



NTDB[®]
NATIONAL TRAUMA DATA BANK

National Trauma Data Bank Report 2006

Version 6.0

Acknowledgments

The American College of Surgeons Committee on Trauma wishes to thank the Health Resources and Services Administration (HRSA), the National Highway Traffic Safety Administration (NHTSA), and the Centers for Disease Control and Prevention (CDC) for their support of the NTDB.

NTDB Annual Report 2006

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Editor's Note

The 2006 Annual Report of the National Trauma Data Bank (NTDB), Version 6.0, is an updated analysis of the largest aggregation of trauma registry data that has ever been assembled. The NTDB now contains over 2 million records.

This 2006 Annual Report is based on 1,191,215 records from the years 2001-2005. The NTDB uses a rolling 5-year time frame for the annual analysis in order to focus on the most recent, highest quality data. Prior to analysis, NTDB data are subjected to a quality screening for consistency and validity, as described in Appendix C.

The mission of the American College of Surgeons (ACS) Committee on Trauma (COT) is to develop and implement meaningful programs for trauma care. In keeping with this mission, the NTDB is committed to being the principal national repository for trauma center registry data. We estimate that 67% of Level I and 56% of Level II trauma centers in the United States have contributed data to the NTDB.

The purpose of this report is to inform the medical community, the public, and decision makers about a wide variety of issues that characterize the current state of care for injured persons in our country. It has implications in many areas including epidemiology, injury control, research, education, acute care, and resource allocation.

The NTDB Subcommittee would like to thank all of the trauma centers that contributed data and hope that this report will attract new participants. The full National Trauma Data Bank Report Version 6.0 is available on the ACS Web site as a PDF file and a PowerPoint presentation at <http://www.ntdb.org>. In addition, information is available on our website about how to obtain actual NTDB data for more detailed study.

Many dedicated individuals on the ACS COT, as well as at trauma centers around the country, have contributed to the early development of the NTDB and its rapid growth in recent years. Building on these achievements, our goals in the coming years include improving data quality, updating analytic methods, and enabling more useful interhospital comparisons. These efforts will be reflected in future NTDB reports to participating hospitals as well as in the Annual Reports.

David E. Clark, MD, FACS
Chair, National Trauma Data Bank Subcommittee

Executive Summary

The National Trauma Data Bank (NTDB) is the largest aggregation of trauma registry data ever assembled. It contains over 2 million records. The 2006 Annual Report reviews the combined data set for the period 2001-2005, containing 1,191,215 records. The goal of the NTDB is to inform the medical community, the public, and decision makers about a wide variety of issues that characterize the current state of care for injured persons in our country. It has implications in many areas including epidemiology, injury control, research, education, acute care, and resource allocation.

This effort is in keeping with the mission of the American College of Surgeons (ACS) Committee on Trauma (COT) which is “To improve the care of the injured through systematic efforts in prevention, care, and rehabilitation.”

NTDB Hospitals

- 640 hospitals submitted data to the NTDB for the period from 2001 to 2005.
- 124 are verified as Level I, representing 67% of Level I centers.
- 139 are verified as Level II, representing 56% of Level II centers.
- 40 are verified as Level III, representing 14% of Level III centers.
- 337 are verified as Level IV, Level V, and unspecified.

Patient Characteristics

- The age distribution of patients in NTDB peaks from ages 16 to 24, representing patients injured in Motor Vehicle Traffic related incidents and by Firearm.
- There is a second peak between ages 35 and 44, including Motor Vehicle Traffic related injuries.
- A third smaller peak occurs between ages 72 and 85, consisting of Motor Vehicle Traffic related injuries and Falls.
- Up to age 70, men predominate, and after age 70 most patients are women.

Mechanism of Injury

- Motor Vehicle Traffic related injuries account for 41.3% of cases in the NTDB.
 - There is a dramatic rise in these injuries beginning at age 14 and peaking around age 19.
 - These injuries are associated with the largest number of hospital and Intensive Care Unit (ICU) days utilized.
 - These injuries account for 44.5% of mortalities.
- Falls account for 27.2% of cases in the NTDB.
 - The incidence of Falls peaks around 85 years of age.
 - Falls are associated with the second largest number of hospital and ICU days utilized.
 - Falls account for 22% of mortalities.
- Struck By, Against and Firearm are the next most frequent categories, representing 6.4% and 5.6% of injuries, respectively. See Appendix D for details on these injury categories.
- Firearm injuries peak around 19 years of age, and then steadily decrease after age 22.
- Firearm injuries account for 22% of mortalities.

Injury Severity Score

The Injury Severity Score (ISS) is a system for numerically stratifying injury severity. The ISS system has a range of 1-75 and risk of death increases with a higher score. This report categorizes ISS 1-9 as Minor; 10-15 as Moderate; 16-24 as Severe; and greater than 24 as Very Severe.

- Almost two thirds (63.1%) of patients suffer Minor injuries, and the remaining third are distributed nearly equally among Moderate, Severe, and Very Severe injuries.
- Average length of stay (LOS) increases for each consecutive severity grouping.
- The largest group (ISS 1-9) has the shortest average LOS (3.5 days), yet account for almost half (41.3%) of the total hospital days due to its size.

- The Moderate group (ISS 10-15) has an average ICU length of stay 1.6 days, accounting for 10.3% of all ICU days.
- The Severe group (ISS 16-24) has an average ICU length of stay 3.7 days, accounting for 25.5% of all ICU days.
- The Very Severe group (ISS > 24) has an average ICU length of stay 7.6 days, accounting for 43.5% of all ICU days.

Payment

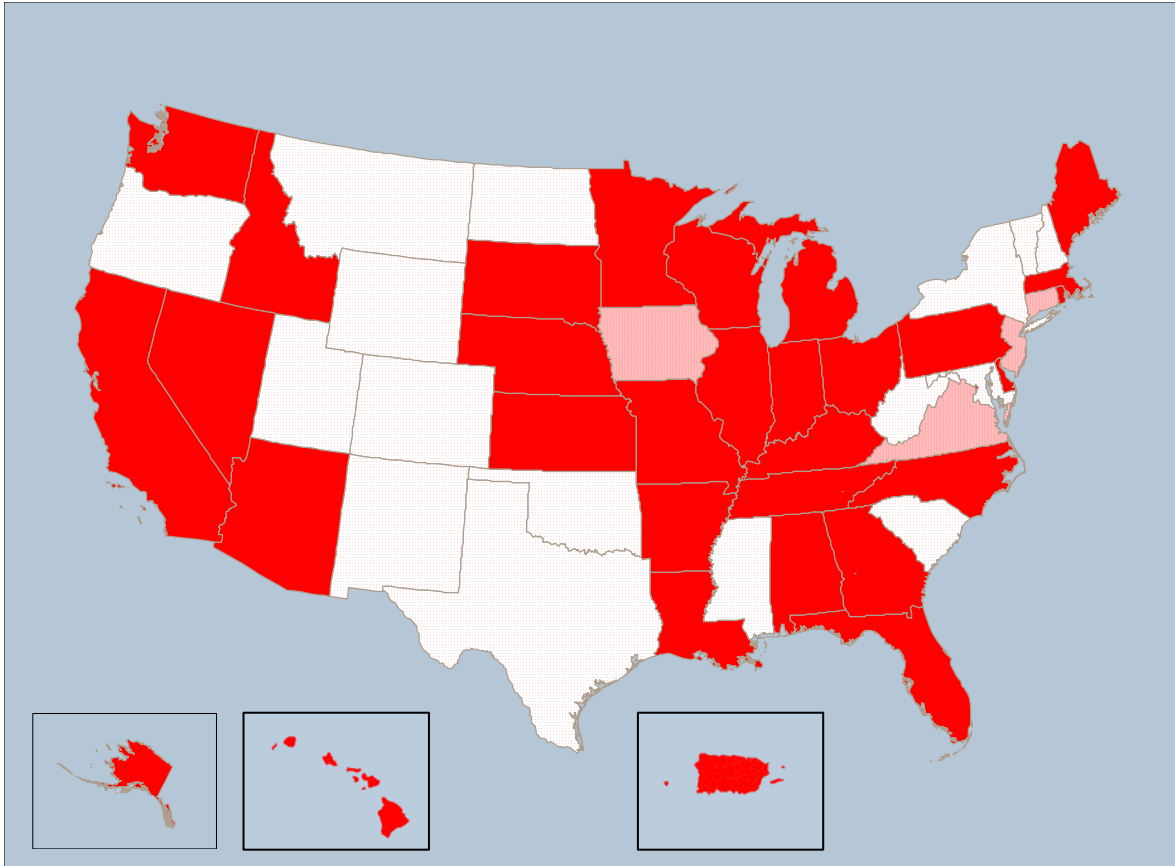
- Self-Pay is the largest single payment category at 17.3%.
- Medicare is second at 15.6%.
- Managed Care accounts for 12.1%.
- Medicaid accounts for 10.8%.
- Commercial Insurance accounts for 10.3%.

Mortality

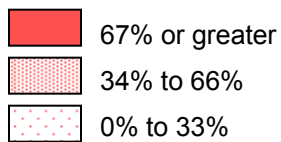
- The largest number of deaths is caused by Motor Vehicle Traffic related injuries, followed by Falls and Firearm.
- Motor Vehicle Traffic related deaths occur in 4.8% of cases.
- Falls result in death in 3.6% of cases.
- Firearms are associated with death in 15.4% of cases, the highest percentage of any penetrating injury.
- Pedestrian injuries are associated with death in 5.6% of cases, the highest percentage for all blunt injuries.
- Fire/Burn is associated with death in 4.5% of cases.
- The percentage of death is highest in the group aged 85 and over.
- Firearm deaths rise dramatically from 12 to 20 years, and then decline steadily.
- Deaths due to Falls increase gradually up to the 75 – 84 years of age category.

Comments

We hope that this document has expanded your understanding of who is admitted to trauma centers in the United States, and why. We further hope that your opinions will be informed by these data, and that you will find ways to share these data with other audiences. Finally, we hope this report has increased your interest to look more deeply at specific problems in the field of injury using the NTDB as a resource. The full National Trauma Data Bank Report 2006, Version 6.0, is available on the ACS Web site as a PDF file and a PowerPoint presentation at <http://www.ntdb.org>.



States and U.S Territories submitting data to the NTDB. Percent of hospitals = Number of hospitals in the state that have submitted to the NTDB divided by the number of hospitals identified by the Trauma Exchange Information Program (TIEP) as trauma centers designated by a state or local authority and/or verified by the American College of Surgeons.



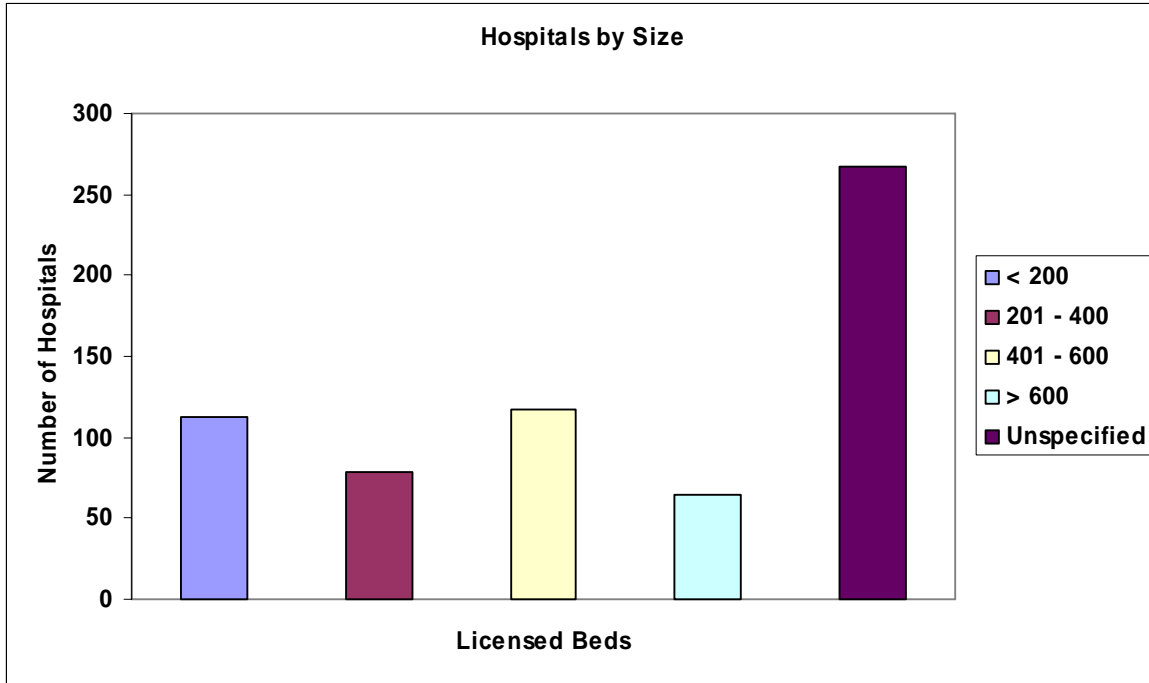


Figure 2A

Size of hospitals submitting data to the NTDB as indicated by number of licensed beds. Total N = 640.

Bed Size	Number	Percent
< 200	113	17.7%
201 - 400	78	12.2%
401 - 600	117	18.3%
> 600	65	10.2%
Unspecified	267	41.7%
Total	640	100.1%

Figure 2B

Hospitals by size. (Percentage of total hospitals by size = number of hospitals by bed size divided by the total number of hospitals × 100).

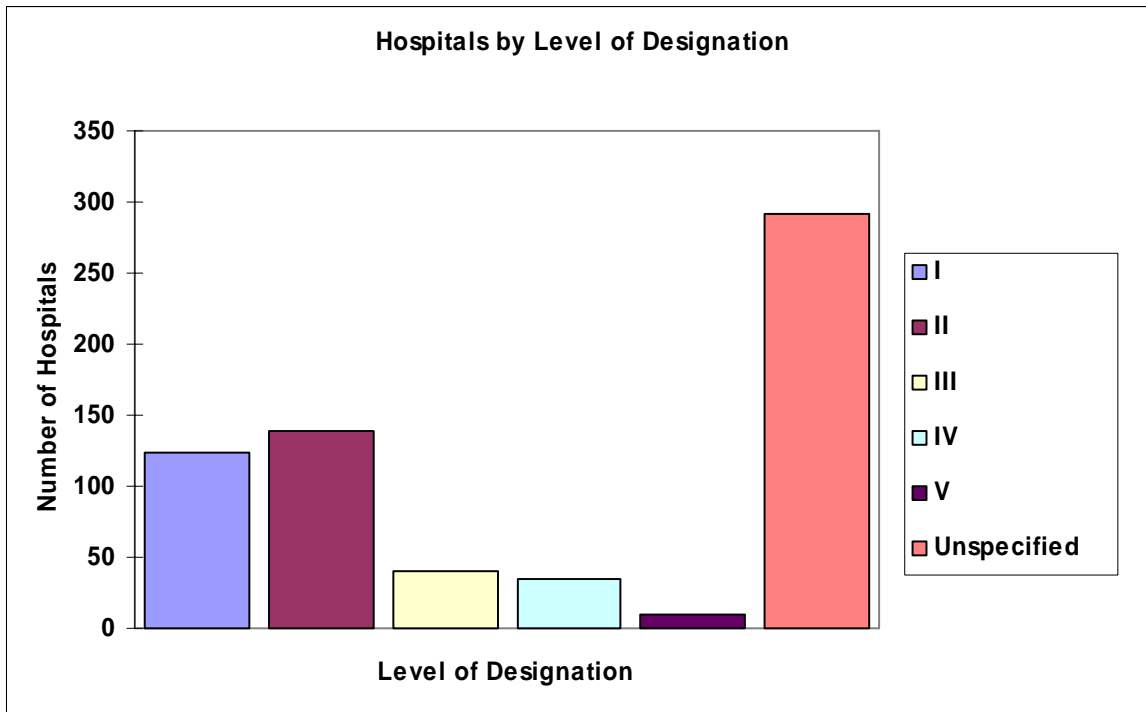


Figure 3A

Number of hospitals submitting data to the NTDB ranked by level of designation. Total N = 640.

Level of Designation	Number	Percent
I	124	19.4%
II	139	21.7%
III	40	6.3%
IV	35	5.5%
V	10	1.6%
Unspecified	292	45.6%
Total	640	100.1%

Figure 3B

Percentage of submitting hospitals for each level of designation.

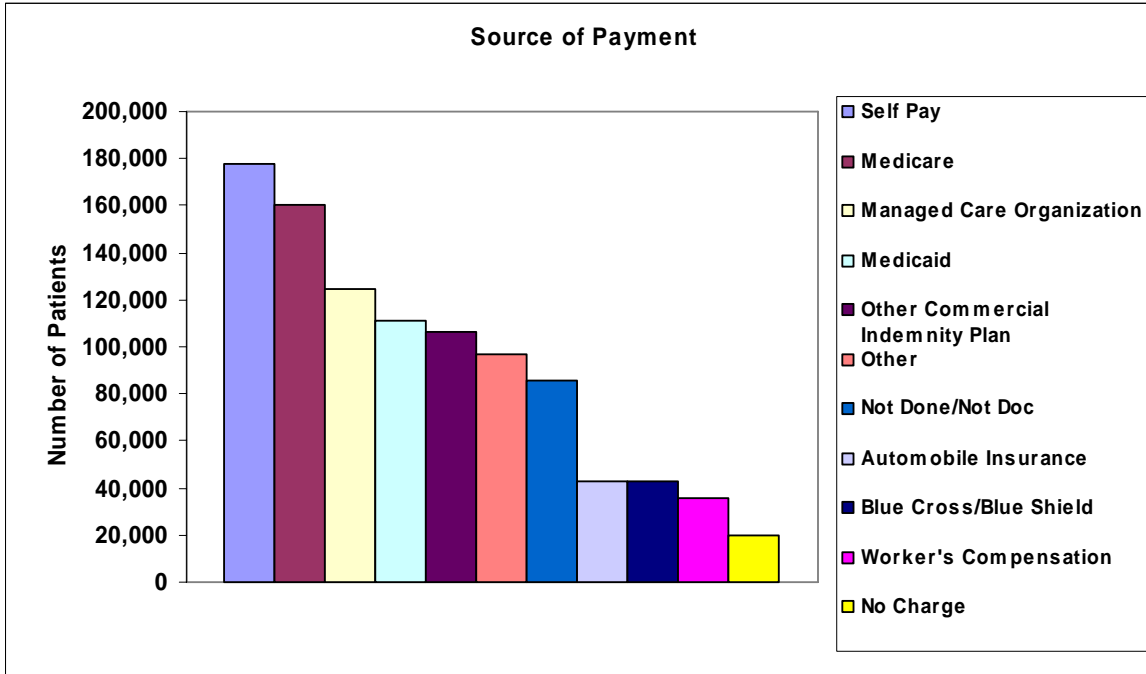


Figure 4A

Source of payment for hospital charges.

Source of Payment	Number	Percent
Self Pay	177,820	17.3%
Medicare	160,711	15.6%
Managed Care Organization	124,944	12.1%
Medicaid	111,333	10.8%
Other Commercial Indemnity Plan	106,222	10.3%
Other	96,730	9.4%
Not Done/Not Doc	85,350	8.3%
Automobile Insurance	42,774	4.2%
Blue Cross/Blue Shield	42,561	4.1%
Worker's Compensation	36,077	3.5%
No Charge	19,991	1.9%
Government/Military Insurance	9,037	0.9%
None	4,041	0.4%
CHAMPUS	3,984	0.4%
Liability Insurance/Under Litigation	3,500	0.3%
No Fault Insurance	2,645	0.3%
Health Maintenance Organization	1,152	0.1%
MCH and Crippled Children's	1,038	0.1%
Labor and Industries (L and I)	661	0.1%
Private Charity	219	0.0%
Pending	182	0.0%
Charity	43	0.0%
Organ Donor Subsidy	8	0.0%
Commercial Insurance	6	0.0%
Health Care Service Contractor	1	0.0%
Total	1,031,030	100.0%

Figure 4B

Percentage of patients by source of payment. (Percentage of patients = number of patients by source of payment divided by the number of patients × 100).

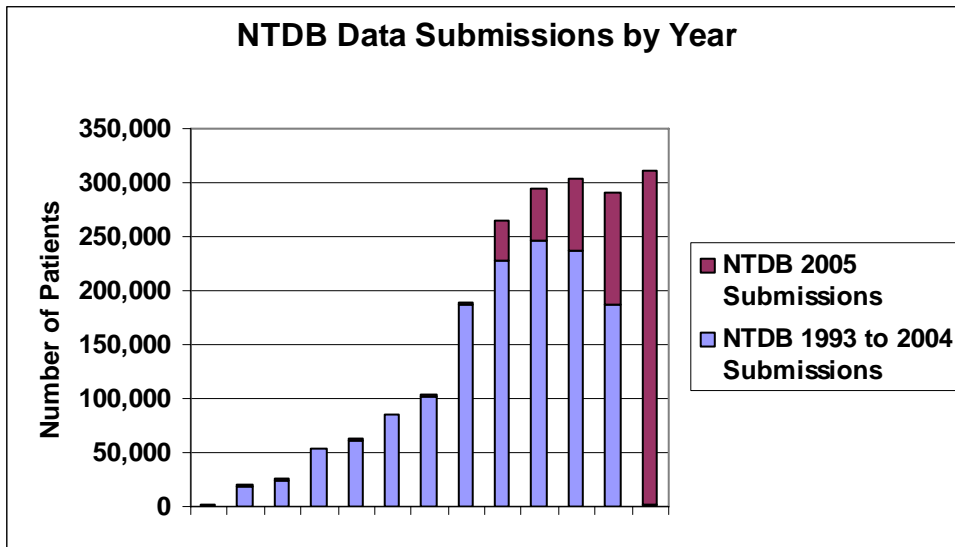


Figure 5A

Yearly comparison of all patients in the NTDB.

Year	Total Number Patients 1993 - 2005	Number Patients for 2006 Annual Report	Percent
1993	1,496	0	
1994	21,199	0	
1995	25,537	0	
1996	54,274	0	
1997	62,215	0	
1998	84,778	0	
1999	104,535	0	
2000	188,995	0	
2001	263,958	217,626	82.5%
2002	293,941	234,795	79.9%
2003	303,677	237,117	78.1%
2004	291,198	247,057	84.8%
2005	311,817	254,620	81.7%
Total	2,007,620	1,191,215	

Figure 5B

The 2006 Annual Report reviews the combined data set for the period 2001 - 2005 that contains 1,191,215 records.

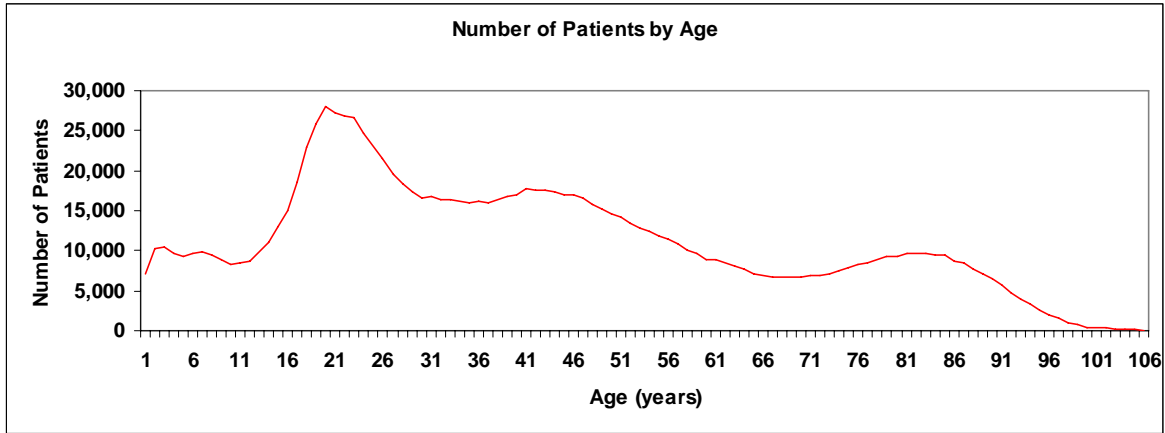


Figure 6A
Number of patients grouped by age.

Age Range	Number	Percent
< 1	7,136	0.6%
1 - 4	39,765	3.3%
5 - 9	46,458	3.9%
10 - 14	51,276	4.3%
15 - 19	110,376	9.3%
20 - 24	128,539	10.8%
25 - 34	175,196	14.7%
35 - 44	169,484	14.2%
45 - 54	143,902	12.1%
55 - 64	91,072	7.7%
65 - 74	70,291	5.9%
75 - 84	91,819	7.7%
≥ 85	65,901	5.5%
Total	1,191,215	100.0%

Figure 6B
Percentage of all patients = number of patients by age range divided by total number of patients × 100.

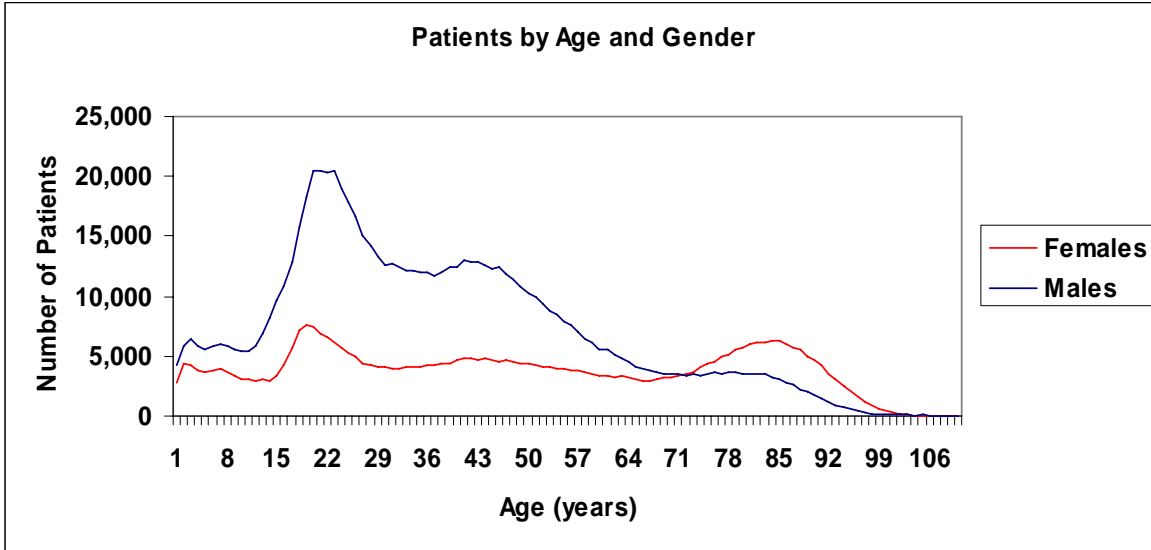


Figure 7A
Number of men and women grouped by age.

Age Range	Number	Number Males	Percent Males	Number Females	Percent Females
< 1	7,136	4,307	60.4%	2,829	39.6%
1 - 4	39,765	23,573	59.3%	16,192	40.7%
5 - 9	46,458	28,650	61.7%	17,808	38.3%
10 - 14	51,276	35,989	70.2%	15,287	29.8%
15 - 19	110,376	78,177	70.8%	32,199	29.2%
20 - 24	128,539	98,090	76.3%	30,449	23.7%
25 - 34	175,196	133,153	76.0%	42,043	24.0%
35 - 44	169,484	123,905	73.1%	45,579	26.9%
45 - 54	143,902	101,043	70.2%	42,859	29.8%
55 - 64	91,072	56,790	62.4%	34,282	37.6%
65 - 74	70,291	35,764	50.9%	34,527	49.1%
75 - 84	91,819	34,912	38.0%	56,907	62.0%
≥ 85	65,901	18,150	27.5%	47,751	72.5%
Totals	1,191,215	772,503		418,712	

Figure 7B
Percentage of patients for men and women at each age range from 0 to 85 and older.

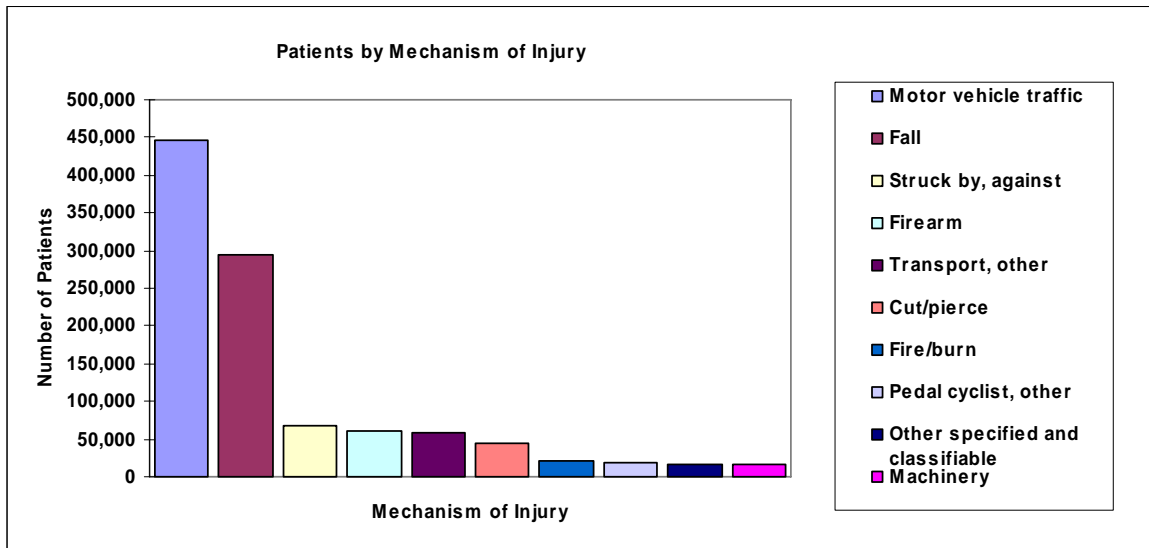


Figure 8A

Proportional distribution of patients by mechanism of injury. Mechanism of injury is defined in Appendix D.

Mechanism of Injury	Number	Percent
Motor vehicle traffic	447,009	41.3%
Fall	293,804	27.2%
Struck by, against	68,691	6.4%
Firearm	60,377	5.6%
Transport, other	58,635	5.4%
Cut/pierce	44,079	4.1%
Fire/burn	21,209	2.0%
Pedal cyclist, other	17,589	1.6%
Other specified and classifiable	17,228	1.6%
Machinery	15,900	1.5%
Unspecified	14,070	1.3%
Natural/environmental	9,165	0.9%
Pedestrian, other	4,012	0.4%
Other specified, not elsewhere classifiable	2,944	0.3%
Overexertion	2,263	0.2%
Other specified, not elsewhere	1,947	0.2%
Suffocation	1,150	0.1%
Drowning/submersion	747	0.1%
Poisoning	641	0.1%
Adverse effects	597	0.1%
Totals	1,082,057	100.0%

Figure 8B

Percentage of total patients by mechanism of injury.

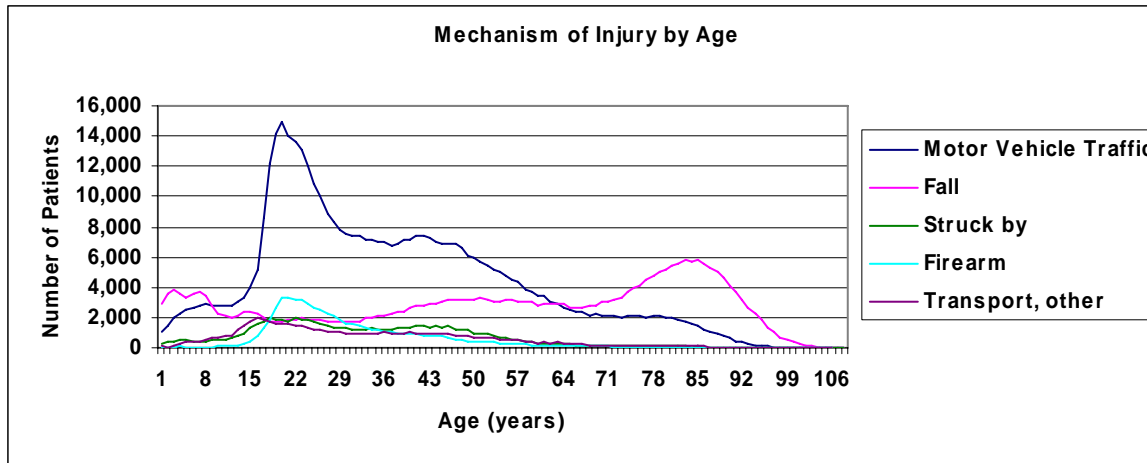


Figure 9A

Number of patients injured by the most common mechanism of injury categories by age. Mechanism of injury is defined in Appendix D.

Figure 9B

Percentage of patients due to the most common mechanism of injury categories by age range.

Age Range	Number	Number Motor Vehicle Traffic	Percent Motor Vehicle Traffic	Number Fall	Percent Fall	Number Struck by	Percent Struck by	Number Firearm	Percent Firearm	Number Transport, other	Percent Transport, other
< 1	7,136	1,019	14.3%	2,944	41.3%	259	3.6%	55	0.8%	76	1.1%
1 - 4	39,765	8,253	20.8%	14,162	35.6%	1,759	4.4%	192	0.5%	747	1.9%
5 - 9	46,458	13,899	29.9%	15,781	34.0%	2,250	4.8%	289	0.6%	2,596	5.6%
10 - 14	51,276	15,994	31.2%	10,910	21.3%	4,181	8.2%	1,005	2.0%	6,045	11.8%
15 - 19	110,376	55,057	49.9%	9,433	8.6%	8,778	8.0%	10,031	9.1%	8,656	7.8%
20 - 24	128,539	63,550	49.4%	9,424	7.3%	9,147	7.1%	15,335	11.9%	6,952	5.4%
25 - 34	175,196	78,623	44.9%	18,184	10.4%	13,263	7.6%	17,038	9.7%	9,905	5.7%
35 - 44	169,484	71,038	41.9%	26,149	15.4%	13,514	8.0%	8,852	5.2%	9,694	5.7%
45 - 54	143,902	58,436	40.6%	31,704	22.0%	9,700	6.7%	4,458	3.1%	6,981	4.9%
55 - 64	91,072	34,346	37.7%	29,147	32.0%	3,288	3.6%	1,677	1.8%	3,740	4.1%
65 - 74	70,291	21,528	30.6%	30,989	44.1%	1,312	1.9%	753	1.1%	1,696	2.4%
75 - 84	91,819	18,907	20.6%	51,947	56.6%	836	0.9%	487	0.5%	1,101	1.2%
≥ 85	65,901	6,359	9.7%	43,030	65.3%	404	0.6%	205	0.3%	446	0.7%
Totals	1,191,215	447,009		293,804		68,691		60,377		58,635	

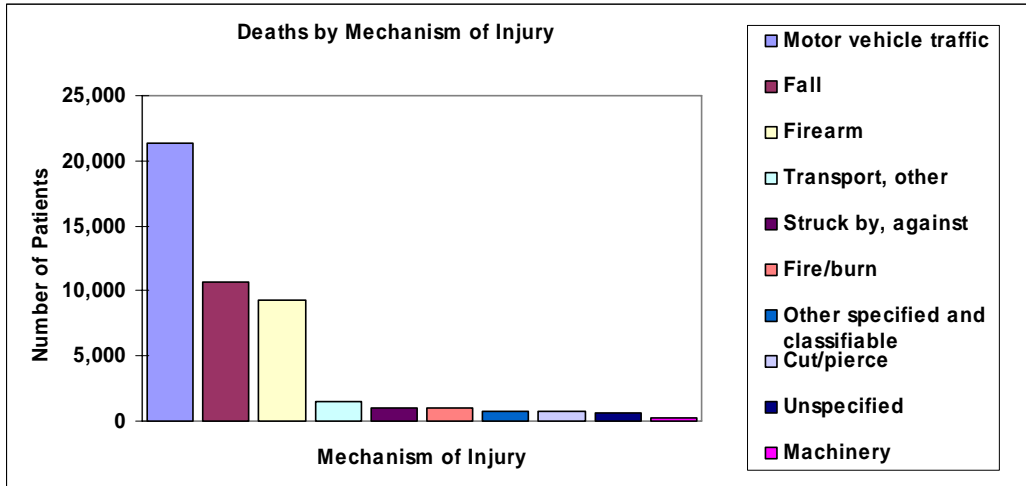


Figure 10A

Number of deaths in each category of injury mechanism. Mechanism of injury is defined in Appendix D.

Other includes the other specified and classifiable mechanism.

Mechanism of Injury	Number	Number Died	Case Fatality
Motor vehicle traffic	447,009	21,419	4.8%
Fall	293,804	10,637	3.6%
Firearm	60,377	9,278	15.4%
Transport, other	58,635	1,469	2.5%
Struck by, against	68,691	958	1.4%
Fire/burn	21,209	956	4.5%
Other specified and classifiable	17,228	799	4.6%
Cut/pierce	44,079	704	1.6%
Unspecified	14,070	638	4.5%
Machinery	15,900	277	1.7%
Suffocation	1,150	260	22.6%
Pedestrian, other	4,012	225	5.6%
Pedal cyclist, other	17,589	165	0.9%
Natural/environmental	9,165	107	1.2%
Drowning/submersion	747	86	11.5%
Other specified, not elsewhere classifiable	2,944	72	2.5%
Other specified, not elsewhere	1,947	56	2.9%
Adverse effects	597	21	3.5%
Poisoning	641	13	2.0%
Overexertion	2,263	9	0.4%
Totals	1,082,057	48,149	

Figure 10B

Percentage of deaths by mechanism of injury. (Case fatality = number of deaths/number of patients × 100).

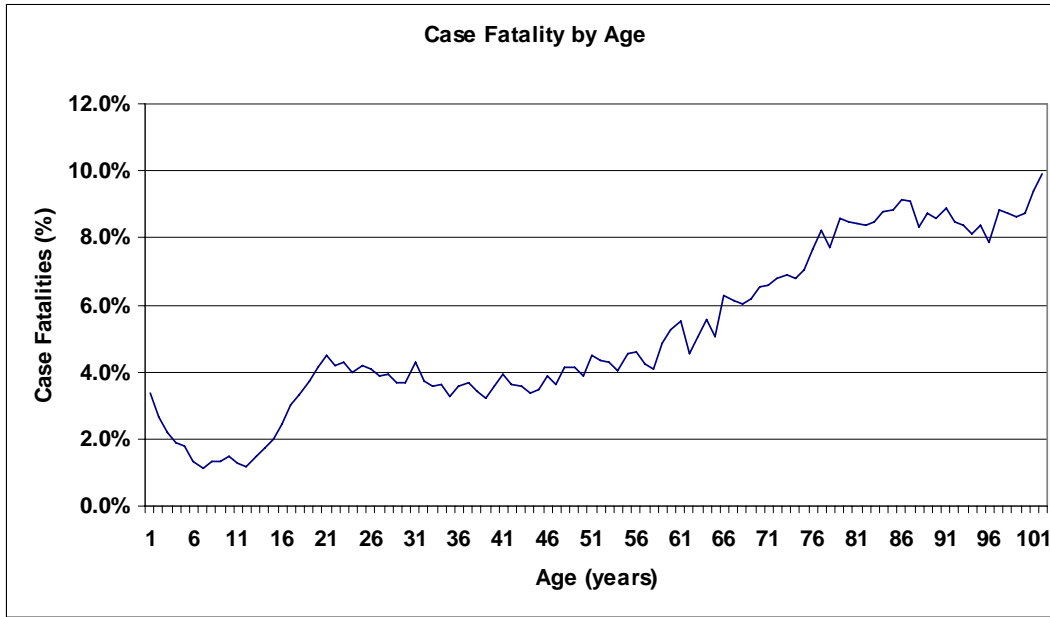


Figure 11A

Case fatality by age. (Case Fatality = number of deaths divided by the number of patients × 100 by age).

Age Range	Number	Number Died	Case Fatality
< 1	7,136	242	3.4%
1 - 4	39,765	852	2.1%
5 - 9	46,458	610	1.3%
10 - 14	51,276	809	1.6%
15 - 19	110,376	3,817	3.5%
20 - 24	128,539	5,431	4.2%
25 - 34	175,196	6,637	3.8%
35 - 44	169,484	6,014	3.6%
45 - 54	143,902	5,920	4.1%
55 - 64	91,072	4,400	4.8%
65 - 74	70,291	4,600	6.5%
75 - 84	91,819	7,687	8.4%
≥ 85	65,901	5,756	8.7%
Totals	1,191,215	52,775	

Figure 11B

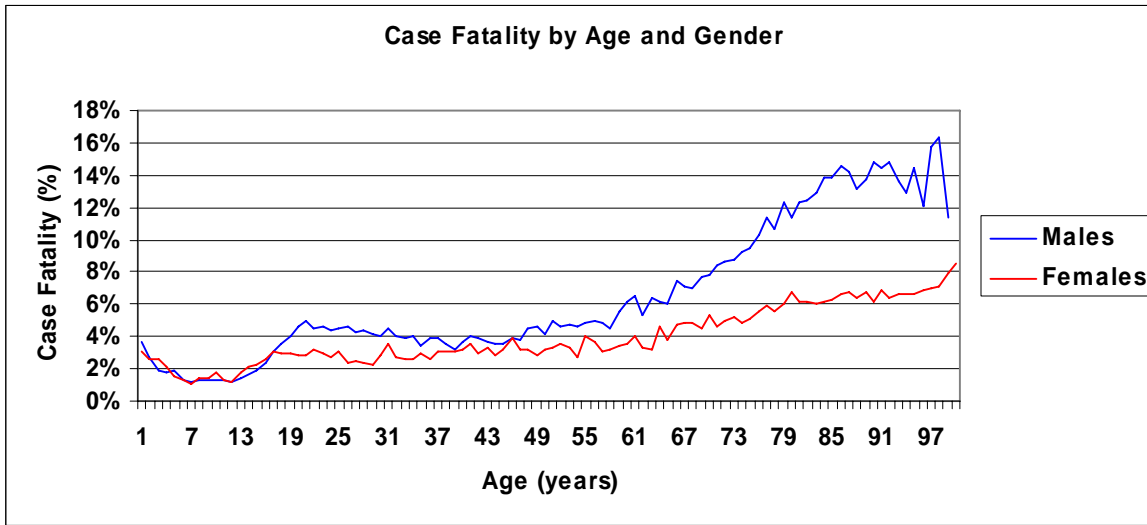


Figure 12A

Case fatality for males and females grouped by age. (Case fatality = number of deaths divided by the number of patients × 100 by age and gender).

Age Range	Number Died	Number Females	Female Deaths	Case Fatality Female	Number Males	Male Deaths	Case Fatality Male
< 1	242	2,829	86	3.0%	4,307	156	3.6%
1 - 4	852	16,192	363	2.2%	23,573	489	2.1%
5 - 9	610	17,808	250	1.4%	28,650	360	1.3%
10 - 14	809	15,287	264	1.7%	35,989	545	1.5%
15 - 19	3,817	32,199	932	2.9%	78,177	2,885	3.7%
20 - 24	5,431	30,449	900	3.0%	98,090	4,531	4.6%
25 - 34	6,637	42,043	1,119	2.7%	133,153	5,518	4.1%
35 - 44	6,014	45,579	1,415	3.1%	123,905	4,599	3.7%
45 - 54	5,920	42,859	1,424	3.3%	101,043	4,496	4.5%
55 - 64	4,400	34,282	1,234	3.6%	56,790	3,166	5.6%
65 - 74	4,600	34,527	1,700	4.9%	35,764	2,900	8.1%
75 - 84	7,687	56,907	3,469	6.1%	34,912	4,218	12.1%
≥ 85	5,756	47,751	3,175	6.7%	18,150	2,581	14.2%
Totals	52,775	418,712	16,331		772,503	36,444	

Figure 12B

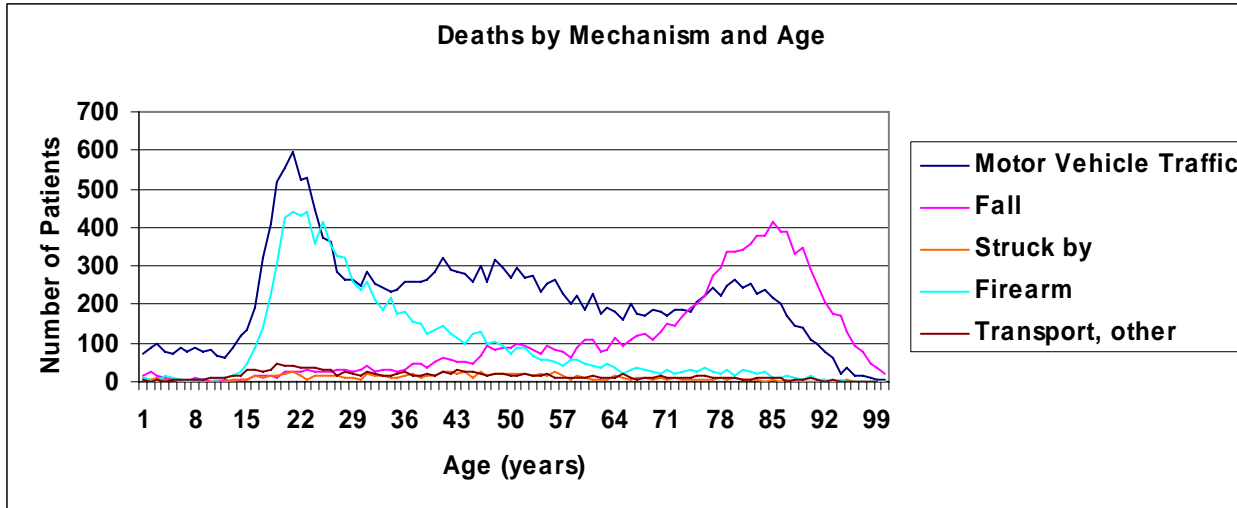


Figure 13A

Number of deaths due to injuries from the most common mechanism of injury categories grouped by age.

Figure 13B

Case fatality due to the most common mechanism of injury categories grouped by age range. (Case fatality = number of deaths divided by the number of patients × 100 by mechanism of injury and age range).

Age Range	Number Motor Vehicle Traffic	Number Died Motor Vehicle Traffic	Case Fatality Motor Vehicle Traffic	Number Fall	Number Died by Fall	Case Fatality Fall	Number Struck by	Number Died Struck by	Case Fatality Struck by	Number Firearms	Number Died Firearm	Case Fatality by Firearm	Number by Transport/ Other	Number Died by Transport/ Other	Case Fatality by Transport/ Other
< 1	1,019	73	7.2%	2,944	13	0.4%	259	9	3.5%	55	9	16.4%	76	4	5.3%
1 - 4	8,253	344	4.2%	14,162	54	0.4%	1,759	20	1.1%	192	32	16.7%	747	14	1.9%
5 - 9	13,899	417	3.0%	15,781	22	0.1%	2,250	8	0.4%	289	26	9.0%	2,596	34	1.3%
10 - 14	15,994	470	2.9%	10,910	17	0.2%	4,181	14	0.3%	1,005	104	10.4%	6,045	82	1.4%
15 - 19	55,057	2,001	3.6%	9,433	80	0.9%	8,778	73	0.8%	10,031	1,185	11.8%	8,656	173	2.0%
20 - 24	63,550	2,471	3.9%	9,424	132	1.4%	9,147	77	0.8%	15,335	2,085	13.6%	6,952	178	2.6%
25 - 34	78,623	2,678	3.4%	18,184	293	1.6%	13,263	116	0.9%	17,038	2,550	15.0%	9,905	212	2.1%
35 - 44	71,038	2,764	3.9%	26,149	482	1.8%	13,514	178	1.3%	8,852	1,355	15.3%	9,694	219	2.3%
45 - 54	58,436	2,770	4.7%	31,704	846	2.7%	9,700	198	2.0%	4,458	859	19.3%	6,981	170	2.4%
55 - 64	34,346	2,043	6.0%	29,147	901	3.1%	3,288	112	3.4%	1,677	434	25.9%	3,740	125	3.3%
65 - 74	21,528	1,852	8.6%	30,989	1,452	4.7%	1,312	76	5.8%	753	272	36.1%	1,696	107	6.3%
75 - 84	18,907	2,389	12.6%	51,947	3,332	6.4%	836	56	6.7%	487	247	50.7%	1,101	105	9.5%
≥ 85	6,359	1,147	18.0%	43,030	3,013	7.0%	404	21	5.2%	205	120	58.5%	446	46	10.3%
Totals	447,009	21,419		293,804	10,637		68,691	958		60,377	9,278		58,635	1,469	

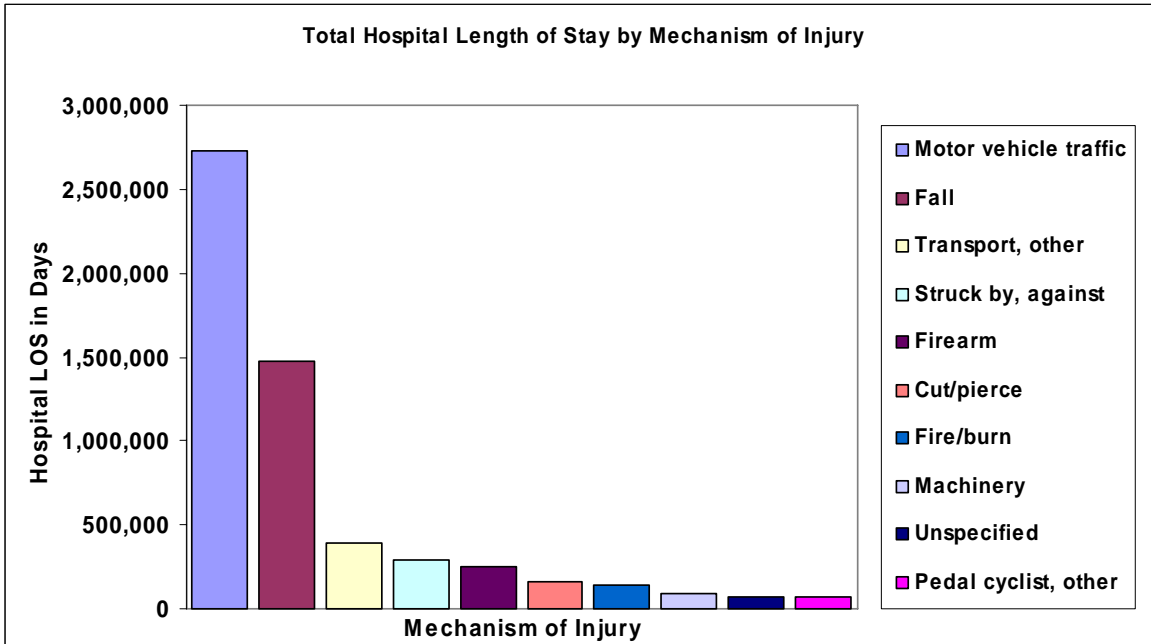


Figure 14A

Proportional distribution of total hospital length of stay, grouped by mechanism of injury. Mechanism of injury is defined in Appendix D.

Mechanism of Injury	Number	Percent	Total Hospital LOS in Days	Percent of Hospital LOS in Days	Average Hospital LOS in Days
Motor vehicle traffic	447,009	41.3%	2,728,733	46.8%	6.1
Fall	293,804	27.2%	1,470,169	25.2%	5.0
Firearm	60,377	5.6%	391,738	6.7%	6.5
Transport, other	58,635	5.4%	285,956	4.9%	4.9
Struck by, against	68,691	6.4%	250,324	4.3%	3.6
Fire/burn	21,209	2.0%	159,628	2.7%	7.5
Cut/pierce	44,079	4.1%	143,173	2.5%	3.2
Other specified and classifiable	17,228	1.6%	90,510	1.6%	5.3
Machinery	15,900	1.5%	75,167	1.3%	4.7
Unspecified	14,070	1.3%	74,037	1.3%	5.3
Pedal cyclist, other	17,589	1.6%	56,516	1.0%	3.2
Natural/environmental	9,165	0.9%	33,425	0.6%	3.6
Pedestrian, other	4,012	0.4%	24,998	0.4%	6.2
Other specified, not elsewhere classifiable	2,944	0.3%	12,184	0.2%	4.1
Other specified, not elsewhere	1,947	0.2%	7,153	0.1%	3.7
Overexertion	2,263	0.2%	6,945	0.1%	3.1
Adverse effects	597	0.1%	5,697	0.1%	9.5
Suffocation	1,150	0.1%	5,199	0.1%	4.5
Drowning/submersion	747	0.1%	4,699	0.1%	6.3
Poisoning	641	0.1%	3,002	0.1%	4.7
Totals	1,082,057	100.4%	5,829,253	100.1%	

Figure 14B

Percentage of injuries and average hospital length of stay (in days) by mechanism of injury.

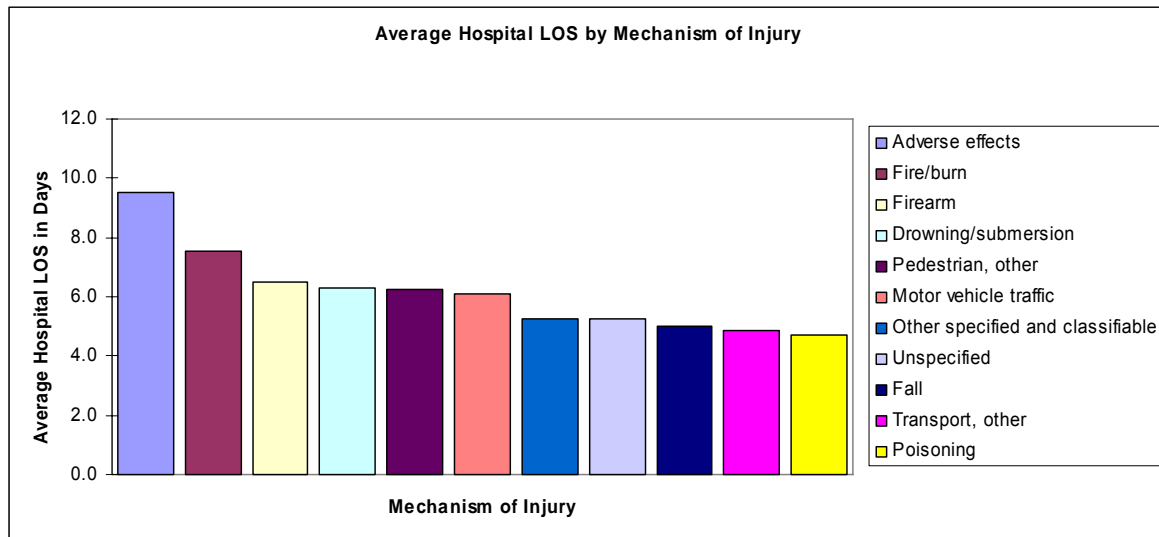


Figure 15A

Average hospital length of stay grouped by mechanism of injury. Mechanism of injury is defined in Appendix D.

Mechanism of Injury	Number	Percent	Average Hospital LOS in Days
Adverse effects	597	0.1%	9.5
Fire/burn	21,209	2.0%	7.5
Firearm	60,377	5.6%	6.5
Drowning/submersion	747	0.1%	6.3
Pedestrian, other	4,012	0.4%	6.2
Motor vehicle traffic	447,009	41.3%	6.1
Other specified and classifiable	14,070	1.3%	5.3
Unspecified	17,228	1.6%	5.3
Fall	293,804	27.2%	5.0
Transport, other	58,635	5.4%	4.9
Poisoning	15,900	1.5%	4.7
Machinery	641	0.1%	4.7
Suffocation	1,150	0.1%	4.5
Other specified, not elsewhere classifiable	2,944	0.3%	4.1
Other specified, not elsewhere	1,947	0.2%	3.7
Natural/environmental	9,165	0.9%	3.6
Struck by, against	68,691	6.4%	3.6
Cut/pierce	44,079	4.1%	3.2
Pedal cyclist, other	17,589	1.6%	3.2
Overexertion	2,263	0.2%	3.1
Total	1,082,057	100.4%	

Figure 15B

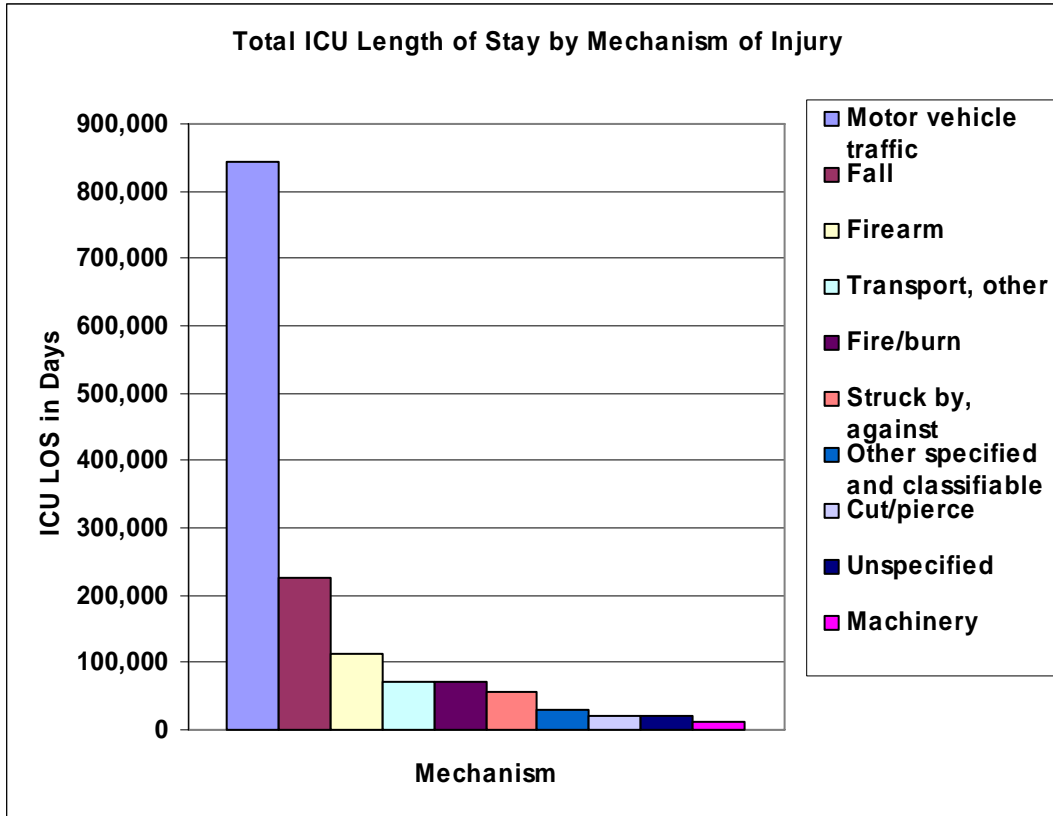


Figure 16A

Proportional distribution of total days of ICU care grouped by mechanism of injury.

Mechanism of injury is defined in Appendix D.

Mechanism of Injury	Number	Percent	Total ICU LOS in Days	Percent ICU LOS in Days
Motor vehicle traffic	313,462	43.6%	844,927	56.4%
Fall	177,439	24.7%	226,897	15.1%
Struck by, against	41,066	5.7%	112,239	7.5%
Transport, other	41,178	5.7%	72,767	4.9%
Firearm	16,175	2.3%	70,952	4.7%
Cut/pierce	45,055	6.3%	55,155	3.7%
Fire/burn	12,189	1.7%	29,173	2.0%
Other specified and classifiable	26,213	3.7%	21,404	1.4%
Pedal cyclist, other	9,091	1.3%	19,824	1.3%
Machinery	10,662	1.5%	12,709	0.9%
Unspecified	11,256	1.6%	11,389	0.8%
Natural/environmental	2,581	0.4%	5,921	0.4%
Pedestrian, other	5,949	0.8%	5,418	0.4%
Other specified, not elsewhere classifiable	1,827	0.3%	2,750	0.2%
Other specified, not elsewhere	907	0.1%	2,324	0.2%
Suffocation	574	0.1%	1,973	0.1%
Overexertion	1,359	0.2%	1,174	0.1%
Drowning/submersion	293	0.0%	941	0.1%
Poisoning	413	0.1%	878	0.1%
Adverse effects	878	0.1%	134	0.0%
Totals	718,567	100.2%	1,498,949	99.9%

Figure 16B

Number of patients in each category of intent, as defined in Appendix D.

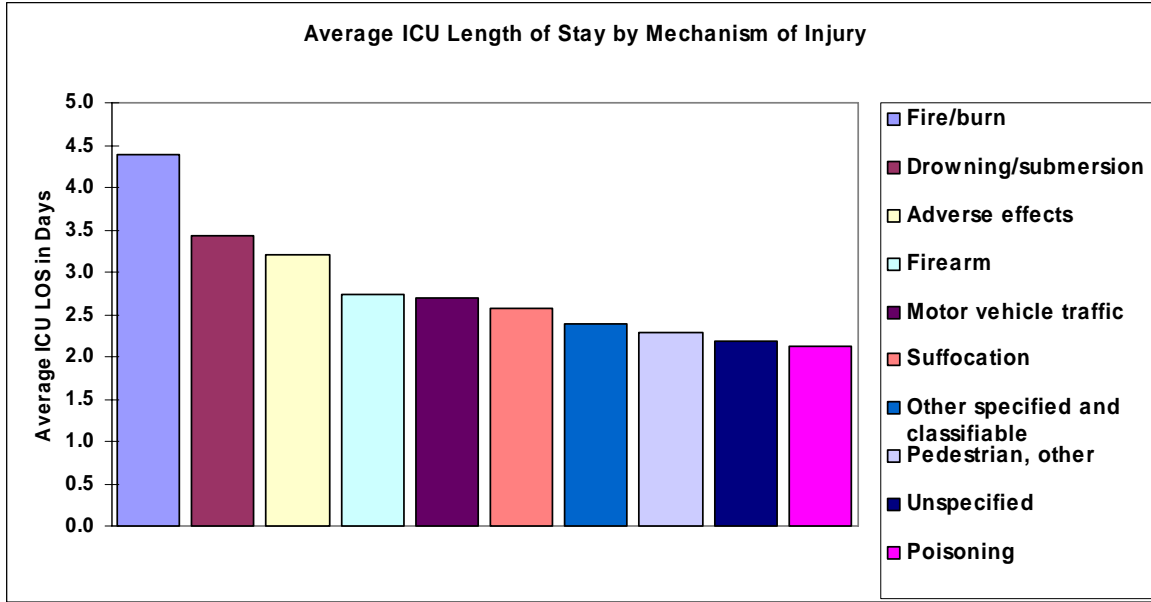


Figure 17A
Average ICU length of stay grouped by mechanism of injury.

Mechanism of injury is defined in Appendix D.

Mechanism of Injury	Number	Percent	Average ICU LOS
Fire/burn	16,175	2.3%	4.4
Drowning/submersion	574	0.1%	3.4
Adverse effects	293	0.0%	3.2
Firearm	41,066	5.7%	2.7
Motor vehicle traffic	313,462	43.6%	2.7
Suffocation	907	0.1%	2.6
Other specified and classifiable	12,189	1.7%	2.4
Pedestrian, other	2,581	0.4%	2.3
Poisoning	9,091	1.3%	2.2
Unspecified	413	0.1%	2.1
Transport, other	41,178	5.7%	1.8
Other specified, not elsewhere classifiable	1,827	0.3%	1.5
Fall	177,439	24.7%	1.3
Struck by, against	45,055	6.3%	1.2
Machinery	10,662	1.5%	1.2
Pedal cyclist, other	11,256	1.6%	1.0
Natural/environmental	5,949	0.8%	0.9
Other specified, not elsewhere	1,359	0.2%	0.9
Cut/pierce	26,213	3.7%	0.8
Overexertion	878	0.1%	0.2
Total	718,567	100.0%	

Figure 17B

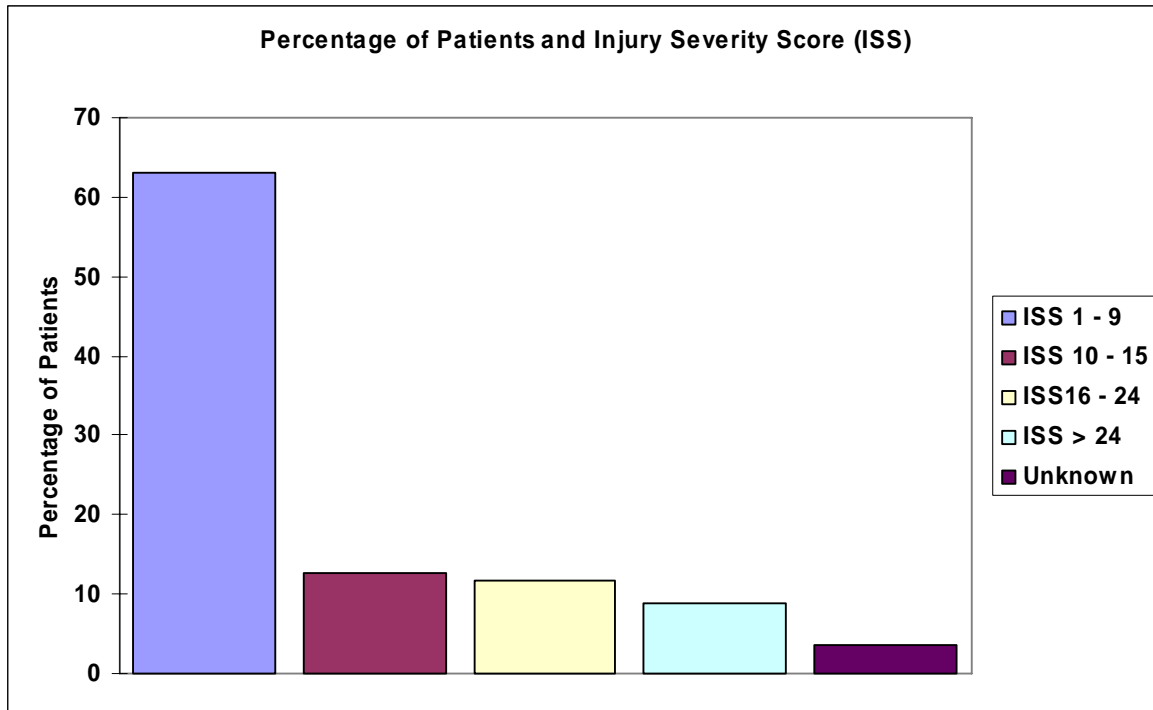


Figure 18A
Percentage of patients by Injury Severity Score (ISS) range.

ISS Range	Number	Percent
ISS 1 - 9	751,128	63.1%
ISS 10 - 15	150,804	12.7%
ISS 16 - 24	139,771	11.7%
ISS > 24	106,013	8.9%
Unknown	43,499	3.7%
Totals	1,191,215	100.0%

Figure 18B

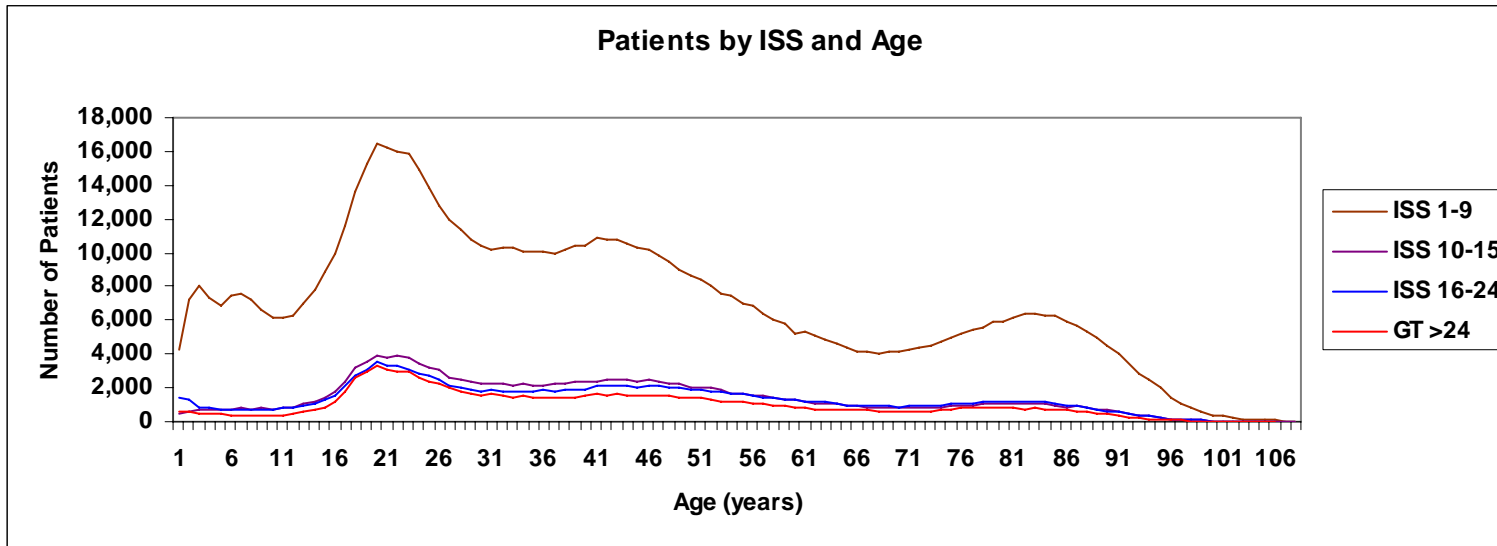


Figure 19A

Number of injured patients by Injury Severity Score (ISS) range, at each age.

Age Range	Number	Percent	ISS 1-9	Percent	ISS 10-15	Percent	ISS 16-24	Percent	ISS >24	Percent	Unknown
< 1	7,136	0.6%	4,321	60.6%	472	6.6%	1,371	19.2%	604	8.5%	368
1 - 4	39,765	3.3%	29,594	74.4%	2,647	6.7%	3,601	9.1%	2,018	5.1%	1,905
5 - 9	46,458	3.9%	34,994	75.3%	3,835	8.3%	3,589	7.7%	1,936	4.2%	2,104
10 - 14	51,276	4.3%	36,152	70.5%	5,177	10.1%	4,905	9.6%	2,932	5.7%	2,110
15 - 19	110,376	9.3%	66,883	60.6%	14,702	13.3%	13,110	11.9%	11,808	10.7%	3,873
20 - 24	128,539	10.8%	76,790	59.7%	18,076	14.1%	15,188	11.8%	13,953	10.9%	4,532
25 - 34	175,196	14.7%	108,302	61.8%	23,794	13.6%	19,266	11.0%	16,934	9.7%	6,900
35 - 44	169,484	14.2%	104,305	61.5%	23,612	13.9%	20,070	11.8%	15,243	9.0%	6,254
45 - 54	143,902	12.1%	85,720	59.6%	20,595	14.3%	18,723	13.0%	13,485	9.4%	5,379
55 - 64	91,072	7.7%	54,514	59.9%	12,335	13.5%	12,344	13.6%	8,585	9.4%	3,294
65 - 74	70,291	5.9%	43,434	61.8%	8,667	12.3%	9,478	13.5%	6,420	9.1%	2,292
75 - 84	91,819	7.7%	59,588	64.9%	10,197	11.1%	11,454	12.5%	7,923	8.6%	2,657
≥ 85	65,901	5.5%	46,531	70.6%	6,695	10.2%	6,672	10.1%	4,172	6.3%	1,831
Totals	1,191,215		751,128		150,804		139,771		106,013		43,499

Figure 19B

Percentage of patients by Injury Severity Score (ISS) range at each age range.

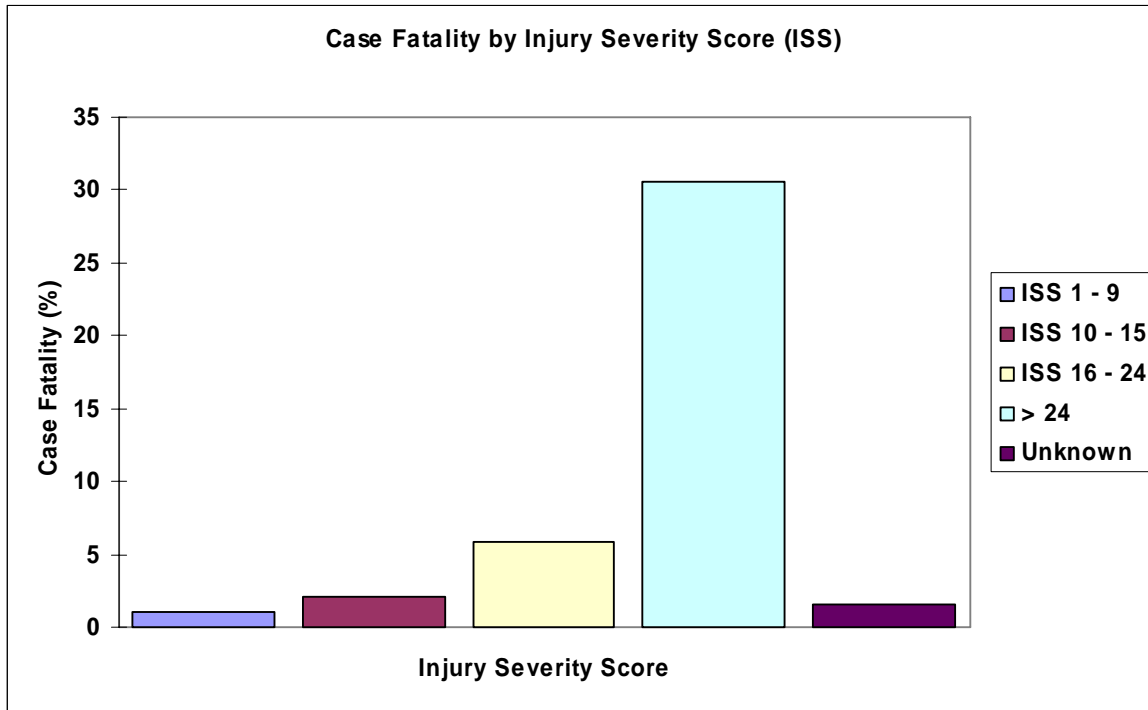


Figure 20A
Case fatality grouped by Injury Severity Score (ISS) range. (Case fatality = number of deaths divided by the number of patients × 100 by ISS range).

ISS Range	Number	Number Died	Case Fatality
1 - 9	751,128	8354	1.1%
10 - 15	150,804	3266	2.2%
16 - 24	139,771	8064	5.8%
> 24	106,013	32384	30.6%
Unknown	43,499	707	1.6%
Totals	1,191,215	52,775	

Figure 20B

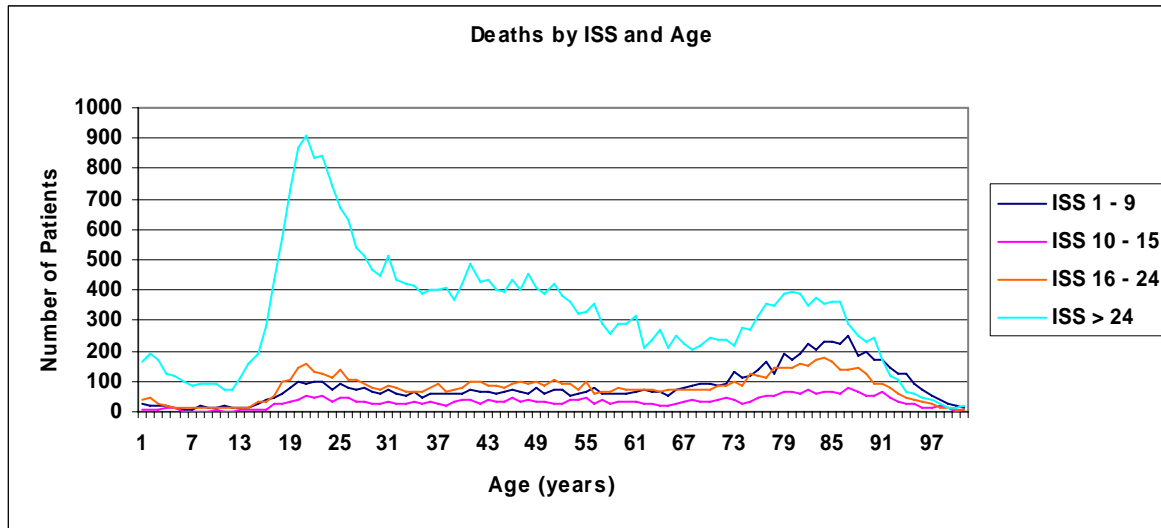


Figure 21A
Number of deaths grouped by Injury Severity Score (ISS) range at each age.

Figure 21B
Case fatality by ISS range at each age range. (Case fatality by ISS range = number of deaths by ISS range divided by the number of patients × 100 by age range).

Age Range	Number	Number Died	Case Fatality All ISS	ISS 1-9	Number Died ISS 1-9	Case Fatality ISS 1-9	ISS 10-15	Number Died ISS 10-15	Case Fatality ISS 10-15	ISS 16-24	Number Died ISS 16-24	Case Fatality ISS 16-24	ISS >24	Number Died ISS >24	Case Fatality ISS >24
< 1	7,136	242	3.4%	4,321	27	0.6%	472	7	1.5%	1,371	40	2.9%	604	165	27.3%
1 - 4	39,765	852	2.1%	29,594	76	0.3%	2,647	35	1.3%	3,601	113	3.1%	2,018	614	30.4%
5 - 9	46,458	610	1.3%	34,994	61	0.2%	3,835	15	0.4%	3,589	63	1.8%	1,936	462	23.9%
10 - 14	51,276	809	1.6%	36,152	79	0.2%	5,177	25	0.5%	4,905	83	1.7%	2,932	611	20.8%
15 - 19	110,376	3,817	3.5%	66,883	318	0.5%	14,702	136	0.9%	13,110	430	3.3%	11,808	2,889	24.5%
20 - 24	128,539	5,431	4.2%	76,790	461	0.6%	18,076	234	1.3%	15,188	666	4.4%	13,953	4,001	28.7%
25 - 34	175,196	6,637	3.8%	108,302	657	0.6%	23,794	316	1.3%	19,266	817	4.2%	16,934	4,761	28.1%
35 - 44	169,484	6,014	3.6%	104,305	628	0.6%	23,612	321	1.4%	20,070	830	4.1%	15,243	4,145	27.2%
45 - 54	143,902	5,920	4.1%	85,720	655	0.8%	20,595	357	1.7%	18,723	923	4.9%	13,485	3,906	29.0%
55 - 64	91,072	4,400	4.8%	54,514	633	1.2%	12,335	289	2.3%	12,344	697	5.7%	8,585	2,734	31.9%
65 - 74	70,291	4,600	6.5%	43,434	954	2.2%	8,667	350	4.0%	9,478	844	8.9%	6,420	2,372	37.0%
75 - 84	91,819	7,687	8.4%	59,588	1,868	3.1%	10,197	599	5.9%	11,454	1,492	13.0%	7,923	3,626	45.8%
≥ 85	65,901	5,756	8.7%	46,531	1,937	4.2%	6,695	582	8.7%	6,672	1,066	16.0%	4,172	2,098	50.3%
Totals	1,191,215	52,775		751,128	8,354		150,804	3,266		139,771	8,064		106,013	32,384	

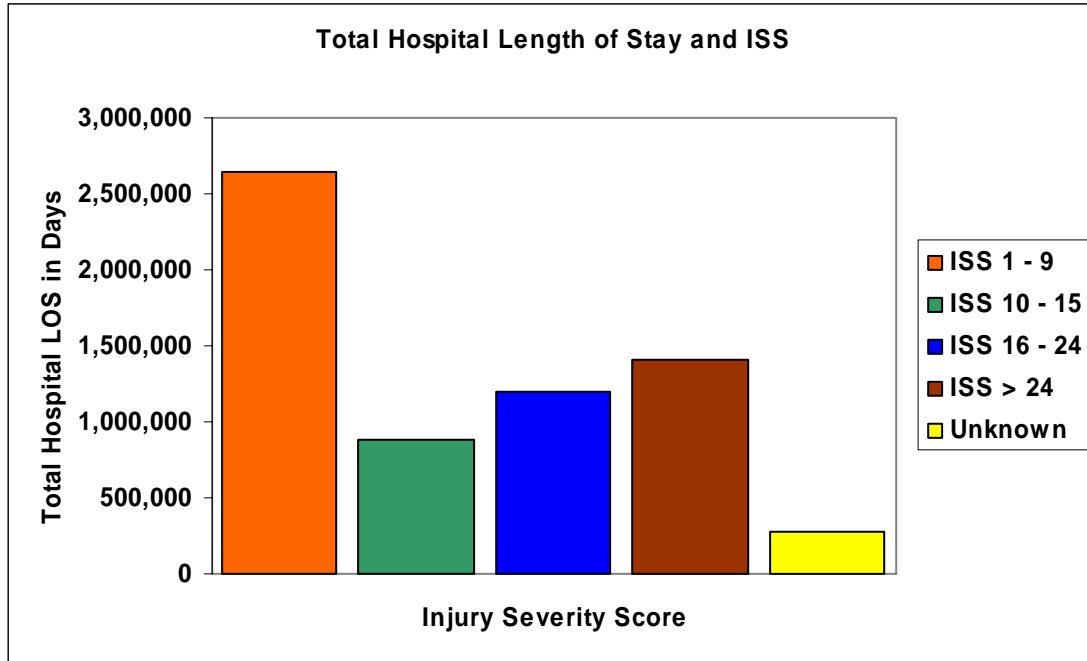


Figure 22A

Proportional distribution of total hospital length of stay for patients, grouped by Injury Severity Score (ISS) range.

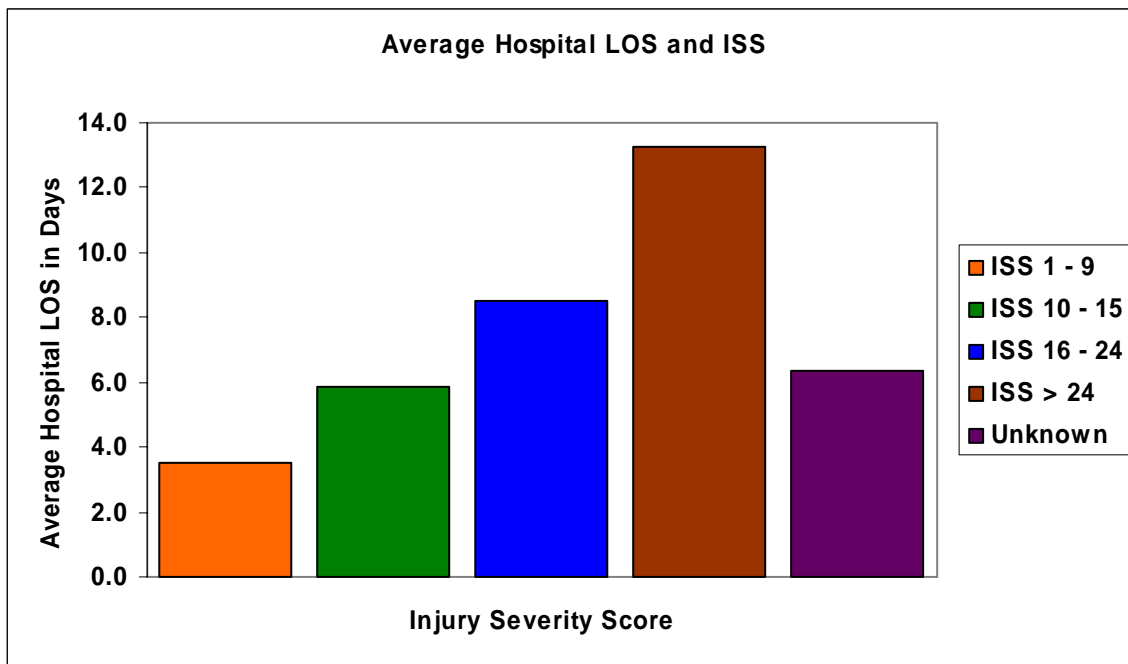


Figure 22B

Average hospital length of stay for each category of Injury Severity Score (ISS) range.

ISS Range	Number of Patients	% of Total Patients	Total Hospital LOS in Days	% Hospital LOS in Days	Average Hospital LOS in Days
1 - 9	751,128	63.1%	2,641,845	41.3%	3.5
10 - 15	150,804	12.7%	879,158	13.7%	5.8
16 - 24	139,771	11.7%	1,192,792	18.6%	8.5
> 24	106,013	8.9%	1,408,720	22.0%	13.3
Unknown	43,499	3.7%	276,857	4.3%	6.4
Totals	1,191,215	100.1%	6,399,372	99.9%	

Figure 22C

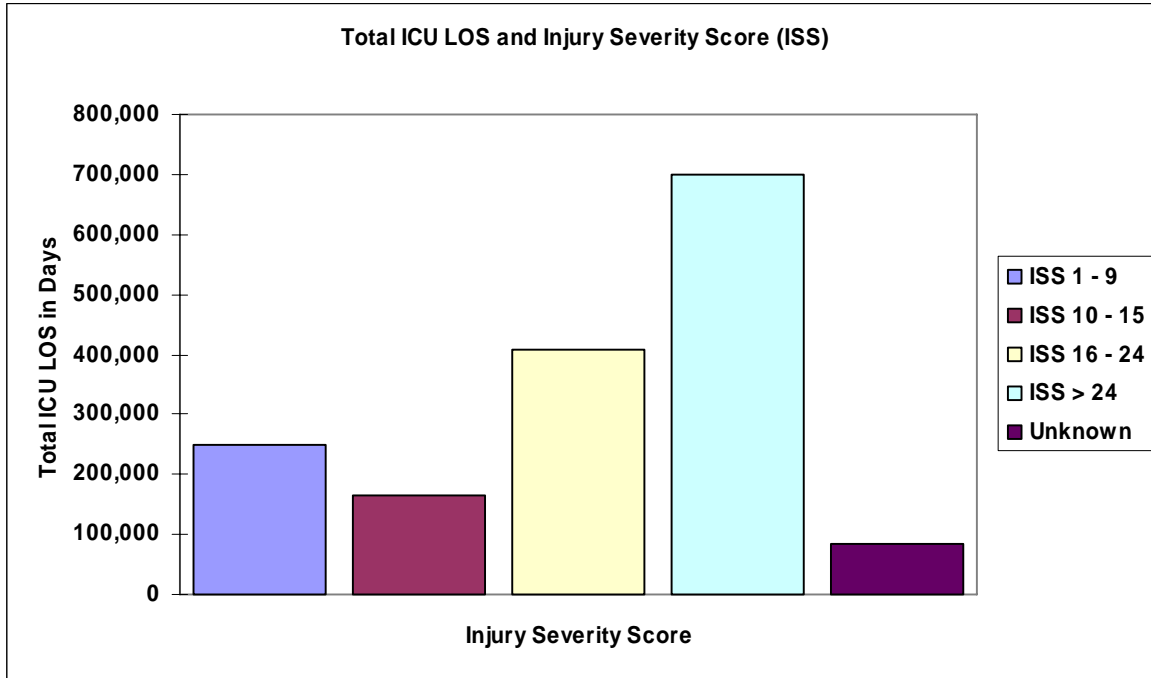


Figure 23A
Proportional distribution of total ICU length of stay for patients, grouped by Injury Severity Score (ISS) range.

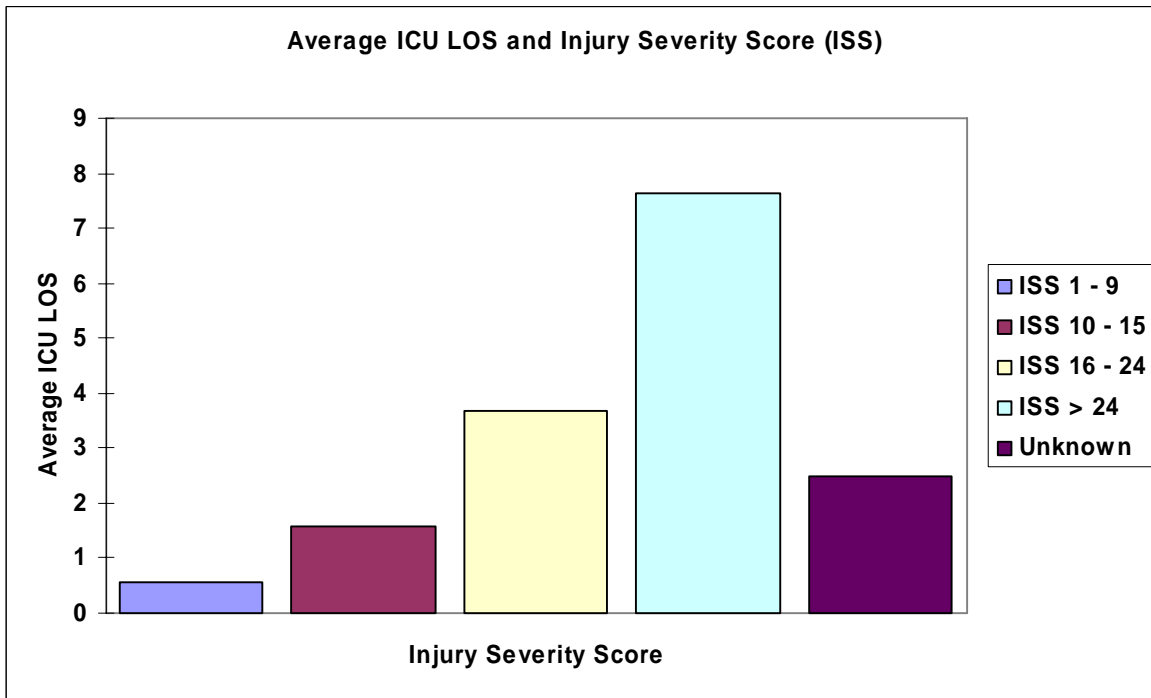


Figure 23B
Average ICU length of stay by Injury Severity Score (ISS) range.

ISS Range	Number	Percent	Total ICU LOS in Days	Percent ICU LOS in Days	Average ICU LOS in Days
1 - 9	443,561	56.5%	249,153	15.5%	0.6
10 - 15	104,608	13.3%	165,073	10.3%	1.6
16 - 24	111,853	14.2%	409,601	25.5%	3.7
> 24	91,682	11.7%	699,005	43.5%	7.6
Unknown	33,508	4.3%	83,500	5.2%	2.5
Totals	785,212	100.0%	1,606,332	100.0%	15.92

Figure 23C

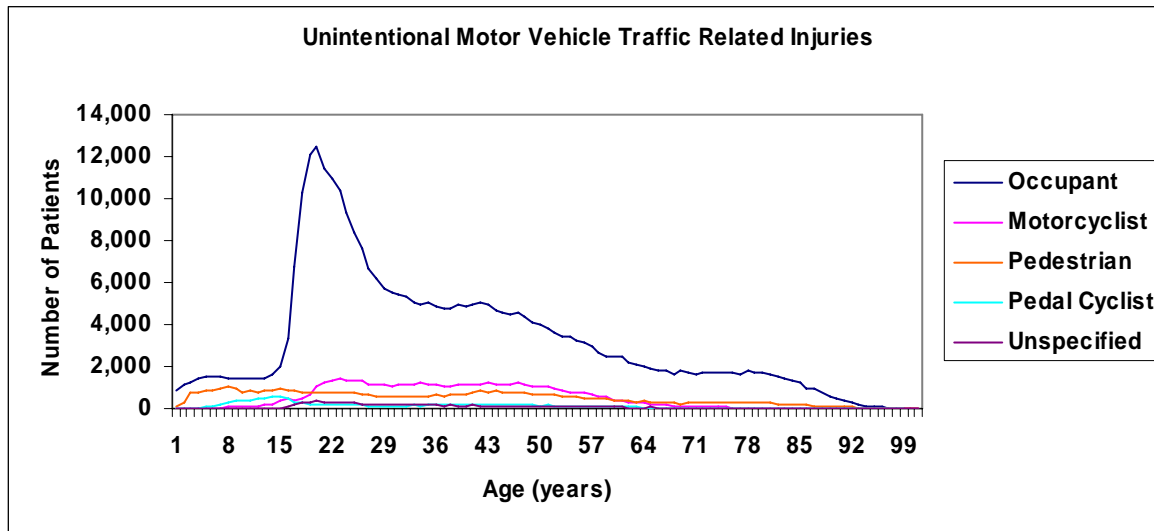


Figure 24A
Unintentional motor vehicle traffic related injuries (UMVTRI) are classified from ICD-9-CM E-Code E810 to E819.

Number of patients injured in UMVTRI, number who were occupant, motorcyclist, pedal cyclist, pedestrian and unspecified at each age.

Figure 24B
Percentage of patients for UMVTRI at each age range.

Age Range	Number	Number Occupants	Percent	Number Motorcyclists	Percent	Number Pedestrians	Percent	Number Pedal Cyclists	Percent	Number Unspecified	Percent
< 1	1,007	862	85.6%	40	4.0%	80	7.9%	11	1.1%	14	1.4%
1 - 4	8,175	5,296	64.8%	56	0.7%	2,679	32.8%	122	1.5%	22	0.3%
5 - 9	13,769	7,411	53.8%	269	2.0%	4,645	33.7%	1,386	10.1%	58	0.4%
10 - 14	15,768	7,871	49.9%	1,019	6.5%	4,305	27.3%	2,470	15.7%	103	0.7%
15 - 19	54,497	44,899	82.4%	3,080	5.7%	4,024	7.4%	1,426	2.6%	1,068	2.0%
20 - 24	63,096	50,356	79.8%	6,621	10.5%	3,769	6.0%	886	1.4%	1,464	2.3%
25 - 34	77,963	57,535	73.8%	11,581	14.9%	5,800	7.4%	1,345	1.7%	1,702	2.2%
35 - 44	70,466	48,562	68.9%	11,435	16.2%	7,368	10.5%	1,771	2.5%	1,330	1.9%
45 - 54	58,044	39,019	67.2%	9,969	17.2%	6,599	11.4%	1,477	2.5%	980	1.7%
55 - 64	34,157	24,471	71.6%	4,445	13.0%	4,014	11.8%	678	2.0%	549	1.6%
65 - 74	21,423	17,113	79.9%	1,026	4.8%	2,647	12.4%	278	1.3%	359	1.7%
75 - 84	18,815	15,620	83.0%	244	1.3%	2,453	13.0%	168	0.9%	330	1.8%
≥ 85	6,332	5,289	83.5%	44	0.7%	876	13.8%	37	0.6%	86	1.4%
Totals	443,512	324,304		49,829		49,259		12,055		8,065	

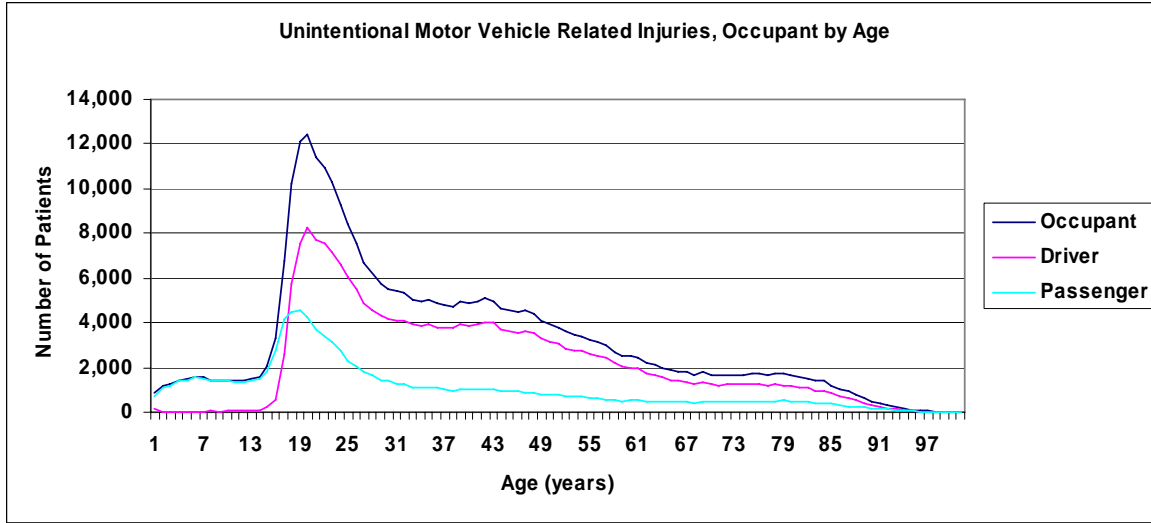


Figure 25A

Unintentional motor vehicle traffic related injuries (UMVTRI) sustained by occupants are classified from ICD-9-CM E-code E810-E819(.0,.1). Number of patients injured in UMVTRI, number who were drivers, and number who were passengers at each age.

Age Range	Number Occupants	Number Drivers	Percent Drivers	Number Passengers	Percent Passengers
< 1	862	165	19.1%	697	80.9%
1 - 4	5,296	98	1.9%	5,198	98.2%
5 - 9	7,411	197	2.7%	7,214	97.3%
10 - 14	7,871	503	6.4%	7,368	93.6%
15 - 19	44,899	24,756	55.1%	20,143	44.9%
20 - 24	50,356	35,062	69.6%	15,294	30.4%
25 - 34	57,535	43,209	75.1%	14,326	24.9%
35 - 44	48,562	38,464	79.2%	10,098	20.8%
45 - 54	39,019	31,239	80.1%	7,780	19.9%
55 - 64	24,471	19,420	79.4%	5,051	20.6%
65 - 74	17,113	12,633	73.8%	4,480	26.2%
75 - 84	15,620	11,010	70.5%	4,610	29.5%
≥ 85	5,289	3,485	65.9%	1,804	34.1%
Totals	324,304	220,241		104,063	

Figure 25B

Percentage of patients for UMVTRI occupant - driver and passenger at each age range.

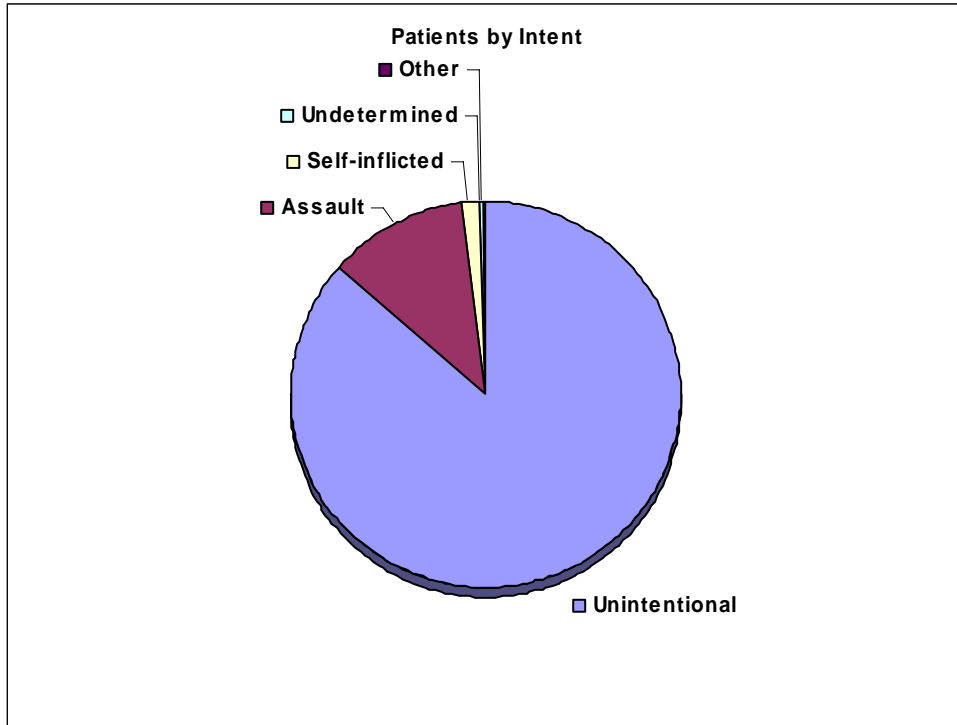


Figure 26A

Proportional distribution of patients, grouped by intent defined in Appendix D.

Injuries by Intent	Number	Percent
Unintentional	933,876	86.3%
Assault	126,744	11.7%
Self-inflicted	14,406	1.3%
Undetermined	5,398	0.5%
Other	1,633	0.2%
Totals	1,082,057	100.0%

Figure 26B

Percentage of patients by intent.

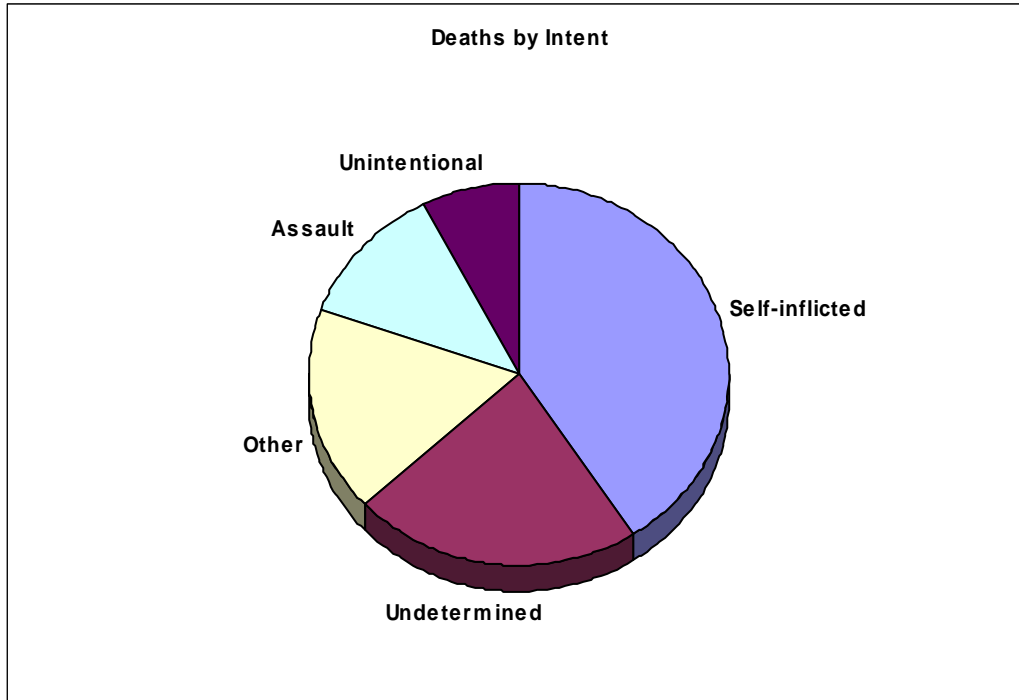


Figure 27A

Proportional distribution of deaths, grouped by Intent defined in Appendix D.

Intent	Number	Number Died	Case Fatality
Self-inflicted	14,406	3,080	21.4%
Undetermined	5,398	627	11.6%
Other	1,633	150	9.2%
Assault	126,744	7,881	6.2%
Unintentional	933,876	36,411	3.9%
Totals	1,082,057	48,149	

Figure 27B

Appendix A

Definition of trauma patient adopted by American College of Surgeons committee on trauma*

All patients with *ICD-9-CM* discharge diagnosis 800.00 – 959.9

- Excluding 905-909 (late effects of injury)
- Excluding 910-924 (blisters, contusions, abrasions, and insect bites)
- Excluding 930-939 (foreign bodies)

AND

Who were admitted

OR

Who died after receiving any evaluation or treatment or were dead on arrival

OR

Who transferred into or out of the hospital.

International Classification of Diseases, 9th Revision, Clinical Modification

* Resources for Optimal Care of the Injured Patients: 1999 by Committee on Trauma of the American College of Surgeons.

Appendix B

NTDB Data Points

The following is a listing of NTDB data elements. For more detailed field information, please see the NTDB Data Submission File Format, located on the NTDB Web site at www.ntdb.org.

FACILITY PROFILE RECORD

- ACS Verification Level
- State Designation
- Number of Adult Hospital Beds
- Number of Pediatric Hospital Beds
- Number of Burn Hospital Beds
- Number of ICU Beds Available for Trauma Patients
- Number of ICU Beds Available for Burn Patients
- Hospital Teaching Status
- Hospital Type

INCIDENT COMPLICATION RECORD

- Complication Code
- Complication Description

INCIDENT DEMOGRAPHICS RECORD

- Date of Birth
- Age
- Gender
- Race/Ethnicity
- Principal Payment Source

INCIDENT DIAGNOSIS RECORD

- ICD-9-CM* Code of Diagnosis
- Description of *ICD-9-CM* Code of Diagnosis
- ICD-9-CM* Effective Date
- Abbreviated Injury Scale (AIS) Full Code of Diagnosis
- Description of AIS Code of Diagnosis
- AIS Effective Year
- AIS Severity Score
- AIS Revision

INCIDENT DIAGNOSIS STATISTICS RECORD

- Total Injury Severity Score
- TRISS Survival Probability

INCIDENT EMERGENCY DEPARTMENT RECORD

- First Recorded Date of Patient's Arrival at Reporting Hospital Emergency Department (ED)
- First Recorded Time of Patient's Arrival at Reporting Hospital ED
- Was Trauma Surgeon Arrival in ED Timely?
- First Systolic Blood Pressure in ED
- First Unassisted Respiratory Rate in ED
- Respiratory Rate Assessment Qualifier in ED
- First Temperature in ED
- Temperature Scale
- Head CT Results
- Abdominal Evaluation
- Abdominal Evaluation Type

Base Deficit/Excess in ED
 Lowest Glasgow Coma Scale (GCS) Eye Component in ED
 Lowest GCS Verbal Component in ED
 Lowest GCS Motor Component in ED
 GCS Assessment Qualifier in ED
 GCS Total in ED
 Revised Trauma Score in ED
 Alcohol Present in Blood?
 Drugs Present?
 Admitting Service
 Emergency Department Disposition

INCIDENT INTERHOSPITAL TRANSFER RECORD

Interhospital Transfer

INCIDENT INTUBATION RECORD

Intubation Location Indicator
 Intubation Type

INCIDENT OUTCOME RECORD

Length of Stay in Hospital
 Days of Total Stay in ICU
 Ventilator Support Days
 Functional Independence Measure (FIM) Self-Feeding Score at Discharge
 Status of FIM Self-Feeding Score
 FIM Locomotion Score at Discharge
 Status of FIM Locomotion Score
 FIM Expression Score at Discharge
 Status of FIM Expression Score
 Total FIM Score
 Date of Discharge or Death
 Discharge Disposition
 Billed Hospital Charges
 Discharge Status

INCIDENT PRE-EXISTING COMORBIDITY FACTORS RECORD

Comorbidity Factor Code
 Comorbidity Description

INCIDENT PREHOSPITAL PROCEDURES RECORD

Prehospital Procedure

INCIDENT PROCEDURE RECORD

ICD-9-CM Code of Procedure
 Description of *ICD-9-CM* Code of Procedure
ICD-9-CM Effective Date
 Current Procedure Terminology (CPT-4) Code of Procedure
 Description of CPT-4 Code of Procedure
 CPT-4 Effective Year
 Date on Which Procedure Occurred
 Time at Which Procedure Occurred
 Number of Days After Arrival Procedure Was Done
 Number of Hours After Arrival Procedure Was Done
 Number of Minutes After Arrival Procedure Was Done

INCIDENT SAFETY EQUIPMENT RECORD

Safety Equipment Used

INCIDENT SCENE RECORD

Site at Which Injury Occurred
Work Relatedness of Injury
E-Code
E-Code Description
Lowest GCS Eye Component at the Scene
Lowest GCS Verbal Component at the Scene
Lowest GCS Motor Component at the Scene
GCS Assessment Qualifier at the Scene
GCS Total at the Scene
Date on Which Injury Occurred
Days Between Injury and Admission
Country in Which Injury Occurred
Injury Type

Appendix C

NTDB Data Quality

The NTDB Committee Data Quality Work Group has developed the National Trauma Data Bank Reference Manual. This manual is a resource for researchers as they use the database, helping them to evaluate the NTDB as a tool for research and providing information on the current limitations of the NTDB. The manual is available on the ACS Web site at www.ntdb.org. Records were excluded from the analysis for this report if they contained missing and/or invalid values for any of the following items:

- Date of birth
- Gender
- LOS
- ISS
- E-Code
- Discharge disposition/Discharge status
- LOS < ICU days

In addition, NTDB data records were screened for the following field-specific edit checks. Records were not excluded from analysis (unless also listed above) based on the following checks, but were flagged in the dataset if they failed the check:

Data Field	Edit Check
Gender	Valid values are Male and Female
LOS < ICU days	The total ICU days must be less than the total length of stay
Year of admission	Year of admission greater than or equal to 1993
Date of birth	Year of birth is less than or equal to year of admission and year of birth plus 120 is less than year of admission
Incident date	Must fall between date of injury and admission date
E-Code (primary)	Should not be E849.x
ED arrival time	Based on 24-hour clock from 0000 to 2359 with valid entries for hour and minute
Initial ED systolic blood pressure	Must have first systolic blood pressure between 0 and 299
Initial ED respiratory rate	First unassisted respiratory rate between 0 and 59
ED disposition	If dead on arrival (DOA), then final hospital disposition must be DOA and must have first systolic blood pressure = 0, first unassisted respiratory rate = 0
Discharge date	Year of admission must be less than or equal to Year of Death
Injury severity score (ISS)	Valid range is from 0 to 75 and must be the sum of three squares
Length of stay (LOS)	Valid range is 0 to 364
Discharge disposition/discharge status	Must be consistent (lived/died)
FIM score total	Total FIM must be an integer between 1 and 12
FIM – feed	Individual component values must be between 0 and 4
FIM – express	Individual component values must be between 0 and 4
FIM -- locomotion	Individual component values must be between 0 and 4
GCS eye	Valid range is 1 to 4, or “unobtainable,” “unknown,” or “missing”
GCS verbal	Valid range is 1 to 5, or “unobtainable,” “unknown,” or

Data Field	Edit Check
	"missing" If GCS qualifier indicates patient intubated GCS verbal must be "unobtainable"
GCS motor	Valid ranges is 1 to 6, or "unobtainable" "unknown" or "missing"
GCS qualifier	T, TP, S, L
GCS total	Must be sum of GCS eye, verbal, and motor if all three are numeric; must be "unobtainable" if any of the above are "unobtainable"
Number of days to admission	Valid range is 0 to 30, "unknown," or "missing"
Probability of survival	Valid range is 0 to 1
Ventilator days	Cannot be greater than length of stay

Appendix D

Recommended Framework for E-Code Groupings for Presenting Injury Mortality and Morbidity Data

Mechanism/Cause	Manner/Intent				
	Unintentional	Self-inflicted	Assault	Undetermined	Other ¹
Cut/pierce	E920.0-.9	E956	E966	E986	E974
Drowning/submersion	E830.0-.9, E832.0-.9 E910.0-.9	E954	E964	E984	
Fall	E880.0-E886.9, E888	E957.0-.9	E968.1	E987.0-.9	
Fire/burn	E890.0-E899, E924.0-.9	E958.1,.2,.7	E961, E968.0,.3	E988.1,.2,.7	
Fire/flame	E890.0-E899	E958.1	E968.0	E988.1	
Hot object/substance	E924.0-.9	E958.2,.7	E961, E968.3	E988.2,.7	
Firearm	E922.0-.3,.8, .9	E955.0-.4	E965.0-.4	E985.0-.4	E970
Machinery	E919 (.0-.9)				
Motor vehicle traffic ^{2,3}	E810-E819 (.0-.9)	E958.5	E968.5	E988.5	
Occupant	E810-E819 (.0,.1)				
Motorcyclist	E810-E819 (.2,.3)				
Pedal cyclist	E810-E819 (.6)				
Pedestrian	E810-E819 (.7)				
Unspecified	E810-E819 (.9)				
Pedal cyclist, other	E800-E807 (.3) E820-E825 (.6), E826.1,.9 E827-E829(.1)				
Pedestrian, other	E800-807(.2) E820-E825(.7) E826-E829(.0)				
Transport, other	E800-E807 (.0,.1,.8,.9) E820-E825 (.0-.5,.8,.9) E826.2-.8 E827-E829 (.2-.9), E831.0-.9, E833.0-E845.9	E958.6		E988.6	
Natural/environmental	E900.0-E909, E928.0-.2	E958.3		E988.3	
Bites and stings ³	E905.0-.6,.9 E906.0-.4,.5,.9				
Overexertion	E927				
Poisoning	E850.0-E869.9	E950.0-E952.9	E962.0-.9	E980.0-E982.9	E972
Struck by, against	E916-E917.9		E960.0; E968.2		E973, E975
Suffocation	E911-E913.9	E953.0-.9	E963	E983.0-.9	
Other specified and classifiable ⁴	E846-E848, E914-E915 E918, E921.0-.9, E922.4,5 E923.0-.9, E925.0-E926.9 E928.3, E929.0-.5	E955.5,.6,.7,.9 E958.0,.4	E960.1, E965.5-.9 E967.0-.9, E968.4,.6, .7 E979.0-.9	E985.5,.6,.7 E988.0,.4	E971, E978, E990-E994, E996 E997.0-.2
Other specified, not elsewhere classifiable	E928.8, E929.8	E958.8, E959	E968.8, E969	E988.8, E989	E977, E995, E997.8 E998, E999

Appendix D

Recommended Framework for E-Code Groupings for Presenting Injury Mortality and Morbidity Data

Mechanism/Cause	Manner/Intent				
	Unintentional	Self-inflicted	Assault	Undetermined	Other ¹
Unspecified	E887, E928.9, E929.9	E958.9	E968.9	E988.9	E976, E997.9
All injury	E800-E869, E880-E929	E950-E959	E960-E969, E979	E980-E989	E970-E978, E990-E999
Adverse effects					E870-E879 E930.0-E949.9
Medical care					E870-E879
Drugs					E930.0-E949.9
All external causes					E800-E999

¹Includes legal intervention (E970-E978) and operations of war (E990-E999).

²Three 4th-digit codes (.4 [occupant of streetcar], .5 [rider of animal], .8 [other specified person]) are not presented separately because of small numbers. However, because they are included in the overall motor vehicle traffic category, the sum of these categories can be derived by subtraction.

³E968.5 (assault by transport vehicle), E906.5 (bite from unspecified animal), E922.4 (unintentional injury [gunshot wound] with BB/pellet), E955.6 (suicide attempt/intentionally self-inflicted injury [gunshot wound] with BB/pellet gun), E968.6 (assault [gunshot wound] with BB/pellet gun), E985.6 (undetermined intent injury [gunshot wound] with BB/pellet gun), E928.3 (unintentional human bite), and E968.7 (assault by human bite), are specific to the *ICD-9-CM* and, therefore, only apply to morbidity coding.

⁴E849 (place of occurrence) has been excluded from the matrix. For mortality coding, an *ICD-9* E849 code does not exist. For morbidity coding, an *ICD-9-CM* E849 code should never be first-listed E code and should only appear as an additional code to specify the place of occurrence of the injury incident.

Appendix E

NTDB Bibliography

The following bibliography includes citations found through PubMed searches, as well as those supplied by NTDB researchers in response to follow-up surveys and e-mails. The list includes publications, articles in press, and presentations in which NTDB is mentioned. This list is not exhaustive. If you have an NTDB-related publication that is not listed below, please provide the citation to Melanie Neal at mneal@facs.org.

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Appendix F

Participating Hospitals

State/Facility Name	Data Submitted in 2006
ALABAMA	
University of South Alabama Medical Center	*
University of South Alabama Children's and Women's Hospital	*
University Hospital	*
Huntsville Hospital	*
DCH Regional Medical Center	*
Children's Hospital of Alabama	*
Walker Baptist Medical Center	
Northport Medical Center	
Northeast Alabama Regional Medical Center	
Crestwood Medical Center	
ALASKA	
Yukon-Kuskokwim Delta Regional Hospital	*
Alaska Regional Hospital	*
Samuel Simmonds Memorial Hospital	*
Bartlett Regional Hospital	*
Bassett Army Community Hospital	*
Central Peninsula General Hospital	*
Cordova Community Medical Center	*
Fairbanks Memorial Hospital	*
Ketchikan General Hospital	*
Providence Kodiak Island Medical Center	*
Maniilaq Health Center	*
SEARHC Mt. Edgecumbe Hospital	*
Norton Sound Regional Hospital	*
Petersburg Medical Center	*
Providence Alaska Medical Center	*
Providence Seward Medical Center	*
Sitka Community Hospital	*
South Peninsula Hospital	*
Elmendorf Regional Medical Center	*
Valdez Community Hospital	*
Mat-Su Medical Center	*
Wrangell Medical Center	*
Alaska Native Medical Center	*
Kanakanak Hospital	*
ARIZONA	
St. Joseph's Hospital and Medical Center	*
Flagstaff Medical Center	*
Banner Good Samaritan Medical Center	*
Scottsdale Healthcare - Osborn	

Maricopa Integrated Health Systems
John C. Lincoln Hospital, North Mountain

ARKANSAS

UAMS Medical Center *

White River Medical Center

Arkansas Children's Hospital

CALIFORNIA

Western Medical Center-SA *

University of California Irvine Medical Center *

University of California Davis Medical Center *

UCSD Medical Center *

St. Elizabeth Community Hospital *

Shasta Regional Medical Center *

Sharp Memorial Hospital *

Seneca District Hospital *

Scripps Memorial Hospital *

Santa Rosa Memorial Hospital *

Santa Barbara Cottage Hospital *

San Francisco General Hospital *

Oroville Hospital *

Northern California EMS *

Mercy San Juan Medical Center *

Mercy Medical Center, Redding *

Mercy Medical Center, Mt. Shasta *

Mayers Memorial Hospital *

John Muir Medical Center *

Highland Hospital *

Glenn Medical Center *

Fairchild Medical Center *

Enloe Medial Center *

Eden Hospital *

Colusa Regional Medical Center *

Biggs-Gridley *

University Medical Center

UCLA Medical Center

Stanford Hospital & Clinics

Santa Clara Valley Medical Center

San Jose Medical Center

Saint Mary Medical Center

Saint Francis Medical Center

Riverside County Regional Medical Center

Providence Holy Cross Medical Center

Palomar Medical Center

Northridge Hospital Medical Center

Mission Hospital Regional Medical Center

Memorial Medical Center

Martin Luther King / Drew Medical Center

Long Beach Memorial Medical Center

Loma Linda University Medical Center

LAC+USC Medical Center
 Huntington Memorial Hospital
 Henry Mayo Newhall Memorial Hospital
 Harbor/UCLA Medical Center
 Children's Hospital Los Angeles
 Cedars-Sinai Medical Center
 Arrowhead Regional Medical Center

COLORADO

Poudre Valley Hospital *

Penrose Hospital *

Swedish Medical Center

CONNECTICUT

Saint Vincent's Medical Center *

Saint Francis Hospital And Medical Center *

Norwalk Hospital *

Hospital of Saint Raphael *

Hartford Hospital *

Danbury Hospital

DELAWARE

Wilmington Hospital *

Nanticoke Memorial Hospital *

Milford Memorial Hospital *

Christiana Hospital *

Beebe Medical Center *

Alfred I. DuPont Hospital for Children *

State of Delaware

Bayhealth Medical Center - Kent Campus

DISTRICT OF COLUMBIA

George Washington University Medical Center

Howard University Hospital

Washington Hospital Center

FLORIDA

West Florida Hospital *

Tampa General Hospital *

St. Joseph's Hospital *

Sacred Heart Health Systems *

North Broward Medical Center *

Memorial Regional Hospital *

Lakeland Regional Medical Center *

Baptist Hospital *

Shands Jacksonville Medical Center

Orlando Regional Healthcare

Holmes Regional Trauma Center

Halifax Medical Center

Broward General Medical Center

Bayfront Medical Center

All Children's Hospital

GEORGIA

Georgia State Office of EMS/Trauma	*
Athens Regional Medical Center	*
Stewart Webster Hospital	
Southern Regional Medical Center	
North Fulton Regional Hospital	
Morgan Memorial Hospital	
Morehouse Medical Clinic	
Memorial Health University Medical Center	
Medical College of Georgia	
Medical Center of Central Georgia	
John D. Archbold Memorial Hospital	
Hamilton Medical Center	
Gwinnett Medical Center	
Grady Memorial Health	
Floyd Medical Center	
DeKalb Medical Center	
Columbus Regional Healthcare System, Inc	
Children's Healthcare of Atlanta of Scottish Rite	
Children's Healthcare of Atlanta at Egleston	
Atlanta Medical Center	

HAWAII

The Queen's Medical Center

IDAHO

Saint Alphonsus Regional Medical Center	*
Eastern Idaho Regional Medical Center	*
Portneuf Medical Center	
Magic Valley RMC	
Bonner General Hospital	

ILLINOIS

Loyola University Medical Center
Illinois Department of Public Health - AMSS

INDIANA

Wishard Memorial Hospital	*
St. Mary's Medical Center	*
Saint Joseph's Regional Medical Center	*
Memorial Hospital of South Bend	*
Elkhart General Hospital	*
Parkview Hospital	
Kiwanis-Riley Regional Pediatric Trauma Center	

IOWA

Virginia Gay Hospital	*
Veterans Memorial Hospital	*
University of Iowa Health Care	*

Trinity Regional Hospital	*
Trinity Medical Center- North Campus	*
Stewart Memorial Community Hospital	*
Skiff Medical Center	*
Sioux Center Community Hospital/Health Center	*
Sartori Hospital	*
Saint Luke's Regional Medical Center	*
Saint Luke's Hospital	*
Palmer Lutheran Health Center	*
Orange City Health System	*
Myrtue Memorial Hospital	*
Mercy Medical Center - Sioux City	*
Mercy Medical Center - North Iowa	*
Mercy Medical Center - Dubuque	*
Mercy Medical Center - Des Moines	*
Mercy Medical Center - Cedar Rapids	*
Mercy Iowa City	*
Mary Greeley Medical Center	*
Marshalltown Medical Surgical Center	*
Mahaska County Hospital	*
Loring Hospital	*
Kossuth Regional Health Center	*
Knoxville Area Community Hospital	*
Keokuk Area Hospital	*
Jennie Edmundson Hospital	*
Iowa Methodist Medical Center	*
Iowa Lutheran Hospital	*
Iowa Department of Public Health	*
Henry County Health Center	*
Hegg Memorial Health Center	*
Hawarden Community Hospital	*
Grinnell Regional Medical Center	*
Greene County Medical Center	*
Great River Medical Center	*
Genesis Medical Center	*
Fort Madison Community Hospital	*
Floyd Valley Hospital	*
Crawford County Memorial Hospital	*
Covenant Medical Center	*
Cass County Memorial Hospital	*
Broadlawns Medical Center	*
Allen Memorial Hospital	*
Alegent Health Mercy	*
Adair County Memorial Hospital	*
Winneshiek County Memorial Hospital	*
Waverly Municipal Hospital	*
Washington County Hospital & Clinics	*
Shenandoah Medical Center	*
Ottumwa Regional Health Center	*
Montgomery County Memorial Hospital	*
Mercy Medical Center	*

Manning Regional Healthcare Center
 Lucas County Health Center
 Hamilton County Hospital
 Franklin General Hospital
 Dickinson County Memorial Hospital
 Alegent Health Community Memorial Hospital

KANSAS

Stormont-Vail Healthcare *
 Kansas Trauma Registry *
 Via Christi Regional Medical Center - St. Francis Campus
 University of Kansas Hospital
 Overland Park Regional Medical Center
 Columbia Wesley Medical Center

KENTUCKY

Taylor Regional Hospital *
 Kosair Children's Hospital *
 University of Louisville Hospital
 University of Kentucky Health Care
 Trover Regional Medical Center - Madisonville

LOUISIANA

Medical Center of Louisiana *
 East Jefferson General Hospital

MAINE

Maine Medical Center *
 Eastern Maine Medical Center *
 Central Maine Medical Center *

MARYLAND

R Adams Cowley Shock Trauma Center *

MASSACHUSETTS

South Shore Hospital *
 New England Medical Center *
 Massachusetts General Hospital *
 Lawrence General Hospital *
 Lahey Clinic *
 Falmouth Hospital *
 Brigham and Women's Hospital *
 Boston Medical Center *
 Berkshire Medical Center *
 Baystate Medical Center *
 Anna Jaques Hospital *
 UMass Memorial Health Care
 North Shore Medical Center
 Beverly Hospital
 Beth Israel Deaconess Medical Center

MICHIGAN

University of Michigan Trauma Burn Center	*
St. Joseph Mercy Hospital	*
St. John Medical Center	*
Spectrum Health	*
Saint Mary's Health Care	*
Pontiac Osteopathic Hospital Medical Center	*
Munson Medical Center	*
Mott Children's Hospital-University of Michigan	*
Marquette General Health System	*
Hurley Medical Center	*
Henry Ford Hospitals	*
Hackley Hospital	*
Genesys Regional Medical Center	*
Detroit Receiving Hospital	*
Bronson Methodist Medical Center	*
Borgess Medical Center	*
William Beaumont Hospital	
Sparrow Health System	
McLaren Regional Medical Center	

MINNESOTA

Minnesota State Department of Health	*
Hennepin County Medical Center	*
North Memorial Medical Center	*
St. Mary's Medical Center	*
St. Cloud Hospital	*
St. Luke's Hospital	*
Mercy Hospital	*
Unity Hospital	*
Regions Hospital	*

MISSISSIPPI

University of Mississippi Medical Center	*
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MISSOURI

Truman Medical Center	*
St. Louis University Hospital	*
St. Louis Children's Hospital	*
St. John's Mercy Medical Center	*
Saint Luke's Hospital of Kansas City	*
New Liberty Hospital District	*
Barnes-Jewish Hospital	*
University of Missouri Healthcare	
St. John's Health System	
Research Medical Center	
Missouri Department of Health	
Independence Regional Health Center	
Freeman Health System	

MONTANA

Deaconess Billings Clinic *

NEBRASKA

The Nebraska Medical Center *
 Regional West Medical Center *
 Good Samaritan Hospital *
 Creighton University Medical Center *
 BryanLGH Medical Center West *
 The Nebraska Methodist Hospital
 Saint Francis Medical Center
 Lincoln General Hospital
 Great Plains Regional Medical Center

NEVADA

Washoe Medical Center *
 University Medical Center *
 Sunrise Hospital/Sunrise Children's Hospital *

NEW HAMPSHIRE

Dartmouth-Hitchcock Medical Center *

NEW JERSEY

Robert Wood Johnson University Hospital *
 NJ Trauma Center *
 Cooper Hospital Trauma Center *
 Capital Health System at Fuld Campus *
 Atlanticare Regional Medical Center *
 Morristown Memorial Hospital

NEW MEXICO

University Of New Mexico Hospital *

NEW YORK

University Hospital Stony Brook *
 University Hospital *
 United Health Services *
 Strong Memorial Hospital *
 St. Elizabeth Medical Center *
 North Shore University Hospital *
 Harlem Hospital Center *
 Brookhaven Memorial Hospital *
 New York Presbyterian Hospital/Weill Cornell
 Jacobi Medical Center
 Bellevue Hospital

NORTH CAROLINA

Wake Medical Center - Wakemed *
 Wake Forest University Baptist Medical Center *
 UNC Hospitals *
 UHS of Eastern Carolina - Pitt County Memorial Hospital *
 Moses H. Cone Hospital *

Mission Hospital	*
Duke University Medical Center	*
Cleveland Regional Medical Center	*
Rowan Regional Medical Center	
New Hanover Regional Medical Center	
Nash General Hospital	
Moore Regional Hospital	
Lake Norman Regional Medical Center	
Iredell Memorial	
Frye Regional Medical Center	
Forsyth Medical Center	
Catawba Memorial	
Carolinas Medical Center	
Cape Fear Medical Center	

NORTH DAKOTA

Altru Hospital	*
St. Luke's Hospital	

OHIO

The University Hospital	*
The Toledo Hospital	*
St. Vincent Mercy Medical Center/Mercy Children's Hospital	*
Miami Valley Hospital	*
Medical University of Ohio	*
East Ohio Regional Hospital	*
Cincinnati Children's Hospital Medical Center	*
Central Ohio Trauma System	*
Akron City Hospital	*
Akron Children's Hospital	*
Children's Hospital	*
Berger Hospital	*
Coshocton County Memorial Hospital	*
Doctors Hospital West	*
Fairfield Medical Center	*
Genesis Good Samaritan	*
Grady Memorial Hospital	*
Grant Medical Center	*
Knox Community Hospital	*
Madison County Hospital	*
Marion General Hospital	*
Memorial Hospital of Union County	*
Morrow County Hospital	*
Mount Carmel East	*
Mount Carmel St. Ann's	*
Mount Carmel West	*
The Ohio State University Hospital East,	*
The Ohio State University Medical Center	*
Riverside Methodist Hospital	*
Southeastern Ohio Regional Medical Center	*

OKLAHOMA

St. John Medical Center *

OU Medical Center *

OREGON

Legacy Emanuel Hospital *

PENNSYLVANIA

Pennsylvania Trauma Systems Foundation *

The Western Pennsylvania Hospital

PUERTO RICO

Puerto Rico Trauma Center *

RHODE ISLAND

Rhode Island Hospital *

SOUTH CAROLINA

Regional Medical Center of Orangeburg and Calhoun *

Palmetto Health *

Medical University of South Carolina *

McLeod Regional Medical Center *

Greenville Memorial Hospital *

Carolinas Hospital System *

Spartanburg Regional Healthcare System

SOUTH DAKOTA

Avera McKennan Hospital *

Sioux Valley Hospital USD Medical Center *

Avera Queen of Peace *

TENNESSEE

University of Tennessee Medical Center *

Regional Medical Center at Memphis *

Johnson City Medical Center *

Erlanger Medical Center *

Bristol Regional Medical Center *

Blount Memorial Hospital *

Vanderbilt University Medical Center

Methodist Healthcare Central

Le Bonheur Children's Medical Center

East Tennessee Children's Hospital

Bradley Memorial Hospital

Baptist Memorial Hospital

TEXAS

University of Texas Medical Branch at Galveston *

University Medical Center *

Texas Children's Hospital *

Shannon Medical Center *

Parkland Health & Hospital System *

Methodist Dallas Medical Center	*
Hillcrest Baptist Medical Center	*
East Texas Medical Center	*
Covenant Children's Hospital	*
Cook Children's Medical Center	*
Children's Medical Center of Dallas	*
Brooke Army Medical Center	*
Brackenridge Hospital	*
Baylor University Medical Center	*
Wilford Hall Medical Center	
Nacogdoches Medical Center	
Darnall Army Community Hospital	
UTAH	
LDS Hospital	*
VERMONT	
Fletcher Allen Health Care	
VIRGINIA	
University of Virginia Health System	*
Sentara Virginia Beach General Hospital	*
Sentara Norfolk General Hospital	*
Lynchburg General Hospital	*
Inova Fairfax Hospital	*
Riverside Regional Medical Center	
Medical College of Virginia Hospitals	
WASHINGTON	
Washington State Department of Health	*
WEST VIRGINIA	
Charleston Area Medical Center	*
WISCONSIN	
University of Wisconsin	*
Theda Clark Medical Center	*
Saint Joseph's Hospital	*
Gunderson Lutheran Hospital	*
Children's Hospital of Wisconsin	*
St. Vincent Hospital	
Froedtert Memorial Lutheran Hospital	
Aurora Baycare Medical Center	
WYOMING	
Wyoming Department of Health	*



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