

TBI: Mortality and Nonfatal Hospitalization

Data Analysis Report

Minnesota 2005

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Text Overview

Background: Minnesota is one of only four states funded by the CDC to conduct surveillance of Emergency Department (ED)-treated traumatic brain injury (TBI) for the 2005-2010 data period.

Methods: Electronic, centralized discharge data from death certificates, the Minnesota TBI/Trauma Registry and the Minnesota Hospital Association were analyzed using the CDC's TBI case definition. Analysis for this report was limited to Minnesota residents.

Results: In 2005, there were 856 TBI deaths, an adjusted rate of 16.0 per 100,000 population. This rate is similar to those of the previous three years. The number of nonfatal hospitalized (NH) TBIs in 2005 was 4,867, yielding an adjusted rate of 92.8 per 100,000 population. The data show an increasing trend. Comparison with 1993-1997 is difficult because of changes in case identification methods.

The TBI mortality data show a bi-modal curve, with peaks among adolescents/young adults and the elderly. The TBI-NH data show a tri-modal curve, with peaks among the infants, adolescents/young adults, and the elderly. Both the TBI mortality and TBI-NH peaks occur in older adults, with the highest rates among persons age 85 and above (101.10 per 100,000 population for mortality and 454.3 per 100,000 population for TBI-NH). The TBI mortality and TBI-NH rates for males were consistently higher than those for females, with male rates among infants and adolescents/young adults approximately twice that of the female rates. Male TBI mortality rates were approximately three times that of the female rates for elders 80-84 and male TBI-NH rates were about three times higher than female rates for young adults age 20-29. Some age- and gender-specific TBI mortality rates were not calculated due to small numbers.

The leading causes of TBI mortality were firearms, especially self-inflicted, unintentional falls, and motor vehicle traffic (MVT). The leading causes of TBI-NH were unintentional falls, MVT, and assault. TBI deaths from firearms were concentrated around middle-aged adults, while MVT fatalities were most prevalent in teens and young adults and unintentional fall deaths most often occurred in older adults. For TBI-NH, unintentional fall rates showed a bi-modal curve with the highest rates among older adults 65 years and above with a smaller peak in infants age < 1. MVT and assault TBI-NH rates were highest for adolescents/young adults, ages 15-24 for MVT and ages 20-29 for assault.

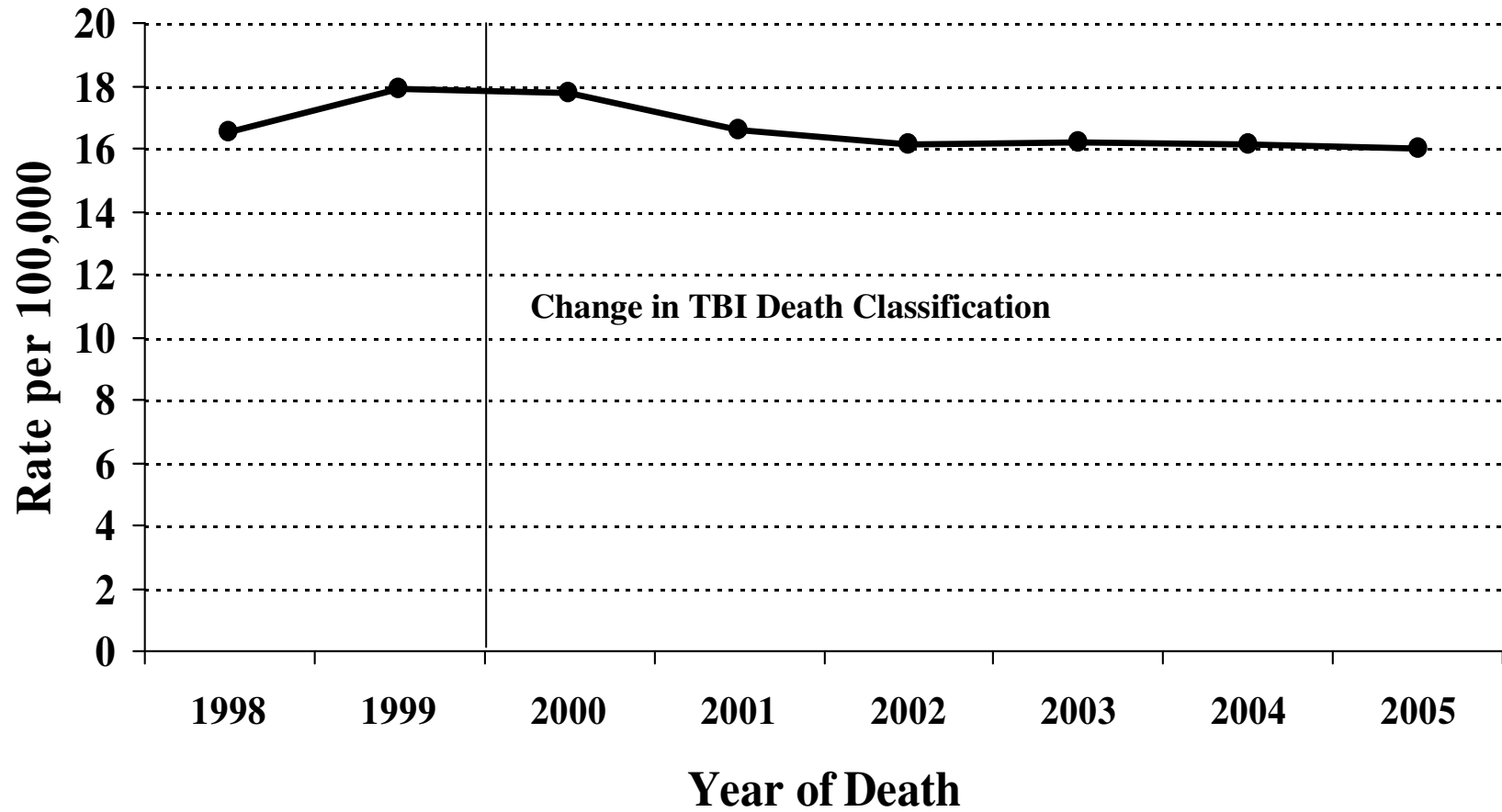
Discussion: Data in this report show the importance of TBI as a public health problem. Population-based information regarding TBI deaths and hospitalizations can be useful in assessing the effect of prevention efforts. Additionally, abstracted data will yield important information on demographic features (e.g., race/ethnicity), modifiable risk factors (e.g., alcohol use), and circumstances at time of injury (e.g., specific activity in which the individual was engaged at time of injury) that in turn can be used to guide intervention activities.

Table 1: TBI Mortality Number and Rate by Gender, Age Group, and Leading Causes, Minnesota 2005

	All causes		Firearm				Fall,		Motor vehicle traffic			
	total		Total		Self-inflicted		unintentional		Total		Occupant	
Total	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
All Ages	856	16.0	262	5.0	215	4.1	234	4.2	224	4.2	159	3.0
<1	2	.	0	.	0	.	1	.	0	.	0	.
1-4	5	.	0	.	0	.	0	.	3	.	2	.
5-9	4	.	0	.	0	.	0	.	2	.	0	.
10-14	15	.	7	.	5	.	0	.	5	.	4	.
15-19	64	17.1	23	6.1	14	.	0	.	33	8.8	31	8.3
20-24	92	24.1	31	8.1	20	5.2	3	.	45	11.8	31	8.1
25-29	31	9.0	16	.	15	.	0	.	12	.	12	.
30-34	42	12.4	23	6.8	19	.	0	.	10	.	5	.
35-39	37	10.1	11	.	8	.	1	.	17	.	12	.
40-44	72	17.4	32	7.7	31	7.5	7	.	22	5.3	14	.
45-49	65	15.8	29	7.0	23	5.6	6	.	18	.	10	.
50-54	59	16.4	21	5.8	20	5.6	16	.	9	.	5	.
55-59	45	15.3	20	6.8	17	.	8	.	8	.	4	.
60-64	36	16.7	13	.	11	.	6	.	12	.	9	.
65-69	25	15.2	6	.	6	.	8	.	7	.	6	.
70-74	36	26.1	12	.	10	.	14	.	6	.	2	.
75-79	55	44.3	8	.	7	.	35	28.2	3	.	2	.
80-84	67	72.0	6	.	5	.	48	51.6	4	.	4	.
85+	104	101.0	4	.	4	.	81	78.6	8	.	6	.
Male	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
All Ages	607	24.4	224	8.6	193	7.5	132	6.0	156	6.0	102	3.9
<1	1	.	0	.	0	.	0	.	0	.	0	.
1-4	2	.	0	.	0	.	0	.	2	.	1	.
5-9	1	.	0	.	0	.	0	.	0	.	0	.
10-14	9	.	5	.	5	.	0	.	2	.	1	.
15-19	46	24.0	19	.	12	.	0	.	20	10.4	18	.
20-24	78	40.1	29	14.9	20	10.3	3	.	33	17.0	20	10.3
25-29	28	15.9	14	.	13	.	0	.	11	.	11	.
30-34	35	20.3	18	.	16	.	0	.	10	.	5	.
35-39	29	15.7	7	.	5	.	1	.	13	.	9	.
40-44	56	26.7	28	13.4	27	12.9	6	.	18	.	11	.
45-49	48	23.2	25	12.1	21	10.1	4	.	10	.	4	.
50-54	51	28.2	18	.	18	.	15	.	8	.	4	.
55-59	35	24.4	17	.	15	.	4	.	6	.	2	.
60-64	24	22.9	11	.	10	.	4	.	6	.	5	.
65-69	19	.	6	.	6	.	6	.	5	.	4	.
70-74	28	43.9	11	.	10	.	10	.	4	.	1	.
75-79	34	64.0	6	.	6	.	21	39.5	3	.	2	.
80-84	46	124.0	6	.	5	.	32	86.2	2	.	2	.
85+	37	117.7	4	.	4	.	26	82.7	3	.	2	.
Female	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
All Ages	249	8.3	38	1.5	22	0.9	102	2.9	68	2.5	57	2.1
<1	1	.	0	.	0	.	1	.	0	.	0	.
1-4	3	.	0	.	0	.	0	.	1	.	1	.
5-9	3	.	0	.	0	.	0	.	2	.	0	.
10-14	6	.	2	.	0	.	0	.	3	.	3	.
15-19	18	.	4	.	2	.	0	.	13	.	13	.
20-24	14	.	2	.	0	.	0	.	12	.	11	.
25-29	3	.	2	.	2	.	0	.	1	.	1	.
30-34	7	.	5	.	3	.	0	.	0	.	0	.
35-39	8	.	4	.	3	.	0	.	4	.	3	.
40-44	16	.	4	.	4	.	1	.	4	.	3	.
45-49	17	.	4	.	2	.	2	.	8	.	6	.
50-54	8	.	3	.	2	.	1	.	1	.	1	.
55-59	10	.	3	.	2	.	4	.	2	.	2	.
60-64	12	.	2	.	1	.	2	.	6	.	4	.
65-69	6	.	0	.	0	.	2	.	2	.	2	.
70-74	8	.	1	.	0	.	4	.	2	.	1	.
75-79	21	29.6	2	.	1	.	14	.	0	.	0	.
80-84	21	37.5	0	.	0	.	16	.	2	.	2	.
85+	67	93.6	0	.	0	.	55	76.8	5	.	4	.

Rates are per 100,000 population. Total rates are adjusted to the U.S. 2000 standard population.

Figure 1: TBI Mortality Rate by Year Minnesota 1998-2005



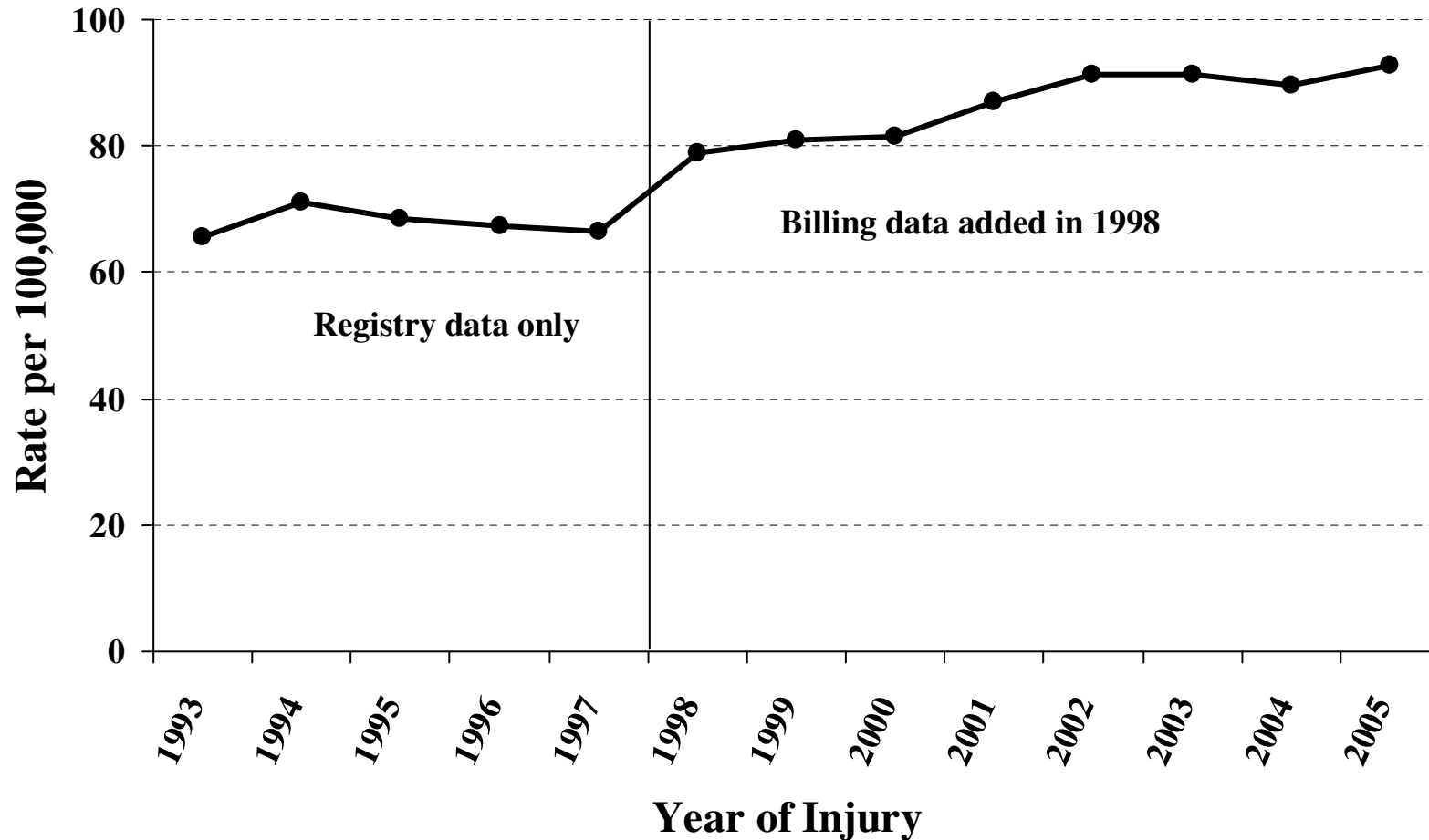
Rates are adjusted to the U.S. 2000 standard population.

Table 2: Nonfatal Hospitalized TBI Number and Rate by Gender, Age Group, and Leading Causes, Minnesota 2005

Total	All causes		Fall, unintentional		Motor vehicle traffic				Assault			
	total		unintentional		Total		Occupant		Total		Struck by or against	
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
All Ages	4,867	92.8	2,065	38.9	1,469	28.1	1,085	20.8	339	6.4	234	4.4
<1	80	112.8	49	69.1	6	.	6	.	13	.	1	.
1-4	142	53.7	84	31.7	18	.	11	.	4	.	0	.
5-9	137	42.5	48	14.9	41	12.7	23	7.1	1	.	0	.
10-14	208	59.8	43	12.4	56	16.1	34	9.8	7	.	5	.
15-19	465	123.9	75	20.0	232	61.8	206	54.9	33	8.8	26	6.9
20-24	438	114.6	48	12.6	230	60.2	185	48.4	78	20.4	61	16.0
25-29	286	83.1	34	9.9	138	40.1	115	33.4	52	15.1	38	11.0
30-34	241	70.9	41	12.1	114	33.5	93	27.4	35	10.3	28	8.2
35-39	214	58.5	40	10.9	94	25.7	67	18.3	22	6.0	10	.
40-44	295	71.1	88	21.2	103	24.8	67	16.2	41	9.9	28	6.8
45-49	277	67.2	87	21.1	107	26.0	56	13.6	23	5.6	17	.
50-54	267	74.2	107	29.7	95	26.4	56	15.6	15	.	9	.
55-59	228	77.4	125	42.4	56	19.0	32	10.9	7	.	5	.
60-64	178	82.8	99	46.0	45	20.9	26	12.1	3	.	3	.
65-69	173	104.9	104	63.1	31	18.8	26	15.8	4	.	3	.
70-74	197	142.7	140	101.4	34	24.6	25	18.1	1	.	0	.
75-79	252	203.0	198	159.5	23	18.5	19	.	0	.	0	.
80-84	321	344.9	257	276.1	22	23.6	16	.	0	.	0	.
85+	468	454.3	398	386.4	24	23.3	22	21.4	0	.	0	.
Male	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
All Ages	2,976	118.8	1,079	45.7	924	35.4	639	24.5	291	10.9	209	7.8
<1	52	143.1	30	82.6	2	.	2	.	9	.	1	.
1-4	76	55.9	43	31.6	10	.	6	.	3	.	0	.
5-9	89	53.9	35	21.2	24	14.5	11	.	1	.	0	.
10-14	143	80.0	29	16.2	35	19.6	16	.	7	.	5	.
15-19	303	157.9	49	25.5	132	68.8	117	61.0	30	15.6	25	13.0
20-24	340	174.7	32	16.4	170	87.4	132	67.8	73	37.5	59	30.3
25-29	212	120.4	18	.	97	55.1	74	42.0	45	25.6	34	19.3
30-34	167	96.7	27	15.6	73	42.3	55	31.9	28	16.2	23	13.3
35-39	148	80.0	27	14.6	56	30.3	35	18.9	19	.	9	.
40-44	191	91.2	52	24.8	68	32.5	41	19.6	33	15.8	24	11.5
45-49	184	88.9	58	28.0	66	31.9	32	15.5	17	.	12	.
50-54	179	99.0	74	40.9	56	31.0	30	16.6	14	.	8	.
55-59	151	105.5	78	54.5	36	25.1	17	.	5	.	3	.
60-64	109	103.8	63	60.0	23	21.9	10	.	3	.	3	.
65-69	103	131.9	58	74.3	19	.	15	.	4	.	3	.
70-74	105	164.5	70	109.7	22	34.5	18	.	0	.	0	.
75-79	125	235.2	95	178.8	12	.	9	.	0	.	0	.
80-84	155	417.7	122	328.8	13	.	10	.	0	.	0	.
85+	144	458.3	119	378.7	10	.	9	.	0	.	0	.
Female	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
All Ages	1,891	67.0	986	32.6	545	20.9	446	17.1	48	1.9	25	1.0
<1	28	81.0	19	.	4	.	4	.	4	.	0	.
1-4	66	51.3	41	31.9	8	.	5	.	1	.	0	.
5-9	48	30.5	13	.	17	.	12	.	0	.	0	.
10-14	65	38.5	14	.	21	12.4	18	.	0	.	0	.
15-19	162	88.4	26	14.2	100	54.6	89	48.6	3	.	1	.
20-24	98	52.3	16	.	60	32.0	53	28.3	5	.	2	.
25-29	74	44.0	16	.	41	24.4	41	24.4	7	.	4	.
30-34	74	44.3	14	.	41	24.5	38	22.7	7	.	5	.
35-39	66	36.5	13	.	38	21.0	32	17.7	3	.	1	.
40-44	104	50.6	36	17.5	35	17.0	26	12.7	8	.	4	.
45-49	93	45.4	29	14.2	41	20.0	24	11.7	6	.	5	.
50-54	88	49.1	33	18.4	39	21.8	26	14.5	1	.	1	.
55-59	77	50.9	47	31.0	20	13.2	15	.	2	.	2	.
60-64	69	62.7	36	32.7	22	20.0	16	.	0	.	0	.
65-69	70	80.6	46	53.0	12	.	11	.	0	.	0	.
70-74	92	123.9	70	94.3	12	.	7	.	1	.	0	.
75-79	127	178.8	103	145.1	11	.	10	.	0	.	0	.
80-84	166	296.6	135	241.2	9	.	6	.	0	.	0	.
85+	324	452.6	279	389.7	14	.	13	.	0	.	0	.

Rates are per 100,000 population. Total rates are adjusted to the U.S. 2000 standard population.

Figure 2: Nonfatal Hospitalized TBI Rate by Year Minnesota 1993-2005



Rates are adjusted to the U.S. 2000 standard population.