

# Head and Neck Injuries

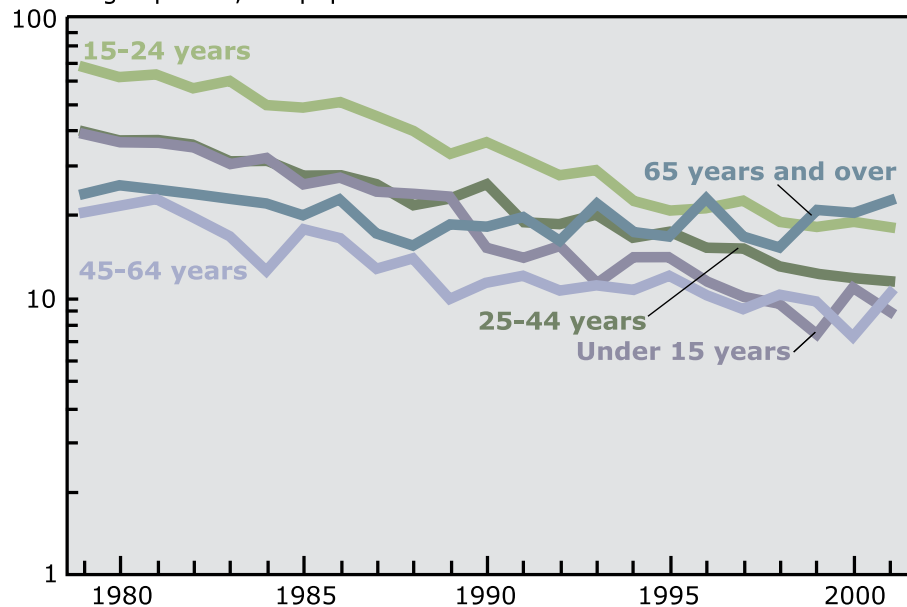
Head and neck injuries include a wide range of injuries from traumatic brain injury (TBI) to more minor injuries to the head, neck, face, or eye. From 1979 to 2001 head and neck injury hospital discharge rates decreased for males and females under 65 years of age an average of 4.0 to 7.6 percent per year (for total decreases of 60 to 82 percent), while rates for those 65 years and over decreased on average 1.2 percent per year for males and 1.1 percent per year for females (for total decreases of 23 and 22 percent, respectively).

Generally males under 65 years of age had higher rates of head and neck injury discharges than females under 65 years of age. For nearly all years in the study period, rates for males and females 65 years and over were similar.

In 2001, among males and females, traumatic brain injuries (TBI) by age accounted for 50–70 percent of all head and neck injuries. Hospital discharge rates for TBI were generally higher for males than for females among the 15–24 and the 25–44 age groups (Appendix tables 17a and 18a). TBI rates for those under 65 years of age declined. TBI discharge rates for those 65 years and over did not change significantly over the 22 years.

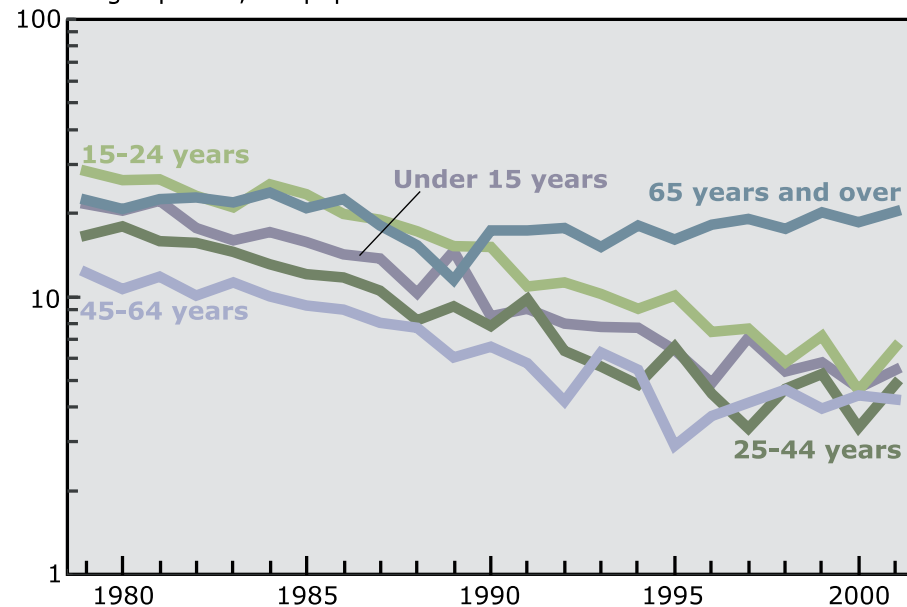
**Figure 17. Head and neck injury hospital discharge rates among males by age, 1979-2001**

Discharges per 10,000 population



**Figure 18. Head and neck injury hospital discharge rates among females by age, 1979-2001**

Discharges per 10,000 population



NOTES: Data are plotted on the log scale. See data table for data points graphed and additional notes. See "Appendix B," for the ICD-9-CM diagnosis codes for head and neck injuries.

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey.

**Data table for figure 17. Head and neck injury hospital discharges among males by age, 1979-2001**

Year	Under 15 years			15-24 years			25-44 years			45-64 years			65 years and over		
	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE
1979	103	39.0	3.2	140	68.1	5.3	118	39.9	3.2	43	20.2	2.0	24	23.5	2.7
1980	95	36.2	3.1	129	62.3	5.2	113	36.9	3.1	46	21.7	2.2	27	25.9	3.0
1981	96	36.7	3.0	130	63.5	5.0	117	37.1	3.0	49	23.0	2.1	26	24.9	2.5
1982	91	34.8	2.7	115	56.8	4.3	116	35.5	2.7	41	19.6	1.8	26	23.7	2.4
1983	80	30.4	2.2	121	60.7	4.0	105	31.3	2.1	36	16.9	1.5	25	22.7	2.2
1984	84	32.1	1.9	98	49.4	2.8	109	31.4	1.7	27	12.5	1.0	24	21.9	1.8
1985	68	25.7	1.6	95	48.5	2.8	100	28.0	1.6	37	17.6	1.3	23	19.8	1.7
1986	72	27.3	1.6	99	50.8	2.8	102	27.9	1.5	35	16.4	1.2	27	22.8	1.8
1987	65	24.3	1.5	85	44.7	2.6	97	25.8	1.5	27	12.6	1.0	20	17.2	1.5
1988	64	23.8	2.8	76	40.4	4.1	83	21.7	1.9	31	14.1	1.7	19	15.6	2.2
1989	63	23.3	3.3	61	32.9	2.9	88	22.6	2.2	22	9.9	1.4	23	18.5	2.5
1990	44	15.3	2.1	69	36.7	3.1	103	25.6	2.1	25	11.4	1.2	22	18.0	2.3
1991	41	14.1	1.7	60	32.1	2.8	77	18.7	1.9	27	12.0	1.5	25	19.4	2.9
1992	45	15.3	2.0	52	27.8	2.0	76	18.6	1.6	25	10.7	1.1	21	16.0	2.1
1993	34	11.3	1.6	54	29.1	3.5	82	19.9	2.1	27	11.2	1.1	29	22.1	3.1
1994	42	14.0	1.9	41	22.3	2.2	68	16.4	1.6	26	10.7	1.1	24	17.6	2.3
1995	43	14.0	2.0	38	20.6	2.0	72	17.3	1.8	30	12.1	1.6	23	16.7	1.9
1996	36	11.7	1.6	40	21.3	2.3	64	15.3	1.5	27	10.3	1.0	31	22.8	3.6
1997	31	10.0	1.4	43	22.5	2.6	64	15.1	1.8	25	9.2	1.1	23	16.6	2.0
1998	29	9.6	1.5	37	19.0	2.4	54	13.0	1.5	29	10.3	1.2	21	15.2	1.7
1999	23	7.4	1.1	35	18.1	1.7	51	12.4	1.5	28	9.7	1.3	29	20.5	2.0
2000	34	10.9	2.1	38	18.9	2.1	49	11.8	1.2	21	7.3	0.8	29	20.2	2.8
2001	28	9.0	1.4	36	18.2	2.4	48	11.5	1.2	33	10.4	1.1	33	22.3	2.6
Average annual percent change		-7.4			-6.6			-5.6			-4.0			-1.2	
Average percent change		-81.4			-78.0			-71.8			-59.6			-23.3	

SE is standard error.

NOTES: See "Appendix B" for the ICD-9-CM diagnosis codes.

Average annual percent change is from 1979-2001 ("Appendix A," Test of trend).

Average percent change is for 1979-2001 ("Appendix A," Average percent change over time).

Rate per 10,000 civilian resident population.

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey.

**Data table for figure 18. Head and neck injury hospital discharges among females by age, 1979-2001**

Year	Under 15 years			15-24 years			25-44 years			45-64 years			65 years and over		
	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE
1979	54	21.6	2.1	60	28.5	2.7	52	16.7	1.6	29	12.3	1.4	33	22.3	2.4
1980	51	20.5	2.1	55	26.4	2.6	57	18.0	1.8	25	10.7	1.3	32	20.6	2.3
1981	56	22.2	2.0	55	26.5	2.4	52	15.9	1.4	28	11.8	1.2	35	22.4	2.2
1982	44	17.7	1.6	47	23.1	2.1	53	15.6	1.2	23	10.1	1.0	37	22.9	2.2
1983	40	16.0	1.4	42	21.0	1.8	51	14.5	1.2	26	11.3	1.1	36	21.9	1.9
1984	43	17.0	1.2	50	25.4	1.7	47	13.1	0.9	23	10.0	0.8	40	23.8	1.7
1985	40	15.8	1.1	46	23.4	1.6	44	12.0	0.8	22	9.3	0.8	35	20.8	1.5
1986	36	14.2	1.0	39	19.9	1.4	44	11.7	0.8	21	9.0	0.7	39	22.4	1.6
1987	35	13.7	1.0	36	19.0	1.4	41	10.5	0.7	19	8.0	0.7	32	18.1	1.4
1988	26	10.3	1.3	32	17.2	2.1	32	8.2	0.8	18	7.8	1.3	28	15.3	1.9
1989	38	14.6	1.9	28	15.3	1.7	37	9.3	1.2	14	6.0	1.0	21	11.5	1.2
1990	23	8.5	1.1	28	15.1	2.0	32	7.8	0.8	16	6.6	1.0	32	17.4	1.9
1991	25	9.0	1.4	20	10.9	1.6	41	9.8	1.6	14	5.8	0.8	32	17.3	2.1
1992	23	8.0	1.4	20	11.3	1.4	27	6.4	0.8	10	4.2	0.6	34	17.7	1.7
1993	22	7.8	1.4	19	10.3	1.4	24	5.6	0.8	16	6.3	0.9	29	15.2	1.7
1994	22	7.7	1.2	16	9.0	1.7	20	4.8	0.6	14	5.5	0.8	35	18.1	2.5
1995	19	6.4	1.0	18	10.1	1.7	28	6.6	0.9	*8	*2.9	*0.4	32	16.1	1.4
1996	14	4.9	0.8	13	7.5	1.1	19	4.5	0.6	10	3.7	0.7	36	18.2	2.5
1997	21	7.1	1.4	14	7.7	1.3	14	3.4	0.5	12	4.1	0.6	38	19.1	2.1
1998	16	5.4	0.9	11	5.8	1.0	20	4.7	0.7	14	4.6	0.7	35	17.6	1.8
1999	17	5.8	1.0	14	7.2	1.3	22	5.3	0.9	12	3.9	0.7	40	20.1	2.1
2000	14	4.7	0.9	*9	*4.6	*0.8	14	3.4	0.6	14	4.4	0.8	37	18.6	2.1
2001	16	5.5	1.0	13	6.6	1.6	21	4.9	0.7	14	4.3	0.7	42	20.3	1.9
Average annual percent change		-7.2			-7.6			-7.3			-5.9			-1.1	
Average percent change		-80.6			-82.4			-81.3			-73.8			-22.2	

SE is standard error.

\*Figure does not meet standard of reliability or precision ("Appendix A," Standards of reliability).

NOTES: See "Appendix B" for the ICD-9-CM diagnosis codes.

Average annual percent change is from 1979-2001 ("Appendix A," Test of trend).

Average percent change is for 1979-2001 ("Appendix A," Average percent change over time).

Rate per 10,000 civilian resident population.

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey.

**Appendix table 17a. Traumatic brain injury hospital discharges among males by age, 1979-2001**

Year	Under 15 years			15-24 years			25-44 years			45-64 years			65 years and over		
	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE
1979	73	27.8	2.5	72	35.1	3.1	54	18.4	1.7	19	9.2	1.1	12	12.1	1.6
1980	64	24.4	2.3	65	31.3	3.0	49	16.0	1.6	22	10.6	1.3	15	14.3	1.9
1981	62	23.7	2.1	74	36.3	3.1	53	16.8	1.5	24	11.2	1.1	15	14.1	1.6
1982	62	23.7	1.5	58	28.5	1.8	58	17.9	1.1	21	9.8	1.0	16	14.7	1.7
1983	58	21.9	1.7	58	29.2	2.3	52	15.4	1.2	20	9.3	1.0	15	13.6	1.5
1984	59	22.6	1.4	52	26.2	1.7	52	15.1	1.0	16	7.3	0.7	16	14.6	1.3
1985	49	18.7	1.3	53	27.3	1.8	55	15.4	1.0	21	10.1	0.9	16	13.8	1.3
1986	52	19.7	1.3	57	29.4	1.8	51	14.0	0.9	23	10.6	0.9	17	14.3	1.3
1987	49	18.6	1.3	54	28.1	1.9	53	14.2	0.9	16	7.4	0.7	14	11.9	1.1
1988	44	16.4	2.4	42	22.4	2.9	38	9.9	0.9	19	8.6	1.3	12	10.2	1.4
1989	46	16.9	2.6	35	19.1	2.1	40	10.3	1.2	11	4.8	0.7	16	12.7	1.9
1990	31	10.7	1.6	36	19.1	2.2	48	12.0	1.5	13	5.9	0.8	15	11.7	1.8
1991	27	9.4	1.3	31	16.9	2.1	43	10.5	1.4	15	6.8	1.3	20	15.4	2.5
1992	29	9.8	1.4	28	15.1	1.5	34	8.4	1.0	18	7.7	1.0	16	12.2	1.7
1993	25	8.2	1.5	31	17.0	2.8	39	9.4	1.2	16	6.8	0.8	23	17.0	2.6
1994	27	8.8	1.4	22	11.9	1.3	37	8.8	1.3	17	6.7	0.9	17	12.9	2.0
1995	32	10.4	1.9	24	13.0	1.7	37	9.0	1.2	21	8.2	1.3	19	13.8	1.8
1996	22	7.2	1.3	23	12.5	1.8	33	7.9	1.0	16	6.1	0.9	25	18.4	3.3
1997	20	6.6	1.1	25	13.4	2.3	33	7.9	1.2	18	6.7	0.9	16	11.6	1.7
1998	18	5.9	1.1	21	11.1	2.0	27	6.4	0.9	16	5.8	0.8	13	9.3	1.2
1999	12	3.9	0.7	22	11.1	1.3	28	6.8	0.9	17	6.0	1.0	19	13.4	1.8
2000	21	6.8	1.6	18	9.0	1.3	23	5.6	0.7	13	4.3	0.6	18	12.3	1.9
2001	15	4.9	0.8	20	9.8	1.6	26	6.3	0.8	21	6.7	1.0	22	14.8	2.1
Average annual percent change	-7.9			-6.1			-5.3			-3.0			**-0.4		
Average percent change	-83.5			-75.0			-69.9			-49.0			**-8.6		

SE is standard error.

\*\*Not significant.

NOTES: See "Appendix B" for the ICD-9-CM diagnosis codes.

Average annual percent change is from 1979-2001 ("Appendix A," Test of trend).

Average percent change is for 1979-2001 ("Appendix A," Average percent change over time).

Rate per 10,000 civilian resident population.

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey.

**Appendix table 18a. Traumatic brain injury hospital discharges among females by age, 1979-2001**

Year	Under 15 years			15-24 years			25-44 years			45-64 years			65 years and over		
	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE
1979	40	15.9	1.6	36	17.1	1.8	27	8.8	1.0	14	6.1	0.8	16	10.7	1.4
1980	37	14.7	1.6	32	15.2	1.7	32	10.1	1.1	14	6.0	0.8	16	10.7	1.4
1981	44	17.5	1.6	31	14.9	1.5	25	7.4	0.8	16	6.9	0.8	20	12.5	1.3
1982	31	12.6	1.2	27	13.4	1.3	29	8.5	0.8	14	5.8	0.7	19	11.9	1.3
1983	30	11.8	1.1	28	14.1	1.3	28	8.1	0.8	17	7.2	0.8	18	11.0	1.2
1984	30	12.1	0.9	32	16.2	1.2	26	7.2	0.6	12	5.4	0.5	24	14.3	1.2
1985	30	11.7	0.9	28	14.4	1.1	28	7.5	0.6	14	5.9	0.6	21	12.6	1.1
1986	27	10.7	0.8	24	12.3	1.0	29	7.5	0.6	14	5.9	0.5	26	15.0	1.2
1987	25	9.8	0.8	23	12.3	1.0	22	5.6	0.5	10	4.4	0.5	21	11.8	1.0
1988	20	7.8	1.1	22	12.0	1.8	19	4.9	0.7	12	4.9	1.0	17	9.3	1.4
1989	27	10.4	1.5	15	8.5	1.2	21	5.1	0.8	9	3.8	0.7	13	6.9	0.9
1990	15	5.4	0.8	18	9.7	1.4	19	4.6	0.8	10	4.3	0.8	20	11.0	1.2
1991	16	5.7	1.0	12	6.3	1.2	27	6.4	1.4	*8	*3.3	*0.6	20	10.8	1.4
1992	15	5.3	1.0	12	6.4	1.2	15	3.5	0.6	*5	*2.2	*0.5	24	12.8	1.5
1993	15	5.1	1.0	11	6.1	1.1	14	3.3	0.6	11	4.5	0.7	17	8.7	1.2
1994	14	4.7	0.9	10	5.7	1.3	12	2.9	0.4	10	3.7	0.8	22	11.1	1.7
1995	12	4.1	0.7	13	7.0	1.4	16	3.9	0.7	*6	*2.3	*0.4	23	11.8	1.2
1996	10	3.3	0.6	10	5.4	0.9	11	2.6	0.4	*8	*2.7	*0.6	25	12.9	1.7
1997	13	4.4	1.0	9	5.1	1.0	*8	*1.9	*0.3	*8	*2.8	*0.6	25	12.7	1.8
1998	10	3.4	0.8	*6	*3.3	*0.6	*9	*2.0	*0.4	*8	*2.9	*0.6	22	11.0	1.5
1999	11	3.7	0.7	9	4.9	1.0	13	3.2	0.6	*7	*2.4	*0.5	25	12.3	1.7
2000	9	3.2	0.7	*	*	*	*6	*1.5	*0.3	*7	*2.3	*0.5	23	11.6	1.9
2001	9	3.1	0.8	*	*	*	11	2.6	0.4	*7	*2.1	*0.4	26	12.4	1.4
Average annual percent change		-8.1			-7.1			-7.2			-5.3			** -0.2	
Average percent change		-84.3			-80.4			-80.8			-70.0			** -5.3	

SE is standard error.

\*Figure does not meet standard of reliability or precision ("Appendix A," Standards of reliability).

\*\*Not significant

NOTES: See "Appendix B" for the ICD-9-CM diagnosis codes.

Average annual percent change is from 1979-2001 ("Appendix A," Test of trend).

Average percent change is for 1979-2001 ("Appendix A," Average percent change over time).

Rate per 10,000 civilian resident population.

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey.

# Hip Fractures

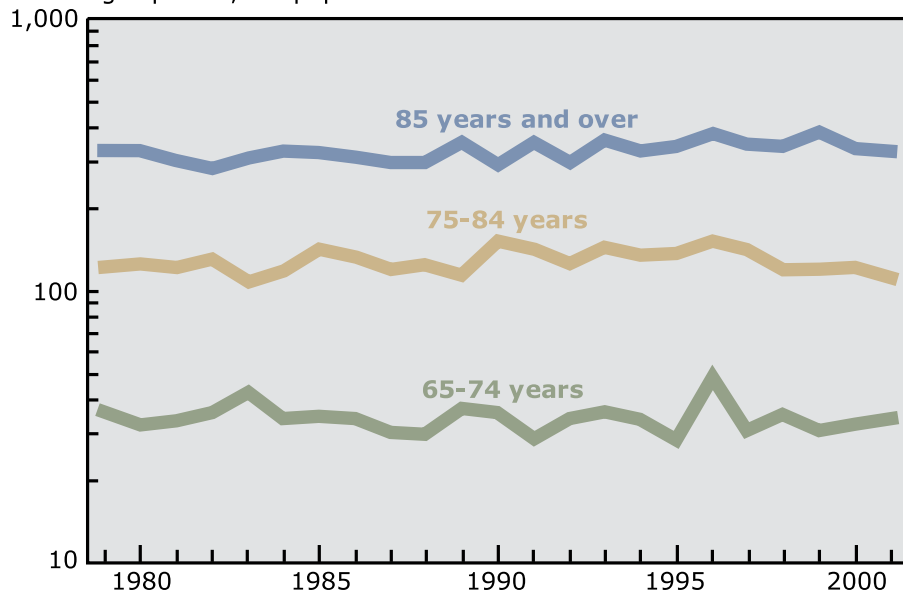
When the dimensions of the Barell Matrix are crossed, the cells provide information on both the body region of the injury and the nature of the injury (e.g., hip fractures). Hip fracture discharges accounted for 24 percent of extremity fracture hospital discharges in 1979 and 42 percent in 2001 (data not shown).

When analyzed by age and sex, discharge rates for hip fractures were consistently higher for females 65 years and over than for males (data not shown). Among females 65 years and over, hip fractures accounted for the majority of all extremity fractures (Appendix table 19a). From 1979 to 2001 females 85 years of age and over had the highest discharge rate for hip fractures, approximately 2 to 3 times the rate among females 75–84 years and 10 times the rate among females 65–74 years of age.

From 1979 to 2001, hospital discharge rates for hip fractures among females remained relatively unchanged among those 65–74 and 75–84 years of age. However, among those 85 years and over the rate increased on average 0.7 percent per year (for a total increase of 16 percent) to 336.5 per 10,000 population in 2001.

**Figure 19. Hip fracture hospital discharge rates among females 65 years and over by age, 1979-2001**

Discharges per 10,000 population



NOTES: Data are plotted on the log scale. See data table for data points graphed and additional notes. ICD-9-CM code for hip fracture is 820.

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey.

**Data table for figure 19. Hip fracture hospital discharges among females 65 years and over by age, 1979-2001**

Year	65 years and over			65-74 years			75-84 years			85 years and over		
	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE	Number in thousands	Rate	Rate SE
1979	139	93.1	7.3	31	36.0	3.9	58	121.9	11.4	50	328.4	31.8
1980	143	93.0	7.6	29	32.2	3.7	62	126.5	12.2	52	330.0	33.1
1981	142	90.3	7.1	30	33.6	3.3	61	122.0	10.8	50	303.6	27.6
1982	149	93.1	6.7	33	36.2	3.5	67	130.5	9.9	49	283.6	25.1
1983	152	92.6	5.7	39	42.3	3.7	57	108.3	8.5	55	307.8	24.4
1984	158	94.5	4.7	32	34.3	2.6	65	118.7	7.4	61	329.3	20.9
1985	175	102.7	5.1	33	34.6	2.6	80	143.0	8.6	62	325.1	20.7
1986	172	98.9	4.7	33	34.2	2.5	77	134.4	7.8	62	314.1	19.3
1987	162	91.4	4.6	30	30.5	2.4	72	121.6	7.5	60	298.6	19.2
1988	166	92.2	5.9	30	30.0	3.7	75	123.8	10.1	62	297.4	25.3
1989	184	100.1	6.1	38	37.5	4.1	70	113.7	8.9	76	355.5	30.3
1990	194	105.2	8.4	36	35.7	4.2	95	152.5	16.5	63	290.9	25.0
1991	199	106.5	6.9	29	28.8	3.4	91	143.5	12.4	79	351.4	37.9
1992	186	97.6	7.6	35	34.3	4.6	82	126.3	10.3	69	295.7	27.2
1993	219	113.5	9.1	37	35.8	3.4	96	146.5	14.5	86	356.5	31.7
1994	209	107.6	7.5	35	33.8	3.6	91	136.8	10.7	84	332.6	34.8
1995	211	107.6	7.7	29	28.5	3.1	93	138.7	13.1	88	341.4	29.8
1996	254	128.4	8.1	49	47.7	5.8	104	151.9	9.2	101	377.0	31.3
1997	227	114.3	7.5	31	30.8	3.6	101	144.1	11.5	95	346.7	28.8
1998	217	108.6	7.1	35	35.3	4.0	85	119.8	10.6	96	339.4	28.6
1999	230	114.8	8.4	30	30.7	4.4	87	121.0	9.4	112	385.3	36.5
2000	221	110.0	8.5	32	32.4	5.1	89	122.7	10.1	100	335.1	32.3
2001	225	108.5	7.3	34	34.2	3.7	86	113.4	9.8	104	336.5	28.2
Average annual percent change		1.2			** -0.3			** 0.3			0.7	
Average percent change		29.1			** -5.7			** 6.5			15.9	

SE is standard error.

\*\*Not significant.

NOTES: Hip fracture - ICD-9-CM code 820.

Average annual percent change is from 1979-2001 ("[Appendix A,](#)" [Test of trend](#)).

Average percent change is for 1979-2001 ("[Appendix A,](#)" [Average percent change over time](#)).

Rate per 10,000 civilian resident population.

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey.

**Appendix table 19a. Extremity fracture hospital discharges among females 65 years and over by body region, 1979-2001**

Year	Upper extremity			Lower extremity					
	Number in thousands	Percent	Percent SE	Hip			Other lower extremity		
				Number in thousands	Percent	Percent SE	Number in thousands	Percent	Percent SE
1979	55	22.8	1.4	139	57.4	1.9	48	19.9	1.3
1980	59	23.8	1.5	143	57.9	2.0	45	18.3	1.3
1981	53	22.3	1.2	142	59.2	1.6	44	18.5	1.0
1982	54	21.8	0.7	149	60.0	1.7	45	18.2	1.1
1983	57	23.0	1.3	152	60.7	1.7	41	16.3	1.1
1984	55	21.1	1.0	158	60.3	1.4	49	18.6	0.9
1985	48	17.9	0.9	175	65.5	1.3	44	16.6	0.9
1986	37	14.4	0.8	172	67.0	1.3	47	18.5	0.9
1987	39	15.9	0.9	162	65.9	1.4	45	18.3	0.9
1988	33	13.7	1.3	166	69.0	1.9	42	17.3	1.4
1989	33	12.3	1.1	184	69.1	2.0	49	18.6	1.9
1990	38	13.5	1.1	194	69.3	2.1	48	17.2	1.5
1991	32	11.4	1.1	199	71.4	1.7	48	17.3	1.4
1992	36	13.6	1.4	186	69.3	2.0	46	17.1	1.5
1993	36	11.7	1.1	219	70.4	1.7	56	17.9	1.6
1994	33	11.0	1.1	209	69.9	1.6	57	19.1	1.2
1995	41	13.5	1.1	211	69.9	1.7	50	16.6	1.4
1996	40	11.4	1.0	254	72.8	1.5	55	15.8	1.2
1997	44	13.3	1.1	227	67.9	1.7	63	18.8	1.6
1998	40	12.9	1.1	217	69.9	1.7	54	17.3	1.4
1999	45	13.6	1.2	230	69.1	1.6	57	17.3	1.4
2000	40	12.6	1.2	221	69.5	1.7	57	17.9	1.2
2001	49	14.6	1.4	225	67.5	1.6	59	17.9	1.1
Average annual percent change		-3.5			0.8			** -0.2	
Average percent change		-54.3			18.9			** -5.0	

SE is standard error.

\*\* Not significant.

NOTES: See "Appendix B" for the ICD-9-CM diagnosis codes in each category.

Average annual percent change is from 1979-2001 ("Appendix A," Test of trend).

Average percent change is for 1979-2001 ("Appendix A," Average percent change over time).

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey.



## External Cause of Injury

The ICD-9 External Cause Matrix is a two-dimensional array describing both the mechanism or external cause of the injury (e.g., fall, motor vehicle traffic, etc.) and the manner or intent of the injury (e.g., self-inflicted, assault, etc.). (See "Appendix A," ICD-9-CM External Cause of Injury Matrix). While this matrix was originally developed for mortality, it has been adapted for use with the ICD-9-CM (1).

In 2001 approximately one third of injury hospitalizations did not have an external cause code. Of all injury hospitalizations, 30 percent were coded to falls, the leading mechanism of injury coded (figure 20), and, in addition, 58 percent of all injuries were coded as unintentional or accidents (figure 21).

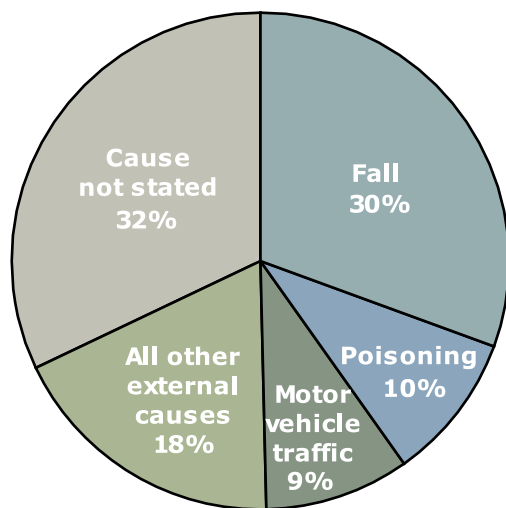
Fractures accounted for about a million injury hospital discharges. Forty-five percent of fractures were coded as fall-related, 9 percent as motor vehicle traffic-related, 12 percent as another external cause, and 34 percent had no external cause of injury code (appendix table 20c).

In 2001, 1.2 million patients, or 68 percent of patients hospitalized due to injury, had at least one recorded external cause code (appendix table 20a). This percent was similar for males and females, and for white and black persons. In the West over three-quarters had these codes. In the Northeast and Midwest external cause codes were recorded for about two-thirds of the injury discharges, and over 60 percent of discharges in the South contained at least one of these codes. The elderly had a lower percentage of injury discharges with an external cause code than those 15–24, 25–44, and 45–64 years of age (appendix table 20f).

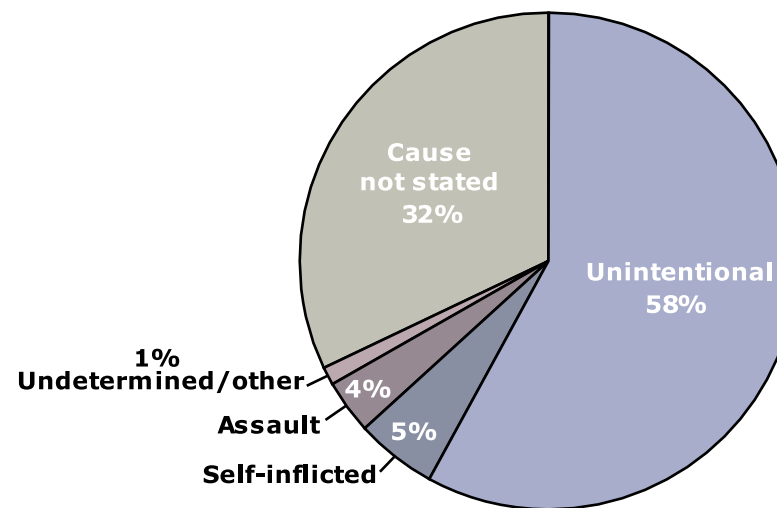
### Reference

1. Recommended framework of E-code groupings for presenting injury mortality and morbidity data. May 15, 2003. See <http://www.cdc.gov/ncipc/whatsnew/matrix2.htm> and "Appendix C," ICD-9-CM External Cause of Injury Matrix.

**Figure 20. Percent distribution of injury hospital discharges by mechanism, 2001**



**Figure 21. Percent distribution of injury hospital discharges by intent, 2001**



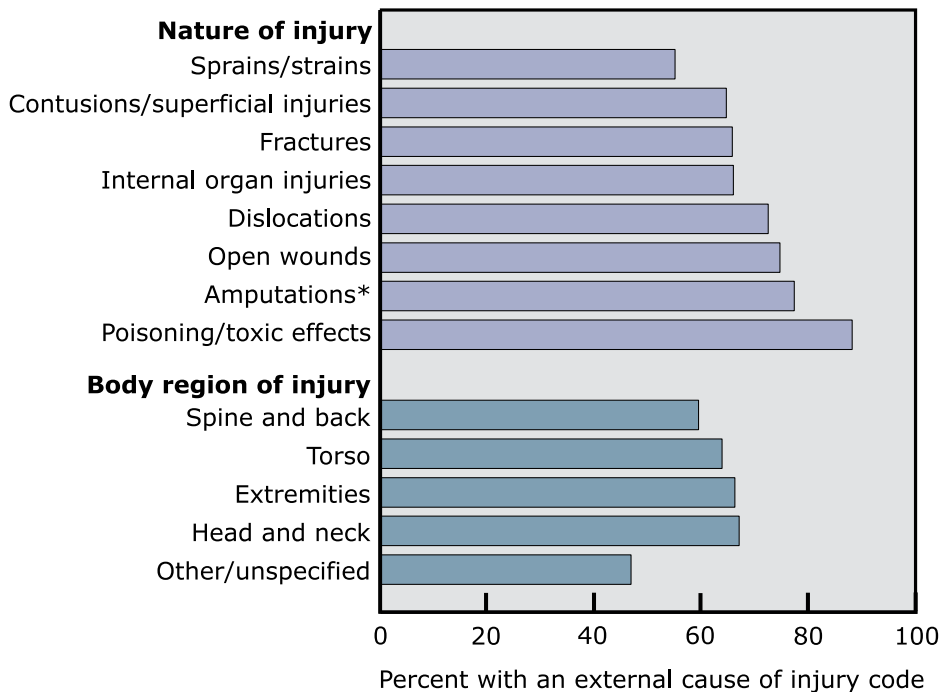
NOTES: See "Appendix A," External cause of injury code. See "Appendix C" for the ICD-9-CM external cause codes in each category.

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey.

# External Cause of Injury

There was considerable variation among the various types of injuries in the completion of external cause codes (figure 22). Only 55 percent of sprains and strains had an external cause compared with about 88 percent of those with poisoning and toxic effects. Other categories with at least two-thirds external cause completion were open wounds and dislocations.

**Figure 22. Percent of injury hospital discharges with an external cause of injury code, by nature of injury diagnosis and body region of injury, 2001**



\*Data do not meet standard of reliability.

NOTES: See data table for data points graphed and additional notes. See ["Appendix A," External cause of injury code.](#) See ["Appendix B"](#) for the ICD-9-CM diagnosis codes in each category.

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey.

**Data table for figure 20. Injury hospital discharges by mechanism, 2001**

External cause	Number in thousands	Percent	Percent SE
Total	1,814	100.0	---
Fall	553	30.5	1.5
Poisoning	177	9.8	0.5
Motor vehicle traffic	171	9.4	0.5
All other external causes	333	18.4	0.8
Cause not stated	580	32.0	1.9

**Data table for figure 21. Injury hospital discharges by intent, 2001**

Intent	Number in thousands	Percent	Percent SE
Total	1,814	100.0	---
Unintentional	1,049	57.9	1.9
Self-inflicted	97	5.4	0.4
Assault	65	3.6	0.4
Undetermined/other	22	1.2	0.2
Cause not stated	580	32.0	1.9

--- Category not applicable.

SE is standard error.

NOTES: See ["Appendix A," External cause of injury code.](#)  
See ["Appendix C"](#) for the ICD-9-CM external cause codes in each category.

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey.

**Data table for figure 22. Injury hospital discharges with an external cause of injury code, by nature of injury diagnosis and body region of injury, 2001**

Nature of injury and body region of injury	Number in thousands	Percent	Percent SE
<b>Nature of injury</b>			
Fractures	658	65.9	2.2
Dislocations	15	72.6	5.5
Sprains and strains	30	55.2	5.0
Internal organ injuries	137	66.1	2.7
Open wounds	70	74.8	3.0
Amputations	*5	*77.5	*8.0
Blood vessel injuries	*	*	*
Contusions and superficial injuries	43	64.8	5.2
Crush injuries	*	*	*
Burns	*	*	*
Nerve injuries	*	*	*
Unspecified injuries	20	57.3	6.9
Poisoning and toxic effects	182	88.3	1.6
<b>Body region of injury</b>			
Head and neck	190	67.2	2.4
Spine and back	54	59.6	3.7
Torso	139	64.0	2.9
Extremities	615	66.4	2.2
Other and unspecified	20	47.0	8.9

SE is standard error.

\* Figure does not meet standard of reliability or precision (["Appendix A," Standards of reliability](#)).

NOTES: See ["Appendix A," External cause of injury code.](#)  
See ["Appendix B"](#) for the ICD-9-CM diagnosis codes in each category.

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey.

**Appendix table 20a. Injury hospital discharges with an external cause of injury code, 1979-2001**

Year	External cause of injury code		
	Number in thousands	Percent	Percent SE
1979	469	14.2	0.6
1980	518	16.0	0.7
1981	538	16.8	0.6
1982	603	19.0	0.7
1983	600	19.7	0.6
1984	631	20.8	0.5
1985	656	23.1	0.6
1986	752	27.4	0.6
1987	789	31.1	0.7
1988	786	33.9	1.8
1989	825	35.7	1.9
1990	868	39.2	2.0
1991	829	38.2	2.1
1992	781	37.6	2.1
1993	872	42.0	2.3
1994	932	47.5	2.4
1995	1,039	53.7	2.5
1996	1,217	64.5	2.0
1997	1,153	63.3	2.1
1998	1,186	66.2	1.9
1999	1,203	66.1	2.2
2000	1,169	66.6	1.9
2001	1,233	68.0	1.9
Average annual percent change		7.7	
Average percent change		413.6	

SE is standard error.

NOTES: See "Appendix A," External cause of injury code. There were a small number of ICD-9-CM coding changes over the study period and they minimally affected the total number of external cause codes ("Appendix A," ICD-9-CM addenda affecting injuries). Average annual percent change is from 1979-2001 ("Appendix A," Test of trend). Average percent change is for 1979-2001 ("Appendix A," Average percent change over time).

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey.

**Appendix table 20b. System wide injury hospital discharges by mechanism and intent, 2001**

Mechanism and intent	Number in thousands	Percent	Percent SE
Mechanism			
Total	255	100.0	---
Poisoning	174	68.4	2.3
All other mechanisms	41	16.1	1.8
External cause not stated	40	15.6	1.8
Intent			
Total	255	100.0	---
Unintentional	108	42.2	2.3
Self-inflicted	88	34.4	2.2
All other intent categories	20	7.8	1.2
External cause not stated	40	15.6	1.8

**Appendix table 20c. Fracture hospital discharges by mechanism, 2001**

Mechanism	Number in thousands	Percent	Percent SE
Total	999	100.0	---
Fall	449	45.0	2.1
Motor vehicle traffic	88	8.8	0.6
All other mechanisms	121	12.1	0.7
External cause not stated	341	34.1	2.2

--- Category not applicable.

SE is standard error.

NOTES: See "Appendix A," External cause of injury code. See "Appendix B" for the ICD-9-CM diagnosis codes. See "Appendix C" for the ICD-9-CM external cause codes in each category. System wide injuries include poisoning, toxic effects, foreign bodies, early complications of trauma, other and unspecified effects of external causes, late effects of injury, poisoning, toxic effects, and other external causes, and child and adult maltreatment.

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey.

**Appendix table 20d. Poisoning and toxic effects hospital discharges by intent, 2001**

Intent	Number in thousands	Percent	Percent SE
Total poisoning and toxic effects discharges <sup>1</sup>	206	100.0	---
Unintentional	79	38.2	2.3
Self-inflicted	87	42.2	2.3
Undetermined	16	7.8	1.4
Other <sup>2</sup>	*	*	*
Cause not stated	24	11.7	1.6

**Appendix table 20e. Poisoning and toxic effects hospital discharges by mechanism, 2001**

Mechanism	Number in thousands	Percent	Percent SE
Total poisoning and toxic effects discharges <sup>1</sup>	206	100.0	---
Poisoning <sup>3</sup>	174	84.4	1.9
All other mechanisms <sup>3</sup>	*8	*3.9	*1.0
Cause not stated <sup>3</sup>	24	11.7	1.6

--- Category not applicable.

\* Figure does not meet standard of reliability or precision. ("Appendix A," Standards of reliability).

SE is standard error.

<sup>1</sup>First-listed diagnosis.

<sup>2</sup>Assault, legal intervention, and operations of war.

<sup>3</sup>External cause.

NOTES: See "Appendix A," External cause of injury code.

See "Appendix B" for the ICD-9-CM diagnosis codes.

See "Appendix C" for the ICD-9-CM external cause codes in each category.

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey.

**Appendix table 20f. Injury hospital discharges with an external cause of injury code by selected patient characteristics, 2001**

Characteristic	Number in thousands	Percent	Percent SE
<b>Sex</b>			
Male	613	70.2	2.1
Female	621	66.0	2.1
<b>Age groups</b>			
Under 15 years	137	73.1	6.1
15-24 years	153	73.4	2.8
25-44 years	287	76.1	1.9
45-64 years	226	69.8	2.4
65 years and over	430	60.1	2.4
<b>Race</b>			
White	772	66.6	2.2
Black	131	72.5	2.7
Other	42	64.4	5.9
Not stated	288	70.5	4.3
<b>Region</b>			
West	267	78.2	3.4
South	423	62.2	2.6
Midwest	303	70.8	4.8
Northeast	241	66.1	4.6
<b>Total</b>	<b>1,233</b>	<b>100.0</b>	<b>---</b>

--- Category not applicable.

SE is standard error.

NOTES: See "Appendix A," Geographic region.

See "Appendix A," External cause of injury code.

SOURCE: Centers for Disease Control and Prevention, National Center for Health Statistics, National Hospital Discharge Survey.