.2	677.5	635.5
Bullitt	408	1.3	585.1	543.2	Jackson	143	0.5	1125.2	1063.8	Owsley	18	0.1	403.4	373.4
Butler	46	0.1	377.3	358.6	Jefferson	5882	18.7	803.4	787.5	Pendleton	110	0.4	815.3	748.4
Caldwell	77	0.2	630.8	593.5	Jessamine	364	1.2	750.1	742.2	Perry	266	0.8	969.8	925.2
Calloway	218	0.7	613.3	580.7	Johnson	91	0.3	414.1	389.0	Pike	431	1.4	700.4	664.1
Campbell	727	2.3	807.5	799.4	Kenton	1167	3.7	740.3	727.5	Powell	126	0.4	1054.2	996.0
Carlisle	33	0.1	598.9	653.7	Knott	82	0.3	535.8	503.4	Pulaski	552	1.8	930.5	867.2
Carroll	65	0.2	591.4	590.2	Knox	270	0.9	878.2	846.7	Robertson	7	0.0	353.0	314.0
Carter	218	0.7	825.3	790.3	Larue	118	0.4	848.4	824.3	Rockcastle	93	0.3	607.6	544.9
Casey	56	0.2	384.1	352.0	Laurel	629	2.0	1117.0	1059.7	Rowan	144	0.5	647.8	610.6
Christian	571	1.8	763.4	775.9	Lawrence	66	0.2	438.8	411.6	Russell	66	0.2	411.3	374.8
Clark	354	1.1	1051.8	996.1	Lee	50	0.2	674.2	639.6	Scott	472	1.5	1009.8	980.3
Clay	260	0.8	1225.0	1197.1	Leslie	72	0.2	690.8	641.0	Shelby	272	0.9	659.1	631.6
Clinton	48	0.2	498.8	470.5	Letcher	138	0.4	609.2	564.5	Simpson	93	0.3	556.7	535.2
Crittenden	41	0.1	474.2	439.2	Lewis	53	0.2	419.3	381.9	Spencer	118	0.4	746.9	679.0
Cumberland	51	0.2	803.7	746.5	Lincoln	178	0.6	749.8	719.7	Taylor	161	0.5	663.9	651.0
Daviess	746	2.4	788.3	767.2	Livingston	67	0.2	785.0	703.0	Todd	52	0.2	414.3	417.2
Edmonson	47	0.1	439.5	388.8	Logan	104	0.3	390.2	388.2	Trigg	79	0.3	574.5	552.3
Elliott	33	0.1	447.0	428.2	Lyon	37	0.1	507.4	444.9	Trimble	35	0.1	446.8	401.2
Estill	137	0.4	1002.3	934.1	Madison	891	2.8	1118.9	1058.4	Union	67	0.2	471.5	444.7
Fayette	1957	6.2	666.0	648.9	Magoffin	35	0.1	274.8	264.8	Warren	486	1.5	420.7	420.7
Fleming	96	0.3	687.9	661.5	Marion	85	0.3	444.4	425.4	Washington	64	0.2	555.0	540.3
Floyd	209	0.7	547.4	533.1	Marshall	209	0.7	720.4	667.6	Wayne	115	0.4	580.1	548.4
Franklin	361	1.1	765.2	730.9	Martin	63	0.2	524.3	494.1	Webster	102	0.3	784.7	746.3
Fulton	13	0.0	209.8	192.5	Mason	167	0.5	994.4	946.0	Whitley	617	2.0	1783.5	1722.4
Gallatin	53	0.2	648.0	615.4	McCracken	602	1.9	939.0	914.0	Wolfe	27	0.1	411.3	367.8
Garrard	108	0.3	695.5	639.6	McCreary	120	0.4	685.8	656.3	Woodford	161	0.5	686.7	645.4

**Rate per 100,000

Table 13: Incidence of All Inpatient TBI* by County, Sorted by Frequency, Kentucky, 2012

***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	810	20.5	102.2	108.4	Bell	21	0.5	72.0	73.1	Casey	11	0.3	64.7	69.1
Fayette	245	6.2	84.3	81.2	Henry	21	0.5	141.9	136.0	Henderson	11	0.3	22.6	23.7
Hardin	130	3.3	131.6	121.0	Knox	21	0.5	63.7	65.9	Leslie	11	0.3	96.3	97.9
Kenton	106	2.7	68.9	66.1	Montgomery	21	0.5	79.2	78.5	Carter	10	0.3	34.8	36.3
McCracken	103	2.6	130.1	156.4	Muhlenberg	21	0.5	59.6	67.2	Lawrence	10	0.3	55.7	62.4
Campbell	88	2.2	93.1	96.8	Spencer	21	0.5	128.0	120.8	Monroe	10	0.3	85.0	91.4
Daviess	87	2.2	80.1	89.5	Clinton	20	0.5	191.6	196.1	Rowan	10	0.3	46.3	42.4
Boone	79	2.0	79.2	64.9	Grant	20	0.5	92.0	80.6	Greenup	9	0.2	18.8	24.4
Pike	73	1.9	111.7	112.5	Harrison	20	0.5	97.0	106.5	Trimble	9	0.2	111.9	103.2
Pulaski	72	1.8	106.7	113.1	Powell	20	0.5	167.8	158.1	Butler	8	0.2	55.5	62.4
Madison	71	1.8	86.2	84.3	Woodford	20	0.5	79.0	80.2	Crittenden	8	0.2	57.6	85.7
Perry	67	1.7	228.8	233.0	Floyd	19	0.5	45.6	48.5	Lewis	8	0.2	58.3	57.6
Warren	61	1.5	55.7	52.8	Wayne	19	0.5	80.7	90.6	Magoffin	8	0.2	62.4	60.5
Laurel	58	1.5	100.1	97.7	Harlan	18	0.5	61.6	61.9	Fulton	7	0.2	81.8	103.6
Nelson	55	1.4	127.2	125.1	Larue	18	0.5	115.2	125.7	Gallatin	7	0.2	88.9	81.3
Bullitt	52	1.3	74.5	69.2	Livingston	18	0.5	193.7	188.9	Menifee	7	0.2	114.4	110.8
Shelby	52	1.3	127.0	120.7	Marion	18	0.5	90.3	90.1	Owen	7	0.2	68.3	64.5
Graves	50	1.3	121.4	133.3	Breathitt	17	0.4	128.2	122.8	Washington	7	0.2	51.6	59.1
Boyd	49	1.2	77.8	99.1	Russell	17	0.4	97.4	96.5	Allen	6	0.2	25.4	29.8
Oldham	49	1.2	102.7	80.8	Carroll	16	0.4	148.5	145.3	Hancock	6	0.2	70.9	70.0
Whitley	48	1.2	129.8	134.0	Christian	16	0.4	24.0	21.7	Martin	6	0.2	51.0	47.1
Scott	46	1.2	105.7	95.5	McCreary	16	0.4	88.7	87.5	McLean	6	0.2	59.2	63.0
Franklin	45	1.1	86.9	91.1	Mercer	16	0.4	63.0	75.2	Nicholas	6	0.2	83.3	84.9
Clark	44	1.1	114.9	123.8	Anderson	15	0.4	69.8	69.3	Union	6	0.2	38.3	39.8
Jessamine	43	1.1	92.6	87.7	Breckinridge	15	0.4	66.4	74.1	Ballard	5	0.1	53.1	60.6
Marshall	39	1.0	103.0	124.6	Estill	15	0.4	94.3	102.3	Caldwell	5	0.1	32.7	38.5
Clay	38	1.0	170.5	175.0	Fleming	15	0.4	107.6	103.4	Carlisle	5	0.1	101.0	99.0
Lincoln	36	0.9	144.7	145.6	Johnson	15	0.4	66.5	64.1	Logan	5	0.1	17.0	18.7
Grayson	34	0.9	122.4	131.0	Lee	15	0.4	190.7	191.9	Lyon	5	0.1	51.0	60.1
Taylor	34	0.9	130.0	137.5	Ohio	15	0.4	67.0	62.2	Webster	5	0.1	33.1	36.6
Barren	31	0.8	67.3	73.3	Owsley	15	0.4	316.8	311.2	Bracken	*	-	-	-
Calloway	29	0.7	73.3	77.2	Bath	14	0.4	129.4	119.2	Edmonson	*	-	-	-
Adair	28	0.7	141.4	149.8	Meade	14	0.4	53.4	47.4	Metcalfe	*	-	-	-
Rockcastle	27	0.7	162.1	158.2	Pendleton	14	0.4	94.0	95.3	Simpson	*	-	-	-
Hopkins	25	0.6	47.6	53.3	Green	13	0.3	106.9	115.9	Cumberland	*	-	-	-
Hart	24	0.6	118.5	131.6	Mason	13	0.3	74.3	73.6	Elliott	*	-	-	-
Jackson	24	0.6	181.6	178.5	Wolfe	13	0.3	184.0	177.1	Todd	*	-	-	-
Bourbon	23	0.6	116.6	115.0	Garrard	12	0.3	59.1	71.1	Hickman	*	-	-	-
Boyle	23	0.6	76.2	80.6	Letcher	12	0.3	45.9	49.1	Robertson	*	-	-	-
Knott	22	0.6	129.0	135.1	Morgan	12	0.3	87.0	86.1	Trigg	*	-	-	-

* 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, 2012

***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	5882	18.7	803.4	787.5	Boyle	176	0.6	637.1	616.5	Morgan	73	0.2	552.3	523.6
Fayette	1957	6.2	666.0	648.9	Mason	167	0.5	994.4	946.0	Leslie	72	0.2	690.8	641.0
Kenton	1167	3.7	740.3	727.5	Montgomery	165	0.5	645.8	617.0	Metcalf	71	0.2	762.0	704.9
Hardin	904	2.9	852.3	841.3	Taylor	161	0.5	663.9	651.0	Monroe	69	0.2	699.1	630.9
Boone	896	2.9	781.4	736.0	Woodford	161	0.5	686.7	645.4	Owen	69	0.2	677.5	635.5
Madison	891	2.8	1118.9	1058.4	Mercer	158	0.5	777.5	742.4	Livingston	67	0.2	785.0	703.0
Daviess	746	2.4	788.3	767.2	Harrison	146	0.5	855.5	777.6	Union	67	0.2	471.5	444.7
Campbell	727	2.3	807.5	799.4	Rowan	144	0.5	647.8	610.6	Adair	66	0.2	341.1	353.2
Boyd	712	2.3	1486.2	1439.4	Jackson	143	0.5	1125.2	1063.8	Lawrence	66	0.2	438.8	411.6
Laurel	629	2.0	1117.0	1059.7	Muhlenberg	141	0.4	486.5	450.9	Russell	66	0.2	411.3	374.8
Whitley	617	2.0	1783.5	1722.4	Anderson	140	0.4	673.1	646.8	Carroll	65	0.2	591.4	590.2
McCracken	602	1.9	939.0	914.0	Henry	140	0.4	978.4	906.6	Washington	64	0.2	555.0	540.3
Christian	571	1.8	763.4	775.9	Letcher	138	0.4	609.2	564.5	Breathitt	63	0.2	492.2	455.1
Pulaski	552	1.8	930.5	867.2	Estill	137	0.4	1002.3	934.1	Martin	63	0.2	524.3	494.1
Hopkins	496	1.6	1133.1	1057.4	Bourbon	131	0.4	716.3	655.1	Bracken	62	0.2	754.7	728.3
Warren	486	1.5	420.7	420.7	Hart	128	0.4	755.9	702.0	Casey	56	0.2	384.1	352.0
Scott	472	1.5	1009.8	980.3	Ohio	126	0.4	557.4	522.8	Ballard	54	0.2	721.5	654.3
Pike	431	1.4	700.4	664.1	Powell	126	0.4	1054.2	996.0	Gallatin	53	0.2	648.0	615.4
Bullitt	408	1.3	585.1	543.2	McCreary	120	0.4	685.8	656.3	Lewis	53	0.2	419.3	381.9
Jessamine	364	1.2	750.1	742.2	Larue	118	0.4	848.4	824.3	Todd	52	0.2	414.3	417.2
Franklin	361	1.1	765.2	730.9	Spencer	118	0.4	746.9	679.0	Cumberland	51	0.2	803.7	746.5
Clark	354	1.1	1051.8	996.1	Wayne	115	0.4	580.1	548.4	Lee	50	0.2	674.2	639.6
Greenup	317	1.0	886.9	859.9	Bell	111	0.4	415.2	386.4	Clinton	48	0.2	498.8	470.5
Oldham	317	1.0	585.2	522.7	Pendleton	110	0.4	815.3	748.4	Edmonson	47	0.1	439.5	388.8
Barren	307	1.0	763.8	726.3	Garrard	108	0.3	695.5	639.6	Butler	46	0.1	377.3	358.6
Shelby	272	0.9	659.1	631.6	Logan	104	0.3	390.2	388.2	Green	42	0.1	416.7	374.3
Knox	270	0.9	878.2	846.7	Webster	102	0.3	784.7	746.3	Crittenden	41	0.1	474.2	439.2
Grant	269	0.9	1108.4	1084.0	Meade	99	0.3	347.0	334.9	Nicholas	41	0.1	608.2	579.8
Perry	266	0.8	969.8	925.2	Fleming	96	0.3	687.9	661.5	Lyon	37	0.1	507.4	444.9
Nelson	264	0.8	620.0	600.4	Rockcastle	93	0.3	607.6	544.9	Menifee	37	0.1	617.7	585.7
Clay	260	0.8	1225.0	1197.1	Simpson	93	0.3	556.7	535.2	Magoffin	35	0.1	274.8	264.8
Harlan	244	0.8	881.6	839.6	Johnson	91	0.3	414.1	389.0	Trimble	35	0.1	446.8	401.2
Henderson	236	0.8	535.0	508.6	Bath	90	0.3	818.5	766.5	Carlisle	33	0.1	598.9	653.7
Grayson	235	0.7	960.8	905.3	Breckinridge	88	0.3	480.6	434.4	Elliott	33	0.1	447.0	428.2
Calloway	218	0.7	613.3	580.7	Marion	85	0.3	444.4	425.4	Hancock	32	0.1	392.7	373.3
Carter	218	0.7	825.3	790.3	McLean	85	0.3	962.2	892.2	Wolfe	27	0.1	411.3	367.8
Floyd	209	0.7	547.4	533.1	Allen	83	0.3	425.8	412.1	Owsley	18	0.1	403.4	373.4
Marshall	209	0.7	720.4	667.6	Knott	82	0.3	535.8	503.4	Fulton	13	0.0	209.8	192.5
Graves	189	0.6	522.1	503.7	Trigg	79	0.3	574.5	552.3	Hickman	7	0.0	169.3	146.3
Lincoln	178	0.6	749.8	719.7	Caldwell	77	0.2	630.8	593.5	Robertson	7	0.0	353.0	314.0

**Rate per 100,000

Table 15: Incidence of All Inpatient TBI* by County, Sorted by Age Adjusted Rate, Kentucky, 2012

***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	15	0.4	316.8	311.2	Carlisle	5	0.1	101.0	99.0	Knox	21	0.5	63.7	65.9
Perry	67	1.7	228.8	233.0	Laurel	58	1.5	100.1	97.7	Mercer	16	0.4	63.0	75.2
Livingston	18	0.5	193.7	188.9	Russell	17	0.4	97.4	96.5	Magoffin	8	0.2	62.4	60.5
Clinton	20	0.5	191.6	196.1	Harrison	20	0.5	97.0	106.5	Harlan	18	0.5	61.6	61.9
Lee	15	0.4	190.7	191.9	Leslie	11	0.3	96.3	97.9	Muhlenberg	21	0.5	59.6	67.2
Wolfe	13	0.3	184.0	177.1	Estill	15	0.4	94.3	102.3	McLean	6	0.2	59.2	63.0
Jackson	24	0.6	181.6	178.5	Pendleton	14	0.4	94.0	95.3	Garrard	12	0.3	59.1	71.1
Clay	38	1.0	170.5	175.0	Campbell	88	2.2	93.1	96.8	Lewis	8	0.2	58.3	57.6
Powell	20	0.5	167.8	158.1	Jessamine	43	1.1	92.6	87.7	Crittenden	8	0.2	57.6	85.7
Rockcastle	27	0.7	162.1	158.2	Grant	20	0.5	92.0	80.6	Lawrence	10	0.3	55.7	62.4
Carroll	16	0.4	148.5	145.3	Marion	18	0.5	90.3	90.1	Warren	61	1.5	55.7	52.8
Lincoln	36	0.9	144.7	145.6	Gallatin	7	0.2	88.9	81.3	Elliott	*	-	-	-
Henry	21	0.5	141.9	136.0	McCreary	16	0.4	88.7	87.5	Butler	8	0.2	55.5	62.4
Adair	28	0.7	141.4	149.8	Morgan	12	0.3	87.0	86.1	Meade	14	0.4	53.4	47.4
Hardin	130	3.3	131.6	121.0	Franklin	45	1.1	86.9	91.1	Ballard	5	0.1	53.1	60.6
McCracken	103	2.6	130.1	156.4	Madison	71	1.8	86.2	84.3	Bracken	*	-	-	-
Taylor	34	0.9	130.0	137.5	Monroe	10	0.3	85.0	91.4	Washington	7	0.2	51.6	59.1
Whitley	48	1.2	129.8	134.0	Fayette	245	6.2	84.3	81.2	Martin	6	0.2	51.0	47.1
Bath	14	0.4	129.4	119.2	Nicholas	6	0.2	83.3	84.9	Lyon	5	0.1	51.0	60.1
Knott	22	0.6	129.0	135.1	Fulton	7	0.2	81.8	103.6	Cumberland	*	-	-	-
Breathitt	17	0.4	128.2	122.8	Wayne	19	0.5	80.7	90.6	Hopkins	25	0.6	47.6	53.3
Spencer	21	0.5	128.0	120.8	Daviess	87	2.2	80.1	89.5	Rowan	10	0.3	46.3	42.4
Nelson	55	1.4	127.2	125.1	Boone	79	2.0	79.2	64.9	Letcher	12	0.3	45.9	49.1
Shelby	52	1.3	127.0	120.7	Montgomery	21	0.5	79.2	78.5	Floyd	19	0.5	45.6	48.5
Grayson	34	0.9	122.4	131.0	Woodford	20	0.5	79.0	80.2	Union	6	0.2	38.3	39.8
Graves	50	1.3	121.4	133.3	Boyd	49	1.2	77.8	99.1	Metcalf	*	-	-	-
Hart	24	0.6	118.5	131.6	Boyle	23	0.6	76.2	80.6	Carter	10	0.3	34.8	36.3
Bourbon	23	0.6	116.6	115.0	Bullitt	52	1.3	74.5	69.2	Webster	5	0.1	33.1	36.6
Larue	18	0.5	115.2	125.7	Mason	13	0.3	74.3	73.6	Caldwell	5	0.1	32.7	38.5
Clark	44	1.1	114.9	123.8	Calloway	29	0.7	73.3	77.2	Edmonson	*	-	-	-
Menifee	7	0.2	114.4	110.8	Bell	21	0.5	72.0	73.1	Robertson	*	-	-	-
Trimble	9	0.2	111.9	103.2	Hancock	6	0.2	70.9	70.0	Hickman	*	-	-	-
Pike	73	1.9	111.7	112.5	Anderson	15	0.4	69.8	69.3	Allen	6	0.2	25.4	29.8
Fleming	15	0.4	107.6	103.4	Kenton	106	2.7	68.9	66.1	Christian	16	0.4	24.0	21.7
Green	13	0.3	106.9	115.9	Owen	7	0.2	68.3	64.5	Henderson	11	0.3	22.6	23.7
Pulaski	72	1.8	106.7	113.1	Barren	31	0.8	67.3	73.3	Simpson	*	-	-	-
Scott	46	1.2	105.7	95.5	Ohio	15	0.4	67.0	62.2	Greenup	9	0.2	18.8	24.4
Marshall	39	1.0	103.0	124.6	Johnson	15	0.4	66.5	64.1	Logan	5	0.1	17.0	18.7
Oldham	49	1.2	102.7	80.8	Breckinridge	15	0.4	66.4	74.1	Todd	*	-	-	-
Jefferson	810	20.5	102.2	108.4	Casey	11	0.3	64.7	69.1	Trigg	*	-	-	-

* 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, 2012

***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	617	2.0	1783.5	1722.4	Hart	128	0.4	755.9	702.0	Simpson	93	0.3	556.7	535.2
Boyd	712	2.3	1486.2	1439.4	Bracken	62	0.2	754.7	728.3	Washington	64	0.2	555.0	540.3
Clay	260	0.8	1225.0	1197.1	Jessamine	364	1.2	750.1	742.2	Morgan	73	0.2	552.3	523.6
Hopkins	496	1.6	1133.1	1057.4	Lincoln	178	0.6	749.8	719.7	Floyd	209	0.7	547.4	533.1
Jackson	143	0.5	1125.2	1063.8	Spencer	118	0.4	746.9	679.0	Knott	82	0.3	535.8	503.4
Madison	891	2.8	1118.9	1058.4	Kenton	1167	3.7	740.3	727.5	Henderson	236	0.8	535.0	508.6
Laurel	629	2.0	1117.0	1059.7	Ballard	54	0.2	721.5	654.3	Martin	63	0.2	524.3	494.1
Grant	269	0.9	1108.4	1084.0	Marshall	209	0.7	720.4	667.6	Graves	189	0.6	522.1	503.7
Powell	126	0.4	1054.2	996.0	Bourbon	131	0.4	716.3	655.1	Lyon	37	0.1	507.4	444.9
Clark	354	1.1	1051.8	996.1	Pike	431	1.4	700.4	664.1	Clinton	48	0.2	498.8	470.5
Scott	472	1.5	1009.8	980.3	Monroe	69	0.2	699.1	630.9	Breathitt	63	0.2	492.2	455.1
Estill	137	0.4	1002.3	934.1	Garrard	108	0.3	695.5	639.6	Muhlenberg	141	0.4	486.5	450.9
Mason	167	0.5	994.4	946.0	Leslie	72	0.2	690.8	641.0	Breckinridge	88	0.3	480.6	434.4
Henry	140	0.4	978.4	906.6	Fleming	96	0.3	687.9	661.5	Crittenden	41	0.1	474.2	439.2
Perry	266	0.8	969.8	925.2	Woodford	161	0.5	686.7	645.4	Union	67	0.2	471.5	444.7
McLean	85	0.3	962.2	892.2	McCreary	120	0.4	685.8	656.3	Elliott	33	0.1	447.0	428.2
Grayson	235	0.7	960.8	905.3	Owen	69	0.2	677.5	635.5	Trimble	35	0.1	446.8	401.2
McCracken	602	1.9	939.0	914.0	Lee	50	0.2	674.2	639.6	Marion	85	0.3	444.4	425.4
Pulaski	552	1.8	930.5	867.2	Anderson	140	0.4	673.1	646.8	Edmonson	47	0.1	439.5	388.8
Greenup	317	1.0	886.9	859.9	Fayette	1957	6.2	666.0	648.9	Lawrence	66	0.2	438.8	411.6
Harlan	244	0.8	881.6	839.6	Taylor	161	0.5	663.9	651.0	Allen	83	0.3	425.8	412.1
Knox	270	0.9	878.2	846.7	Shelby	272	0.9	659.1	631.6	Warren	486	1.5	420.7	420.7
Harrison	146	0.5	855.5	777.6	Gallatin	53	0.2	648.0	615.4	Lewis	53	0.2	419.3	381.9
Hardin	904	2.9	852.3	841.3	Rowan	144	0.5	647.8	610.6	Green	42	0.1	416.7	374.3
Larue	118	0.4	848.4	824.3	Montgomery	165	0.5	645.8	617.0	Bell	111	0.4	415.2	386.4
Carter	218	0.7	825.3	790.3	Boyle	176	0.6	637.1	616.5	Todd	52	0.2	414.3	417.2
Bath	90	0.3	818.5	766.5	Caldwell	77	0.2	630.8	593.5	Johnson	91	0.3	414.1	389.0
Pendleton	110	0.4	815.3	748.4	Nelson	264	0.8	620.0	600.4	Russell	66	0.2	411.3	374.8
Campbell	727	2.3	807.5	799.4	Menifee	37	0.1	617.7	585.7	Wolfe	27	0.1	411.3	367.8
Cumberland	51	0.2	803.7	746.5	Calloway	218	0.7	613.3	580.7	Owsley	18	0.1	403.4	373.4
Jefferson	5882	18.7	803.4	787.5	Letcher	138	0.4	609.2	564.5	Hancock	32	0.1	392.7	373.3
Daviess	746	2.4	788.3	767.2	Nicholas	41	0.1	608.2	579.8	Logan	104	0.3	390.2	388.2
Livingston	67	0.2	785.0	703.0	Rockcastle	93	0.3	607.6	544.9	Casey	56	0.2	384.1	352.0
Webster	102	0.3	784.7	746.3	Carlisle	33	0.1	598.9	653.7	Butler	46	0.1	377.3	358.6
Boone	896	2.9	781.4	736.0	Carroll	65	0.2	591.4	590.2	Robertson	7	0.0	353.0	314.0
Mercer	158	0.5	777.5	742.4	Oldham	317	1.0	585.2	522.7	Meade	99	0.3	347.0	334.9
Franklin	361	1.1	765.2	730.9	Bullitt	408	1.3	585.1	543.2	Adair	66	0.2	341.1	353.2
Barren	307	1.0	763.8	726.3	Wayne	115	0.4	580.1	548.4	Magoffin	35	0.1	274.8	264.8
Christian	571	1.8	763.4	775.9	Trigg	79	0.3	574.5	552.3	Fulton	13	0.0	209.8	192.5
Metcalfe	71	0.2	762.0	704.9	Ohio	126	0.4	557.4	522.8	Hickman	7	0.0	169.3	146.3

**Rate per 100,000

Table 17: Barrell Matrix TBI Type I/II/III by Mechanism for Non-Fatal Inpatient TBI, Kentucky, 2012

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	227	12.8	76	25.9	9	13.0	7	9.2	319
Falls	950	53.5	103	35.2	35	50.7	48	63.2	1,136
Non-traffic land transportation	64	3.6	13	4.4	4	5.8	1	1.3	82
Struck by or against object or person	103	5.8	16	5.5	9	13.0	5	6.6	133
Non-traffic pedal cycle	10	0.6	3	1.0	0	0.0	0	0.0	13
Firearm	15	0.8	0	0.0	1	1.4	0	0.0	16
Other	88	5.0	22	7.5	3	4.3	3	3.9	116
Unknown	318	17.9	60	20.5	8	11.6	12	15.8	398
Total	1,775	100.0	293	100.0	69	100.0	76	100.0	2,213

Table 18: Barrell Matrix TBI Type I/II/III by Mechanism for Non-Fatal ED TBI, Kentucky, 2012

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	133	16.6	1,598	20.8	46	14.6	1,855	13.6	3,632
Falls	374	46.8	2,603	33.9	128	40.5	6,577	48.3	9,682
Non-traffic land transportation	41	5.1	281	3.7	13	4.1	252	1.9	587
Struck by or against object or person	75	9.4	1,993	26.0	73	23.1	2,829	20.8	4,970
Non-traffic pedal cycle	8	1.0	124	1.6	5	1.6	167	1.2	304
Firearm	2	0.3	3	0.0	0	0.0	2	0.0	7
Other	66	8.3	524	6.8	36	11.4	801	5.9	1,427
Unknown	100	12.5	549	7.2	15	4.7	1,125	8.3	1,789
Total	799	100.0	7,675	100.0	316	100.0	13,608	100.0	22,398

Table 19: Length of Stay for Non-Fatal Inpatient TBI, Kentucky, 2012

Length of Stay	Number	Percent*
1 day	723	19.7
More than one day but less than 1 week	1966	53.5
1 week to less than 2 weeks	572	15.6
2 weeks to less than 3 weeks	237	6.5
3 weeks to less than 4 weeks	97	2.6
4 weeks or more	78	2.1
Total	3673	100.0

*Percent of hospitalized TBI

Table 20: Work Related Non-Fatal TBI, Kentucky 2012

Inpatient Work TBI (n=74)	LOS Days	Cost
Mean	4.9	\$54,456
Median	4	\$37,600
Min, Max	1 - 21	\$2,017, \$260,535
Sum of Charges		\$4,029,736

ED Work TBI (n=99)	Cost
Mean	\$3,504
Median	\$2,593
Min, Max	\$98, \$34,814
Sum of Charges	\$3,475,424

Table 21: Primary Payer and Charges for Non-Fatal Inpatient TBI, Kentucky, 2012

Payer	Number of Discharges	Percent of Discharges	Total Hospital Charges
Government	1,689	46.0	\$ 74,706,143
Commercial Ins	892	24.3	\$ 65,304,533
Self Pay	199	5.4	\$ 9,081,613
Workers Compensation	74	2.0	\$ 4,029,736
Other	819	22.3	\$ 59,821,910
Total	3,673	100.0	\$ 212,943,935

Table 22: Primary Payer and Charges for Non-Fatal ED TBI, Kentucky, 2012

Payer	Number of Discharges	Percent of Discharges	Total Hospital Charges
Government	6,178	19.8	\$ 24,169,031
Commercial Ins	10,218	32.7	\$ 35,067,829
Self Pay	4,022	12.9	\$ 15,546,703
Workers Compensation	992	3.2	\$ 3,475,424
Other	9,864	31.5	\$ 33,163,848
Total	31,274	100.0	\$ 111,422,835

Table 23: Non-Fatal ABI by Age Group, Kentucky, 2012

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	127	31.1	45.2	282	68.9	100.3	409	100.0	145.5
5-14	56	18.3	9.9	250	81.7	44.0	306	100.0	53.9
15-24	188	47.2	31.8	210	52.8	35.5	398	100.0	67.3
25-44	664	62.8	58.3	394	37.2	34.6	1,058	100.0	92.9
45-64	1,086	78.8	90.6	293	21.2	24.5	1,379	100.0	115.1
65+	663	87.5	112.0	95	12.5	16.1	758	100.0	128.1
Total	2,784	64.6	63.7	1,524	35.4	34.9	4,308	100.0	98.6

Table 24: Non-Fatal ABI by Gender, Kentucky, 2012

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Male	1,342	66.4	62.4	679	33.6	31.6	2,021	100.0	94.0
Female	1,442	63.4	65.0	832	36.6	37.5	2,274	100.0	102.5
Total	2,784	64.8	63.7	1,511	35.2	34.6	4,295	100.0	98.3

Table 25: Incidence of All Inpatient ABI* by County, Sorted by County, Kentucky, 2012

***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	11	0.3	57.9	58.9	Grant	31	0.9	130.6	124.9	McLean	6	0.2	58.2	63.0
Allen	15	0.4	64.8	74.5	Graves	62	1.7	149.4	165.3	Meade	17	0.5	61.1	57.5
Anderson	13	0.4	56.9	60.1	Grayson	24	0.7	88.7	92.5	Menifee	*	-	-	-
Ballard	9	0.2	99.9	109.1	Green	11	0.3	98.5	98.0	Mercer	18	0.5	73.7	84.6
Barren	35	1.0	72.5	82.8	Greenup	14	0.4	29.9	38.0	Metcalfe	9	0.2	80.9	89.3
Bath	18	0.5	165.7	153.3	Hancock	*	-	-	-	Monroe	5	0.1	35.1	45.7
Bell	35	1.0	107.7	121.8	Hardin	90	2.5	85.4	83.8	Montgomery	25	0.7	87.4	93.5
Boone	86	2.4	77.2	70.6	Harlan	24	0.7	75.4	82.6	Morgan	9	0.2	61.1	64.5
Bourbon	26	0.7	116.6	130.0	Harrison	17	0.5	76.6	90.5	Muhlenberg	31	0.9	92.5	99.1
Boyd	36	1.0	69.0	72.8	Hart	10	0.3	46.1	54.8	Nelson	46	1.3	98.3	104.6
Boyle	37	1.0	116.3	129.6	Henderson	17	0.5	33.3	36.6	Nicholas	*	-	-	-
Bracken	*	-	-	-	Henry	13	0.4	85.8	84.2	Ohio	12	0.3	51.9	49.8
Breathitt	19	0.5	124.4	137.3	Hickman	*	-	-	-	Oldham	22	0.6	38.8	36.3
Breckinridge	13	0.4	55.5	64.2	Hopkins	52	1.4	104.7	110.9	Owen	9	0.2	78.7	82.9
Bullitt	42	1.2	52.5	55.9	Jackson	21	0.6	145.4	156.2	Owsley	17	0.5	357.2	352.7
Butler	6	0.2	40.1	46.8	Jefferson	639	17.6	80.4	85.6	Pendleton	14	0.4	83.5	95.3
Caldwell	8	0.2	53.3	61.7	Jessamine	33	0.9	68.8	67.3	Perry	30	0.8	92.6	104.3
Calloway	15	0.4	36.8	40.0	Johnson	27	0.7	104.1	115.4	Pike	62	1.7	86.9	95.5
Campbell	63	1.7	63.9	69.3	Kenton	125	3.4	76.5	77.9	Powell	18	0.5	130.8	142.3
Carlisle	6	0.2	143.8	118.9	Knott	13	0.4	69.2	79.8	Pulaski	63	1.7	90.3	99.0
Carroll	7	0.2	61.1	63.6	Knox	42	1.2	120.6	131.7	Robertson	0	0.0	0.0	0.0
Carter	19	0.5	64.8	68.9	Larue	14	0.4	89.0	97.8	Rockcastle	14	0.4	82.0	82.0
Casey	13	0.4	78.3	81.7	Laurel	46	1.3	77.7	77.5	Rowan	24	0.7	108.1	101.8
Christian	32	0.9	49.3	43.5	Lawrence	5	0.1	34.5	31.2	Russell	16	0.4	85.1	90.9
Clark	37	1.0	92.0	104.1	Lee	12	0.3	145.5	153.5	Scott	45	1.2	94.5	93.5
Clay	40	1.1	177.8	184.2	Leslie	20	0.6	165.1	178.0	Shelby	22	0.6	48.2	51.1
Clinton	12	0.3	115.5	117.6	Letcher	21	0.6	84.6	85.9	Simpson	12	0.3	61.9	69.1
Crittenden	5	0.1	47.2	53.6	Lewis	*	-	-	-	Spencer	10	0.3	61.7	57.5
Cumberland	12	0.3	180.1	175.6	Lincoln	25	0.7	92.8	101.1	Taylor	25	0.7	93.2	101.1
Daviess	61	1.7	58.8	62.7	Livingston	11	0.3	104.6	115.4	Todd	5	0.1	32.7	40.1
Edmonson	*	-	-	-	Logan	19	0.5	64.0	70.9	Trigg	7	0.2	47.1	48.9
Elliott	6	0.2	67.3	77.9	Lyon	6	0.2	56.9	72.1	Trimble	8	0.2	88.7	91.7
Estill	13	0.4	81.8	88.6	Madison	75	2.1	93.1	89.1	Union	*	-	-	-
Fayette	250	6.9	85.1	82.9	Magoffin	18	0.5	137.5	136.2	Warren	79	2.2	72.1	68.4
Fleming	7	0.2	46.9	48.2	Marion	14	0.4	68.8	70.1	Washington	6	0.2	41.8	50.7
Floyd	33	0.9	77.2	84.2	Marshall	27	0.7	72.3	86.2	Wayne	15	0.4	67.1	71.5
Franklin	30	0.8	53.2	60.7	Martin	12	0.3	92.1	94.1	Webster	8	0.2	47.9	58.5
Fulton	9	0.2	108.5	133.2	Mason	9	0.2	44.7	51.0	Whitley	57	1.6	149.2	159.1
Gallatin	8	0.2	98.7	92.9	McCracken	78	2.2	105.1	118.4	Wolfe	11	0.3	127.0	149.8
Garrard	15	0.4	79.2	88.8	McCreary	16	0.4	83.2	87.5	Woodford	27	0.7	102.3	108.2

* 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 26: Incidence of All ED ABI* by County, Sorted by County, Kentucky, 2012

***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	*	-	-	-	Grant	18	1.2	70.9	72.5	McLean	*	-	-	-
Allen	9	0.6	42.2	44.7	Graves	16	1.0	44.9	42.6	Meade	7	0.5	22.0	23.7
Anderson	7	0.5	32.3	32.3	Grayson	7	0.5	27.4	27.0	Menifee	0	0.0	0.0	0.0
Ballard	0	0.0	0.0	0.0	Green	8	0.5	73.0	71.3	Mercer	*	-	-	-
Barren	25	1.6	64.0	59.1	Greenup	8	0.5	25.1	21.7	Metcalfe	10	0.6	103.7	99.3
Bath	7	0.5	66.0	59.6	Hancock	0	0.0	0.0	0.0	Monroe	*	-	-	-
Bell	10	0.6	36.7	34.8	Hardin	44	2.8	41.0	40.9	Montgomery	5	0.3	18.3	18.7
Boone	28	1.8	23.0	23.0	Harlan	7	0.5	25.1	24.1	Morgan	*	-	-	-
Bourbon	5	0.3	25.6	25.0	Harrison	6	0.4	36.1	32.0	Muhlenberg	7	0.5	23.5	22.4
Boyd	8	0.5	18.2	16.2	Hart	5	0.3	29.4	27.4	Nelson	6	0.4	13.6	13.6
Boyle	7	0.5	27.8	24.5	Henderson	6	0.4	14.0	12.9	Nicholas	8	0.5	120.1	113.1
Bracken	*	-	-	-	Henry	9	0.6	64.7	58.3	Ohio	12	0.8	49.0	49.8
Breathitt	0	0.0	0.0	0.0	Hickman	*	-	-	-	Oldham	19	1.2	30.0	31.3
Breckinridge	9	0.6	43.1	44.4	Hopkins	19	1.2	42.8	40.5	Owen	*	-	-	-
Bullitt	17	1.1	22.9	22.6	Jackson	10	0.6	83.4	74.4	Owsley	0	0.0	0.0	0.0
Butler	*	-	-	-	Jefferson	348	22.4	49.0	46.6	Pendleton	*	-	-	-
Caldwell	6	0.4	57.7	46.3	Jessamine	31	2.0	63.8	63.2	Perry	*	-	-	-
Calloway	6	0.4	16.9	16.0	Johnson	8	0.5	36.8	34.2	Pike	21	1.4	35.5	32.4
Campbell	34	2.2	38.5	37.4	Kenton	53	3.4	33.3	33.0	Powell	11	0.7	78.8	87.0
Carlisle	0	0.0	0.0	0.0	Knott	5	0.3	35.2	30.7	Pulaski	15	1.0	26.6	23.6
Carroll	6	0.4	59.2	54.5	Knox	19	1.2	62.7	59.6	Robertson	0	0.0	0.0	0.0
Carter	*	-	-	-	Larue	7	0.5	51.1	48.9	Rockcastle	5	0.3	31.3	29.3
Casey	12	0.8	74.9	75.4	Laurel	21	1.4	36.4	35.4	Rowan	8	0.5	38.8	33.9
Christian	22	1.4	29.6	29.9	Lawrence	8	0.5	54.3	49.9	Russell	7	0.5	41.0	39.8
Clark	26	1.7	80.6	73.2	Lee	*	-	-	-	Scott	22	1.4	45.3	45.7
Clay	6	0.4	25.9	27.6	Leslie	*	-	-	-	Shelby	8	0.5	19.6	18.6
Clinton	*	-	-	-	Letcher	*	-	-	-	Simpson	6	0.4	31.2	34.5
Crittenden	*	-	-	-	Lewis	*	-	-	-	Spencer	9	0.6	48.4	51.8
Cumberland	8	0.5	143.1	117.1	Lincoln	11	0.7	46.1	44.5	Taylor	9	0.6	34.9	36.4
Daviess	13	0.8	14.9	13.4	Livingston	*	-	-	-	Todd	*	-	-	-
Edmonson	*	-	-	-	Logan	10	0.6	39.5	37.3	Trigg	10	0.6	80.7	69.9
Elliott	*	-	-	-	Lyon	0	0.0	0.0	0.0	Trimble	*	-	-	-
Estill	15	1.0	108.9	102.3	Madison	19	1.2	22.4	22.6	Union	*	-	-	-
Fayette	90	5.8	29.4	29.8	Magoffin	5	0.3	38.6	37.8	Warren	45	2.9	42.1	39.0
Fleming	*	-	-	-	Marion	*	-	-	-	Washington	*	-	-	-
Floyd	14	0.9	39.2	35.7	Marshall	9	0.6	27.8	28.7	Wayne	9	0.6	43.4	42.9
Franklin	19	1.2	40.4	38.5	Martin	6	0.4	54.3	47.1	Webster	5	0.3	39.9	36.6
Fulton	*	-	-	-	Mason	*	-	-	-	Whitley	30	1.9	89.5	83.7
Gallatin	*	-	-	-	McCracken	17	1.1	29.5	25.8	Wolfe	*	-	-	-
Garrard	12	0.8	81.1	71.1	McCreary	*	-	-	-	Woodford	12	0.8	51.7	48.1

* 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, 2012

***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	639	17.6	80.4	85.6	Grayson	24	0.7	88.7	92.5	Ohio	12	0.3	51.9	49.8
Fayette	250	6.9	85.1	82.9	Harlan	24	0.7	75.4	82.6	Simpson	12	0.3	61.9	69.1
Kenton	125	3.4	76.5	77.9	Rowan	24	0.7	108.1	101.8	Adair	11	0.3	57.9	58.9
Hardin	90	2.5	85.4	83.8	Oldham	22	0.6	38.8	36.3	Green	11	0.3	98.5	98.0
Boone	86	2.4	77.2	70.6	Shelby	22	0.6	48.2	51.1	Livingston	11	0.3	104.6	115.4
Warren	79	2.2	72.1	68.4	Jackson	21	0.6	145.4	156.2	Wolfe	11	0.3	127.0	149.8
McCracken	78	2.2	105.1	118.4	Letcher	21	0.6	84.6	85.9	Hart	10	0.3	46.1	54.8
Madison	75	2.1	93.1	89.1	Leslie	20	0.6	165.1	178.0	Spencer	10	0.3	61.7	57.5
Campbell	63	1.7	63.9	69.3	Breathitt	19	0.5	124.4	137.3	Ballard	9	0.2	99.9	109.1
Pulaski	63	1.7	90.3	99.0	Carter	19	0.5	64.8	68.9	Fulton	9	0.2	108.5	133.2
Graves	62	1.7	149.4	165.3	Logan	19	0.5	64.0	70.9	Mason	9	0.2	44.7	51.0
Pike	62	1.7	86.9	95.5	Bath	18	0.5	165.7	153.3	Metcalfe	9	0.2	80.9	89.3
Daviess	61	1.7	58.8	62.7	Magoffin	18	0.5	137.5	136.2	Morgan	9	0.2	61.1	64.5
Whitley	57	1.6	149.2	159.1	Mercer	18	0.5	73.7	84.6	Owen	9	0.2	78.7	82.9
Hopkins	52	1.4	104.7	110.9	Powell	18	0.5	130.8	142.3	Caldwell	8	0.2	53.3	61.7
Laurel	46	1.3	77.7	77.5	Harrison	17	0.5	76.6	90.5	Gallatin	8	0.2	98.7	92.9
Nelson	46	1.3	98.3	104.6	Henderson	17	0.5	33.3	36.6	Trimble	8	0.2	88.7	91.7
Scott	45	1.2	94.5	93.5	Meade	17	0.5	61.1	57.5	Webster	8	0.2	47.9	58.5
Bullitt	42	1.2	52.5	55.9	Owsley	17	0.5	357.2	352.7	Carroll	7	0.2	61.1	63.6
Knox	42	1.2	120.6	131.7	McCreary	16	0.4	83.2	87.5	Fleming	7	0.2	46.9	48.2
Clay	40	1.1	177.8	184.2	Russell	16	0.4	85.1	90.9	Trigg	7	0.2	47.1	48.9
Boyle	37	1.0	116.3	129.6	Allen	15	0.4	64.8	74.5	Butler	6	0.2	40.1	46.8
Clark	37	1.0	92.0	104.1	Calloway	15	0.4	36.8	40.0	Carlisle	6	0.2	143.8	118.9
Boyd	36	1.0	69.0	72.8	Garrard	15	0.4	79.2	88.8	Elliott	6	0.2	67.3	77.9
Barren	35	1.0	72.5	82.8	Wayne	15	0.4	67.1	71.5	Lyon	6	0.2	56.9	72.1
Bell	35	1.0	107.7	121.8	Greenup	14	0.4	29.9	38.0	McLean	6	0.2	58.2	63.0
Floyd	33	0.9	77.2	84.2	Larue	14	0.4	89.0	97.8	Washington	6	0.2	41.8	50.7
Jessamine	33	0.9	68.8	67.3	Marion	14	0.4	68.8	70.1	Crittenden	5	0.1	47.2	53.6
Christian	32	0.9	49.3	43.5	Pendleton	14	0.4	83.5	95.3	Lawrence	5	0.1	34.5	31.2
Grant	31	0.9	130.6	124.9	Rockcastle	14	0.4	82.0	82.0	Monroe	5	0.1	35.1	45.7
Muhlenberg	31	0.9	92.5	99.1	Anderson	13	0.4	56.9	60.1	Todd	5	0.1	32.7	40.1
Franklin	30	0.8	53.2	60.7	Breckinridge	13	0.4	55.5	64.2	Bracken	*	-	-	-
Perry	30	0.8	92.6	104.3	Casey	13	0.4	78.3	81.7	Edmonson	*	-	-	-
Johnson	27	0.7	104.1	115.4	Estill	13	0.4	81.8	88.6	Hancock	*	-	-	-
Marshall	27	0.7	72.3	86.2	Henry	13	0.4	85.8	84.2	Lewis	*	-	-	-
Woodford	27	0.7	102.3	108.2	Knott	13	0.4	69.2	79.8	Nicholas	*	-	-	-
Bourbon	26	0.7	116.6	130.0	Clinton	12	0.3	115.5	117.6	Menifee	*	-	-	-
Lincoln	25	0.7	92.8	101.1	Cumberland	12	0.3	180.1	175.6	Union	*	-	-	-
Montgomery	25	0.7	87.4	93.5	Lee	12	0.3	145.5	153.5	Hickman	*	-	-	-
Taylor	25	0.7	93.2	101.1	Martin	12	0.3	92.1	94.1	Robertson	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 28: Incidence of All ED ABI* by County, Sorted by Frequency, Kentucky, 2012

***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	348	22.4	49.0	46.6	Breckinridge	9	0.6	43.1	44.4	Carter	*	-	-	-
Fayette	90	5.8	29.4	29.8	Henry	9	0.6	64.7	58.3	Clinton	*	-	-	-
Kenton	53	3.4	33.3	33.0	Marshall	9	0.6	27.8	28.7	Fulton	*	-	-	-
Warren	45	2.9	42.1	39.0	Spencer	9	0.6	48.4	51.8	Marion	*	-	-	-
Hardin	44	2.8	41.0	40.9	Taylor	9	0.6	34.9	36.4	McCreary	*	-	-	-
Campbell	34	2.2	38.5	37.4	Wayne	9	0.6	43.4	42.9	Pendleton	*	-	-	-
Jessamine	31	2.0	63.8	63.2	Boyd	8	0.5	18.2	16.2	Todd	*	-	-	-
Whitley	30	1.9	89.5	83.7	Cumberland	8	0.5	143.1	117.1	Trimble	*	-	-	-
Boone	28	1.8	23.0	23.0	Green	8	0.5	73.0	71.3	Washington	*	-	-	-
Clark	26	1.7	80.6	73.2	Greenup	8	0.5	25.1	21.7	Adair	*	-	-	-
Barren	25	1.6	64.0	59.1	Johnson	8	0.5	36.8	34.2	Crittenden	*	-	-	-
Christian	22	1.4	29.6	29.9	Lawrence	8	0.5	54.3	49.9	Fleming	*	-	-	-
Scott	22	1.4	45.3	45.7	Nicholas	8	0.5	120.1	113.1	Lee	*	-	-	-
Laurel	21	1.4	36.4	35.4	Rowan	8	0.5	38.8	33.9	Leslie	*	-	-	-
Pike	21	1.4	35.5	32.4	Shelby	8	0.5	19.6	18.6	Mason	*	-	-	-
Franklin	19	1.2	40.4	38.5	Anderson	7	0.5	32.3	32.3	Monroe	*	-	-	-
Hopkins	19	1.2	42.8	40.5	Bath	7	0.5	66.0	59.6	Morgan	*	-	-	-
Knox	19	1.2	62.7	59.6	Boyle	7	0.5	27.8	24.5	Owen	*	-	-	-
Madison	19	1.2	22.4	22.6	Grayson	7	0.5	27.4	27.0	Perry	*	-	-	-
Oldham	19	1.2	30.0	31.3	Harlan	7	0.5	25.1	24.1	Butler	*	-	-	-
Grant	18	1.2	70.9	72.5	Larue	7	0.5	51.1	48.9	Edmonson	*	-	-	-
Bullitt	17	1.1	22.9	22.6	Meade	7	0.5	22.0	23.7	Elliott	*	-	-	-
McCracken	17	1.1	29.5	25.8	Muhlenberg	7	0.5	23.5	22.4	Gallatin	*	-	-	-
Graves	16	1.0	44.9	42.6	Russell	7	0.5	41.0	39.8	Letcher	*	-	-	-
Estill	15	1.0	108.9	102.3	Caldwell	6	0.4	57.7	46.3	McLean	*	-	-	-
Pulaski	15	1.0	26.6	23.6	Calloway	6	0.4	16.9	16.0	Mercer	*	-	-	-
Floyd	14	0.9	39.2	35.7	Carroll	6	0.4	59.2	54.5	Union	*	-	-	-
Daviess	13	0.8	14.9	13.4	Clay	6	0.4	25.9	27.6	Bracken	*	-	-	-
Casey	12	0.8	74.9	75.4	Harrison	6	0.4	36.1	32.0	Hickman	*	-	-	-
Garrard	12	0.8	81.1	71.1	Henderson	6	0.4	14.0	12.9	Lewis	*	-	-	-
Ohio	12	0.8	49.0	49.8	Martin	6	0.4	54.3	47.1	Livingston	*	-	-	-
Woodford	12	0.8	51.7	48.1	Nelson	6	0.4	13.6	13.6	Wolfe	*	-	-	-
Lincoln	11	0.7	46.1	44.5	Simpson	6	0.4	31.2	34.5	Ballard	0	0.0	0.0	0.0
Powell	11	0.7	78.8	87.0	Bourbon	5	0.3	25.6	25.0	Breathitt	0	0.0	0.0	0.0
Bell	10	0.6	36.7	34.8	Hart	5	0.3	29.4	27.4	Carlisle	0	0.0	0.0	0.0
Jackson	10	0.6	83.4	74.4	Knott	5	0.3	35.2	30.7	Hancock	0	0.0	0.0	0.0
Logan	10	0.6	39.5	37.3	Magoffin	5	0.3	38.6	37.8	Lyon	0	0.0	0.0	0.0
Metcalfe	10	0.6	103.7	99.3	Montgomery	5	0.3	18.3	18.7	Menifee	0	0.0	0.0	0.0
Trigg	10	0.6	80.7	69.9	Rockcastle	5	0.3	31.3	29.3	Owsley	0	0.0	0.0	0.0
Allen	9	0.6	42.2	44.7	Webster	5	0.3	39.9	36.6	Robertson	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 29: Incidence of All Inpatient ABI* by County, Sorted by Age Adjusted Rate, Kentucky, 2012

***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	17	0.5	357.2	352.7	Larue	14	0.4	89.0	97.8	Spencer	10	0.3	61.7	57.5
Cumberland	12	0.3	180.1	175.6	Trimble	8	0.2	88.7	91.7	Carroll	7	0.2	61.1	63.6
Clay	40	1.1	177.8	184.2	Grayson	24	0.7	88.7	92.5	Meade	17	0.5	61.1	57.5
Bath	18	0.5	165.7	153.3	Montgomery	25	0.7	87.4	93.5	Morgan	9	0.2	61.1	64.5
Leslie	20	0.6	165.1	178.0	Pike	62	1.7	86.9	95.5	Daviess	61	1.7	58.8	62.7
Graves	62	1.7	149.4	165.3	Henry	13	0.4	85.8	84.2	McLean	6	0.2	58.2	63.0
Whitley	57	1.6	149.2	159.1	Hardin	90	2.5	85.4	83.8	Adair	11	0.3	57.9	58.9
Lee	12	0.3	145.5	153.5	Fayette	250	6.9	85.1	82.9	Lyon	6	0.2	56.9	72.1
Jackson	21	0.6	145.4	156.2	Russell	16	0.4	85.1	90.9	Anderson	13	0.4	56.9	60.1
Carlisle	6	0.2	143.8	118.9	Letcher	21	0.6	84.6	85.9	Breckinridge	13	0.4	55.5	64.2
Magoffin	18	0.5	137.5	136.2	Pendleton	14	0.4	83.5	95.3	Caldwell	8	0.2	53.3	61.7
Powell	18	0.5	130.8	142.3	McCreary	16	0.4	83.2	87.5	Franklin	30	0.8	53.2	60.7
Grant	31	0.9	130.6	124.9	Rockcastle	14	0.4	82.0	82.0	Bullitt	42	1.2	52.5	55.9
Wolfe	11	0.3	127.0	149.8	Estill	13	0.4	81.8	88.6	Menifee	*	-	-	-
Breathitt	19	0.5	124.4	137.3	Metcalfe	9	0.2	80.9	89.3	Ohio	12	0.3	51.9	49.8
Knox	42	1.2	120.6	131.7	Jefferson	639	17.6	80.4	85.6	Christian	32	0.9	49.3	43.5
Bourbon	26	0.7	116.6	130.0	Garrard	15	0.4	79.2	88.8	Nicholas	*	-	-	-
Boyle	37	1.0	116.3	129.6	Owen	9	0.2	78.7	82.9	Shelby	22	0.6	48.2	51.1
Clinton	12	0.3	115.5	117.6	Casey	13	0.4	78.3	81.7	Hancock	*	-	-	-
Fulton	9	0.2	108.5	133.2	Laurel	46	1.3	77.7	77.5	Webster	8	0.2	47.9	58.5
Rowan	24	0.7	108.1	101.8	Boone	86	2.4	77.2	70.6	Crittenden	5	0.1	47.2	53.6
Bell	35	1.0	107.7	121.8	Floyd	33	0.9	77.2	84.2	Trigg	7	0.2	47.1	48.9
McCracken	78	2.2	105.1	118.4	Harrison	17	0.5	76.6	90.5	Fleming	7	0.2	46.9	48.2
Hopkins	52	1.4	104.7	110.9	Kenton	125	3.4	76.5	77.9	Hart	10	0.3	46.1	54.8
Livingston	11	0.3	104.6	115.4	Harlan	24	0.7	75.4	82.6	Mason	9	0.2	44.7	51.0
Johnson	27	0.7	104.1	115.4	Mercer	18	0.5	73.7	84.6	Washington	6	0.2	41.8	50.7
Woodford	27	0.7	102.3	108.2	Barren	35	1.0	72.5	82.8	Bracken	*	-	-	-
Ballard	9	0.2	99.9	109.1	Marshall	27	0.7	72.3	86.2	Butler	6	0.2	40.1	46.8
Gallatin	8	0.2	98.7	92.9	Warren	79	2.2	72.1	68.4	Oldham	22	0.6	38.8	36.3
Green	11	0.3	98.5	98.0	Knott	13	0.4	69.2	79.8	Calloway	15	0.4	36.8	40.0
Nelson	46	1.3	98.3	104.6	Boyd	36	1.0	69.0	72.8	Monroe	5	0.1	35.1	45.7
Scott	45	1.2	94.5	93.5	Jessamine	33	0.9	68.8	67.3	Lawrence	5	0.1	34.5	31.2
Taylor	25	0.7	93.2	101.1	Marion	14	0.4	68.8	70.1	Henderson	17	0.5	33.3	36.6
Madison	75	2.1	93.1	89.1	Elliott	6	0.2	67.3	77.9	Todd	5	0.1	32.7	40.1
Lincoln	25	0.7	92.8	101.1	Wayne	15	0.4	67.1	71.5	Greenup	14	0.4	29.9	38.0
Perry	30	0.8	92.6	104.3	Carter	19	0.5	64.8	68.9	Edmonson	*	-	-	-
Muhlenberg	31	0.9	92.5	99.1	Allen	15	0.4	64.8	74.5	Lewis	*	-	-	-
Martin	12	0.3	92.1	94.1	Logan	19	0.5	64.0	70.9	Hickman	*	-	-	-
Clark	37	1.0	92.0	104.1	Campbell	63	1.7	63.9	69.3	Union	*	-	-	-
Pulaski	63	1.7	90.3	99.0	Simpson	12	0.3	61.9	69.1	Robertson	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 30: Causes of Non-Fatal ABI, Kentucky, 2012

ABI Category	Inpatient		ED	
	Number	Percent	Number	Percent
Anoxia	1292	41.3	127	8.3
Exposure to toxic substances	1426	45.6	1123	73.3
Allergy/anaphylaxis	229	7.3	280	18.3
Acute medical clinical incidents	179	5.7	2	0.1

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

Table 31: Injury-Related Causes of Non-Fatal ABI, Kentucky, 2012

Mechanism of Injury	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Poisoning	929	57.2	21.3	695	42.8	15.9	1,624	100.0	37.2
Suffocation	21	61.8	0.5	13	38.2	0.3	34	100.0	0.8
Drowning	13	29.5	0.3	31	70.5	0.7	44	100.0	1.0
Falls	70	86.4	1.6	11	13.6	0.3	81	100.0	1.9
Motor vehicle traffic crash	3	37.5	0.1	5	62.5	0.1	8	100.0	0.2
Fire/burn	2	33.3	0.0	4	66.7	0.1	6	100.0	0.1
Other	98	27.5	2.2	258	72.5	5.9	356	100.0	8.1
Unknown or Non-Injury Related	1,648	76.5	37.7	507	23.5	11.6	2,155	100.0	49.3
Total	2,784	64.6	63.7	1,524	35.4	34.9	4,308	100.0	98.6

Table 32: Non-Fatal Anoxia by Age Group, Kentucky, 2012

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	38	61.3	13.5	24	38.7	8.5	62	100.0	22.1
5-14	17	56.7	3.0	13	43.3	2.3	30	100.0	5.3
15-24	78	77.2	13.2	23	22.8	3.9	101	100.0	17.1
25-44	250	86.2	21.9	40	13.8	3.5	290	100.0	25.5
45-64	498	96.1	41.6	20	3.9	1.7	518	100.0	43.2
65+	411	98.3	69.4	7	1.7	1.2	418	100.0	70.6
Total	1,292	91.1	29.6	127	8.9	2.9	1,419	100.0	32.5

Table 33: Diagnosis Distribution for Non-Fatal Anoxia, Kentucky, 2012

Diagnosis	Description	Inpatient		ED	
		Number	Percent	Number	Percent
348.1	Anoxic brain damage (related to hereditary and degenerative diseases of the central nervous system)	728	56.3	42	33.1
997.0	Nervous system complications (related to medical care)	434	33.6	19	15.0
	- Anoxic brain damage				0.0
	- Cerebral hypoxia				0.0
	- Postoperative stroke				0.0
	- Other				0.0
669.4	Cerebral anoxia following cesarean	82	6.3	11	8.7
994.1	Drowning and nonfatal submersion	18	1.4	39	30.7
768					
(.1,.5,.6,.9)	Birth asphyxia	11	0.9	0	0.0
799.0, 994.7	Asphyxia	19	1.5	16	12.6
Total		1,292	100.0	127	100.0

Table 34: Non-Fatal Exposure to Toxic Substances by Age Group, Kentucky, 2012

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	69	24.5	24.4	213	75.5	75.4	282	100.0	99.9
5-14	36	15.9	6.3	191	84.1	33.7	227	100.0	40.0
15-24	95	38.6	16.2	151	61.4	25.7	246	100.0	41.9
25-44	394	58.0	34.5	285	42.0	24.9	679	100.0	59.4
45-64	560	72.4	47.4	214	27.6	18.1	774	100.0	65.5
65+	272	79.8	47.0	69	20.2	11.9	341	100.0	59.0
Total	1,426	55.9	32.9	1,123	44.1	25.9	2,549	100.0	58.7

Table 35 Diagnosis Distribution for Non-Fatal Exposure to Toxic Substances, Kentucky, 2012

Diagnosis	Description	Inpatient		ED	
		Number	Percent	Number	Percent
967	Poisoning by sedatives and hypnotics	547	38.4	314	28.8
980	Toxic effect of alcohol	284	19.9	171	13.3
968	Poisoning by other central nervous system depressants and anesthetics	138	9.7	73	8.9
964.2	Poisoning by anticoagulants	74	5.2	53	5.0
998	Post-operative shock	252	17.7	2	0.2
995.5	Child Maltreatment Syndrome	69	4.8	340	25.1
986	Toxic effect of carbon monoxide	45	3.2	128	14.6
985	Toxic effect of other metals	13	0.9	14	1.0
988.0-988.2	Toxic effect of noxious substances eaten as food	1	0.1	27	3.0
995.4	Shock due to anesthesia	3	0.2	0	0.1
Total		1426	100.0	1122	100.0

Table 36: Length of Stay for Non-Fatal Inpatient ABI, Kentucky, 2012

Length of Stay	Number	Percent*
1 day	538	19.3
More than one day but less than 1 week	1230	44.2
1 week to less than 2 weeks	558	20.0
2 weeks to less than 3 weeks	216	7.8
3 weeks to less than 4 weeks	99	3.6
4 weeks or more	143	5.1
Total	2784	100.0

*Percent of hospitalized ABI

Table 37: Discharge Disposition for Non-Fatal ABI, Kentucky, 2012

Discharge Disposition	Inpatient		ED	
	Number	Percent	Number	Percent
Routine discharge (home/self care)	1,467	52.7	1,309	85.9
Skilled nursing facility (SNF)	331	11.9	7	0.5
Home health	243	8.7	0	0.0
Inpatient-other type facility	31	1.1	22	1.4
Inpatient-other short-term hospital	106	3.8	94	6.2
Intermediate care facility (ICF)	12	0.4	2	0.1
Other	594	21.3	90	5.9
Total	2,784	100.0	1,524	100.0

Table 38: Primary Payer and Charges for Non-Fatal Inpatient ABI, Kentucky, 2012

Payer	Number of Discharges	Percent of Discharges	Total Hospital Charges
Government	1,316	47.3	\$ 85,185,149
Commercial Insurance	739	26.5	\$ 52,512,244
Self Pay	245	8.8	\$ 7,361,385
Workers Compensation	4	0.1	\$ 215,208
Other	480	17.2	\$ 27,601,071
Total	2,784	100.0	\$ 172,875,057

Table 39: Primary Payer and Charges for Non-Fatal ED ABI, Kentucky, 2012

Payer	Number of Discharges	Percent of Discharges	Total Hospital Charges
Government	425	27.9	\$ 1,033,201
Commercial Insurance	398	26.1	\$ 796,228
Self Pay	232	15.2	\$ 502,694
Workers Compensation	15	1.0	\$ 27,765
Other	454	29.8	\$ 847,968
Total	1,524	100.0	\$ 3,207,856

Table 40: Non-Fatal SCI by Age Group, Kentucky, 2012

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	2	0.0	0.7	0	0.0	0.0	2	100.0	0.7
5-14	4	133.3	0.7	3	42.9	0.5	7	100.0	1.2
15-24	15	68.2	2.5	7	31.8	1.2	22	100.0	3.7
25-44	41	58.6	3.6	29	41.4	2.5	70	100.0	6.1
45-64	83	76.1	6.9	26	23.9	2.2	109	100.0	9.1
65+	46	75.4	7.8	15	24.6	2.5	61	100.0	10.3
Total	191	70.5	4.4	80	29.5	1.8	271	100.0	6.2

Table 41: Non-Fatal SCI by Gender, Kentucky, 2012

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Male	141	76.2	6.6	44	23.8	2.0	185	100.0	8.6
Female	50	58.1	2.3	36	41.9	1.6	86	100.0	3.9
Total	191	70.5	4.4	80	29.5	1.8	271	100.0	6.2

Table 42: Leading Causes of Non-Fatal SCI, Kentucky, 2012

Mechanism of Injury	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Motor vehicle traffic crash	25	61.0	0.6	16	39.0	0.4	41	100.0	0.9
Fall	65	66.3	1.5	33	33.7	0.8	98	100.0	2.2
Non-traffic land transportation	5	38.5	0.1	8	61.5	0.2	13	100.0	0.3
Struck by or against object or person	6	54.5	0.1	5	45.5	0.1	11	100.0	0.3
Firearm	5	100.0	0.1	0	0.0	0.0	5	100.0	0.1
Other	12	57.1	0.3	9	42.9	0.2	21	100.0	0.5
Unknown (missing E-code)	73	89.0	1.7	9	11.0	0.2	82	100.0	1.9
Total	191	70.5	4.4	80	29.5	1.8	271	100.0	6.2

Table 43: Length of Stay for Non-Fatal Inpatient SCI, Kentucky, 2012

Length of Stay	Number	Percent*
1 day	14	7.3
More than one day but less than 1 week	58	30.4
1 week to less than 2 weeks	64	33.5
2 weeks to less than 3 weeks	18	9.4
3 weeks to less than 4 weeks	15	7.9
4 weeks or more	22	11.5
Total	191	100.0

*Percent of hospitalized SCI

Table 44: Discharge Disposition for Non-Fatal SCI, Kentucky, 2012

Discharge Disposition	Inpatient		ED	
	Number	Percent	Number	Percent
Routine discharge (home/self care)	52	27.2	39	55.6
Home health	22	11.5	0	0.0
Skilled nursing facility (SNF)	19	9.9	0	0.0
Inpatient-other	10	5.2	35	38.3
Rehab	80	41.9	0	2.5
Other	8	4.2	6	3.7
Total	191	100.0	80	100.0

Table 45: Primary Payer and Charges for Non-Fatal Inpatient SCI, Kentucky, 2012

Payer	Number of Discharges	Percent of Discharges	Total Hospital Discharges
Government	68	35.6	\$ 6,572,380
Commercial Ins	61	31.9	\$ 9,204,648
Workers Compensation	8	4.2	\$ 1,490,648
Self Pay	8	4.2	\$ 598,879
Other	46	24.1	\$ 11,319,412
Total	191	100.0	\$29,185,967

Table 46: Primary Payer and Charges for Non-Fatal ED SCI, Kentucky, 2012

Payer	Number of Discharges	Percent of Discharges	Total Hospital Discharges
Government	22	27.5	\$ 90,968
Commercial Ins	32	40.0	\$ 191,945
Workers Compensation	1	1.3	\$ 5,481
Self Pay	8	10.0	\$ 56,841
Other	17	21.3	\$ 116,982
Total	80	100.0	\$462,217

Table 47: Non-Fatal Stroke by Age Group, Kentucky, 2012

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
0-4	56	0.0	19.9	19	0.0	6.8	75	100.0	26.7
5-14	30	76.9	5.3	39	56.5	6.9	69	100.0	12.1
15-24	99	55.0	16.7	81	45.0	13.7	180	100.0	30.4
25-44	1,170	62.4	102.7	705	37.6	61.9	1,875	100.0	164.6
45-64	9,140	77.5	762.9	2,653	22.5	221.4	11,793	100.0	984.4
65+	22,037	84.3	3723.4	4,115	15.7	695.3	26,152	100.0	4418.7
Total	32,532	81.0	744.5	7,612	19.0	174.2	40,144	100.0	918.8

Table 48: Non-Fatal Stroke by Gender, Kentucky, 2012

Age	Inpatient			ED			Total		
	Number	Percent	Rate	Number	Percent	Rate	Number	Percent	Rate
Male	14,723	81.1	684.8	3,427	18.9	159.4	18,150	100.0	844.2
Female	17,808	81.0	802.3	4,185	19.0	188.6	21,993	100.0	990.9
Total	32,531	81.0	744.5	7,612	19.0	174.2	40,143	100.0	918.7

Table 49: Length of Stay for Non-Fatal Inpatient Stroke, Kentucky, 2012

Length of Stay	Number	Percent*
1 day	4638	14.3
More than one day but less than 1 week	18383	56.5
1 week to less than 2 weeks	6208	19.1
2 weeks to less than 3 weeks	1896	5.8
3 weeks to less than 4 weeks	779	2.4
4 weeks or more	628	1.9
Total	32532	100.0

Table 50: Discharge Disposition for Non-Fatal Stroke, Kentucky, 2012

Discharge Disposition	Inpatient		ED	
	Number	Percent	Number	Percent
Routine discharge (home/self care)	15,077	46.3	4513	55.6
Home health	4,950	15.2	5	0.0
Skilled nursing facility (SNF)	6,473	19.9	137	0.0
Inpatient-other	1,177	3.6	2249	38.3
Intermediate Care Facility	325	1.0	32	2.5
Rehab	2,593	8.0	13	
Other	1,937	6.0	663	3.7
Total	32,532	100.0	7612	100.0

Table 51: Primary Payer and Charges for Non-Fatal Inpatient Stroke, Kentucky, 2012

Payer	Number of Discharges	Percent of Discharges	Total Hospital Discharges
Government	25029	76.9	\$ 882,703,093
Commercial Ins	4808	14.8	\$ 203,922,037
Workers Compensation	25	0.1	\$ 1,179,324
Self Pay	924	2.8	\$ 34,225,624
Other	1746	5.4	\$ 95,136,961
Total	32,532	100.0	\$1,217,167,039

Table 52: Primary Payer and Charges for Non-Fatal ED Stroke, Kentucky, 2012

Payer	Number of Discharges	Percent of Discharges	Total Hospital Discharges
Government	4970	65.3	\$ 19,644,636
Commercial Ins	1433	18.8	\$ 6,467,364
Workers Compensation	13	0.2	\$ 68,079
Self Pay	529	6.9	\$ 1,985,621
Other	667	8.8	\$ 2,739,808
Total	7,612	100.0	\$30,905,508

Table 53: Incidence of All Inpatient Stroke* by County, Sorted by County, Kentucky, 2012

***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	145	0.4	645.8	776.0	Grant	270	0.8	1170.8	1088.0	McLean	87	0.3	700.8	913.2
Allen	184	0.5	776.9	913.6	Graves	489	1.4	1008.5	1303.3	Meade	88	0.3	316.8	297.7
Anderson	135	0.4	624.0	623.7	Grayson	266	0.8	880.9	1024.8	Menifee	54	0.2	696.2	854.8
Ballard	76	0.2	692.5	920.9	Green	102	0.3	675.8	909.1	Mercer	170	0.5	626.6	798.8
Barren	295	0.9	573.5	697.9	Greenup	250	0.7	513.1	678.2	Metcalfe	93	0.3	726.6	923.3
Bath	111	0.3	824.2	945.3	Hancock	52	0.2	546.8	606.6	Monroe	163	0.5	1157.9	1490.4
Bell	340	1.0	967.4	1183.6	Hardin	668	1.9	661.9	621.7	Montgomery	195	0.6	697.8	729.2
Boone	1036	3.0	1056.0	851.0	Harlan	263	0.8	733.5	905.0	Morgan	79	0.2	517.3	566.6
Bourbon	136	0.4	560.3	680.1	Harrison	158	0.5	695.3	841.5	Muhlenberg	300	0.9	757.9	959.3
Boyd	422	1.2	635.5	853.1	Hart	143	0.4	698.2	784.2	Nelson	251	0.7	575.7	570.8
Boyle	212	0.6	604.5	742.6	Henderson	331	1.0	625.6	713.3	Nicholas	68	0.2	813.1	961.7
Bracken	75	0.2	823.8	881.0	Henry	138	0.4	767.8	893.6	Ohio	197	0.6	685.1	817.3
Breathitt	180	0.5	1197.8	1300.4	Hickman	25	0.1	332.9	522.6	Oldham	251	0.7	510.0	413.9
Breckinridge	161	0.5	661.8	794.8	Hopkins	681	2.0	1190.1	1451.8	Owen	74	0.2	602.0	681.5
Bullitt	412	1.2	567.2	548.5	Jackson	120	0.3	822.0	892.7	Owsley	94	0.3	1540.6	1950.2
Butler	116	0.3	708.6	904.3	Jefferson	5489	16.0	653.0	734.9	Pendleton	140	0.4	909.7	952.5
Caldwell	103	0.3	591.7	794.0	Jessamine	299	0.9	619.1	609.6	Perry	329	1.0	1021.6	1144.3
Calloway	232	0.7	540.2	617.9	Johnson	228	0.7	844.8	974.5	Pike	626	1.8	837.9	964.5
Campbell	860	2.5	896.1	945.7	Kenton	1464	4.3	948.2	912.7	Powell	106	0.3	773.6	837.9
Carlisle	75	0.2	1025.8	1485.7	Knott	147	0.4	798.1	902.5	Pulaski	562	1.6	712.0	882.9
Carroll	99	0.3	861.1	898.9	Knox	229	0.7	624.3	718.1	Robertson	27	0.1	826.2	1211.3
Carter	197	0.6	608.3	714.1	Larue	103	0.3	582.2	719.5	Rockcastle	116	0.3	598.8	679.6
Casey	115	0.3	591.4	722.9	Laurel	447	1.3	726.7	753.1	Rowan	179	0.5	786.0	759.1
Christian	243	0.7	382.5	330.2	Lawrence	184	0.5	1004.4	1147.5	Russell	146	0.4	616.4	829.1
Clark	312	0.9	734.0	878.0	Lee	88	0.3	1000.4	1125.8	Scott	252	0.7	613.1	523.4
Clay	245	0.7	1117.5	1128.0	Leslie	117	0.3	896.6	1041.6	Shelby	182	0.5	414.6	422.6
Clinton	96	0.3	763.9	941.1	Letcher	274	0.8	940.1	1120.8	Simpson	142	0.4	694.6	817.1
Crittenden	101	0.3	797.9	1081.8	Lewis	60	0.2	395.3	432.3	Spencer	96	0.3	608.2	552.4
Cumberland	79	0.2	798.8	1156.3	Lincoln	225	0.7	767.7	909.8	Taylor	301	0.9	995.8	1217.1
Daviess	881	2.6	767.2	906.1	Livingston	99	0.3	783.8	1038.7	Todd	47	0.1	339.3	377.1
Edmonson	103	0.3	651.9	851.9	Logan	189	0.6	594.6	705.4	Trigg	75	0.2	382.5	524.3
Elliott	32	0.1	386.2	415.2	Lyon	68	0.2	537.2	817.6	Trimble	60	0.2	628.1	687.7
Estill	153	0.4	840.2	1043.2	Madison	501	1.5	632.3	595.1	Union	55	0.2	337.7	365.0
Fayette	1628	4.7	586.0	539.8	Magoffin	132	0.4	946.2	998.8	Warren	868	2.5	814.6	751.4
Fleming	160	0.5	926.1	1102.5	Marion	138	0.4	635.1	690.6	Washington	89	0.3	584.4	751.3
Floyd	374	1.1	856.5	953.9	Marshall	362	1.1	810.0	1156.3	Wayne	146	0.4	562.2	696.3
Franklin	262	0.8	458.2	530.4	Martin	114	0.3	917.3	894.1	Webster	139	0.4	840.6	1017.0
Fulton	98	0.3	1054.9	1450.8	Mason	131	0.4	620.0	742.1	Whitley	430	1.3	1028.7	1200.4
Gallatin	126	0.4	1568.6	1463.1	McCracken	889	2.6	1007.6	1349.8	Wolfe	102	0.3	1115.1	1389.3
Garrard	112	0.3	545.0	663.3	McCreary	129	0.4	741.3	705.5	Woodford	159	0.5	574.1	637.4

**Rate per 100,000

Table 54: Incidence of All ED Stroke* by County, Sorted by County, Kentucky, 2012

***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	51	0.7	244.9	272.9	Grant	117	1.5	517.5	471.5	McLean	23	0.3	184.2	241.4
Allen	42	0.5	181.7	208.5	Graves	46	0.6	102.7	122.6	Meade	9	0.1	36.0	30.4
Anderson	49	0.6	213.5	226.4	Grayson	64	0.8	216.9	246.6	Menifee	18	0.2	236.5	284.9
Ballard	*	-	-	-	Green	33	0.4	223.0	294.1	Mercer	44	0.6	167.3	206.7
Barren	118	1.5	237.2	279.2	Greenup	46	0.6	102.8	124.8	Metcalfe	30	0.4	256.5	297.8
Bath	37	0.5	278.1	315.1	Hancock	13	0.2	153.6	151.7	Monroe	29	0.4	218.3	265.2
Bell	60	0.8	172.6	208.9	Hardin	113	1.5	108.8	105.2	Montgomery	86	1.1	305.4	321.6
Boone	209	2.7	199.7	171.7	Harlan	51	0.7	154.2	175.5	Morgan	47	0.6	314.0	337.1
Bourbon	57	0.7	236.0	285.0	Harrison	43	0.6	183.1	229.0	Muhlenberg	74	1.0	188.3	236.6
Boyd	41	0.5	66.6	82.9	Hart	33	0.4	172.5	181.0	Nelson	68	0.9	155.4	154.6
Boyle	47	0.6	139.8	164.6	Henderson	45	0.6	83.9	97.0	Nicholas	37	0.5	442.5	523.3
Bracken	16	0.2	169.6	187.9	Henry	25	0.3	150.0	161.9	Ohio	61	0.8	216.8	253.1
Breathitt	18	0.2	123.7	130.0	Hickman	5	0.1	93.2	104.5	Oldham	43	0.6	83.0	70.9
Breckinridge	33	0.4	141.7	162.9	Hopkins	82	1.1	147.1	174.8	Owen	23	0.3	176.9	211.8
Bullitt	41	0.5	54.1	54.6	Jackson	33	0.4	228.4	245.5	Owsley	13	0.2	235.9	269.7
Butler	5	0.1	30.6	39.0	Jefferson	768	10.0	92.2	102.8	Pendleton	25	0.3	161.1	170.1
Caldwell	43	0.6	264.0	331.5	Jessamine	100	1.3	201.8	203.9	Perry	55	0.7	180.5	191.3
Calloway	79	1.0	190.6	210.4	Johnson	50	0.7	193.7	213.7	Pike	120	1.6	168.3	184.9
Campbell	189	2.5	196.4	207.8	Kenton	372	4.9	228.1	231.9	Powell	36	0.5	262.3	284.6
Carlisle	5	0.1	88.6	99.0	Knott	28	0.4	159.0	171.9	Pulaski	70	0.9	95.5	110.0
Carroll	23	0.3	196.5	208.8	Knox	60	0.8	168.6	188.2	Robertson	*	-	-	-
Carter	30	0.4	94.7	108.8	Larue	23	0.3	137.5	160.7	Rockcastle	35	0.5	176.2	205.1
Casey	31	0.4	169.3	194.9	Laurel	93	1.2	147.1	156.7	Rowan	49	0.6	220.5	207.8
Christian	72	0.9	113.6	97.8	Lawrence	23	0.3	138.2	143.4	Russell	51	0.7	222.1	289.6
Clark	82	1.1	199.3	230.7	Lee	17	0.2	197.8	217.5	Scott	69	0.9	151.7	143.3
Clay	67	0.9	296.3	308.5	Leslie	29	0.4	231.7	258.2	Shelby	47	0.6	103.8	109.1
Clinton	24	0.3	190.8	235.3	Letcher	66	0.9	236.2	270.0	Simpson	49	0.6	242.6	282.0
Crittenden	29	0.4	238.5	310.6	Lewis	20	0.3	126.8	144.1	Spencer	15	0.2	72.4	86.3
Cumberland	14	0.2	162.5	204.9	Lincoln	65	0.9	230.5	262.8	Taylor	102	1.3	335.5	412.4
Daviess	316	4.1	282.4	325.0	Livingston	19	0.2	162.4	199.3	Todd	13	0.2	104.8	104.3
Edmonson	6	0.1	41.4	49.6	Logan	72	0.9	225.8	268.7	Trigg	64	0.8	320.5	447.4
Elliott	*	-	-	-	Lyon	22	0.3	169.6	264.5	Trimble	*	-	-	-
Estill	54	0.7	289.2	368.2	Madison	163	2.1	204.2	193.6	Union	52	0.7	318.8	345.1
Fayette	470	6.2	166.9	155.9	Magoffin	36	0.5	274.5	272.4	Warren	70	0.9	64.1	60.6
Fleming	34	0.4	205.4	234.3	Marion	70	0.9	325.4	350.3	Washington	55	0.7	388.2	464.3
Floyd	136	1.8	325.6	346.9	Marshall	120	1.6	270.8	383.3	Wayne	46	0.6	178.0	219.4
Franklin	123	1.6	209.8	249.0	Martin	18	0.2	129.2	141.2	Webster	25	0.3	168.3	182.9
Fulton	34	0.4	375.4	503.3	Mason	33	0.4	161.6	186.9	Whitley	77	1.0	189.1	214.9
Gallatin	22	0.3	232.1	255.5	McCracken	83	1.1	104.3	126.0	Wolfe	19	0.2	234.7	258.8
Garrard	24	0.3	115.4	142.1	McCreary	13	0.2	72.6	71.1	Woodford	39	0.5	133.4	156.3

* 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 55: Incidence of All Inpatient Stroke* by County, Sorted by Frequency, Kentucky, 2012

***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	5489	16.0	653.0	734.9	Knox	229	0.7	624.3	718.1	Casey	115	0.3	591.4	722.9
Fayette	1628	4.7	586.0	539.8	Johnson	228	0.7	844.8	974.5	Martin	114	0.3	917.3	894.1
Kenton	1464	4.3	948.2	912.7	Lincoln	225	0.7	767.7	909.8	Garrard	112	0.3	545.0	663.3
Boone	1036	3.0	1056.0	851.0	Boyle	212	0.6	604.5	742.6	Bath	111	0.3	824.2	945.3
McCracken	889	2.6	1007.6	1349.8	Carter	197	0.6	608.3	714.1	Powell	106	0.3	773.6	837.9
Daviess	881	2.6	767.2	906.1	Ohio	197	0.6	685.1	817.3	Caldwell	103	0.3	591.7	794.0
Warren	868	2.5	814.6	751.4	Montgomery	195	0.6	697.8	729.2	Edmonson	103	0.3	651.9	851.9
Campbell	860	2.5	896.1	945.7	Logan	189	0.6	594.6	705.4	Larue	103	0.3	582.2	719.5
Hopkins	681	2.0	1190.1	1451.8	Allen	184	0.5	776.9	913.6	Green	102	0.3	675.8	909.1
Hardin	668	1.9	661.9	621.7	Lawrence	184	0.5	1004.4	1147.5	Wolfe	102	0.3	1115.1	1389.3
Pike	626	1.8	837.9	964.5	Shelby	182	0.5	414.6	422.6	Crittenden	101	0.3	797.9	1081.8
Pulaski	562	1.6	712.0	882.9	Breathitt	180	0.5	1197.8	1300.4	Carroll	99	0.3	861.1	898.9
Madison	501	1.5	632.3	595.1	Rowan	179	0.5	786.0	759.1	Livingston	99	0.3	783.8	1038.7
Graves	489	1.4	1008.5	1303.3	Mercer	170	0.5	626.6	798.8	Fulton	98	0.3	1054.9	1450.8
Laurel	447	1.3	726.7	753.1	Monroe	163	0.5	1157.9	1490.4	Clinton	96	0.3	763.9	941.1
Whitley	430	1.3	1028.7	1200.4	Breckinridge	161	0.5	661.8	794.8	Spencer	96	0.3	608.2	552.4
Boyd	422	1.2	635.5	853.1	Fleming	160	0.5	926.1	1102.5	Owsley	94	0.3	1540.6	1950.2
Bullitt	412	1.2	567.2	548.5	Woodford	159	0.5	574.1	637.4	Metcalfe	93	0.3	726.6	923.3
Floyd	374	1.1	856.5	953.9	Harrison	158	0.5	695.3	841.5	Washington	89	0.3	584.4	751.3
Marshall	362	1.1	810.0	1156.3	Estill	153	0.4	840.2	1043.2	Lee	88	0.3	1000.4	1125.8
Bell	340	1.0	967.4	1183.6	Knott	147	0.4	798.1	902.5	Meade	88	0.3	316.8	297.7
Henderson	331	1.0	625.6	713.3	Russell	146	0.4	616.4	829.1	McLean	87	0.3	700.8	913.2
Perry	329	1.0	1021.6	1144.3	Wayne	146	0.4	562.2	696.3	Cumberland	79	0.2	798.8	1156.3
Clark	312	0.9	734.0	878.0	Adair	145	0.4	645.8	776.0	Morgan	79	0.2	517.3	566.6
Taylor	301	0.9	995.8	1217.1	Hart	143	0.4	698.2	784.2	Ballard	76	0.2	692.5	920.9
Muhlenberg	300	0.9	757.9	959.3	Simpson	142	0.4	694.6	817.1	Bracken	75	0.2	823.8	881.0
Jessamine	299	0.9	619.1	609.6	Pendleton	140	0.4	909.7	952.5	Carlisle	75	0.2	1025.8	1485.7
Barren	295	0.9	573.5	697.9	Webster	139	0.4	840.6	1017.0	Trigg	75	0.2	382.5	524.3
Letcher	274	0.8	940.1	1120.8	Henry	138	0.4	767.8	893.6	Owen	74	0.2	602.0	681.5
Grant	270	0.8	1170.8	1088.0	Marion	138	0.4	635.1	690.6	Lyon	68	0.2	537.2	817.6
Grayson	266	0.8	880.9	1024.8	Bourbon	136	0.4	560.3	680.1	Nicholas	68	0.2	813.1	961.7
Harlan	263	0.8	733.5	905.0	Anderson	135	0.4	624.0	623.7	Lewis	60	0.2	395.3	432.3
Franklin	262	0.8	458.2	530.4	Magoffin	132	0.4	946.2	998.8	Trimble	60	0.2	628.1	687.7
Scott	252	0.7	613.1	523.4	Mason	131	0.4	620.0	742.1	Union	55	0.2	337.7	365.0
Nelson	251	0.7	575.7	570.8	McCreary	129	0.4	741.3	705.5	Menifee	54	0.2	696.2	854.8
Oldham	251	0.7	510.0	413.9	Gallatin	126	0.4	1568.6	1463.1	Hancock	52	0.2	546.8	606.6
Greenup	250	0.7	513.1	678.2	Jackson	120	0.3	822.0	892.7	Todd	47	0.1	339.3	377.1
Clay	245	0.7	1117.5	1128.0	Leslie	117	0.3	896.6	1041.6	Elliott	32	0.1	386.2	415.2
Christian	243	0.7	382.5	330.2	Butler	116	0.3	708.6	904.3	Robertson	27	0.1	826.2	1211.3
Calloway	232	0.7	540.2	617.9	Rockcastle	116	0.3	598.8	679.6	Hickman	25	0.1	332.9	522.6

* 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, 2012

***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	768	10.0	92.2	102.8	Perry	55	0.7	180.5	191.3	Metcalfe	30	0.4	256.5	297.8
Fayette	470	6.2	166.9	155.9	Washington	55	0.7	388.2	464.3	Crittenden	29	0.4	238.5	310.6
Kenton	372	4.9	228.1	231.9	Estill	54	0.7	289.2	368.2	Leslie	29	0.4	231.7	258.2
Daviess	316	4.1	282.4	325.0	Union	52	0.7	318.8	345.1	Monroe	29	0.4	218.3	265.2
Boone	209	2.7	199.7	171.7	Adair	51	0.7	244.9	272.9	Knott	28	0.4	159.0	171.9
Campbell	189	2.5	196.4	207.8	Harlan	51	0.7	154.2	175.5	Henry	25	0.3	150.0	161.9
Madison	163	2.1	204.2	193.6	Russell	51	0.7	222.1	289.6	Pendleton	25	0.3	161.1	170.1
Floyd	136	1.8	325.6	346.9	Johnson	50	0.7	193.7	213.7	Webster	25	0.3	168.3	182.9
Franklin	123	1.6	209.8	249.0	Anderson	49	0.6	213.5	226.4	Clinton	24	0.3	190.8	235.3
Marshall	120	1.6	270.8	383.3	Rowan	49	0.6	220.5	207.8	Garrard	24	0.3	115.4	142.1
Pike	120	1.6	168.3	184.9	Simpson	49	0.6	242.6	282.0	Carroll	23	0.3	196.5	208.8
Barren	118	1.5	237.2	279.2	Boyle	47	0.6	139.8	164.6	Larue	23	0.3	137.5	160.7
Grant	117	1.5	517.5	471.5	Morgan	47	0.6	314.0	337.1	Lawrence	23	0.3	138.2	143.4
Hardin	113	1.5	108.8	105.2	Shelby	47	0.6	103.8	109.1	McLean	23	0.3	184.2	241.4
Taylor	102	1.3	335.5	412.4	Graves	46	0.6	102.7	122.6	Owen	23	0.3	176.9	211.8
Jessamine	100	1.3	201.8	203.9	Greenup	46	0.6	102.8	124.8	Gallatin	22	0.3	232.1	255.5
Laurel	93	1.2	147.1	156.7	Wayne	46	0.6	178.0	219.4	Lyon	22	0.3	169.6	264.5
Montgomery	86	1.1	305.4	321.6	Henderson	45	0.6	83.9	97.0	Lewis	20	0.3	126.8	144.1
McCracken	83	1.1	104.3	126.0	Mercer	44	0.6	167.3	206.7	Livingston	19	0.2	162.4	199.3
Clark	82	1.1	199.3	230.7	Caldwell	43	0.6	264.0	331.5	Wolfe	19	0.2	234.7	258.8
Hopkins	82	1.1	147.1	174.8	Harrison	43	0.6	183.1	229.0	Breathitt	18	0.2	123.7	130.0
Calloway	79	1.0	190.6	210.4	Oldham	43	0.6	83.0	70.9	Martin	18	0.2	129.2	141.2
Whitley	77	1.0	189.1	214.9	Allen	42	0.5	181.7	208.5	Menifee	18	0.2	236.5	284.9
Muhlenberg	74	1.0	188.3	236.6	Boyd	41	0.5	66.6	82.9	Lee	17	0.2	197.8	217.5
Christian	72	0.9	113.6	97.8	Bullitt	41	0.5	54.1	54.6	Bracken	16	0.2	169.6	187.9
Logan	72	0.9	225.8	268.7	Woodford	39	0.5	133.4	156.3	Spencer	15	0.2	72.4	86.3
Marion	70	0.9	325.4	350.3	Bath	37	0.5	278.1	315.1	Cumberland	14	0.2	162.5	204.9
Pulaski	70	0.9	95.5	110.0	Nicholas	37	0.5	442.5	523.3	Hancock	13	0.2	153.6	151.7
Warren	70	0.9	64.1	60.6	Magoffin	36	0.5	274.5	272.4	McCreary	13	0.2	72.6	71.1
Scott	69	0.9	151.7	143.3	Powell	36	0.5	262.3	284.6	Owsley	13	0.2	235.9	269.7
Nelson	68	0.9	155.4	154.6	Rockcastle	35	0.5	176.2	205.1	Todd	13	0.2	104.8	104.3
Clay	67	0.9	296.3	308.5	Fleming	34	0.4	205.4	234.3	Meade	9	0.1	36.0	30.4
Letcher	66	0.9	236.2	270.0	Fulton	34	0.4	375.4	503.3	Edmonson	6	0.1	41.4	49.6
Lincoln	65	0.9	230.5	262.8	Breckinridge	33	0.4	141.7	162.9	Butler	5	0.1	30.6	39.0
Grayson	64	0.8	216.9	246.6	Green	33	0.4	223.0	294.1	Carlisle	5	0.1	88.6	99.0
Trigg	64	0.8	320.5	447.4	Hart	33	0.4	172.5	181.0	Hickman	5	0.1	93.2	104.5
Ohio	61	0.8	216.8	253.1	Jackson	33	0.4	228.4	245.5	Robertson	*	-	-	-
Bell	60	0.8	172.6	208.9	Mason	33	0.4	161.6	186.9	Ballard	*	-	-	-
Knox	60	0.8	168.6	188.2	Casey	31	0.4	169.3	194.9	Trimble	*	-	-	-
Bourbon	57	0.7	236.0	285.0	Carter	30	0.4	94.7	108.8	Elliott	*	-	-	-

* 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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