



Epidemiologic Notes & Reports

Volume 35 Number 10

October 2000

TRAUMATIC BRAIN INJURY IN KENTUCKY

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Traumatic Brain Injury (TBI) is one of the leading causes of death, disability, loss of productivity, use of medical resources, and human suffering in Kentucky. It is important to have a data-based understanding of TBI for the purposes of assessing the need for services by people with TBI, estimating the impact of TBI on the medical system, and focusing TBI prevention efforts. During 1999, the Kentucky Traumatic Brain Injury Trust Fund Advisory Board authorized the Department for Public Health, State Injury Prevention Program to conduct a six month pilot study to determine the feasibility of establishing a permanent Acquired Brain Injury Surveillance System in Kentucky. The TBI data presented in this report are part of the larger study.

Objectives

This report focuses on six specific questions about TBI in Kentucky during 1997.

1. How many Kentuckians sustained fatal or serious (hospitalization required) TBI in 1997, and what were the statewide rates for each?
2. What were the demographic and geographic distributions of these cases?
3. What were the causes of TBI?
4. What was the extent of hospitalization?
5. What was the hospital discharge status?
6. Who were the primary payers for TBI cases?

Methodology

The Centers for Disease Control and

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Prevention (CDC) has established ICD-9 diagnosis code standards for TBI case identification that were used in this report.

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

Three 1997 data sets were used to Identify TBI cases:

- National Center for Health Statistics (NCHS) Kentucky Supplemental Death File.
- Kentucky Hospital Discharge Data (KHDD) reported on Uniform Billing 1992 forms (UB92)
- Hospital-based trauma registries from the three level-1 trauma centers in Kentucky (University of Kentucky, University of Louisville, and Kosair Children's Hospital).

TBI cases from the three data sets were computer linked, using a probabilistic linking algorithm, to insure no duplicate cases and that maximum information was available for each case.

Traumatic Brain Injury Continued

TBI Incidence and Distribution in Kentucky During 1997

During 1997, there were 3,244 unduplicated fatal and non-fatal TBI cases in Kentucky. 2,408 cases were non-fatal and 836 (26%) were fatal. These cases yield a population-based rate of 21 deaths per 100,000 for fatal TBI and 83 cases per 100,000 for all TBI.

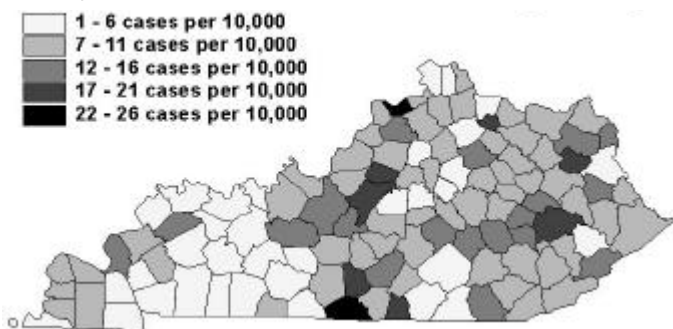
Table 1 shows the distribution of TBI cases by age and gender. The most common occurrence is between the ages of 25 and 44 (28.9 % of total cases). The 15-24 age group accounted for 19.6% of the cases and the 75+ accounted for 15.3%. Males accounted for 63% of all cases.

Table 1. TBIs BY AGE AND GENDER, Kentucky,

AGE	MALE			FEMALE			TOTAL	
	Non-Fatal	Fatal	Total	Non-Fatal	Fatal	Total	No.	%
0-4	87	15	102	59	10	69	171	5.3
5-14	129	25	154	67	16	83	237	7.3
15-24	342	118	460	142	35	177	637	19.6
25-44	481	188	669	219	50	269	938	28.9
45-64	227	108	335	155	44	199	534	16.5
65-74	88	47	135	69	27	96	231	7.1
75+	131	86	217	212	67	279	496	15.3
Total	1485	587	2072	923	249	1172	3244	100

Figure 1 shows rates for TBI across the state for all fatal and non-fatal cases.

Figure 1. Population-Based Rates for Kentucky-TBI by County



Causes of TBI during 1997

Note in Table 2 that the major cause of TBI is motor vehicle crashes (34.5%). Falls caused another 14.1%. However, the unknown category contributes more than 27% of TBI. This is a result of poor reporting of E-codes by hospitals, with only about 50% of UB92 inpatient records for 1997 containing E-codes in the proper field and format.

Table 2. CAUSES OF TBI, Kentucky, 1997

E-CODE CAUSE	NON-FATAL		FATAL		TOTAL	
	No.	%	No.	%	No.	%
Motor Vehicle Traffic Accidents (E810-E819)	804	33.4%	316	37.8%	1120	34.5%
Accidental Falls (E880-E888)	363	15.1%	93	11.1%	456	14.1%
Motor Vehicle Non-Traffic Accidents (E820-E825)	227	9.4%	35	4.2%	262	8.1%
Homicide / Assault (E960-E969)	133	5.5%	59	7.1%	192	5.9%
Suicide / Self-Inflicted (E950-E959)	14	0.6%	88	10.5%	102	3.1%
Other	155	6.4%	75	9.0%	230	7.1%
Unknown	712	29.6%	170	20.3%	882	27.2%
Total	2408	100%	836	100%	3244	100%

Length of Hospital Stay & Discharge Status

The length of patients' hospital stays could be determined in a majority of cases (2,668 out of 3,244), as this data element is available in the Trauma and KHDD data sets. Hospital stays varied widely among victims of TBI, from stays of one single day to over three months. Note from Table 3 that 442 patients stayed in the hospital only one day. In total, TBI resulted in 20,778 hospital days in 1997, an average of 7.8 days per case.

Traumatic Brain Injury Continued

Table 3. TBI HOSPITAL STAYS, Kentucky, 1997

# CASES	MEAN	MODE	MAXIMUM	TOTAL
2668	7.8 days	1 day (442 records)	97 days	20,778 days

In Table 4, the discharge status is listed for those TBI cases where it was available (1745 records).

Table 4. TBI DISCHARGE STATUS, Kentucky, 1997

DISCHARGE STATUS	NUMBER CASES (% OF TOTAL)	AVERAGE STAY (MEAN)
Discharge Home (Routine)	1187 (68.0%)	5.2 days
Transfer	414 (23.8%)	13.2 days
Left against medical advise	14 (0.8%)	1.8 days
Expired	90 (5.2%)	7.4 days
Still patient or expected to return for outpatient services	37 (2.1%)	13.7 days
Unknown	3 (<0.1%)	10.0 days
Total	1745	7.4 days

Table 5. PRIMARY PAYERS FOR TBI, Kentucky,

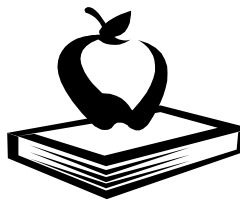
PRIMARY PAYER	NON-FATAL (%)	FATAL (%)	TOTAL (%)
Self Pay	109 (6.6%)	5 (5.5%)	114 (6.5%)
Workers' Compensation	56 (3.4%)	1 (1.1%)	57 (3.3%)
Medicare	356 (21.5%)	35 (38.5%)	391 (22.4%)
Medicaid	188 (11.4%)	11 (12.1%)	199 (11.4%)
Other Federal Programs	2 (0.1%)	—	2 (0.1%)
Insurance Company	524 (31.7%)	22 (24.2%)	546 (31.3%)
Blue Cross	70 (4.2%)	8 (8.8%)	78 (4.5%)
CHAMPUS	11	—	11 (0.6%)
Other	302 (18.3%)	8 (8.8%)	310 (17.8%)
Unknown	36 (2.2%)	1 (1.1%)	37 (2.1%)
Total	1654 (100%)	91 (100%)	1745 (100%)

Primary Payers

Primary payers are listed in the KHDD (1,745 cases) data set only. For TBI, insurance companies and Medicare were the primary payers in over 53% of all cases. Table 5 shows the distribution of primary payers.



New! Injury Data Book for Kentucky



The State Injury Prevention Program has recently published an 80-page, annotated data book - **Injury Deaths In Kentucky, 1993-1997**. It presents data and analysis of all types of injury deaths, including analysis by region. If you are interested in receiving a copy, please call Freda Francis at 859-257-4954.

Update: Flu Vaccine Supply

Updated recommendations from the Advisory Committee on Immunization Practices in response to delays in supply of influenza vaccine for 2000-01 influenza season

This update provides information on the influenza vaccine supply situation and updated influenza vaccination recommendations by the Advisory Committee on Immunization Practices (ACIP) for the 2000-01 influenza season.

Influenza vaccine supplies that are expected to be distributed this year should be approximately equal to what was distributed last year, but a substantial amount of vaccine will reach providers later than usual. Based on information provided by manufacturers, distribution of approximately 75 million doses is anticipated. This total includes 9 million doses that CDC has contracted with one of the vaccine manufacturers to produce. During last year's influenza season in the United States, approximately 77 million doses of vaccine were distributed, of which 3 million were returned, for a net distribution of 74 million doses. Most vaccine doses usually become available to providers by October, with 99 percent of distributed doses available before December. This year, as many as 18 million doses are expected to be distributed in December.

Because of the potential health impact of delayed flu vaccine availability, CDC and ACIP updated recommendations for the 2000-01 season. The overall goal of these recommendations is to minimize the adverse health impact of delays on high risk persons.

Persons at high risk from complications from influenza are:

- Persons aged 65 years and older;
- Residents of nursing homes and other chronic-care facilities that house persons of any age who have chronic medical conditions;

- Adults and children who have chronic disorders of the pulmonary or cardiovascular systems, including asthma;
- Adults and children who have required regular medical follow-up or hospitalization during the past year because of chronic metabolic disease (including diabetes mellitus), kidney dysfunction, blood disorders (hemoglobinopathies), or immunosuppression (e.g., caused by medications or HIV);
- Children and teenagers (aged 6 months to 18 years) who are receiving long-term aspirin therapy and therefore might be at risk for developing Reye syndrome after influenza infection;
- Women who will be in the second or third trimester of pregnancy during the influenza season.

The recommendations are as follows:

1. When influenza vaccine becomes available, vaccination efforts should be focused on persons at high risk of complications associated with influenza disease and on health care workers who care for these persons.
2. Temporary shortages because of delayed or partial shipments may require decisions on how to prioritize use of vaccine available early in the season among high-risk persons and health-care workers; such decisions are best made by those familiar with the local situation.
3. Mass vaccination campaigns should be scheduled later in the season as availability of vaccine is assured. Given projected vaccine distribution, in most areas, campaigns will be scheduled in November

Update: Flu Vaccine Supply, Continued

or later. Efforts should be made to increase participation by high-risk persons and their household contacts, but other persons should not be turned away.

4. Groups implementing mass vaccination efforts should seek to enhance coverage among those at greatest risk for complications of influenza and their household contacts.
5. Special efforts should be undertaken in December and later to vaccinate persons 50-64 years of age, including those who are not at high risk and are not household contacts of high risk persons. Persons in this age group with high risk conditions should be vaccinated along with other high risk persons. Special efforts to vaccinate healthy persons in this age group should begin in December and continue as long as vaccine is available.
6. Vaccination efforts for all groups should continue into December and later, as long as influenza vaccine is available. Production of influenza vaccine will continue through December, and providers should plan for how vaccine provided late in the season can be used effectively.
7. Pneumococcal vaccines are recommended by ACIP for many of the same high risk persons as for whom influenza vaccine is recommended. Assuring pneumococcal vaccination of high risk persons early in the influenza season, will confer substantial protection from a major complication of influenza (pneumococcal pneumonia). Pneumococcal vaccine should be administered when indicated even if influenza vaccine is not yet available. Providers should emphasize to patients or their caregivers that pneumococcal vaccination is not a substitute for influenza vaccination and that patients need to return for influenza vaccine when it is available.

Update on the Use of Influenza Vaccine in Children

conditions is a priority because two doses of vaccine administered at least 1 month apart are recommended for children <9 years who are receiving influenza vaccine for the first time. Two influenza vaccines (Flushield, Wyeth Laboratories, Inc. [Marietta, PA], and Fluzone split, Aventis Pasteur, Inc.) are licensed and recommended for use in high-risk children aged >5 months. One other influenza vaccine, Fluvirin (Medeva Pharma Ltd., Leatherwood, England), is labeled in the United States for use only in persons aged > than 3 years because its efficacy in younger persons has not been demonstrated. Because Fluvirin is not indicated for children aged 6 months – 3 years, providers should use other approved influenza vaccines for vaccination for children in this age group.

The above two notices are reprinted from the Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report, Vol. 49, No. 39, October 6, 2000.

For information regarding ordering and distribution of vaccines for children: please contact the Kentucky Department for Public Health, Immunization Program at 502-564-4478.

Questions regarding recommendations for influenza vaccine and antiviral drugs may be directed to: Peggy Dixon, RN, CIC, at 1-888-973-7678 (toll free).

KENTUCKY EPIDEMIOLOGIC NOTES & REPORTS

Printed With State Funds

by the

COMMONWEALTH OF KENTUCKY
CABINET FOR HEALTH SERVICES
DEPARTMENT FOR PUBLIC HEALTH
275 EAST MAIN STREET
FRANKFORT, KENTUCKY 40621



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NOTICE: CALL FOR BACK ISSUES OF KENTUCKY EPIDEMIOLOGIC NOTES AND REPORTS

Dear Epi Notes Readers:

My name is Philip Yannarella, the Documents Librarian at Northern Kentucky University. I am trying to collect and index all the issues of Kentucky Epidemiologic Notes & Reports (KENR). As a product of a public agency, the Kentucky Department for Libraries and Archives (KDLA) holds an archival or "record" copy of issues of this publication. Over the years, not all issues were forwarded to the Archives with the net result being that even their file is incomplete. KENR has been distributed by the Kentucky State Department of Health since 1966. KENR is currently distributed monthly, but was published weekly from 1966 through July 1970, under the title Epidemiologic Notes and Reports (ENR). Its companion, The Weekly Morbidity Report was also sent out from 1966 through 1971. As of January 1972, the Monthly Morbidity Report became part of KENR.

I have been able to obtain all the KENR issues from August 1970 through present. I am trying to make contact with any current or retired KENR public health professional who may have kept any pre August 1970 issues of the ENR newsletter. Do you (or your) office have any back issues of ENR? Do you know someone who did? If so, please contact me at the address below.

I would like to find and photocopy:

All the 1966 ENR weekly issues.

In 1967, I need the February 18 and August 26 (1967) issues.

In 1968, I need the November 2 (1968) issue.

In 1969, I need the February 1, February 8, and March 1 (1969) issues.

In 1970, I need the June and July (1970) issues.

I also need a copy of all issues of the Weekly Morbidity Reports (from 1966-July 1971) and Monthly Morbidity Reports issued (from August 1970 to December 1971) as separate publications from 1966 through 1971.

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