# Kentucky Traumatic Brain & Spinal Cord Injury Surveillance Project

Fiscal Year 2005 Final Report

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## FOR MORE INFORMATION

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## Introduction

In 2002, traumatic brain injury (TBI) was a factor in the deaths of 1,087 Kentuckians (compared to 1,094 in 2001), as well as the live discharges of 3,713 (2001: 3,976) Kentuckians from licensed, acute-care hospitals across the state. TBI played a role in the death or hospitalization of 13 state residents per day. Acquired brain injury (ABI) was diagnosed in 1,266 (2001: 1,178) deaths and 2,193 (2001: 2,062) live discharges (more than 9 ABI per day), and spinal cord injury (SCI) was reported in 64 (2001: 64) deaths and 204 (2001: 273) live discharges, or about five SCI per week. See Tables 1, 17, and 32 for details.

The results of this year's report suggest the same leading causes as last year's:

- Motor vehicle traffic crashes (TBI and SCI)
- Falls (TBI and SCI)
- Anoxia/hypoxia (ABI)
- Exposure to toxic substances (ABI)

Motor vehicle traffic crashes in persons aged 15-24, and falls in persons aged 65 and older, again emerged as the leading causes of TBI. We discovered that anoxia/hypoxia was more common cause of ABI than previously reported (see the 'Methods' and 'Discussion' sections for details). It was most common among persons aged 65 and older, whereas exposure to toxic substances was greatest among those aged 25-44. Combined, these two were the cause of nearly 99% of fatal ABI and 92% of nonfatal, hospitalized ABI.

Geographically, rates of TBI and ABI were both highest in eastern Kentucky. The west-central part of the state is also high for TBI, and the western part is high for ABI. We identified counties that ranked in the top thirty in both frequency and rate of TBI and ABI. For TBI the counties that met these criteria for 2002 were Breathitt, Clay, Letcher, Nelson, Perry, Pike, Pulaski, and Taylor. For ABI they were Bell, Breathitt, Hopkins, Johnson, Knox, Laurel, Letcher, McCracken, Perry, and Whitley. These can be considered excellent candidates for in-depth pilot studies leading to interventions to prevent and control TBI, ABI, and SCI. In particular, Perry, Nelson, and McCracken would represent a good geographic coverage of the most-affected areas. Jefferson county would also be a good choice because it represented 19% of all TBI in 2002 and had an age-adjusted rate that was higher than the statewide rate, and 41% higher than the rate for Fayette county, which had the second highest number of TBI.

There were seven fewer TBI deaths in 2002 than in 2001 – not a statistically significant difference. The 3,713 nonfatal TBI hospitalizations, however, represent a decrease of 263 (7%) from last year. This was quite unexpected, as the overall number of injury-related hospital discharges in 2002 increased by 6% over 2001. We do not know whether this decline in TBI hospitalizations in 2002 reflects a true decrease, an artifact of inconsistent reporting practices between

the two years, or normal year-to-year variation. In general, we refrained from drawing conclusions about fluctuations between 2001 and 2002, preferring to wait until three or four years of stable data are available before making inferences about trends.

*Enhancements to this year's report*

Tables of rates by county have been frequently requested. In last year's report we included only one view of the county rate tables, ordered by frequency of TBI, ABI, or SCI. In order to make these data more accessible, this year we included two additional views of the county rate tables for TBI and ABI, one ordered by county name and one by age-adjusted rate. See Tables 10, 12, 19 and 21. (Most counties have very few SCI in any given year, so the additional tables were not created for SCI).

Also this year we analyzed the ABI data more thoroughly. Specifically, we created six new tables showing the age group and diagnosis code breakdowns for the two leading causes of ABI, anoxia/hypoxia and exposure to toxic substances (see Tables 22 through 28). We also modified the table on categories of ABI to show fatal and nonfatal injuries separately (see Tables 22).

In Figure 4 we mapped the TBI cases for Kentucky residents that were obtained from the Tennessee TBI registry for 2002.

**Methods**

*Data collection*

Data used for surveillance were all received electronically. Hospital Discharge Data files from the Kentucky Department for Public Health (KDPH) are routinely received by the Kentucky Injury Prevention and Research Center (KIPRC) for surveillance purposes, as are trauma registry databases from the five American College of Surgeons-certified trauma centers in Kentucky: University of Kentucky Hospital, University of Louisville Hospital, Kosair Children's Hospital, Trover Regional Medical Center, and Taylor County Hospital. The National Center for Health Statistics' Multiple Cause of Death File (NCHS Death) was required, as this data set contains information on up to 20 supplemental causes of death, whereas the Kentucky computerized death certificate data file generally includes only the external cause of injury (E-code) for trauma cases. In addition to these data sets, we were able to obtain data on Kentucky residents treated in Tennessee from that state's TBI registry. We have reported the number of TBI identified on that dataset. However, those cases were not included in the data linkage or in the final count or rates.

*Traumatic brain injury case definition*

The Centers for Disease Control and Prevention (CDC) have established standards for TBI case identification (CDC, 1995). Hospitals and trauma registries 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 and trauma registry data:

- 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

ICD-10 codes were used to identify TBI in mortality data:

- Open wound of head: S01.0-S02.9
- Fracture of skull and facial bones: S02.0-S02.1, S02.3, S02.7-S02.9
- Intracranial injury: S06.0, S06.2-S06.9
- Crushing injury of head: S07.0-S07.1, S07.8-S07.9
- Other unspecified injuries of head: S09.7-S09.9
- Open wounds involving head with neck: T01.0
- Fractures involving head with neck: T02.0
- Crushing injuries involving head with neck: T04.0
- Injuries of brain and cranial nerve with injuries of nerves and spinal cord at neck level: T06.0
- Sequelae of injuries of head: T90.1-T90.2, T90.4-T90.5, T90.8-T90.9

If one or more of these codes was found in any of the diagnosis code fields in HDD, NCHS Death, or trauma registry data, 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 are 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/Hypoxia: 348.1, 668.2, 669.4, 768.1, 768.5, 768.6, 768.9, 799.0, 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, 995.5, 998.0

The following ICD-10 codes were used to identify ABI in NCHS death records:

- Anoxia/Hypoxia: G93.1, O29.2, O74.3, O75.4, O89.2, P20.1, P21.0, P21.1, P21.9, R09.0, T75.1
- Allergy/Anaphylaxis: T78.0, T78.2, T80.5, T80.6, T88.1, T88.6
- Acute Medical Clinical Incidents: G00.0, G00.1, G00.2, G00.3, G00.8, G01, G07, G02.0, G02.1, G02.8, G04.2, G04.8, G05.0, G05.1, G06.2
- Toxic Substances: G03.8, G03.9, G97.1, G97.2, G97.8, G97.9, N14.3, R29.1, T40.5, T41.0, T41.1, T41.2, T41.3, T41.4, T42.3, T42.4, T42.6, T42.7, T45.5, T49.0, T51.0, T51.1, T51.2, T51.3, T51.8, T51.9, T56.1, T56.2, T56.3, T56.4, T56.5, T56.6, T56.7, T56.8, T57.0, T57.2, T57.3, T57.8, T58, T60.4, T61.9, T62.0, T62.1, T62.2, T62.8, T62.8, T64, T65.0, T65.8, T65.9, T71, T81.1, T88.2, T88.5

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

*Note:* In creating the new diagnosis code tables (Tables 25 through 28) for this year's ABI results, we noticed that some codes in both the ICD-9 and ICD-10 lists appeared to be misclassified. In particular, for ICD-10 the code T71 was reclassified from 'Toxic Substances' to 'Anoxia/Hypoxia'. The definition of T71 is 'Asphyxiation', and includes 'suffocation (by strangulation)' and 'systemic oxygen deficiency due to low oxygen content in ambient air or mechanical threat to breathing'. The result was that 155 fatal ABI cases were reclassified to anoxia/hypoxia.

For ICD-9, the codes 994.7 and 997.0 were also reclassified from 'Toxic Substances' to 'Anoxia/Hypoxia'. The definition of 994.7 is 'Asphyxiation and strangulation', and includes suffocation by bedclothes, cave-in, constriction, mechanical, plastic bag, pressure, or strangulation. There is no mention of toxic substances. The definition of 997.0 is 'Nervous system complications', and includes anoxic brain damage and cerebral hypoxia. The result was that 441 nonfatal, hospitalized ABI cases were reclassified to anoxia/hypoxia.

As a result of these changes, anoxia/hypoxia was shown by this year's report to be the leading cause of ABI, whereas previous year's reports had found exposure to toxic substances to be the leading cause.

*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

The following ICD-10 codes were used to identify SCI in mortality records:

- Fracture of neck: S12.0-S12.2, S12.7, S12.9
- Fracture of thoracic vertebra and thoracic spine: S22.0-S22.1
- Fracture of lumbar spine: S32.0, S32.7

- Injury of nerves and spinal cord at neck level: S14.0-S14.1
- Injury of nerves and spinal cord at thorax level: S24.0-S24.1
- Injury of nerves and lumbar spinal cord at abdomen, lower back, and pelvis level: S34.0-S34.1, S34.3
- Fracture of spine, level unspecified: T08
- Injury of nerves and spinal cord involving other multiple body regions: T06.1
- Injury of spinal cord, level unspecified: T09.3
- Sequelae of injury of spinal cord: T91.3

For this report, SCI records had to contain one of these codes in one of the first three diagnosis code fields in HDD, NCHS Death, or trauma registry data.

*Probabilistic data linkage*

Probabilistic data linkage (PDL) has been described in scholarly depth by Jaro (1995, 1989). Briefly, PDL is a statistical method for matching records in unrelated databases. By comparing the frequencies of all individuals' characteristics, such as age, birth date, and zip code, the data linkage software decides which records in the different databases probably pertain to the same person. Thus, we avoid counting these cases more than once when calculating incidence. For this project, the ratio of authentic to spurious links was set to 99:1.

Standardized variables were created from variables necessary for linkage. These included dates (of injury, admission, discharge, death, birth), geographic variables (resident county, resident state, zip codes), and demographic characteristics (age, gender, race, martial status) and others (hospital ID, TBI indicator, cause of injury).

Self match: As a first step, we matched each file against itself to determine the extent of duplication of cases within the datasets. We found that 1.3% of the HDD records, 0.3% of the trauma registry records, and almost none of the NCHS death records had at least one record that appeared to be a duplicate. In other words, duplication of cases within the datasets appeared to be minimal.

File linkages and master dataset: Next we linked the HDD and trauma registry datasets, then the HDD and NCHS death datasets, and finally the trauma registry and NCHS death datasets. We then created a master dataset containing three sections: one for the HDD portion of the record; one for the trauma registry portion, and one for the NCHS death portion. For example, if a case was identified by data linkage in both the HDD and trauma registry files, the master file would contain a single record with an HDD and a trauma registry portion. If it was found in the HDD only, the master file would contain a single record with only the HDD portion populated, and so on.

Create analytical file: From the master dataset we created a simplified dataset from which the tables and figures in this report were derived. In doing so we made several choices which we outline briefly here. First, we defined a master record to represent a TBI, ABI, or SCI case if there was a TBI, ABI, or SCI diagnosis on any of the three files. Second, we declared a master record to represent a fatality if there was an NCHS death record present, or if there was a HDD or a trauma registry record with a patient disposition indicating death. Third, we established rules of precedence for the data source. For fatalities, if a NCHS death record was found its values were used to populate the analytical file. If a death was indicated on the HDD or trauma registry files but no death record was found, then those files were used to populate the analytical file. For non-fatal injuries, the HDD was the preferred data source. If a value was missing on that file and a trauma registry record was available, then the value from that file was used.

Using these rules we reduced the master file to an analytical file with a single value for each data element (age, gender, diagnosis codes, etc.).

*Incidence rates*

Crude incidence rates were calculated for each injury type by dividing the number of injuries by 4,093,008, the estimated 2002 population of Kentucky according to the Kentucky State Data Center, and then multiplying by 100,000. This figure represents the number of TBI, ABI, or SCI that occurred per 100,000 residents of Kentucky. Age-adjusted rates were calculated using the Year 2000 Standard Population.

*Data analysis*

All data analysis, including mapping, was performed using SAS Version 9.1.

## Results

*Traumatic brain injury*

There were 4,801 Kentucky-resident TBI cases identified for 2002 (Table 1). This number is 5.3% lower than the 5,070 cases identified in 2001. The crude incidence rate was 117.3 per 100,000 population, which represents a 5.9% decrease from 124.7/100,000 for 2001. Of the five years for which this report has been produced, this is the first in which the number and incidence of TBI decreased, which suggests that we have reached a baseline figure. (Residents who were treated out-of-state are not included in any of any of the estimate in this report.)

The Venn diagram in Figure 1 shows the distribution of cases among the three databases. All but 384 (8%) of the 4,801 TBI cases for 2002 came from the HDD or MCOD files. Some of the 384 cases that were identified only in the trauma registry had lengths of stay equal to zero, suggesting that they were non-admissions – and some were patients who died before they could be admitted. The remainder appears to be cases that were admitted and, therefore, should be in the HDD but were not. We have not yet been able to determine why this is so.

The demographics of TBI in 2002 were consistent with those for 2001. Table 1 shows that the highest rates of TBI were again found among those aged 65 and over and 15-24. From Table 2 we find that 61% of non-fatal and 73% of fatal TBI occurred in males. The leading mechanisms of injury were also consistent with last year's report. Motor vehicle traffic crashes (MVTC) were the cause of 42% of all TBI, and falls caused 21% (Table 3). The top three mechanisms varied by age group (Tables 4 to 9). For those aged 65 and over, falls were the leading cause (47%). MVTC's caused two-thirds of TBI in those aged 15-24, and were the leading cause from ages 5 to 64. Falls led among young children (ages 0-4).

As one would expect, the incidence of TBI was highest in the larger counties (Figure 2). The four most populous counties in 2002 (Jefferson, Fayette, Kenton, Hardin) were among the top ten in TBI incidence. A notable exception was Christian county, which was 10$^{th}$ in population but 67$^{th}$ in frequency of TBI. Because it borders Tennessee, we can reasonable infer that a substantial number of TBI cases in Christian county residents are not treated in Kentucky. This conclusion is supported by Figure 4, which shows that 21 Christian county residents appeared in the 2002 Tennessee TBI registry. In general, Figure 4 shows that several southern border counties have significant numbers of residents treated in Tennessee hospitals. Prominent examples, in addition to Christian, include McCreary, Whitley, Bell, and Harlan. 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.

Viewing the state in terms of age-adjusted rates (Figure 3), again there were clusters of high-incidence counties in the eastern and west-central regions. The eastern cluster for 2002 was almost identical to 2001. A west-central cluster was again evident, but the specific counties changed quite a bit. One useful way of determining priority counties is to find those that ranked among the top thirty in both frequency and age-adjusted rate of TBI. For 2002 there were eight such counties: Breathitt, Clay, Letcher, Nelson, Perry, Pike, Pulaski, and Taylor. Three of these counties – Breathitt, Letcher, and Perry – met these criteria in 2001 as well. Tables 10 through 12 show the frequency and rates of TBI by county, ranked in order by county, frequency, and age-adjusted rate respectively.

Nearly 4 out of 5 TBI (77%) were non-fatal (Table 1). We attempted by several means to estimate the number of the non-fatal TBI that inclined toward the higher end of the severity spectrum. Each of the three methods placed the number somewhere between 1,200 and 1,500, a finding consistent with the 2001 report.

Table 13 indicates that 1,218 non-fatal TBI discharges had a disposition other than "routine". The three most frequent non-routine discharges, as in 2001, were "inpatient – other type of facility", "home health", and "skilled nursing facility." A total of 865 discharges had one of these three dispositions.

Table 14 shows that 1,490 non-fatal TBI discharges had an injury severity score (ISS) of "severe" or "critical". It must be noted that ISS is based on injuries to six designated body regions, not only head injuries. It is therefore possible for a high ISS to result from, for example, a relatively mild head injury plus major injuries to the torso and/or lower extremities. So a high ISS does not necessarily indicate a severe head injury.

Table 15 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."

From this Table we see that 1,237 non-fatal TBI discharges had a principal diagnosis indicating a "Type I" TBI.

Commercial (46%) or government (34%) sources were the primary payers billed for acute care charges in 80% of nonfatal TBI, based on discharges identified from the HDD (Table 16). Commercial payers were billed nearly $58 million in 2001, and government payers over $24 million. Please note that the amount billed by the hospital will generally be larger than the amount actually paid after adjudication of the claim.

Figures 9 through 13 demonstrate that the leading mechanism of TBI varies according to the primary insurance source billed. For example, MVTC was the mechanism of injury in 69% of TBI for which 'Commercial Insurance' was the primary payer billed. Falls were the leading mechanism of TBI when "Government" was the primary payer, at 45%. These insurers should be viewed as stakeholders in programs to prevent those injuries that result in a substantial portion of their claims.

*Acquired brain injury*

There were 3,459 ABI cases for Kentucky residents identified in 2002 (Table 17). This is an increase of 219 cases (6.7%) over 2001. The crude incidence rate for 2002 was 84.9 per 100,000 population, compared to 79.7 in 2001. The Venn diagram in Figure 5 shows the distribution of cases among the three databases. Nearly all of the nonfatal ABI cases came from the HDD.

ABI was skewed toward the middle and older age groups, with 87% occurring in persons aged 25 and older, compared to 71% of TBI (Table 17). Also in contrast to TBI, of which 64% occurred in males, ABI affected the genders in closer to equal proportions (Table 18). Only about half (51%) of ABI were nonfatal, compared to 77% of TBI.

As shown in Table 22, nearly all ABI (99% of fatal and 92% of nonfatal, hospitalized) were a result of either anoxia/hypoxia or exposure to toxic substances (ETS). In preparing this year's report we noticed that several diagnosis codes for anoxia/hypoxia had been misclassified as ETS (see the 'Methods' section for a full discussion). After reclassifying these codes, we found that anoxia/hypoxia is responsible for a greater percentage of ABI than previously reported. Anoxia/hypoxia tends to affect older people (ages 45 and over) considerably more often than younger people, where as ETS affects persons 15 and older with at similar rates, and is most common among persons aged 25-44 (Tables 23 and 24). Diagnosis codes (Tables 25-28) provide minimal information about the circumstances of injury. Complications related to medical care were the leading cause for nonfatal anoxia/hypoxia, but were much less common in fatal cases. Asphyxia was a common cause in both fatal and nonfatal anoxia/hypoxia. Alcohol and drugs were involved in most of the nonfatal ETS. They were common in fatal ETS as well, as were carbon monoxide poisoning and postoperative shock.

Among those ABI discharges that were reported to have some relationship with an injury (i.e., included an E-code), 77% of the non-fatal ones were poisonings. Poisoning, suffocation or drowning was indicated in 7 out of 10 of the fatal, injury-related ABI (Table 29). (Note that we are making a distinction here between "injury-related" and traumatic, with trauma being considered one of several forms of injury. ABI is, by the statutory definition, non-traumatic).

In general, as with TBI, the more populous counties had high numbers of ABI (Figure 6). The four most populous counties in 2001 (Jefferson, Fayette, Kenton, and Hardin) were among the top ten in ABI incidence. However, none of the ten most populous counties appeared in the top fifty counties when ranked by age-adjusted rate.

The counties with the highest rates were strongly concentrated in eastern Kentucky, and there was a second, smaller group of high-rate counties in the far western part of the state (Figure 7). As with TBI, we located the counties that ranked among the top thirty in both frequency and age-adjusted rate of ABI. There were ten counties that met both criteria in 2002: Bell, Breathitt, Hopkins, Johnson, Knox, Laurel, Letcher, McCracken, Perry, and Whitley. These can be considered leading candidates for further study and intervention. Tables 19 through 21 show the frequency and rates of ABI cases by county, ranked in order by county, frequency, and age-adjusted rate respectively.

Table 30 indicates that nearly 40% of ABI discharges were other than "routine" – i.e., to destinations other than the home. The three most frequent non-routine discharges were "home health", "inpatient – other type of facility", and "skilled nursing facility".

Government (53%) or commercial (22%) sources were the primary payer billed for hospital charges in nearly 4 out of every 5 non-fatal ABI, based on discharges identified from the HDD (Table 31). Government payers were billed more than $32 million in 2001, and commercial payers over $15 million.

*Spinal cord injury*

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 268 SCI cases for Kentucky residents identified in 2002 (Table 32). This number is 69 fewer than the number of cases identified in 2001, representing a 20% decrease. The crude incidence rate was 6.5 per 100,000 population. The Venn diagram in Figure 8 shows the distribution of cases among the three databases. All but nine of the hospitalized cases were found in the HDD.

As with TBI, the age groups 65 and over and 15-24 had the highest age-specific rates of SCI (Table 32). Rates for persons aged 25-64 were similar to those for

ages 15-24. Males had more than double the SCI rate of females, and had 71% of the non-fatal SCI (Table 33).

Table 34 presents the number of SCI per county. Due to the small number of cases per county, we did not attempt a graphical analysis of SCI rates by county, as the rates would be unstable.

Among SCI's for which an E-code was reported, MVTC and falls were the leading mechanisms of injury (Table 35). Unfortunately, for about one-quarter of the non-fatal SCI discharges, no E-code was reported.

Two-thirds of the non-fatal SCI discharges had dispositions other than "routine", compared to one-third for TBI (Table 36). In terms of ISS, about 43% were "severe" or "critical" (Table 37). This is down from 56% in 2001.

Commercial (47%) or government (32%) sources were the primary payer billed for acute care charges in 79% of nonfatal SCI, based on discharges identified from the HDD (Table 38). Commercial payers were billed $7.6 million in 2001, and government payers almost $3 million.

## Discussion

*Comment on the Data Sources*

Numbers and rates for fatal TBI, ABI and SCI have been relatively stable since 1999, because the MCOD system from which we take the cases is a mature data system. The nonfatal statistics, however, have increased substantially over the same period. The explanation is the same: the HDD and trauma registry databases were less developed, and have only begun to stabilize in the past couple of years (Table 39). As a result, with 2001 and 2002 we now have two years of complete data on which to base our conclusions.

*Traumatic Brain Injury and Spinal Cord Injury Prevention*

TBI affects all ages, but the mechanisms differ by age group. The results for 2002 reinforce previous findings which show that two issues stand out as being primary candidates for further study and intervention, each by virtue of being the leading cause of TBI in the age groups with the highest incidence rates. They are falls in persons aged 65 and older and MVTC in 15-24 year-olds.

Improvements to the state's seat belt and graduated driver licensing laws offer opportunities to address the latter issue. In addition, if funds become available there could be much to gain from conducting focused research in problem counties aimed at better understanding the causes and circumstances leading to both MVTC's and falls. Our geographic analysis suggests that eastern and west-

central Kentucky are two areas that should be given primary consideration. In 2002 there were eight counties that ranked among the top thirty in both frequency and age-adjusted rate of TBI: Breathitt, Clay, Letcher, Nelson, Perry, Pike, Pulaski, and Taylor. Perry county would make a good choice for a pilot county for the eastern part of the state, as it ranked sixth in frequency with 102 TBI in 2002, and second in age-adjusted rate (349.3). Similarly, Nelson county would make a good representative for the midwestern region, ranking tenth in both frequency (81) and age-adjusted rate (226.1).

Furthermore, Jefferson county may also be a good pilot candidate because it had nearly four times as many TBI in 2002 than Fayette county, which ranked second, and its age-adjusted rate (128.9) was nearly 41% higher than Fayette's (91.6). This difference appears to be stable, as a similar relationship held for 2001: Jefferson's age-adjusted rate (141.3) was 35% higher than Fayette's (104.4) in that year.

As MVTC's and falls are the leading causes of SCI as well as TBI, a focus on those two issues should have an impact on the occurrence of SCI also.

*Acquired Brain Injury Prevention*

In general eastern Kentucky exhibited a higher incidence of ABI than the rest of the state. Of the four broad categories comprising our definition of ABI, 'exposure to toxic substances' (ETS) and 'anoxia/hypoxia' accounted for 94% of the cases (Table 22). Persons aged 25-44 had the highest rates of ETS diagnoses. A focus on substance abuse prevention in that age group may be an appropriate countermeasure.

Persons aged 45 and older had the highest rates of anoxia/hypoxia diagnoses. Unfortunately, the diagnosis codes on the computerized records provide little insight regarding the causes or contributing circumstances. Different research methods, such as review of medical records, may be necessary for these cases in order to gain information useful for preventive purposes.

As with the TBI discussion above, if we think in terms of identifying representative pilot counties for further investigation we should consider candidates from the eastern and far western parts of the state (Figure 7). There were ten counties that ranked among the top thirty in both frequency and age-adjusted rate of ABI in 2002: Bell, Breathitt, Hopkins, Johnson, Knox, Laurel, Letcher, McCracken, Perry, and Whitley. Perry has already been identified for TBI in eastern Kentucky, and would make a good choice for ABI as well (ninth in frequency and second in age-adjusted rate). In the west, McCracken county was fourth in frequency of ABI and 24$^{th}$ in age-adjusted rate. It was also fifth in TBI frequency and 32$^{nd}$ in age-adjusted rate, making it a logical target for further investigation of both ABI and TBI.

It must be noted that the methodology used in this report under-represents the incidence of ABI. The reason is that the injury subset of the HDD used in this and previous years included only those cases of ABI that were comorbid with at least one injury diagnosis.

**Limitations**

Double counting of cases is possible for several reasons, including multiple representation of cases within individual data sets (e.g., transfers between hospitals), or across linked data sets (due to failure of data linkage to identify duplicate records).

"Non-fatal" in this report refers to Kentucky-resident inpatients discharged alive from a licensed, acute-care hospital *in Kentucky* (including trauma centers). It does not include those treated and released at emergency departments (with the exception of certain cases treated and released from ED's at certified trauma centers), those treated by emergency medical services who refused transport to a hospital, or those hospitalized outside of Kentucky. The incidence of non-fatal TBI in Kentucky residents, in that larger sense, is certainly several times larger than the results reported here.

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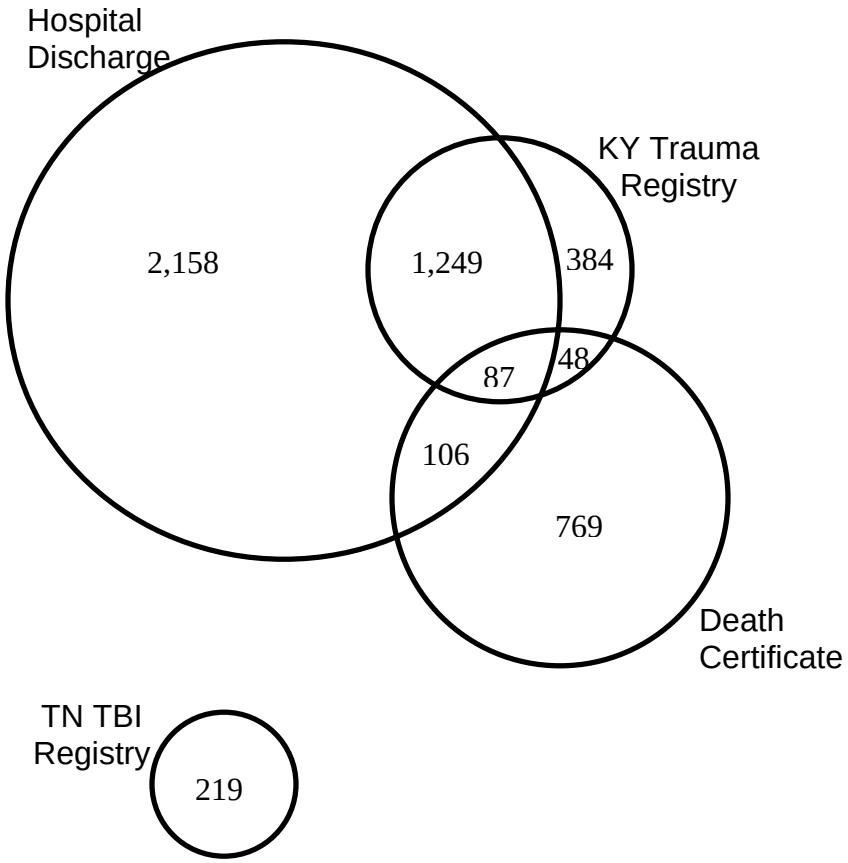
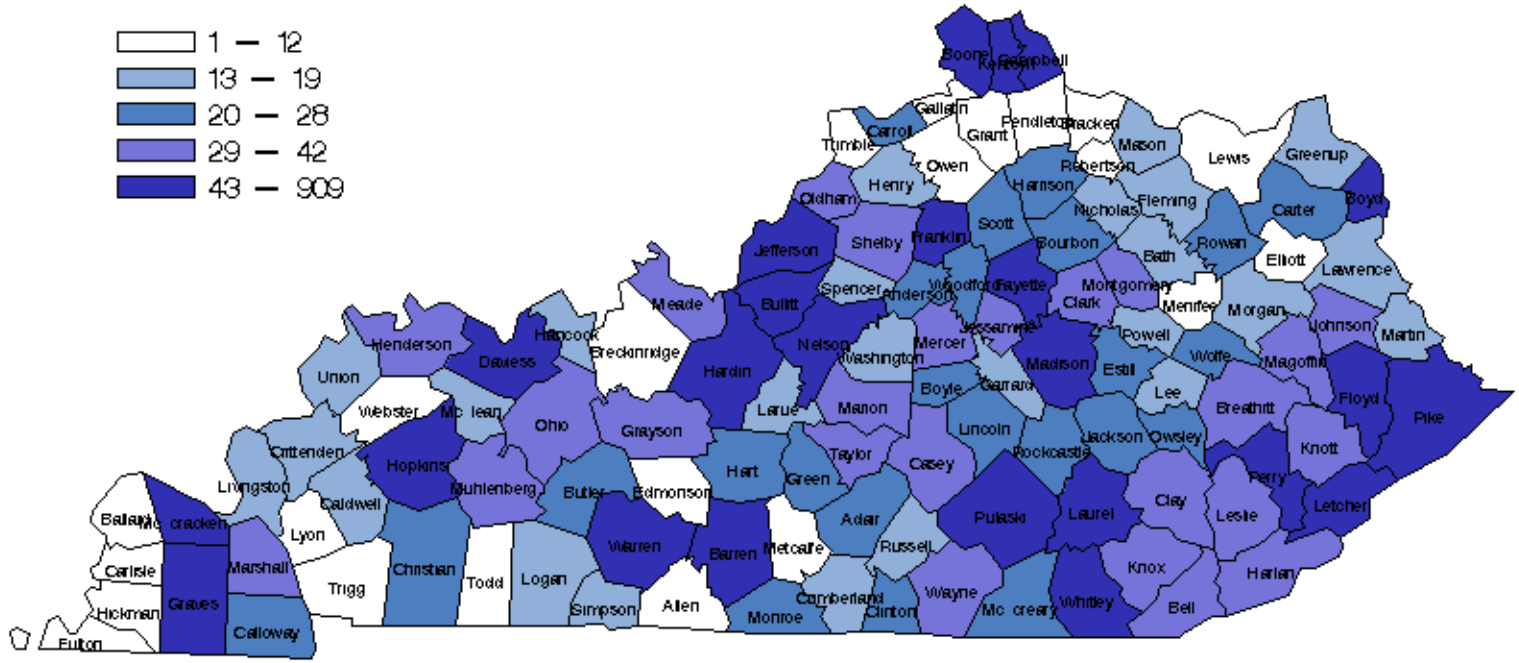
**FIGURES**

Figure 1. Distribution of TBI among databases, 2002

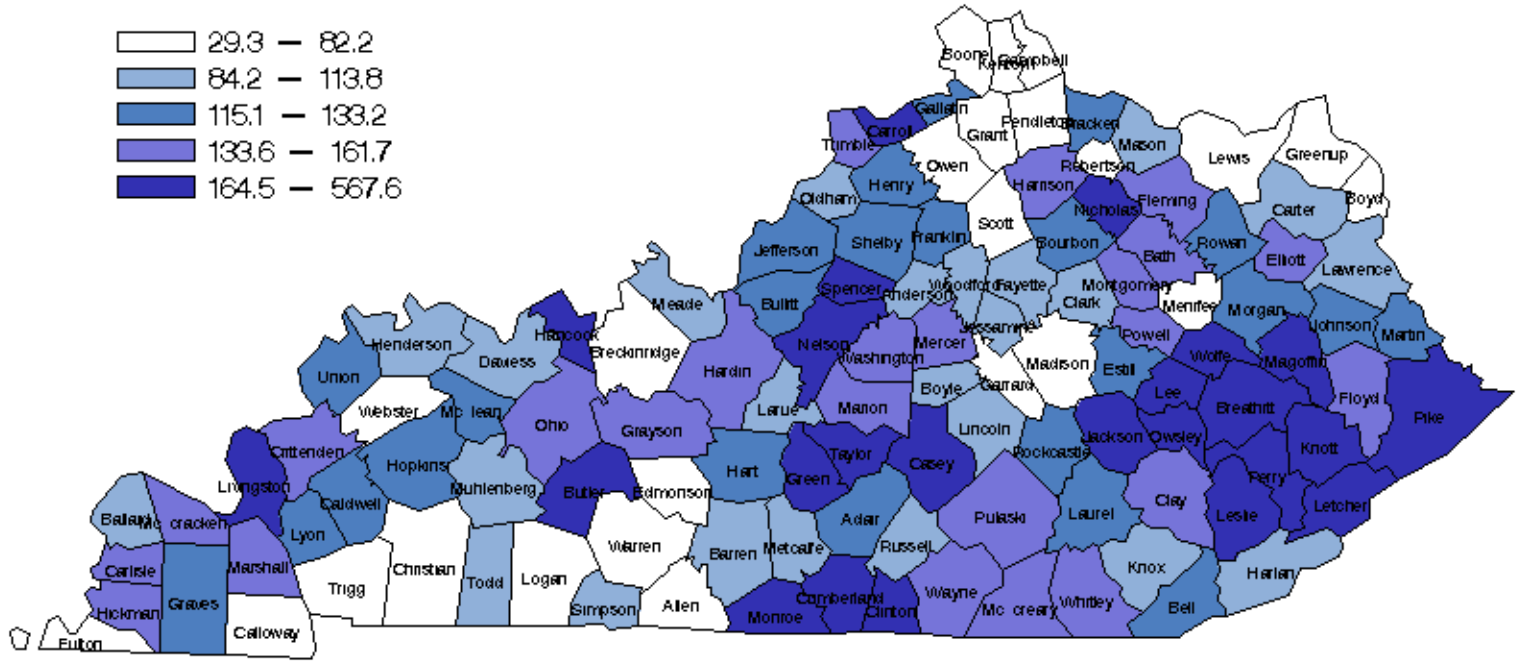


# TBI Cases by County, Kentucky 2002




Source: Kentucky TBI Surveillance Project 2002.

# Age–Adjusted TBI Rates by County, Kentucky 2002




Source: Kentucky TBI Surveillance Project 2002.

Figure 4. Distribution of TBI cases from Tennessee TBI registry, by county (2002)

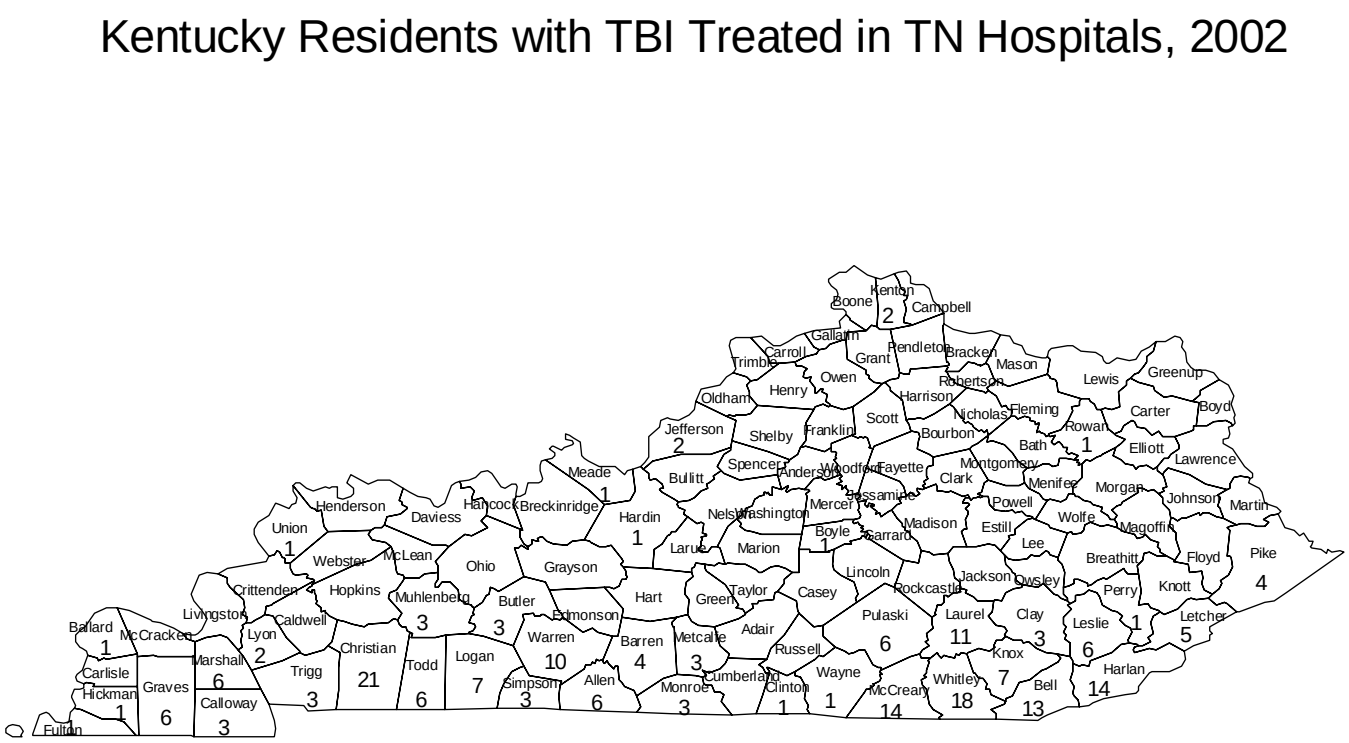
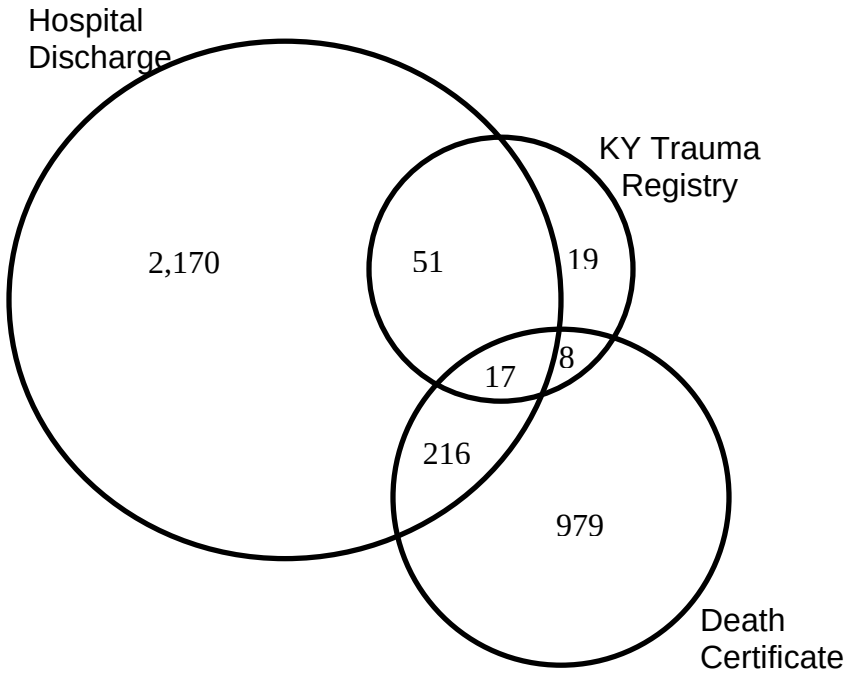
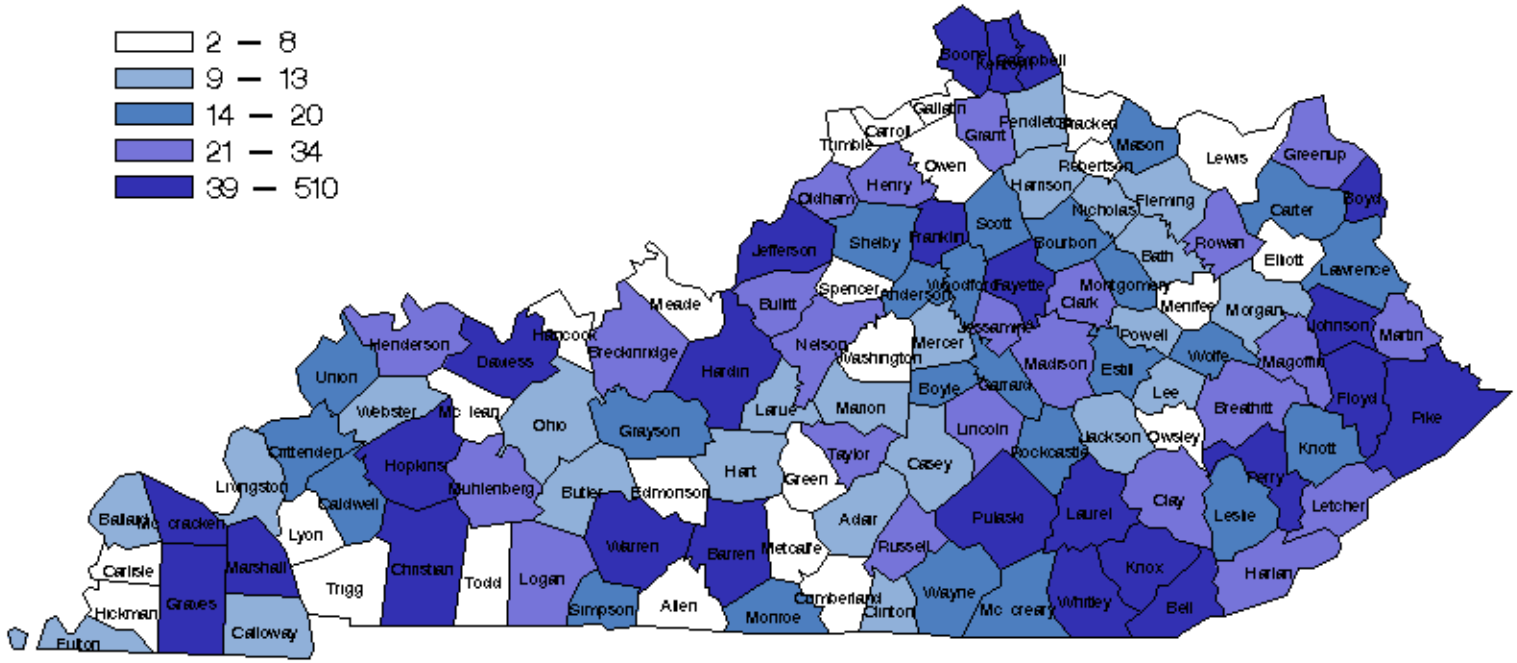


Figure 5. Distribution of ABI among databases, 2002

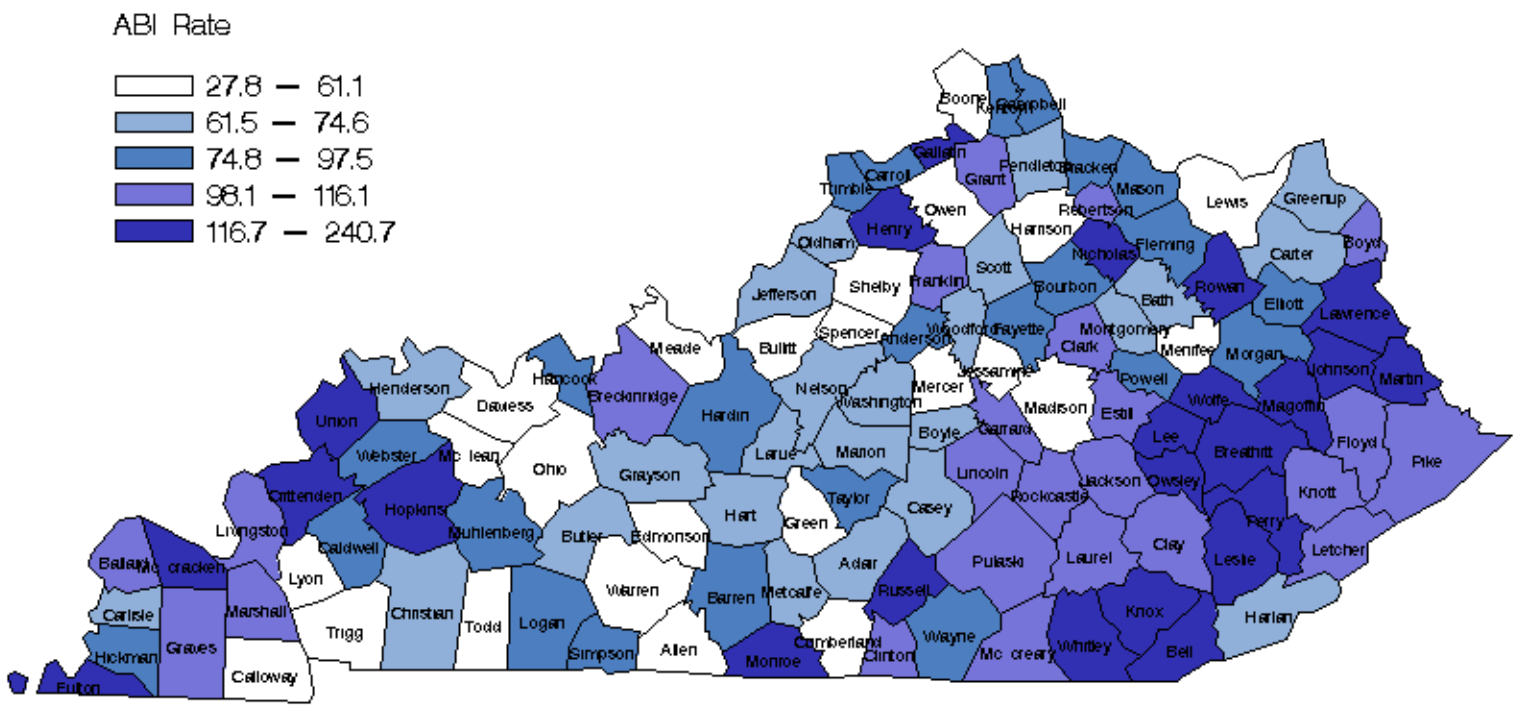


# ABI Cases by County, Kentucky 2002




Source: Kentucky TBI Surveillance Project 2002.

# Age–Adjusted ABI Rates by County, Kentucky 2002




Source: Kentucky TBI Surveillance Project 2002.

Figure 8. Distribution of SCI among databases, 2002

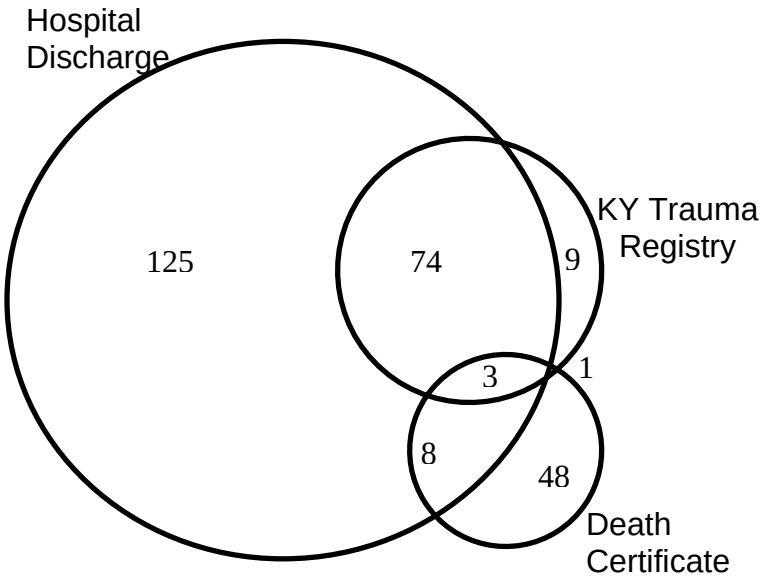


Figure 9. Mechanism of injury for self-pay TBI, 2002

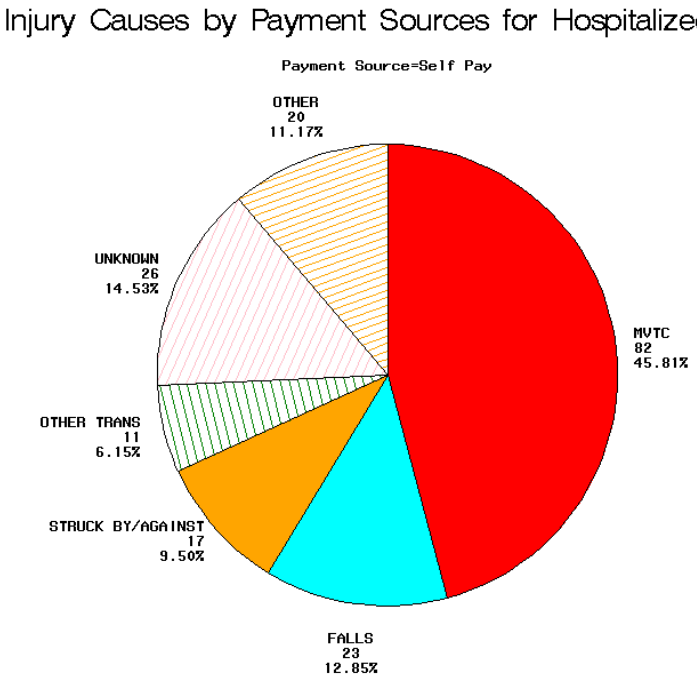



Figure 10. Mechanism of injury for TBI having 'Commercial Insurance' as primary payer, 2002

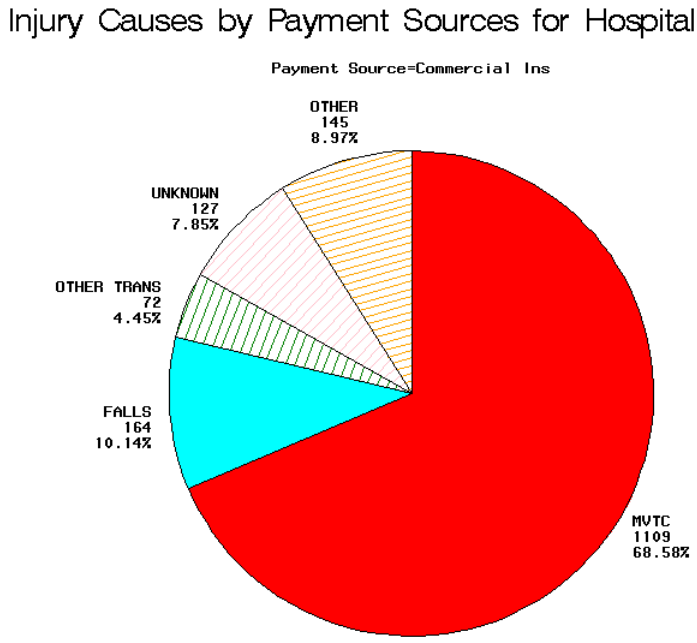


Figure 11. Mechanism of injury for TBI having 'Government' as primary payer, 2002

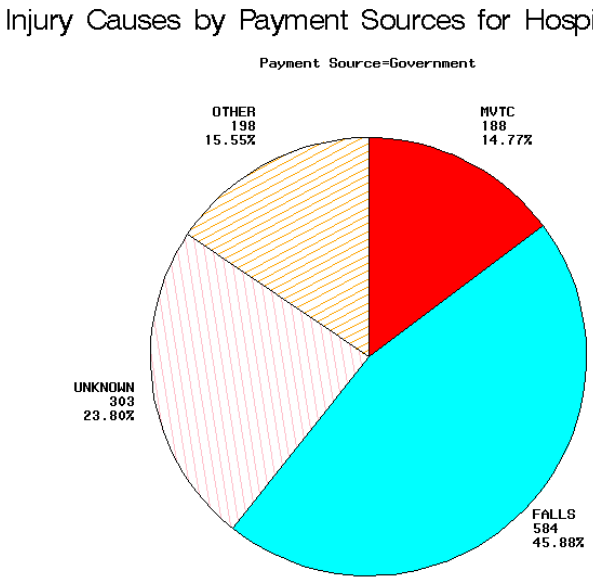



Figure 12. Mechanism of injury for TBI having 'Worker's Compensation' as primary payer, 2002

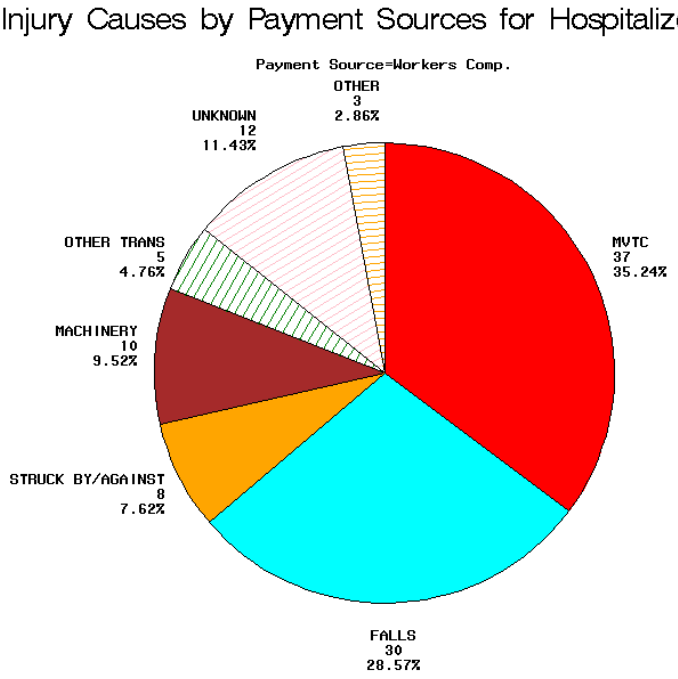
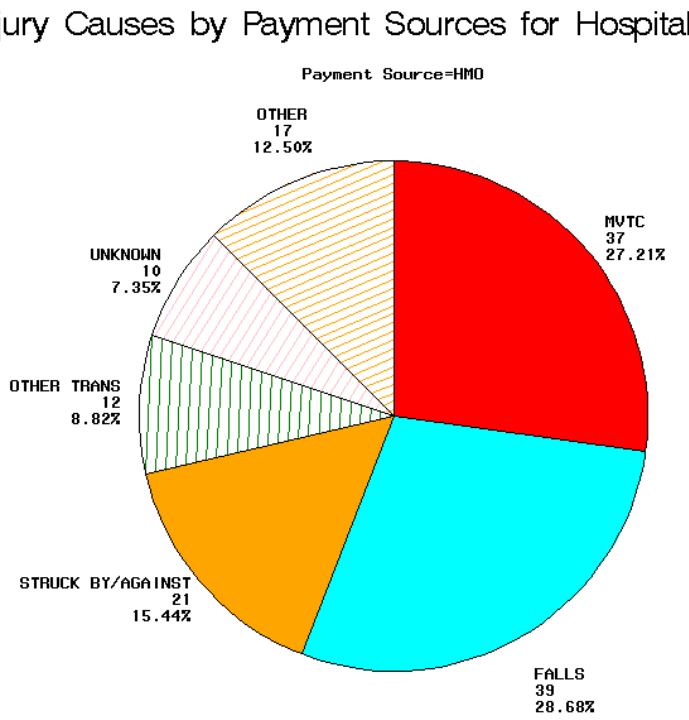


Figure 13. Mechanism of injury for TBI having 'HMO' as primary payer, 2002



TABLES

Table 1. TBI by age, 2002

| | Fatal | | | Non-fatal | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| Age | Number | Percent | Rate | Number | Percent | Rate | Number | Percent | Rate |
| 0-4 | 21 | 11.5 | 7.8 | 162 | 88.5 | 59.9 | 183 | 100.0 | 67.7 |
| 5-14 | 19 | 6.3 | 3.4 | 284 | 93.7 | 50.9 | 303 | 100.0 | 54.3 |
| 15-24 | 183 | 20.6 | 31.3 | 704 | 79.4 | 120.4 | 887 | 100.0 | 151.7 |
| 25-44 | 320 | 25.4 | 27.0 | 942 | 74.6 | 79.4 | 1,262 | 100.0 | 106.4 |
| 45-64 | 250 | 26.8 | 25.4 | 682 | 73.2 | 69.2 | 932 | 100.0 | 94.6 |
| 65+ | 294 | 23.8 | 57.8 | 939 | 76.2 | 184.6 | 1,233 | 100.0 | 242.4 |
| Total | 1,087 | 22.6 | 26.6 | 3,713 | 77.4 | 90.7 | 4,800 | 100.0 | 117.3 |

* For one observation, the individual's age was not reported

Table 2. TBI by gender, 2002

| | Fatal | | | Non-fatal | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| Age | Number | Percent | Rate | Number | Percent | Rate | Number | Percent | Rate |
| Male | 797 | 26.1 | 39.8 | 2,256 | 73.9 | 112.6 | 3,053 | 100.0 | 152.4 |
| Female | 290 | 16.6 | 13.9 | 1,458 | 83.4 | 69.8 | 1,748 | 100.0 | 83.7 |
| Total | 1,087 | 22.6 | 26.6 | 3,714 | 77.4 | 90.7 | 4,801 | 100.0 | 117.3 |

Table 3. Leading causes of TBI, all ages, 2002

| | Fatal | | | Non-fatal | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| Mechanism of Injury | Number | Pct. | Rate | Number | Pct. | Rate | Number | Pct. | Rate |
| Motor vehicle traffic crash | 420 | 19.5 | 10.3 | 1,734 | 80.5 | 42.4 | 2,154 | 100.0 | 52.6 |
| Fall | 154 | 15.1 | 3.8 | 868 | 84.9 | 21.2 | 1,022 | 100.0 | 25.0 |
| Firearm | 325 | 92.1 | 7.9 | 28 | 7.9 | 0.7 | 353 | 100.0 | 8.6 |
| Non-traffic land transport | 27 | 12.2 | 0.7 | 195 | 87.8 | 4.8 | 222 | 100.0 | 5.4 |
| Struck by object or person | 15 | 7.4 | 0.4 | 189 | 92.6 | 4.6 | 204 | 100.0 | 5.0 |
| Non-traffic pedal cycle | 0 | 0.0 | 0.0 | 37 | 100.0 | 0.9 | 37 | 100.0 | 0.9 |
| Machinery | 7 | 24.1 | 0.2 | 22 | 75.9 | 0.5 | 29 | 100.0 | 0.7 |
| Other | 97 | 40.9 | 2.4 | 140 | 59.1 | 3.4 | 237 | 100.0 | 5.8 |
| Unknown (missing E-code) | 42 | 7.7 | 1.0 | 501 | 92.3 | 12.2 | 543 | 100.0 | 13.3 |
| Total | 1,087 | 22.6 | 26.6 | 3,714 | 77.4 | 90.7 | 4,801 | 100.0 | 117.3 |

Table 4. Leading causes of TBI for ages 0-4, 2002

| | Fatal | | Non-fatal | | Total | |
|---|---|---|---|---|---|---|
| Mechanism of Injury | Number | Percent | Number | Percent | Number | Percent |
| Fall | 0 | 0.0 | 62 | 38.3 | 62 | 33.9 |
| Motor vehicle traffic crash | 5 | 23.8 | 42 | 25.9 | 47 | 25.7 |
| Struck by or against object or person | 2 | 9.5 | 14 | 8.6 | 16 | 8.7 |
| Non-traffic land transportation | 1 | 4.8 | 2 | 1.2 | 3 | 1.6 |
| Other (including non-specific codes) | 13 | 61.9 | 28 | 17.3 | 41 | 22.4 |
| Unknown (missing E-code) | 0 | 0.0 | 14 | 8.6 | 14 | 7.7 |
| Total | 21 | 100.0 | 162 | 100.0 | 183 | 100.0 |

Table 5. Leading causes of TBI for ages 5-14, 2002

| | Fatal | | Non-fatal | | Total | |
|---|---|---|---|---|---|---|
| Mechanism of Injury | Number | Percent | Number | Percent | Number | Percent |
| Motor vehicle traffic crash | 12 | 63.2 | 126 | 44.4 | 138 | 75.4 |
| Fall | 0 | 0.0 | 55 | 19.4 | 55 | 30.1 |
| Non-traffic land transportation | 2 | 10.5 | 42 | 14.8 | 44 | 24.0 |
| Struck by or against object or person | 1 | 5.3 | 20 | 7.0 | 21 | 11.5 |
| Other pedal cycle | 0 | 0.0 | 18 | 6.3 | 18 | 9.8 |
| Firearm | 3 | 15.8 | 1 | 0.4 | 4 | 2.2 |
| Other (including non-specific codes) | 1 | 5.3 | 13 | 4.6 | 14 | 7.7 |
| Unknown (missing E-code) | 0 | 0.0 | 9 | 3.2 | 9 | 4.9 |
| Total | 19 | 100.0 | 284 | 100.0 | 303 | 165.6 |

Table 6. Leading causes of TBI for ages 15-24, 2002

| | Fatal | | Non-fatal | | Total | |
|---|---|---|---|---|---|---|
| Mechanism of Injury | Number | Percent | Number | Percent | Number | Percent |
| Motor vehicle traffic crash | 104 | 56.8 | 486 | 69.0 | 590 | 66.5 |
| Firearm | 59 | 32.2 | 6 | 0.9 | 65 | 7.3 |
| Non-traffic land transportation | 4 | 2.2 | 59 | 8.4 | 63 | 7.1 |
| Struck by or against object or person | 1 | 0.5 | 40 | 5.7 | 41 | 4.6 |
| Fall | 5 | 2.7 | 34 | 4.8 | 39 | 4.4 |
| Other (including non-specific codes) | 6 | 3.3 | 33 | 4.7 | 39 | 4.4 |
| Unknown (missing E-code) | 4 | 2.2 | 46 | 6.5 | 50 | 5.6 |
| Total | 183 | 100.0 | 704 | 100.0 | 887 | 100.0 |

Table 7. Leading causes of TBI for ages 25-44, 2002

| | Fatal | | Non-fatal | | Total | |
|---|---|---|---|---|---|---|
| Mechanism of Injury | Number | Percent | Number | Percent | Number | Percent |
| Motor vehicle traffic crash | 149 | 46.6 | 577 | 61.3 | 726 | 57.5 |
| Firearm | 105 | 32.8 | 12 | 1.3 | 117 | 9.3 |
| Fall | 15 | 4.7 | 87 | 9.2 | 102 | 8.1 |
| Struck by or against object or person | 6 | 1.9 | 69 | 7.3 | 75 | 5.9 |
| Non-traffic land transportation | 7 | 2.2 | 58 | 6.2 | 65 | 5.2 |
| Machinery | 3 | 0.9 | 10 | 1.1 | 13 | 1.0 |
| Other (including non-specific codes) | 28 | 8.8 | 43 | 4.6 | 71 | 5.6 |
| Unknown (missing E-code) | 7 | 2.2 | 86 | 9.1 | 93 | 7.4 |
| Total | 320 | 100.0 | 942 | 100.0 | 1,262 | 100.0 |

Table 8. Leading causes of TBI for ages 45-64, 2002

| | Fatal | | Non-fatal | | Total | |
|---|---|---|---|---|---|---|
| Mechanism of Injury | Number | Percent | Number | Percent | Number | Percent |
| Motor vehicle traffic crash | 89 | 35.6 | 332 | 48.7 | 421 | 45.2 |
| Fall | 25 | 10.0 | 156 | 22.9 | 181 | 19.4 |
| Firearm | 109 | 43.6 | 7 | 1.0 | 116 | 12.4 |
| Non-traffic land transportation | 8 | 3.2 | 30 | 4.4 | 38 | 4.1 |
| Struck by or against object or person | 3 | 1.2 | 24 | 3.5 | 27 | 2.9 |
| Other (including non-specific codes) | 13 | 5.2 | 31 | 4.5 | 44 | 4.7 |
| Unknown (missing E-code) | 3 | 1.2 | 102 | 15.0 | 105 | 11.3 |
| Total | 250 | 100.0 | 682 | 100.0 | 932 | 100.0 |

Table 9. Leading causes of TBI for ages 65+, 2002

| | Fatal | | Non-fatal | | Total | |
|---|---|---|---|---|---|---|
| Mechanism of Injury | Number | Percent | Number | Percent | Number | Percent |
| Fall | 109 | 37.1 | 474 | 50.5 | 583 | 47.3 |
| Motor vehicle traffic crash | 61 | 20.7 | 171 | 18.2 | 232 | 18.8 |
| Firearm | 48 | 16.3 | 1 | 0.1 | 49 | 4.0 |
| Struck by or against object or person | 2 | 0.7 | 21 | 2.2 | 23 | 1.9 |
| Non-traffic land transportation | 5 | 1.7 | 4 | 0.4 | 9 | 0.7 |
| Other (including non-specific codes) | 41 | 13.9 | 24 | 2.6 | 65 | 5.3 |
| Unknown (missing E-code) | 28 | 9.5 | 244 | 26.0 | 272 | 22.1 |
| Total | 294 | 100.0 | 939 | 100.0 | 1,233 | 100.0 |

Table 10. Incidence of TBI by county, sorted by county name, 2002

| 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 | 24 | 0.5 | 129.0 | 138.4 | GRANT | 12 | 0.3 | 52.6 | 50.8 | MCLEAN | 14 | 0.3 | 123.9 | 139.3 |
| ALLEN | 12 | 0.3 | 65.8 | 66.0 | GRAVES | 43 | 0.9 | 115.8 | 115.5 | MEADE | 29 | 0.6 | 106.6 | 105.7 |
| ANDERSON | 20 | 0.4 | 107.0 | 102.2 | GRAYSON | 34 | 0.7 | 139.6 | 139.3 | MENIFEE | 5 | 0.1 | 79.9 | 74.5 |
| BALLARD | 8 | 0.2 | 101.9 | 98.1 | GREEN | 26 | 0.5 | 204.1 | 221.2 | MERCER | 32 | 0.7 | 155.3 | 152.1 |
| BARREN | 44 | 0.9 | 110.6 | 113.5 | GREENUP | 18 | 0.4 | 45.7 | 49.0 | METCALFE | 10 | 0.2 | 97.0 | 99.6 |
| BATH | 18 | 0.4 | 157.8 | 157.7 | HANCOCK | 13 | 0.3 | 170.8 | 151.6 | MONROE | 20 | 0.4 | 169.4 | 169.5 |
| BELL | 39 | 0.8 | 126.9 | 129.5 | HARDIN | 128 | 2.7 | 142.7 | 133.7 | MONTGOMERY | 32 | 0.7 | 136.9 | 137.6 |
| BOONE | 51 | 1.1 | 71.8 | 54.7 | HARLAN | 32 | 0.7 | 95.5 | 98.2 | MORGAN | 18 | 0.4 | 121.4 | 126.8 |
| BOURBON | 23 | 0.5 | 117.5 | 117.5 | HARRISON | 24 | 0.5 | 133.6 | 132.8 | MUHLENBERG | 36 | 0.8 | 113.2 | 113.6 |
| BOYD | 43 | 0.9 | 82.2 | 86.7 | HART | 24 | 0.5 | 133.2 | 135.8 | NELSON | 81 | 1.7 | 226.1 | 208.7 |
| BOYLE | 25 | 0.5 | 88.5 | 89.7 | HENDERSON | 41 | 0.9 | 90.3 | 91.1 | NICHOLAS | 17 | 0.4 | 250.4 | 244.8 |
| BRACKEN | 10 | 0.2 | 125.5 | 117.9 | HENRY | 19 | 0.4 | 130.6 | 123.7 | OHIO | 35 | 0.7 | 148.5 | 150.3 |
| BREATHITT | 40 | 0.8 | 255.1 | 251.8 | HICKMAN | 8 | 0.2 | 140.2 | 154.0 | OLDHAM | 39 | 0.8 | 113.8 | 79.1 |
| BRECKINRIDGE | 12 | 0.3 | 63.8 | 63.3 | HOPKINS | 54 | 1.1 | 118.4 | 115.9 | OWEN | 9 | 0.2 | 77.8 | 82.2 |
| BULLITT | 67 | 1.4 | 133.2 | 105.0 | JACKSON | 24 | 0.5 | 170.9 | 174.1 | OWSLEY | 26 | 0.5 | 567.6 | 545.8 |
| BUTLER | 23 | 0.5 | 173.1 | 174.8 | JEFFERSON | 909 | 19.0 | 128.9 | 130.2 | PENDLETON | 8 | 0.2 | 57.7 | 54.0 |
| CALDWELL | 18 | 0.4 | 128.2 | 139.2 | JESSAMINE | 39 | 0.8 | 98.4 | 95.7 | PERRY | 102 | 2.1 | 349.3 | 347.2 |
| CALLOWAY | 26 | 0.5 | 71.0 | 75.6 | JOHNSON | 30 | 0.6 | 129.7 | 128.5 | PIKE | 129 | 2.7 | 191.7 | 190.3 |
| CAMPBELL | 65 | 1.4 | 74.6 | 73.4 | KENTON | 100 | 2.1 | 70.1 | 65.7 | POWELL | 19 | 0.4 | 144.1 | 143.9 |
| CARLISLE | 8 | 0.2 | 161.7 | 150.4 | KNOTT | 34 | 0.7 | 196.9 | 191.7 | PULASKI | 90 | 1.9 | 159.8 | 157.5 |
| CARROLL | 21 | 0.4 | 214.1 | 205.3 | KNOX | 36 | 0.8 | 112.6 | 113.1 | ROBERTSON | * | - | - | - |
| CARTER | 24 | 0.5 | 87.8 | 88.7 | LARUE | 14 | 0.3 | 101.7 | 104.8 | ROCKCASTLE | 21 | 0.4 | 124.8 | 125.1 |
| CASEY | 35 | 0.7 | 226.6 | 221.9 | LAUREL | 68 | 1.4 | 127.7 | 125.2 | ROWAN | 25 | 0.5 | 115.1 | 112.4 |
| CHRISTIAN | 22 | 0.5 | 36.5 | 30.9 | LAWRENCE | 17 | 0.4 | 110.5 | 107.7 | RUSSELL | 15 | 0.3 | 87.5 | 90.2 |
| CLARK | 34 | 0.7 | 97.7 | 100.8 | LEE | 18 | 0.4 | 217.2 | 226.5 | SCOTT | 28 | 0.6 | 81.3 | 79.3 |
| CLAY | 39 | 0.8 | 158.3 | 160.8 | LESLIE | 33 | 0.7 | 270.2 | 268.8 | SHELBY | 38 | 0.8 | 116.5 | 108.2 |
| CLINTON | 22 | 0.5 | 222.0 | 227.7 | LETCHER | 50 | 1.0 | 204.9 | 200.4 | SIMPSON | 14 | 0.3 | 84.2 | 84.0 |
| CRITTENDEN | 15 | 0.3 | 150.4 | 162.5 | LEWIS | 9 | 0.2 | 63.5 | 64.5 | SPENCER | 19 | 0.4 | 164.5 | 140.5 |
| CUMBERLAND | 18 | 0.4 | 265.4 | 250.4 | LINCOLN | 23 | 0.5 | 102.9 | 95.6 | TAYLOR | 42 | 0.9 | 179.0 | 180.9 |
| DAVIESS | 84 | 1.8 | 88.5 | 91.6 | LIVINGSTON | 17 | 0.4 | 170.9 | 172.7 | TODD | 10 | 0.2 | 85.6 | 83.5 |
| EDMONSON | 7 | 0.1 | 62.6 | 59.1 | LOGAN | 13 | 0.3 | 51.2 | 48.5 | TRIGG | * | - | - | - |
| ELLIOTT | 10 | 0.2 | 141.2 | 148.2 | LYON | 10 | 0.2 | 123.9 | 122.4 | TRIMBLE | 11 | 0.2 | 133.7 | 126.8 |
| ESTILL | 21 | 0.4 | 133.2 | 136.9 | MADISON | 50 | 1.0 | 69.5 | 68.2 | UNION | 17 | 0.4 | 117.1 | 109.3 |
| FAYETTE | 236 | 4.9 | 91.6 | 89.5 | MAGOFFIN | 30 | 0.6 | 227.5 | 224.6 | WARREN | 78 | 1.6 | 80.9 | 82.3 |
| FLEMING | 19 | 0.4 | 136.9 | 134.8 | MARION | 30 | 0.6 | 160.9 | 162.8 | WASHINGTON | 18 | 0.4 | 161.5 | 162.4 |
| FLOYD | 58 | 1.2 | 136.0 | 137.4 | MARSHALL | 41 | 0.9 | 134.3 | 135.4 | WAYNE | 29 | 0.6 | 142.3 | 144.4 |
| FRANKLIN | 62 | 1.3 | 128.2 | 128.7 | MARTIN | 16 | 0.3 | 129.1 | 127.7 | WEBSTER | 8 | 0.2 | 55.2 | 56.9 |
| FULTON | 6 | 0.1 | 72.5 | 79.5 | MASON | 18 | 0.4 | 105.8 | 106.4 | WHITLEY | 51 | 1.1 | 140.6 | 139.1 |
| GALLATIN | 8 | 0.2 | 116.6 | 102.1 | MCCRACKEN | 103 | 2.2 | 150.8 | 159.7 | WOLFE | 23 | 0.5 | 319.4 | 331.6 |
| GARRARD | 13 | 0.3 | 81.3 | 83.2 | MCCREARY | 24 | 0.5 | 144.0 | 141.2 | WOODFORD | 23 | 0.5 | 101.4 | 98.3 |

* At least one but fewer than five

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

Table 11. Incidence of TBI by county, sorted by frequency, 2002

| 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 | 909 | 19.0 | 128.9 | 130.2 | LESLIE | 33 | 0.7 | 270.2 | 268.8 | GREENUP | 18 | 0.4 | 45.7 | 49.0 |
| FAYETTE | 236 | 4.9 | 91.6 | 89.5 | HARLAN | 32 | 0.7 | 95.5 | 98.2 | LEE | 18 | 0.4 | 217.2 | 226.5 |
| PIKE | 129 | 2.7 | 191.7 | 190.3 | MERCER | 32 | 0.7 | 155.3 | 152.1 | MASON | 18 | 0.4 | 105.8 | 106.4 |
| HARDIN | 128 | 2.7 | 142.7 | 133.7 | MONTGOMERY | 32 | 0.7 | 136.9 | 137.6 | MORGAN | 18 | 0.4 | 121.4 | 126.8 |
| MCCRACKEN | 103 | 2.2 | 150.8 | 159.7 | JOHNSON | 30 | 0.6 | 129.7 | 128.5 | WASHINGTON | 18 | 0.4 | 161.5 | 162.4 |
| PERRY | 102 | 2.1 | 349.3 | 347.2 | MAGOFFIN | 30 | 0.6 | 227.5 | 224.6 | LAWRENCE | 17 | 0.4 | 110.5 | 107.7 |
| KENTON | 100 | 2.1 | 70.1 | 65.7 | MARION | 30 | 0.6 | 160.9 | 162.8 | LIVINGSTON | 17 | 0.4 | 170.9 | 172.7 |
| PULASKI | 90 | 1.9 | 159.8 | 157.5 | MEADE | 29 | 0.6 | 106.6 | 105.7 | NICHOLAS | 17 | 0.4 | 250.4 | 244.8 |
| DAVIESS | 84 | 1.8 | 88.5 | 91.6 | WAYNE | 29 | 0.6 | 142.3 | 144.4 | UNION | 17 | 0.4 | 117.1 | 109.3 |
| NELSON | 81 | 1.7 | 226.1 | 208.7 | SCOTT | 28 | 0.6 | 81.3 | 79.3 | MARTIN | 16 | 0.3 | 129.1 | 127.7 |
| WARREN | 78 | 1.6 | 80.9 | 82.3 | CALLOWAY | 26 | 0.5 | 71.0 | 75.6 | CRITTENDEN | 15 | 0.3 | 150.4 | 162.5 |
| LAUREL | 68 | 1.4 | 127.7 | 125.2 | GREEN | 26 | 0.5 | 204.1 | 221.2 | RUSSELL | 15 | 0.3 | 87.5 | 90.2 |
| BULLITT | 67 | 1.4 | 133.2 | 105.0 | OWSLEY | 26 | 0.5 | 567.6 | 545.8 | LARUE | 14 | 0.3 | 101.7 | 104.8 |
| CAMPBELL | 65 | 1.4 | 74.6 | 73.4 | BOYLE | 25 | 0.5 | 88.5 | 89.7 | MCLEAN | 14 | 0.3 | 123.9 | 139.3 |
| FRANKLIN | 62 | 1.3 | 128.2 | 128.7 | ROWAN | 25 | 0.5 | 115.1 | 112.4 | SIMPSON | 14 | 0.3 | 84.2 | 84.0 |
| FLOYD | 58 | 1.2 | 136.0 | 137.4 | ADAIR | 24 | 0.5 | 129.0 | 138.4 | GARRARD | 13 | 0.3 | 81.3 | 83.2 |
| HOPKINS | 54 | 1.1 | 118.4 | 115.9 | CARTER | 24 | 0.5 | 87.8 | 88.7 | HANCOCK | 13 | 0.3 | 170.8 | 151.6 |
| BOONE | 51 | 1.1 | 71.8 | 54.7 | HARRISON | 24 | 0.5 | 133.6 | 132.8 | LOGAN | 13 | 0.3 | 51.2 | 48.5 |
| WHITLEY | 51 | 1.1 | 140.6 | 139.1 | HART | 24 | 0.5 | 133.2 | 135.8 | ALLEN | 12 | 0.3 | 65.8 | 66.0 |
| LETCHER | 50 | 1.0 | 204.9 | 200.4 | JACKSON | 24 | 0.5 | 170.9 | 174.1 | BRECKINRIDGE | 12 | 0.3 | 63.8 | 63.3 |
| MADISON | 50 | 1.0 | 69.5 | 68.2 | MCCREARY | 24 | 0.5 | 144.0 | 141.2 | GRANT | 12 | 0.3 | 52.6 | 50.8 |
| BARREN | 44 | 0.9 | 110.6 | 113.5 | BOURBON | 23 | 0.5 | 117.5 | 117.5 | TRIMBLE | 11 | 0.2 | 133.7 | 126.8 |
| BOYD | 43 | 0.9 | 82.2 | 86.7 | BUTLER | 23 | 0.5 | 173.1 | 174.8 | BRACKEN | 10 | 0.2 | 125.5 | 117.9 |
| GRAVES | 43 | 0.9 | 115.8 | 115.5 | LINCOLN | 23 | 0.5 | 102.9 | 95.6 | ELLIOTT | 10 | 0.2 | 141.2 | 148.2 |
| TAYLOR | 42 | 0.9 | 179.0 | 180.9 | WOLFE | 23 | 0.5 | 319.4 | 331.6 | LYON | 10 | 0.2 | 123.9 | 122.4 |
| HENDERSON | 41 | 0.9 | 90.3 | 91.1 | WOODFORD | 23 | 0.5 | 101.4 | 98.3 | METCALFE | 10 | 0.2 | 97.0 | 99.6 |
| MARSHALL | 41 | 0.9 | 134.3 | 135.4 | CHRISTIAN | 22 | 0.5 | 36.5 | 30.9 | TODD | 10 | 0.2 | 85.6 | 83.5 |
| BREATHITT | 40 | 0.8 | 255.1 | 251.8 | CLINTON | 22 | 0.5 | 222.0 | 227.7 | LEWIS | 9 | 0.2 | 63.5 | 64.5 |
| BELL | 39 | 0.8 | 126.9 | 129.5 | CARROLL | 21 | 0.4 | 214.1 | 205.3 | OWEN | 9 | 0.2 | 77.8 | 82.2 |
| CLAY | 39 | 0.8 | 158.3 | 160.8 | ESTILL | 21 | 0.4 | 133.2 | 136.9 | BALLARD | 8 | 0.2 | 101.9 | 98.1 |
| JESSAMINE | 39 | 0.8 | 98.4 | 95.7 | ROCKCASTLE | 21 | 0.4 | 124.8 | 125.1 | CARLISLE | 8 | 0.2 | 161.7 | 150.4 |
| OLDHAM | 39 | 0.8 | 113.8 | 79.1 | ANDERSON | 20 | 0.4 | 107.0 | 102.2 | GALLATIN | 8 | 0.2 | 116.6 | 102.1 |
| SHELBY | 38 | 0.8 | 116.5 | 108.2 | MONROE | 20 | 0.4 | 169.4 | 169.5 | HICKMAN | 8 | 0.2 | 140.2 | 154.0 |
| KNOX | 36 | 0.8 | 112.6 | 113.1 | FLEMING | 19 | 0.4 | 136.9 | 134.8 | PENDLETON | 8 | 0.2 | 57.7 | 54.0 |
| MUHLENBERG | 36 | 0.8 | 113.2 | 113.6 | HENRY | 19 | 0.4 | 130.6 | 123.7 | WEBSTER | 8 | 0.2 | 55.2 | 56.9 |
| CASEY | 35 | 0.7 | 226.6 | 221.9 | POWELL | 19 | 0.4 | 144.1 | 143.9 | EDMONSON | 7 | 0.1 | 62.6 | 59.1 |
| OHIO | 35 | 0.7 | 148.5 | 150.3 | SPENCER | 19 | 0.4 | 164.5 | 140.5 | FULTON | 6 | 0.1 | 72.5 | 79.5 |
| CLARK | 34 | 0.7 | 97.7 | 100.8 | BATH | 18 | 0.4 | 157.8 | 157.7 | MENIFEE | 5 | 0.1 | 79.9 | 74.5 |
| GRAYSON | 34 | 0.7 | 139.6 | 139.3 | CALDWELL | 18 | 0.4 | 128.2 | 139.2 | TRIGG | * | - | - | - |
| KNOTT | 34 | 0.7 | 196.9 | 191.7 | CUMBERLAND | 18 | 0.4 | 265.4 | 250.4 | ROBERTSON | * | - | - | - |

* 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 TBI by county, sorted by age-adjusted rate, 2002

| 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 | 26 | 0.5 | 567.6 | 545.8 | HICKMAN | 8 | 0.2 | 140.2 | 154.0 | LINCOLN | 23 | 0.5 | 102.9 | 95.6 |
| PERRY | 102 | 2.1 | 349.3 | 347.2 | GRAYSON | 34 | 0.7 | 139.6 | 139.3 | BALLARD | 8 | 0.2 | 101.9 | 98.1 |
| WOLFE | 23 | 0.5 | 319.4 | 331.6 | FLEMING | 19 | 0.4 | 136.9 | 134.8 | LARUE | 14 | 0.3 | 101.7 | 104.8 |
| LESLIE | 33 | 0.7 | 270.2 | 268.8 | MONTGOMERY | 32 | 0.7 | 136.9 | 137.6 | WOODFORD | 23 | 0.5 | 101.4 | 98.3 |
| CUMBERLAND | 18 | 0.4 | 265.4 | 250.4 | FLOYD | 58 | 1.2 | 136.0 | 137.4 | JESSAMINE | 39 | 0.8 | 98.4 | 95.7 |
| BREATHITT | 40 | 0.8 | 255.1 | 251.8 | MARSHALL | 41 | 0.9 | 134.3 | 135.4 | CLARK | 34 | 0.7 | 97.7 | 100.8 |
| NICHOLAS | 17 | 0.4 | 250.4 | 244.8 | TRIMBLE | 11 | 0.2 | 133.7 | 126.8 | METCALFE | 10 | 0.2 | 97.0 | 99.6 |
| MAGOFFIN | 30 | 0.6 | 227.5 | 224.6 | HARRISON | 24 | 0.5 | 133.6 | 132.8 | HARLAN | 32 | 0.7 | 95.5 | 98.2 |
| CASEY | 35 | 0.7 | 226.6 | 221.9 | HART | 24 | 0.5 | 133.2 | 135.8 | FAYETTE | 236 | 4.9 | 91.6 | 89.5 |
| NELSON | 81 | 1.7 | 226.1 | 208.7 | BULLITT | 67 | 1.4 | 133.2 | 105.0 | HENDERSON | 41 | 0.9 | 90.3 | 91.1 |
| CLINTON | 22 | 0.5 | 222.0 | 227.7 | ESTILL | 21 | 0.4 | 133.2 | 136.9 | DAVIESS | 84 | 1.8 | 88.5 | 91.6 |
| LEE | 18 | 0.4 | 217.2 | 226.5 | HENRY | 19 | 0.4 | 130.6 | 123.7 | BOYLE | 25 | 0.5 | 88.5 | 89.7 |
| CARROLL | 21 | 0.4 | 214.1 | 205.3 | JOHNSON | 30 | 0.6 | 129.7 | 128.5 | CARTER | 24 | 0.5 | 87.8 | 88.7 |
| LETCHER | 50 | 1.0 | 204.9 | 200.4 | MARTIN | 16 | 0.3 | 129.1 | 127.7 | RUSSELL | 15 | 0.3 | 87.5 | 90.2 |
| GREEN | 26 | 0.5 | 204.1 | 221.2 | ADAIR | 24 | 0.5 | 129.0 | 138.4 | TODD | 10 | 0.2 | 85.6 | 83.5 |
| KNOTT | 34 | 0.7 | 196.9 | 191.7 | JEFFERSON | 909 | 19.0 | 128.9 | 130.2 | SIMPSON | 14 | 0.3 | 84.2 | 84.0 |
| PIKE | 129 | 2.7 | 191.7 | 190.3 | FRANKLIN | 62 | 1.3 | 128.2 | 128.7 | BOYD | 43 | 0.9 | 82.2 | 86.7 |
| TAYLOR | 42 | 0.9 | 179.0 | 180.9 | CALDWELL | 18 | 0.4 | 128.2 | 139.2 | SCOTT | 28 | 0.6 | 81.3 | 79.3 |
| BUTLER | 23 | 0.5 | 173.1 | 174.8 | LAUREL | 68 | 1.4 | 127.7 | 125.2 | GARRARD | 13 | 0.3 | 81.3 | 83.2 |
| JACKSON | 24 | 0.5 | 170.9 | 174.1 | BELL | 39 | 0.8 | 126.9 | 129.5 | WARREN | 78 | 1.6 | 80.9 | 82.3 |
| LIVINGSTON | 17 | 0.4 | 170.9 | 172.7 | BRACKEN | 10 | 0.2 | 125.5 | 117.9 | MENIFEE | 5 | 0.1 | 79.9 | 74.5 |
| HANCOCK | 13 | 0.3 | 170.8 | 151.6 | ROCKCASTLE | 21 | 0.4 | 124.8 | 125.1 | OWEN | 9 | 0.2 | 77.8 | 82.2 |
| MONROE | 20 | 0.4 | 169.4 | 169.5 | LYON | 10 | 0.2 | 123.9 | 122.4 | CAMPBELL | 65 | 1.4 | 74.6 | 73.4 |
| SPENCER | 19 | 0.4 | 164.5 | 140.5 | MCLEAN | 14 | 0.3 | 123.9 | 139.3 | FULTON | 6 | 0.1 | 72.5 | 79.5 |
| CARLISLE | 8 | 0.2 | 161.7 | 150.4 | MORGAN | 18 | 0.4 | 121.4 | 126.8 | BOONE | 51 | 1.1 | 71.8 | 54.7 |
| WASHINGTON | 18 | 0.4 | 161.5 | 162.4 | HOPKINS | 54 | 1.1 | 118.4 | 115.9 | CALLOWAY | 26 | 0.5 | 71.0 | 75.6 |
| MARION | 30 | 0.6 | 160.9 | 162.8 | BOURBON | 23 | 0.5 | 117.5 | 117.5 | KENTON | 100 | 2.1 | 70.1 | 65.7 |
| PULASKI | 90 | 1.9 | 159.8 | 157.5 | UNION | 17 | 0.4 | 117.1 | 109.3 | MADISON | 50 | 1.0 | 69.5 | 68.2 |
| CLAY | 39 | 0.8 | 158.3 | 160.8 | GALLATIN | 8 | 0.2 | 116.6 | 102.1 | ALLEN | 12 | 0.3 | 65.8 | 66.0 |
| BATH | 18 | 0.4 | 157.8 | 157.7 | SHELBY | 38 | 0.8 | 116.5 | 108.2 | BRECKINRIDGE | 12 | 0.3 | 63.8 | 63.3 |
| MERCER | 32 | 0.7 | 155.3 | 152.1 | GRAVES | 43 | 0.9 | 115.8 | 115.5 | LEWIS | 9 | 0.2 | 63.5 | 64.5 |
| MCCRACKEN | 103 | 2.2 | 150.8 | 159.7 | ROWAN | 25 | 0.5 | 115.1 | 112.4 | EDMONSON | 7 | 0.1 | 62.6 | 59.1 |
| CRITTENDEN | 15 | 0.3 | 150.4 | 162.5 | OLDHAM | 39 | 0.8 | 113.8 | 79.1 | PENDLETON | 8 | 0.2 | 57.7 | 54.0 |
| OHIO | 35 | 0.7 | 148.5 | 150.3 | MUHLENBERG | 36 | 0.8 | 113.2 | 113.6 | WEBSTER | 8 | 0.2 | 55.2 | 56.9 |
| POWELL | 19 | 0.4 | 144.1 | 143.9 | KNOX | 36 | 0.8 | 112.6 | 113.1 | ROBERTSON | * | - | - | - |
| MCCREARY | 24 | 0.5 | 144.0 | 141.2 | BARREN | 44 | 0.9 | 110.6 | 113.5 | GRANT | 12 | 0.3 | 52.6 | 50.8 |
| HARDIN | 128 | 2.7 | 142.7 | 133.7 | LAWRENCE | 17 | 0.4 | 110.5 | 107.7 | LOGAN | 13 | 0.3 | 51.2 | 48.5 |
| WAYNE | 29 | 0.6 | 142.3 | 144.4 | ANDERSON | 20 | 0.4 | 107.0 | 102.2 | GREENUP | 18 | 0.4 | 45.7 | 49.0 |
| ELLIOTT | 10 | 0.2 | 141.2 | 148.2 | MEADE | 29 | 0.6 | 106.6 | 105.7 | CHRISTIAN | 22 | 0.5 | 36.5 | 30.9 |
| WHITLEY | 51 | 1.1 | 140.6 | 139.1 | MASON | 18 | 0.4 | 105.8 | 106.4 | GG | * | - | - | - |

* At least one but fewer than five

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

Table 13. Hospital discharges by disposition for non-fatal TBI, 2002

| Discharge Disposition | Number | Percent |
|---|---|---|
| Routine discharge (home/self care) | 2,496 | 67.2 |
| Inpatient-other short-term hospital | 92 | 2.5 |
| Skilled nursing facility (SNF) | 278 | 7.5 |
| Intermediate care facility (ICF) | 42 | 1.1 |
| Inpatient-other type facility | 295 | 7.9 |
| Home health | 292 | 7.9 |
| Rehab (from trauma registry data) | 22 | 0.6 |
| Other | 197 | 5.3 |
| Total | 3,714 | 100.0 |

Table 14. Injury Severity Score by mechanism for non-fatal TBI, 2002

| | Injury Severity Score | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mild | | Moderate | | Severe | | Critical | | Unknown | | |
| Injury Mechanism | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Total |
| Motor vehicle traffic crash | 630 | 51.4 | 483 | 59.2 | 388 | 32.6 | 203 | 67.7 | 30 | 16.4 | 1,734 |
| Falls | 253 | 20.7 | 136 | 16.7 | 371 | 31.2 | 35 | 11.7 | 73 | 39.9 | 868 |
| Non-traffic land transportation | 67 | 5.5 | 55 | 6.7 | 54 | 4.5 | 13 | 4.3 | 6 | 3.3 | 195 |
| Struck by or against object or person | 76 | 6.2 | 35 | 4.3 | 58 | 4.9 | 5 | 1.7 | 15 | 8.2 | 189 |
| Firearm | 0 | 0.0 | 3 | 0.4 | 18 | 1.5 | 7 | 2.3 | 0 | 0.0 | 28 |
| Non-traffic pedal cycle | 15 | 1.2 | 12 | 1.5 | 9 | 0.8 | 0 | 0.0 | 1 | 0.5 | 37 |
| Other | 47 | 3.8 | 29 | 3.6 | 68 | 5.7 | 7 | 2.3 | 11 | 6.0 | 162 |
| Unknown | 137 | 11.2 | 63 | 7.7 | 224 | 18.8 | 30 | 10.0 | 47 | 25.7 | 501 |
| Total | 1,225 | 100.0 | 816 | 100.0 | 1,190 | 100.0 | 300 | 100.0 | 183 | 100.0 | 3,714 |

Table 15. Barrell Matrix Type I/II/III TBI by mechanism for non-fatal TBI, 2002

| | Type of TBI | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Type I | | Type II | | Type III | | Other | | |
| Injury Mechanism | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Total |
| Motor vehicle traffic crash | 395 | 31.9 | 214 | 43.4 | 24 | 23.5 | 562 | 71.6 | 1,195 |
| Falls | 405 | 32.7 | 116 | 23.5 | 39 | 38.2 | 87 | 11.1 | 647 |
| Non-traffic land transportation | 67 | 5.4 | 34 | 6.9 | 3 | 2.9 | 43 | 5.5 | 147 |
| Struck by or against object or person | 69 | 5.6 | 38 | 7.7 | 15 | 14.7 | 35 | 4.5 | 157 |
| Non-traffic pedal cycle | 13 | 1.1 | 6 | 1.2 | 6 | 5.9 | 8 | 1.0 | 33 |
| Firearm | 19 | 1.5 | 2 | 0.4 | 1 | 1.0 | 1 | 0.1 | 23 |
| Other | 63 | 5.1 | 26 | 5.3 | 8 | 7.8 | 22 | 2.8 | 119 |
| Unknown | 206 | 16.7 | 57 | 11.6 | 6 | 5.9 | 27 | 3.4 | 296 |
| Total | 1,237 | 100.0 | 493 | 100.0 | 102 | 100.0 | 785 | 100.0 | 2,617 |

Table 16. Primary payers for hospitalized TBI, 2002
(Hospital Discharge Dataset only)

| Payer | Number of Discharges | Percent of Discharges | Total Hospital Charges |
|---|---|---|---|
| Commercial Ins | 1,529 | 45.5 | $57,533,603 |
| Government | 1,148 | 34.2 | $24,071,049 |
| Self Pay | 174 | 5.2 | $2,031,362 |
| Workers Compensation | 96 | 2.9 | $2,674,934 |
| HMO | 130 | 3.9 | $3,099,070 |
| Other | 281 | 8.4 | $6,252,540 |
| Total | 3,358 | 100.0 | $95,662,558 |

Table 17. ABI by age, 2002

| | Fatal | | | Non-fatal | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| Age | Number | Percent | Rate | Number | Percent | Rate | Number | Percent | Rate |
| 0-4 | 60 | 48.4 | 22.2 | 64 | 51.6 | 23.7 | 124 | 100.0 | 45.9 |
| 5-14 | 19 | 26.0 | 3.4 | 54 | 74.0 | 9.7 | 73 | 100.0 | 13.1 |
| 15-24 | 89 | 33.1 | 15.2 | 180 | 66.9 | 30.8 | 269 | 100.0 | 46.0 |
| 25-44 | 246 | 27.8 | 20.7 | 640 | 72.2 | 54.0 | 886 | 100.0 | 74.7 |
| 45-64 | 302 | 32.4 | 30.7 | 630 | 67.6 | 64.0 | 932 | 100.0 | 94.6 |
| 65+ | 550 | 46.8 | 108.1 | 625 | 53.2 | 122.9 | 1,175 | 100.0 | 231.0 |
| Total | 1,266 | 36.6 | 30.9 | 2,193 | 63.4 | 53.6 | 3,459 | 100.0 | 84.5 |

* For one observation, the individual's age was not reported

Table 18. ABI by gender, 2002

| | Fatal | | | Non-fatal | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| Age | Number | Percent | Rate | Number | Percent | Rate | Number | Percent | Rate |
| Male | 759 | 42.1 | 37.9 | 1,043 | 57.9 | 52.1 | 1,802 | 100.0 | 89.9 |
| Female | 508 | 30.6 | 24.3 | 1,150 | 69.4 | 55.0 | 1,658 | 100.0 | 79.3 |
| Total | 1,267 | 36.6 | 31.0 | 2,193 | 63.4 | 53.6 | 3,460 | 100.0 | 84.5 |

Table 19. Incidence of ABI by county, sorted by county name, 2002

| 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 | 13 | 0.4 | 69.4 | 75.0 | GRANT | 21 | 0.6 | 100.1 | 88.9 | MCLEAN | 6 | 0.2 | 59.0 | 59.7 |
| ALLEN | 8 | 0.2 | 42.4 | 44.0 | GRAVES | 41 | 1.2 | 105.2 | 110.2 | MEADE | 8 | 0.2 | 35.4 | 29.2 |
| ANDERSON | 14 | 0.4 | 74.8 | 71.6 | GRAYSON | 19 | 0.5 | 73.4 | 77.8 | MENIFEE | 3 | 0.1 | 41.1 | 44.7 |
| BALLARD | 10 | 0.3 | 100.5 | 122.6 | GREEN | 8 | 0.2 | 59.3 | 68.1 | MERCER | 10 | 0.3 | 45.7 | 47.5 |
| BARREN | 39 | 1.1 | 97.5 | 100.6 | GREENUP | 24 | 0.7 | 61.5 | 65.3 | METCALFE | 7 | 0.2 | 65.5 | 69.7 |
| BATH | 9 | 0.3 | 74.0 | 78.9 | HANCOCK | 6 | 0.2 | 81.1 | 70.0 | MONROE | 19 | 0.5 | 150.5 | 161.0 |
| BELL | 43 | 1.2 | 143.7 | 142.7 | HARDIN | 74 | 2.1 | 86.6 | 77.3 | MONTGOMERY | 17 | 0.5 | 71.7 | 73.1 |
| BOONE | 46 | 1.3 | 54.5 | 49.3 | HARLAN | 25 | 0.7 | 72.4 | 76.7 | MORGAN | 11 | 0.3 | 88.9 | 77.5 |
| BOURBON | 19 | 0.5 | 92.1 | 97.0 | HARRISON | 10 | 0.3 | 54.5 | 55.3 | MUHLENBERG | 28 | 0.8 | 80.7 | 88.3 |
| BOYD | 52 | 1.5 | 101.9 | 104.8 | HART | 13 | 0.4 | 69.4 | 73.6 | NELSON | 25 | 0.7 | 69.3 | 64.4 |
| BOYLE | 19 | 0.5 | 67.2 | 68.2 | HENDERSON | 32 | 0.9 | 69.1 | 71.1 | NICHOLAS | 10 | 0.3 | 126.0 | 144.0 |
| BRACKEN | 8 | 0.2 | 88.2 | 94.3 | HENRY | 22 | 0.6 | 149.8 | 143.2 | OHIO | 9 | 0.3 | 37.1 | 38.7 |
| BREATHITT | 34 | 1.0 | 217.5 | 214.1 | HICKMAN | 5 | 0.1 | 91.2 | 96.3 | OLDHAM | 24 | 0.7 | 62.4 | 48.7 |
| BRECKINRIDGE | 23 | 0.7 | 109.0 | 121.4 | HOPKINS | 73 | 2.1 | 139.5 | 156.7 | OWEN | 5 | 0.1 | 45.0 | 45.7 |
| BULLITT | 29 | 0.8 | 50.0 | 45.5 | JACKSON | 13 | 0.4 | 98.1 | 94.3 | OWSLEY | 8 | 0.2 | 166.4 | 167.9 |
| BUTLER | 10 | 0.3 | 74.3 | 76.0 | JEFFERSON | 510 | 14.7 | 71.0 | 73.1 | PENDLETON | 9 | 0.3 | 65.8 | 60.8 |
| CALDWELL | 14 | 0.4 | 95.3 | 108.3 | JESSAMINE | 22 | 0.6 | 59.5 | 54.0 | PERRY | 69 | 2.0 | 229.9 | 234.9 |
| CALLOWAY | 12 | 0.3 | 33.6 | 34.9 | JOHNSON | 39 | 1.1 | 166.5 | 167.0 | PIKE | 72 | 2.1 | 104.5 | 106.2 |
| CAMPBELL | 72 | 2.1 | 80.5 | 81.3 | KENTON | 132 | 3.8 | 87.8 | 86.8 | POWELL | 11 | 0.3 | 86.5 | 83.3 |
| CARLISLE | 5 | 0.1 | 73.4 | 94.0 | KNOTT | 20 | 0.6 | 116.1 | 112.7 | PULASKI | 60 | 1.7 | 103.9 | 105.0 |
| CARROLL | 7 | 0.2 | 76.3 | 68.4 | KNOX | 49 | 1.4 | 152.4 | 153.9 | ROBERTSON | 2 | 0.1 | 102.4 | 84.7 |
| CARTER | 18 | 0.5 | 68.1 | 66.5 | LARUE | 10 | 0.3 | 68.3 | 74.8 | ROCKCASTLE | 18 | 0.5 | 103.9 | 107.2 |
| CASEY | 10 | 0.3 | 62.2 | 63.4 | LAUREL | 57 | 1.6 | 112.2 | 105.0 | ROWAN | 27 | 0.8 | 140.0 | 121.4 |
| CHRISTIAN | 46 | 1.3 | 74.6 | 64.6 | LAWRENCE | 19 | 0.5 | 124.5 | 120.4 | RUSSELL | 30 | 0.9 | 160.0 | 180.3 |
| CLARK | 34 | 1.0 | 101.1 | 100.8 | LEE | 10 | 0.3 | 117.6 | 125.8 | SCOTT | 20 | 0.6 | 65.8 | 56.6 |
| CLAY | 25 | 0.7 | 112.0 | 103.1 | LESLIE | 14 | 0.4 | 117.0 | 114.0 | SHELBY | 17 | 0.5 | 51.2 | 48.4 |
| CLINTON | 11 | 0.3 | 100.0 | 113.8 | LETCHER | 30 | 0.9 | 112.6 | 120.3 | SIMPSON | 14 | 0.4 | 84.1 | 84.0 |
| CRITTENDEN | 16 | 0.5 | 154.6 | 173.4 | LEWIS | 7 | 0.2 | 52.0 | 50.2 | SPENCER | 7 | 0.2 | 52.7 | 51.8 |
| CUMBERLAND | 3 | 0.1 | 28.4 | 41.7 | LINCOLN | 25 | 0.7 | 101.3 | 104.0 | TAYLOR | 22 | 0.6 | 89.1 | 94.8 |
| DAVIESS | 55 | 1.6 | 58.6 | 60.0 | LIVINGSTON | 11 | 0.3 | 100.6 | 111.7 | TODD | 8 | 0.2 | 61.1 | 66.8 |
| EDMONSON | 4 | 0.1 | 27.8 | 33.7 | LOGAN | 21 | 0.6 | 78.9 | 78.4 | TRIGG | 7 | 0.2 | 55.1 | 55.2 |
| ELLIOTT | 6 | 0.2 | 79.0 | 88.9 | LYON | 5 | 0.1 | 48.1 | 61.2 | TRIMBLE | 7 | 0.2 | 82.2 | 80.7 |
| ESTILL | 17 | 0.5 | 107.2 | 110.8 | MADISON | 34 | 1.0 | 53.0 | 46.4 | UNION | 19 | 0.5 | 118.3 | 122.2 |
| FAYETTE | 210 | 6.1 | 83.7 | 79.7 | MAGOFFIN | 21 | 0.6 | 158.7 | 157.2 | WARREN | 44 | 1.3 | 48.5 | 46.4 |
| FLEMING | 12 | 0.3 | 83.2 | 85.1 | MARION | 13 | 0.4 | 71.5 | 70.5 | WASHINGTON | 8 | 0.2 | 66.8 | 72.2 |
| FLOYD | 44 | 1.3 | 103.5 | 104.2 | MARSHALL | 39 | 1.1 | 103.5 | 128.8 | WAYNE | 15 | 0.4 | 75.8 | 74.7 |
| FRANKLIN | 48 | 1.4 | 98.2 | 99.6 | MARTIN | 29 | 0.8 | 240.7 | 231.5 | WEBSTER | 13 | 0.4 | 82.8 | 92.4 |
| FULTON | 12 | 0.3 | 142.0 | 159.0 | MASON | 15 | 0.4 | 80.3 | 88.6 | WHITLEY | 46 | 1.3 | 125.4 | 125.5 |
| GALLATIN | 8 | 0.2 | 118.0 | 102.1 | MCCRACKEN | 77 | 2.2 | 116.7 | 119.4 | WOLFE | 15 | 0.4 | 211.4 | 216.3 |
| GARRARD | 17 | 0.5 | 103.7 | 108.8 | MCCREARY | 18 | 0.5 | 106.1 | 105.9 | WOODFORD | 14 | 0.4 | 63.4 | 59.8 |

* At least one but fewer than five

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

## Table 20. Incidence of ABI by county, sorted by frequency, 2002

| 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 | 510 | 14.7 | 71.0 | 73.1 | OLDHAM | 24 | 0.7 | 62.4 | 48.7 | CLINTON | 11 | 0.3 | 100.0 | 113.8 |
| FAYETTE | 210 | 6.1 | 83.7 | 79.7 | BRECKINRIDGE | 23 | 0.7 | 109.0 | 121.4 | LIVINGSTON | 11 | 0.3 | 100.6 | 111.7 |
| KENTON | 132 | 3.8 | 87.8 | 86.8 | HENRY | 22 | 0.6 | 149.8 | 143.2 | MORGAN | 11 | 0.3 | 88.9 | 77.5 |
| MCCRACKEN | 77 | 2.2 | 116.7 | 119.4 | JESSAMINE | 22 | 0.6 | 59.5 | 54.0 | POWELL | 11 | 0.3 | 86.5 | 83.3 |
| HARDIN | 74 | 2.1 | 86.6 | 77.3 | TAYLOR | 22 | 0.6 | 89.1 | 94.8 | BALLARD | 10 | 0.3 | 100.5 | 122.6 |
| HOPKINS | 73 | 2.1 | 139.5 | 156.7 | GRANT | 21 | 0.6 | 100.1 | 88.9 | BUTLER | 10 | 0.3 | 74.3 | 76.0 |
| CAMPBELL | 72 | 2.1 | 80.5 | 81.3 | LOGAN | 21 | 0.6 | 78.9 | 78.4 | CASEY | 10 | 0.3 | 62.2 | 63.4 |
| PIKE | 72 | 2.1 | 104.5 | 106.2 | MAGOFFIN | 21 | 0.6 | 158.7 | 157.2 | HARRISON | 10 | 0.3 | 54.5 | 55.3 |
| PERRY | 69 | 2.0 | 229.9 | 234.9 | KNOTT | 20 | 0.6 | 116.1 | 112.7 | LARUE | 10 | 0.3 | 68.3 | 74.8 |
| PULASKI | 60 | 1.7 | 103.9 | 105.0 | SCOTT | 20 | 0.6 | 65.8 | 56.6 | LEE | 10 | 0.3 | 117.6 | 125.8 |
| LAUREL | 57 | 1.6 | 112.2 | 105.0 | BOURBON | 19 | 0.5 | 92.1 | 97.0 | MERCER | 10 | 0.3 | 45.7 | 47.5 |
| DAVIESS | 55 | 1.6 | 58.6 | 60.0 | BOYLE | 19 | 0.5 | 67.2 | 68.2 | NICHOLAS | 10 | 0.3 | 126.0 | 144.0 |
| BOYD | 52 | 1.5 | 101.9 | 104.8 | GRAYSON | 19 | 0.5 | 73.4 | 77.8 | BATH | 9 | 0.3 | 74.0 | 78.9 |
| KNOX | 49 | 1.4 | 152.4 | 153.9 | LAWRENCE | 19 | 0.5 | 124.5 | 120.4 | OHIO | 9 | 0.3 | 37.1 | 38.7 |
| FRANKLIN | 48 | 1.4 | 98.2 | 99.6 | MONROE | 19 | 0.5 | 150.5 | 161.0 | PENDLETON | 9 | 0.3 | 65.8 | 60.8 |
| BOONE | 46 | 1.3 | 54.5 | 49.3 | UNION | 19 | 0.5 | 118.3 | 122.2 | ALLEN | 8 | 0.2 | 42.4 | 44.0 |
| CHRISTIAN | 46 | 1.3 | 74.6 | 64.6 | CARTER | 18 | 0.5 | 68.1 | 66.5 | BRACKEN | 8 | 0.2 | 88.2 | 94.3 |
| WHITLEY | 46 | 1.3 | 125.4 | 125.5 | MCCREARY | 18 | 0.5 | 106.1 | 105.9 | GALLATIN | 8 | 0.2 | 118.0 | 102.1 |
| FLOYD | 44 | 1.3 | 103.5 | 104.2 | ROCKCASTLE | 18 | 0.5 | 103.9 | 107.2 | GREEN | 8 | 0.2 | 59.3 | 68.1 |
| WARREN | 44 | 1.3 | 48.5 | 46.4 | ESTILL | 17 | 0.5 | 107.2 | 110.8 | MEADE | 8 | 0.2 | 35.4 | 29.2 |
| BELL | 43 | 1.2 | 143.7 | 142.7 | GARRARD | 17 | 0.5 | 103.7 | 108.8 | OWSLEY | 8 | 0.2 | 166.4 | 167.9 |
| GRAVES | 41 | 1.2 | 105.2 | 110.2 | MONTGOMERY | 17 | 0.5 | 71.7 | 73.1 | TODD | 8 | 0.2 | 61.1 | 66.8 |
| BARREN | 39 | 1.1 | 97.5 | 100.6 | SHELBY | 17 | 0.5 | 51.2 | 48.4 | WASHINGTON | 8 | 0.2 | 66.8 | 72.2 |
| JOHNSON | 39 | 1.1 | 166.5 | 167.0 | CRITTENDEN | 16 | 0.5 | 154.6 | 173.4 | CARROLL | 7 | 0.2 | 76.3 | 68.4 |
| MARSHALL | 39 | 1.1 | 103.5 | 128.8 | MASON | 15 | 0.4 | 80.3 | 88.6 | LEWIS | 7 | 0.2 | 52.0 | 50.2 |
| BREATHITT | 34 | 1.0 | 217.5 | 214.1 | WAYNE | 15 | 0.4 | 75.8 | 74.7 | METCALFE | 7 | 0.2 | 65.5 | 69.7 |
| CLARK | 34 | 1.0 | 101.1 | 100.8 | WOLFE | 15 | 0.4 | 211.4 | 216.3 | SPENCER | 7 | 0.2 | 52.7 | 51.8 |
| MADISON | 34 | 1.0 | 53.0 | 46.4 | ANDERSON | 14 | 0.4 | 74.8 | 71.6 | TRIGG | 7 | 0.2 | 55.1 | 55.2 |
| HENDERSON | 32 | 0.9 | 69.1 | 71.1 | CALDWELL | 14 | 0.4 | 95.3 | 108.3 | TRIMBLE | 7 | 0.2 | 82.2 | 80.7 |
| LETCHER | 30 | 0.9 | 112.6 | 120.3 | LESLIE | 14 | 0.4 | 117.0 | 114.0 | ELLIOTT | 6 | 0.2 | 79.0 | 88.9 |
| RUSSELL | 30 | 0.9 | 160.0 | 180.3 | SIMPSON | 14 | 0.4 | 84.1 | 84.0 | HANCOCK | 6 | 0.2 | 81.1 | 70.0 |
| BULLITT | 29 | 0.8 | 50.0 | 45.5 | WOODFORD | 14 | 0.4 | 63.4 | 59.8 | MCLEAN | 6 | 0.2 | 59.0 | 59.7 |
| MARTIN | 29 | 0.8 | 240.7 | 231.5 | ADAIR | 13 | 0.4 | 69.4 | 75.0 | CARLISLE | 5 | 0.1 | 73.4 | 94.0 |
| MUHLENBERG | 28 | 0.8 | 80.7 | 88.3 | HART | 13 | 0.4 | 69.4 | 73.6 | HICKMAN | 5 | 0.1 | 91.2 | 96.3 |
| ROWAN | 27 | 0.8 | 140.0 | 121.4 | JACKSON | 13 | 0.4 | 98.1 | 94.3 | LYON | 5 | 0.1 | 48.1 | 61.2 |
| CLAY | 25 | 0.7 | 112.0 | 103.1 | MARION | 13 | 0.4 | 71.5 | 70.5 | OWEN | 5 | 0.1 | 45.0 | 45.7 |
| HARLAN | 25 | 0.7 | 72.4 | 76.7 | WEBSTER | 13 | 0.4 | 82.8 | 92.4 | EDMONSON | * | - | - | - |
| LINCOLN | 25 | 0.7 | 101.3 | 104.0 | CALLOWAY | 12 | 0.3 | 33.6 | 34.9 | CUMBERLAND | * | - | - | - |
| NELSON | 25 | 0.7 | 69.3 | 64.4 | FLEMING | 12 | 0.3 | 83.2 | 85.1 | MENIFEE | * | - | - | - |
| GREENUP | 24 | 0.7 | 61.5 | 65.3 | FULTON | 12 | 0.3 | 142.0 | 159.0 | ROBERTSON | * | - | - | - |

* At least one but fewer than five

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

Table 21. Incidence of ABI by county, sorted by age-adjusted rate, 2002

| County | Freq | Percent | Age-Adjusted Rate | Crude Rate | County | Freq | Percent | Age-Adjusted Rate | Crude Rate | County | Freq | Percent | Age-Adjusted Rate | Crude Rate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MARTIN | 29 | 0.8 | 240.7 | 231.5 | LINCOLN | 25 | 0.7 | 101.3 | 104.0 | JEFFERSON | 510 | 14.7 | 71.0 | 73.1 |
| PERRY | 69 | 2.0 | 229.9 | 234.9 | CLARK | 34 | 1.0 | 101.1 | 100.8 | ADAIR | 13 | 0.4 | 69.4 | 75.0 |
| BREATHITT | 34 | 1.0 | 217.5 | 214.1 | LIVINGSTON | 11 | 0.3 | 100.6 | 111.7 | HART | 13 | 0.4 | 69.4 | 73.6 |
| WOLFE | 15 | 0.4 | 211.4 | 216.3 | BALLARD | 10 | 0.3 | 100.5 | 122.6 | NELSON | 25 | 0.7 | 69.3 | 64.4 |
| JOHNSON | 39 | 1.1 | 166.5 | 167.0 | GRANT | 21 | 0.6 | 100.1 | 88.9 | HENDERSON | 32 | 0.9 | 69.1 | 71.1 |
| OWSLEY | 8 | 0.2 | 166.4 | 167.9 | CLINTON | 11 | 0.3 | 100.0 | 113.8 | LARUE | 10 | 0.3 | 68.3 | 74.8 |
| RUSSELL | 30 | 0.9 | 160.0 | 180.3 | FRANKLIN | 48 | 1.4 | 98.2 | 99.6 | CARTER | 18 | 0.5 | 68.1 | 66.5 |
| MAGOFFIN | 21 | 0.6 | 158.7 | 157.2 | JACKSON | 13 | 0.4 | 98.1 | 94.3 | BOYLE | 19 | 0.5 | 67.2 | 68.2 |
| CRITTENDEN | 16 | 0.5 | 154.6 | 173.4 | BARREN | 39 | 1.1 | 97.5 | 100.6 | WASHINGTON | 8 | 0.2 | 66.8 | 72.2 |
| KNOX | 49 | 1.4 | 152.4 | 153.9 | CALDWELL | 14 | 0.4 | 95.3 | 108.3 | SCOTT | 20 | 0.6 | 65.8 | 56.6 |
| MONROE | 19 | 0.5 | 150.5 | 161.0 | BOURBON | 19 | 0.5 | 92.1 | 97.0 | PENDLETON | 9 | 0.3 | 65.8 | 60.8 |
| HENRY | 22 | 0.6 | 149.8 | 143.2 | HICKMAN | 5 | 0.1 | 91.2 | 96.3 | METCALFE | 7 | 0.2 | 65.5 | 69.7 |
| BELL | 43 | 1.2 | 143.7 | 142.7 | TAYLOR | 22 | 0.6 | 89.1 | 94.8 | WOODFORD | 14 | 0.4 | 63.4 | 59.8 |
| FULTON | 12 | 0.3 | 142.0 | 159.0 | MORGAN | 11 | 0.3 | 88.9 | 77.5 | OLDHAM | 24 | 0.7 | 62.4 | 48.7 |
| ROWAN | 27 | 0.8 | 140.0 | 121.4 | BRACKEN | 8 | 0.2 | 88.2 | 94.3 | CASEY | 10 | 0.3 | 62.2 | 63.4 |
| HOPKINS | 73 | 2.1 | 139.5 | 156.7 | KENTON | 132 | 3.8 | 87.8 | 86.8 | GREENUP | 24 | 0.7 | 61.5 | 65.3 |
| NICHOLAS | 10 | 0.3 | 126.0 | 144.0 | HARDIN | 74 | 2.1 | 86.6 | 77.3 | TODD | 8 | 0.2 | 61.1 | 66.8 |
| WHITLEY | 46 | 1.3 | 125.4 | 125.5 | POWELL | 11 | 0.3 | 86.5 | 83.3 | JESSAMINE | 22 | 0.6 | 59.5 | 54.0 |
| LAWRENCE | 19 | 0.5 | 124.5 | 120.4 | SIMPSON | 14 | 0.4 | 84.1 | 84.0 | GREEN | 8 | 0.2 | 59.3 | 68.1 |
| UNION | 19 | 0.5 | 118.3 | 122.2 | FAYETTE | 210 | 6.1 | 83.7 | 79.7 | MCLEAN | 6 | 0.2 | 59.0 | 59.7 |
| GALLATIN | 8 | 0.2 | 118.0 | 102.1 | FLEMING | 12 | 0.3 | 83.2 | 85.1 | DAVIESS | 55 | 1.6 | 58.6 | 60.0 |
| LEE | 10 | 0.3 | 117.6 | 125.8 | WEBSTER | 13 | 0.4 | 82.8 | 92.4 | TRIGG | 7 | 0.2 | 55.1 | 55.2 |
| LESLIE | 14 | 0.4 | 117.0 | 114.0 | TRIMBLE | 7 | 0.2 | 82.2 | 80.7 | BOONE | 46 | 1.3 | 54.5 | 49.3 |
| MCCRACKEN | 77 | 2.2 | 116.7 | 119.4 | HANCOCK | 6 | 0.2 | 81.1 | 70.0 | HARRISON | 10 | 0.3 | 54.5 | 55.3 |
| KNOTT | 20 | 0.6 | 116.1 | 112.7 | MUHLENBERG | 28 | 0.8 | 80.7 | 88.3 | MADISON | 34 | 1.0 | 53.0 | 46.4 |
| LETCHER | 30 | 0.9 | 112.6 | 120.3 | CAMPBELL | 72 | 2.1 | 80.5 | 81.3 | SPENCER | 7 | 0.2 | 52.7 | 51.8 |
| LAUREL | 57 | 1.6 | 112.2 | 105.0 | MASON | 15 | 0.4 | 80.3 | 88.6 | LEWIS | 7 | 0.2 | 52.0 | 50.2 |
| CLAY | 25 | 0.7 | 112.0 | 103.1 | ELLIOTT | 6 | 0.2 | 79.0 | 88.9 | SHELBY | 17 | 0.5 | 51.2 | 48.4 |
| BRECKINRIDGE | 23 | 0.7 | 109.0 | 121.4 | LOGAN | 21 | 0.6 | 78.9 | 78.4 | BULLITT | 29 | 0.8 | 50.0 | 45.5 |
| ESTILL | 17 | 0.5 | 107.2 | 110.8 | CARROLL | 7 | 0.2 | 76.3 | 68.4 | WARREN | 44 | 1.3 | 48.5 | 46.4 |
| MCCREARY | 18 | 0.5 | 106.1 | 105.9 | WAYNE | 15 | 0.4 | 75.8 | 74.7 | LYON | 5 | 0.1 | 48.1 | 61.2 |
| GRAVES | 41 | 1.2 | 105.2 | 110.2 | ANDERSON | 14 | 0.4 | 74.8 | 71.6 | MERCER | 10 | 0.3 | 45.7 | 47.5 |
| PIKE | 72 | 2.1 | 104.5 | 106.2 | CHRISTIAN | 46 | 1.3 | 74.6 | 64.6 | OWEN | 5 | 0.1 | 45.0 | 45.7 |
| ROCKCASTLE | 18 | 0.5 | 103.9 | 107.2 | BUTLER | 10 | 0.3 | 74.3 | 76.0 | ALLEN | 8 | 0.2 | 42.4 | 44.0 |
| PULASKI | 60 | 1.7 | 103.9 | 105.0 | BATH | 9 | 0.3 | 74.0 | 78.9 | MENIFEE | 3 | 0.1 | 41.1 | 44.7 |
| GARRARD | 17 | 0.5 | 103.7 | 108.8 | GRAYSON | 19 | 0.5 | 73.4 | 77.8 | OHIO | 9 | 0.3 | 37.1 | 38.7 |
| MARSHALL | 39 | 1.1 | 103.5 | 128.8 | CARLISLE | 5 | 0.1 | 73.4 | 94.0 | MEADE | 8 | 0.2 | 35.4 | 29.2 |
| FLOYD | 44 | 1.3 | 103.5 | 104.2 | HARLAN | 25 | 0.7 | 72.4 | 76.7 | CALLOWAY | 12 | 0.3 | 33.6 | 34.9 |
| ROBERTSON | 2 | 0.1 | 102.4 | 84.7 | MONTGOMERY | 17 | 0.5 | 71.7 | 73.1 | CUMBERLAND | 3 | 0.1 | 28.4 | 41.7 |
| BOYD | 52 | 1.5 | 101.9 | 104.8 | MARION | 13 | 0.4 | 71.5 | 70.5 | MONSON | 4 | 0.1 | 27.8 | 33.7 |

* At least one but fewer than five

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

Table 22. Causes of ABI (based on diagnosis code), 2002

| | Fatal | | Non-fatal | |
|---|---|---|---|---|
| ABI Category | Number | Percent | Number | Percent |
| Anoxia/hypoxia | 1,008 | 78.3 | 1,028 | 46.6 |
| Exposure to toxic substances | 262 | 20.4 | 993 | 45.0 |
| Allergy/anaphylaxis | 5 | 0.4 | 132 | 6.0 |
| Acute medical clinical incidents | 12 | 0.9 | 55 | 2.5 |

* 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 Table xx.

Table 23. Anoxia/hypoxia by age group, 2002

| | Fatal | | | Non-fatal | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| Age | Number | Percent | Rate | Number | Percent | Rate | Number | Percent | Rate |
| 0-4 | 54 | 70.1 | 20.0 | 23 | 29.9 | 8.5 | 77 | 100.0 | 28.5 |
| 5-14 | 15 | 41.7 | 2.7 | 21 | 58.3 | 3.8 | 36 | 100.0 | 6.5 |
| 15-24 | 67 | 64.4 | 11.5 | 37 | 35.6 | 6.3 | 104 | 100.0 | 17.8 |
| 25-44 | 142 | 48.3 | 12.0 | 152 | 51.7 | 12.8 | 294 | 100.0 | 24.8 |
| 45-64 | 236 | 41.5 | 24.0 | 332 | 58.5 | 33.7 | 568 | 100.0 | 57.7 |
| 65+ | 493 | 51.6 | 96.9 | 463 | 48.4 | 91.0 | 956 | 100.0 | 188.0 |
| Total | 1,007 | 49.5 | 24.6 | 1,028 | 50.5 | 25.1 | 2,035 | 100.0 | 49.7 |

* For one observation, the individual's age was not reported

Table 24. Exposure to toxic substances by age group, 2002

| | Fatal | | | Non-fatal | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| Age | Number | Percent | Rate | Number | Percent | Rate | Number | Percent | Rate |
| 0-4 | 6 | 15.0 | 2.2 | 34 | 85.0 | 12.6 | 40 | 100.0 | 14.8 |
| 5-14 | 3 | 10.0 | 0.5 | 27 | 90.0 | 4.8 | 30 | 100.0 | 5.4 |
| 15-24 | 23 | 15.2 | 3.9 | 128 | 84.8 | 21.9 | 151 | 100.0 | 25.8 |
| 25-44 | 106 | 19.2 | 8.9 | 447 | 80.8 | 37.7 | 553 | 100.0 | 46.6 |
| 45-64 | 65 | 22.0 | 6.6 | 231 | 78.0 | 23.4 | 296 | 100.0 | 30.0 |
| 65+ | 59 | 31.9 | 11.6 | 126 | 68.1 | 24.8 | 185 | 100.0 | 36.4 |
| Total | 262 | 20.9 | 6.4 | 993 | 79.1 | 24.3 | 1,255 | 100.0 | 30.7 |

* For one observation, the individual's age was not reported

Table 25. Diagnoses in non-fatal anoxia/hypoxia, 2002

| Diagnosis | Description | Number | Percent | Cumulative Percent |
|---|---|---|---|---|
| 997.0 | Nervous system complications (related to medical care)<br>- Anoxic brain damage<br>- Cerebral hypoxia<br>- Postoperative stroke<br>- Other | 465 | 45.2 | 45.2 |
| 799.0 | Asphyxia | 414 | 40.3 | 85.5 |
| 348.1 | Anoxic brain damage (related to hereditary and degenerative diseases of the central nervous system) | 108 | 10.5 | 96.0 |
| 994.1 | Drowning and nonfatal submersion | 27 | 2.6 | 98.6 |
| 669.4 | Cerebral anoxia following ceserean | 11 | 1.1 | 99.7 |
| 768 (.1,.5,.6,.9) | Birth asphyxia | 2 | 0.2 | 99.9 |
| 668.2 | Cerebral anoxia following anesthesia ... | 1 | 0.1 | 100.0 |
| Total | | 1,028 | 100.0 | 100.0 |

Table 26. Diagnoses in fatal anoxia/hypoxia, 2002

| Diagnosis | Description | Number | Percent | Cumulative Percent |
|---|---|---|---|---|
| R09.0 | Asphyxia | 325 | 32.2 | 32.2 |
| G93.1 | Anoxic brain damage, not elsewhere classified | 267 | 26.5 | 58.7 |
| T71 | Asphyxiation | 155 | 15.4 | 74.1 |
| 348.1 | Anoxic brain damage (related to hereditary and degenerative diseases of the central nervous system) | 83 | 8.2 | 82.3 |
| T75.1, 994.1 | Drowning | 76 | 7.5 | 89.9 |
| 997.0 | Nervous system complications (related to medical care)<br>- Anoxic brain damage<br>- Cerebral hypoxia<br>- Postoperative stroke<br>- Other | 63 | 6.3 | 96.1 |
| 799.0 | Asphyxia | 23 | 2.3 | 98.4 |
| P21 | Birth asphyxia | 16 | 1.6 | 100.0 |
| Total | | 1,008 | 100.0 | 100.0 |

Table 27. Diagnoses in non-fatal exposures to toxic substances, 2002

| Diagnosis | Description | Number | Percent | Cumulative Percent |
|---|---|---|---|---|
| 980 | Toxic effect of alcohol | 283 | 28.5 | 28.5 |
| 967 | Poisoning by sedatives and hypnotics | 242 | 24.4 | 52.9 |
| 968 | Poisoning by other central nervous system depressants and anesthetics | 209 | 21.0 | 73.9 |
| 964.2 | Poisoning by anticoagulants | 72 | 7.3 | 81.2 |
| 995.4,995.5 | Shock due to anesthesia; Child Maltreatment Syndrome | 61 | 6.1 | 87.3 |
| 986 | Toxic effect of carbon monoxide | 54 | 5.4 | 92.7 |
| 998 | Post-operative shock | 53 | 5.3 | 98.1 |
| 985 | Toxic effect of other metals | 14 | 1.4 | 99.5 |
| 988.0-988.2 | Toxic effect of noxious substances eaten as food | 4 | 0.4 | 99.9 |
| 989 | Toxic effect of hydrocyanic acid and cyanide | 1 | 0.1 | 100.0 |
| Total | | 993 | 100.0 | 100.0 |

Table 28. Diagnoses in fatal exposures to toxic substances, 2002

| Diagnosis | Description | Number | Percent | Cumulative Percent |
|---|---|---|---|---|
| T42 (.3,.4,.6,.7) | Poisoning by barbiturates, benzodiazepines, or anti-epileptic and sedative-hypnotic drugs | 64 | 24.4 | 24.4 |
| T58 | Toxic effect of carbon monoxide | 44 | 16.8 | 41.2 |
| T40.5 | Poisoning by cocaine | 39 | 14.9 | 56.1 |
| 998.0 | Postoperative shock | 36 | 13.7 | 69.8 |
| T51 | Toxic effect of alcohol | 21 | 8.0 | 77.9 |
| G03 (.8,.9) | Meningitis due to other and unspecified causes | 19 | 7.3 | 85.1 |
| T81.1 | Shock during or resulting from a procedure, not elsewhere classified | 11 | 4.2 | 89.3 |
| 967 | Poisoning by sedatives and hypnotics | 7 | 2.7 | 92.0 |
| G97 | Postproceural disorders of nervous system, not elsewhere classified | 5 | 1.9 | 93.9 |
| Other | See 'Methods' section for other diagnoses | 16 | 6.1 | 100.0 |
| Total | | 262 | 100.0 | 100.0 |

Table 29. Injury-related causes of ABI (based on E-code), 2002

| | Fatal | | | Non-fatal | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| Mechanism of Injury | Number | Percent | Rate | Number | Percent | Rate | Number | Percent | Rate |
| Poisoning | 169 | 18.3 | 4.1 | 752 | 81.7 | 18.4 | 921 | 100.0 | 22.5 |
| Suffocation | 138 | 92.0 | 3.4 | 12 | 8.0 | 0.3 | 150 | 100.0 | 3.7 |
| Drowning | 60 | 83.3 | 1.5 | 12 | 16.7 | 0.3 | 72 | 100.0 | 1.8 |
| Falls | 24 | 27.6 | 0.6 | 63 | 72.4 | 1.5 | 87 | 100.0 | 2.1 |
| Motor vehicle traffic crash | 43 | 58.9 | 1.1 | 30 | 41.1 | 0.7 | 73 | 100.0 | 1.8 |
| Fire/burn | 24 | 75.0 | 0.6 | 8 | 25.0 | 0.2 | 32 | 100.0 | 0.8 |
| Other | 52 | 35.6 | 1.3 | 94 | 64.4 | 2.3 | 146 | 100.0 | 3.6 |
| Total | 510 | 34.4 | 12.5 | 971 | 65.6 | 23.7 | 1,481 | 100.0 | 36.2 |

Table 30. Hospital discharge disposition for nonfatal ABI, 2002

| Discharge Disposition | Number | Percent |
|---|---|---|
| Routine discharge (home/self care) | 1,326 | 60.5 |
| Inpatient-other short-term hospital | 93 | 4.2 |
| Skilled nursing facility (SNF) | 179 | 8.2 |
| Intermediate care facility (ICF) | 13 | 0.6 |
| Inpatient-other type facility | 180 | 8.2 |
| Home health | 216 | 9.8 |
| Other | 186 | 8.5 |
| Total | 2,193 | 100.0 |

Table 31. Primary payers for hospitalized ABI, 2002
(Hospital Discharge Dataset only)

| Payer | Number of Discharges | Percent of Discharges | Total Hospital Charges |
|---|---|---|---|
| Government | 1,165 | 53.4 | $32,580,944 |
| Commercial Insurance | 479 | 22.0 | $15,019,590 |
| Self Pay | 183 | 8.4 | $1,239,186 |
| Workers Compensation | 30 | 1.4 | $779,811 |
| HMO | 138 | 6.3 | $3,659,760 |
| Other | 185 | 8.5 | $4,413,932 |
| Total | 2,180 | 100.0 | $57,693,222 |

* For 13 observations, the payer and/or charges were not reported

Table 32. SCI by age, 2002

| | Fatal | | | Non-fatal | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| Age | Number | Percent | Rate | Number | Percent | Rate | Number | Percent | Rate |
| 0-4 | 1 | 33.3 | 0.4 | 3 | 75.0 | 1.1 | 4 | 100.0 | 1.5 |
| 5-14 | 0 | 0.0 | 0.0 | 6 | 100.0 | 1.1 | 6 | 100.0 | 1.1 |
| 15-24 | 9 | 27.3 | 1.5 | 33 | 78.6 | 5.6 | 42 | 100.0 | 7.2 |
| 25-44 | 10 | 13.7 | 0.8 | 73 | 88.0 | 6.2 | 83 | 100.0 | 7.0 |
| 45-64 | 20 | 40.8 | 2.0 | 49 | 71.0 | 5.0 | 69 | 100.0 | 7.0 |
| 65+ | 24 | 60.0 | 4.7 | 40 | 62.5 | 7.9 | 64 | 100.0 | 12.6 |
| Total | 64 | 23.9 | 1.6 | 204 | 76.1 | 5.0 | 268 | 100.0 | 6.5 |

Table 33. SCI by gender, 2002

| | Fatal | | | Non-fatal | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| Age | Number | Percent | Rate | Number | Percent | Rate | Number | Percent | Rate |
| Male | 45 | 23.8 | 2.2 | 144 | 76.2 | 7.2 | 189 | 100.0 | 9.4 |
| Female | 19 | 24.1 | 0.9 | 60 | 75.9 | 2.9 | 79 | 100.0 | 3.8 |
| Total | 64 | 23.9 | 1.6 | 204 | 76.1 | 5.0 | 268 | 100.0 | 6.5 |

## Table 34. Incidence of SCI by county, 2002

| 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 | 50 | 18.7 | 6.9 | 7.2 | ELLIOTT | * | - | - | - | SHELBY | * | - | - | - |
| PULASKI | 11 | 4.1 | 19.6 | 19.2 | FLEMING | * | - | - | - | SPENCER | * | - | - | - |
| FAYETTE | 10 | 3.7 | 3.9 | 3.8 | GRAVES | * | - | - | - | TAYLOR | * | - | - | - |
| WHITLEY | 8 | 3.0 | 22.1 | 21.8 | GRAYSON | * | - | - | - | TRIGG | * | - | - | - |
| FLOYD | 7 | 2.6 | 16.8 | 16.6 | HARRISON | * | - | - | - | WOLFE | * | - | - | - |
| KNOX | 7 | 2.6 | 22.1 | 22.0 | LARUE | * | - | - | - | ANDERSON | 0 | 0.0 | 0.0 | 0.0 |
| BOYD | 6 | 2.2 | 11.5 | 12.1 | MERCER | * | - | - | - | BRACKEN | 0 | 0.0 | 0.0 | 0.0 |
| HOPKINS | 6 | 2.2 | 10.3 | 12.9 | MONTGOMERY | * | - | - | - | BUTLER | 0 | 0.0 | 0.0 | 0.0 |
| KENTON | 6 | 2.2 | 4.1 | 3.9 | OLDHAM | * | - | - | - | CALLOWAY | 0 | 0.0 | 0.0 | 0.0 |
| MCCRACKEN | 6 | 2.2 | 8.5 | 9.3 | OWSLEY | * | - | - | - | ESTILL | 0 | 0.0 | 0.0 | 0.0 |
| SCOTT | 5 | 1.9 | 14.0 | 14.2 | PERRY | * | - | - | - | FULTON | 0 | 0.0 | 0.0 | 0.0 |
| BRECKINRIDGE | * | - | - | - | ROCKCASTLE | * | - | - | - | GALLATIN | 0 | 0.0 | 0.0 | 0.0 |
| DAVIESS | * | - | - | - | WOODFORD | * | - | - | - | GARRARD | 0 | 0.0 | 0.0 | 0.0 |
| HARDIN | * | - | - | - | BALLARD | * | - | - | - | GREEN | 0 | 0.0 | 0.0 | 0.0 |
| HENDERSON | * | - | - | - | BATH | * | - | - | - | HART | 0 | 0.0 | 0.0 | 0.0 |
| MUHLENBERG | * | - | - | - | BOURBON | * | - | - | - | HICKMAN | 0 | 0.0 | 0.0 | 0.0 |
| OHIO | * | - | - | - | BREATHITT | * | - | - | - | JESSAMINE | 0 | 0.0 | 0.0 | 0.0 |
| WARREN | * | - | - | - | CAMPBELL | * | - | - | - | JOHNSON | 0 | 0.0 | 0.0 | 0.0 |
| ALLEN | * | - | - | - | CARROLL | * | - | - | - | KNOTT | 0 | 0.0 | 0.0 | 0.0 |
| BARREN | * | - | - | - | CASEY | * | - | - | - | LAWRENCE | 0 | 0.0 | 0.0 | 0.0 |
| BELL | * | - | - | - | CLARK | * | - | - | - | LESLIE | 0 | 0.0 | 0.0 | 0.0 |
| BOONE | * | - | - | - | CLINTON | * | - | - | - | LIVINGSTON | 0 | 0.0 | 0.0 | 0.0 |
| BOYLE | * | - | - | - | CRITTENDEN | * | - | - | - | MARION | 0 | 0.0 | 0.0 | 0.0 |
| BULLITT | * | - | - | - | CUMBERLAND | * | - | - | - | MARSHALL | 0 | 0.0 | 0.0 | 0.0 |
| CALDWELL | * | - | - | - | GRANT | * | - | - | - | MARTIN | 0 | 0.0 | 0.0 | 0.0 |
| FRANKLIN | * | - | - | - | GREENUP | * | - | - | - | MASON | 0 | 0.0 | 0.0 | 0.0 |
| HENRY | * | - | - | - | HANCOCK | * | - | - | - | MENIFEE | 0 | 0.0 | 0.0 | 0.0 |
| JACKSON | * | - | - | - | HARLAN | * | - | - | - | OWEN | 0 | 0.0 | 0.0 | 0.0 |
| LAUREL | * | - | - | - | LEE | * | - | - | - | PENDLETON | 0 | 0.0 | 0.0 | 0.0 |
| LINCOLN | * | - | - | - | LETCHER | * | - | - | - | POWELL | 0 | 0.0 | 0.0 | 0.0 |
| MADISON | * | - | - | - | LEWIS | * | - | - | - | ROBERTSON | 0 | 0.0 | 0.0 | 0.0 |
| MONROE | * | - | - | - | LOGAN | * | - | - | - | ROWAN | 0 | 0.0 | 0.0 | 0.0 |
| MORGAN | * | - | - | - | LYON | * | - | - | - | RUSSELL | 0 | 0.0 | 0.0 | 0.0 |
| NELSON | * | - | - | - | MCCREARY | * | - | - | - | SIMPSON | 0 | 0.0 | 0.0 | 0.0 |
| ADAIR | * | - | - | - | MCLEAN | * | - | - | - | TODD | 0 | 0.0 | 0.0 | 0.0 |
| CARLISLE | * | - | - | - | MAGOFFIN | * | - | - | - | TRIMBLE | 0 | 0.0 | 0.0 | 0.0 |
| CARTER | * | - | - | - | MEADE | * | - | - | - | UNION | 0 | 0.0 | 0.0 | 0.0 |
| CHRISTIAN | * | - | - | - | METCALFE | * | - | - | - | WASHINGTON | 0 | 0.0 | 0.0 | 0.0 |
| CLAY | * | - | - | - | NICHOLAS | * | - | - | - | WAYNE | 0 | 0.0 | 0.0 | 0.0 |
| EDMONSON | * | - | - | - | PIKE | * | - | - | - | WEBSTER | 0 | 0.0 | 0.0 | 0.0 |

* At least one but fewer than five

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

Table 35. Leading causes of SCI, all ages, 2002

| Mechanism of Injury | Number | Percent | Rate | Number | Percent | Rate | Number | Percent | Rate |
|---|---|---|---|---|---|---|---|---|---|
| Motor vehicle traffic crash | 26 | 26.5 | 0.6 | 72 | 73.5 | 1.8 | 98 | 100.0 | 2.4 |
| Fall | 15 | 27.3 | 0.4 | 40 | 72.7 | 1.0 | 55 | 100.0 | 1.3 |
| Non-traffic land transportation | 1 | 7.7 | 0.0 | 12 | 92.3 | 0.3 | 13 | 100.0 | 0.3 |
| Struck by or against object or person | 1 | 12.5 | 0.0 | 7 | 87.5 | 0.2 | 8 | 100.0 | 0.2 |
| Firearm | 4 | 36.4 | 0.1 | 7 | 63.6 | 0.2 | 11 | 100.0 | 0.3 |
| Other | 5 | 23.8 | 0.1 | 16 | 76.2 | 0.4 | 21 | 100.0 | 0.5 |
| Unknown (missing E-code) | 12 | 19.4 | 0.3 | 50 | 80.6 | 1.2 | 62 | 100.0 | 1.5 |
| Total | 64 | 23.9 | 1.6 | 204 | 76.1 | 5.0 | 268 | 100.0 | 6.5 |

Table 36. Hospital discharge disposition for non-fatal SCI, 2002

| Discharge Disposition | Number | Percent |
|---|---|---|
| Routine discharge (home/self care) | 70 | 34.3 |
| Inpatient-other short-term hospital | 7 | 3.4 |
| Skilled nursing facility (SNF) | 14 | 6.9 |
| Intermediate care facility (ICF) | 3 | 1.5 |
| Inpatient-other type facility | 62 | 30.4 |
| Home health | 21 | 10.3 |
| Rehab (from trauma registry data) | 3 | 1.5 |
| Other | 24 | 11.8 |
| Total | 204 | 100.0 |

Table 37. Injury Severity Score by mechanism for non-fatal SCI, 2002

| | Injury Severity Score | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mild | | Moderate | | Severe | | Critical | | Unknown | | |
| Injury Mechanism | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Total |
| Motor vehicle traffic crash | 1 | 50.0 | 21 | 20.0 | 21 | 43.8 | 27 | 69.2 | 2 | 20.0 | 72 |
| Falls | 0 | 0.0 | 23 | 21.9 | 11 | 22.9 | 4 | 10.3 | 2 | 20.0 | 40 |
| Non-traffic land transportation | 1 | 50.0 | 5 | 4.8 | 1 | 2.1 | 4 | 10.3 | 1 | 10.0 | 12 |
| Struck by or against object or person | 0 | 0.0 | 5 | 4.8 | 1 | 2.1 | 1 | 2.6 | 0 | 0.0 | 7 |
| Firearm | 0 | 0.0 | 5 | 4.8 | 1 | 2.1 | 1 | 2.6 | 0 | 0.0 | 7 |
| Other | 0 | 0.0 | 11 | 10.5 | 4 | 8.3 | 0 | 0.0 | 1 | 10.0 | 16 |
| Unknown | 0 | 0.0 | 35 | 33.3 | 9 | 18.8 | 2 | 5.1 | 4 | 40.0 | 50 |
| Total | 2 | 100.0 | 105 | 100.0 | 48 | 100.0 | 39 | 100.0 | 10 | 100.0 | 204 |

Table 38. Primary payers for hospitalized SCI, 2002
(Hospital Discharge Dataset only)

| Payer | Number of Discharges | Percent of Discharges | Total Hospital Discharges |
|---|---|---|---|
| Commercial Ins | 93 | 47.2 | $7,618,353 |
| Government | 63 | 32.0 | $2,971,885 |
| Workers Compensation | 7 | 3.6 | $148,681 |
| HMO | 9 | 4.6 | $605,407 |
| Self Pay | 5 | 2.5 | $183,036 |
| Other | 20 | 10.2 | $684,901 |
| Total | 197 | 100.0 | $12,212,262 |

* For 7 observations, payer and/or charges was missing

Table 39. Number of injury-related cases reported on hospital discharge file, 1999-2003

| Year | Number | Percent Increase |
|---|---|---|
| 1999 | 56,972 | - |
| 2000 | 73,808 | 29.6 |
| 2001 | 85,588 | 16.0 |
| 2002 | 91,100 | 6.4 |
| 2003 | 93,700 | 2.9 |

Table 40. Estimates of overall incidence rates per 100,000 Kentucky residents for TBI, SCI, and ABI, 1998-2001

| | Incidence Rate Estimate | | | | | |
|---|---|---|---|---|---|---|
| Year | All TBI | Percent Increase | All SCI | Percent Increase | All ABI | Percent Increase |
| 1998 | 62.5 | - | 4.1 | - | 40.0 | - |
| 1999 | 76.7 | 22.7 | 3.2 | -22.0 | 55.9 | 39.8 |
| 2000 | 96.0 | 25.2 | 3.6 | 12.5 | 78.6 | 40.6 |
| 2001 | 124.7 | 29.9 | 8.3 | 130.6 | 79.7 | 1.4 |
| 2002 | 117.3 | -5.9 | 6.5 | -21.7 | 84.5 | 6.0 |

Table 41. Estimates of fatal and non-fatal incidence rates per 100,000 Kentucky residents for TBI, SCI, and ABI, 1998-2001

| | Incidence Rate Estimate | | | | | |
|---|---|---|---|---|---|---|
| | TBI | | SCI | | ABI | |
| Year | Fatal | Non-fatal | Fatal | Non-fatal | Fatal | Non-fatal |
| 1998 | 21.4 | 40.8 | 1.1 | 3.0 | 12.6 | 26.4 |
| 1999 | 24.2 | 52.5 | 1.8 | 1.4 | 26.0 | 29.9 |
| 2000 | 24.5 | 71.5 | 0.4 | 3.2 | 30.5 | 48.1 |
| 2001 | 26.9 | 97.8 | 1.6 | 6.7 | 29.0 | 50.7 |
| 2002 | 26.6 | 90.7 | 1.6 | 5.0 | 31.0 | 63.4 |