

Japan Trauma Data Bank Report 2019 (2014-2018)

Japan Trauma Care and Research

**The Japanese Association for the Surgery of Trauma
(Trauma Registry Committee)**



**The Japanese Association for Acute Medicine
(Committee for Clinical Care Evaluation)**



Figure
1A**Names of All Hospitals Submitting Data to the JTDB. (N=280, Part 1)**

Sapporo City General Hospital
 Nikko Memorial Hospital
 Sapporo Medical University Hospital
 Teine Keijinkai Hospital
 Hokkaido University Hospital
 Hokuto Hospital
 Hokkaido Medical Center
 Asahikawa Red Cross Hospital
 Sapporo Tokushukai Hospital
 Hakodate Municipal Hospital
 Hachinohe City Hospital
 Hirosaki University School of Medicine & Hospital
 Aomori Prefectural Central Hospital
 Iwate Medical University Hospital
 Iwate Prefectural Kuji Hospital
 Iwate Prefectural Central Hospital
 Osaki Citizen Hospital
 Tohoku University Hospital
 Sendai City Hospital
 Ishinomaki Red Cross Hospital
 Sendai Medical Center
 South Miyagi Medical Center
 Akita Red Cross Hospital
 Akita University Hospital
 Yamagata Prefectural Central Hospital
 Ohta Nishinouchi Hospital
 Aizu Central Hospital
 Fukushima Medical University Hospital
 Niigata City General Hospital
 Niigata University Medical & Dental Hospital
 Niigata Prefectural Shibata Hospital
 Uonuma Kikan Hospital
 Tsukuba Medical Center Hospital
 Ibaraki Seinan Medical Hospital
 Mito Medical Center
 University of Tsukuba Hospital
 Ibaraki Prefectural Central Hospital
 Mito Saiseikai General Hospital
 Dokkyo Medical University Hospital
 Jichi Medical University Hospital
 Saiseikai Utunomiya Hospital
 Gunma University Hospital
 Maebashi Red Cross Hospital
 Takasaki General Medical Center
 Ota Memorial Hospital
 Saitama Red Cross Hospital
 Kawaguchi Municipal Medical Center

Dokkyo Medical University Koshigaya Hospital
 National Defense Medical College Hospital
 Saitama Medical University Medical Center
 Saitama Medical University International Medical Center
 Kuki General Hospital
 Fukaya Red Cross Hospital
 Jichi Medical University Saitama Medical Center
 Funabashi Municipal Medical Center
 Asahi General Hospital
 Nippon Medical School Chiba Hokusoh Hospital
 Chiba Emergency Medical Center
 Kameda General Hospital
 Kimitsu Chuou Hospital
 Juntendo University Urayasu Hospital
 Chiba University Hospital
 Matsudo City General Hospital
 Jikei University Kashiwa Hospital
 Tokyo Women's Medical University Yachiyo Medical Center
 Tokyo Bay Urayasu Ichikawa Medical Center
 Chiba Rosai Hospital
 Eastern Chiba Medical Center
 Showa University Hospital
 Tokyo Medical Center
 Department of Social Medicine, School of Medicine, Nihon University
 National Disaster Medical Center
 Musashino Red Cross Hospital
 Nippon Medical School Tama Nagayama Hospital
 Teikyo University Hospital
 National Center for Global Health and Medicine
 Tokyo Women's Medical University Medical Center East
 Nippon Medical School Hospital
 Kyorin University Hospital
 Surugadai Nihon University Hospital
 Tokyo Women's Medical University Hospital
 Ohme Municipal General Hospital
 Nihon University Itabashi Hospital
 Tokyo Medical and Dental University Hospital
 Tokyo Metropolitan Bokutoh Hospital
 Tokyo Metropolitan Hiroo Hospital
 Tokyo Medical University Hospital
 Tokyo Medical University Hachioji Medical Center
 Keio University Hospital
 St. Luke's International Hospital
 Toho University Omori Medical Center
 University of Tokyo Hospital
 Showa General Hospital

Tokyo Saiseikai Central Hospital
 National Center for Child Health and Development
 Shirahigebashi Hospital
 Japanese Red Cross Medical Center
 Tokyo Metropolitan Tama Medical Center
 Kokushikan University
 Showa University Northern Yokohama Hospital
 Yokohama Medical Center
 St. Marianna University School of Medicine Hospital
 Kanto Rosai Hospital
 Yokohama City University Medical Center
 Tokai University Hospital
 Showa University Fujigaoka Hospital
 Kitasato University Hospital
 Yokosuka General Hospital Uwamachi
 Yokohama City Minato Red Cross Hospital
 Nippon Medical School Musashikosugi Hospital
 Saiseikai Yokohama-city East Hospital
 Shonan Kamakura General Hospital
 Yokohama Municipal Citizens Hospital
 Odawara Municipal Hospital
 Yokosuka Kyosai Hospital
 Hiratsuka City Hospital
 Fujisawa City Hospital
 Yokohama Rosai Hospital
 Yokohama Sakae Kyosai Hospital
 Shin-Yurigaoka General Hospital
 Ebina General Hospital
 Kawasaki Municipal Hospital
 Yamanashi Prefectural Central Hospital
 Saku Central Hospital Advanced Care Center
 Shinshu University Hospital
 Aizawa Hospital
 Suwa Red Cross Hospital
 Iida Municipal Hospital
 Ina Central Hospital
 Nagano Red Cross Hospital
 Nagano Municipal Hospital
 Chuno Kosei Hospital
 Gifu University Hospital
 Takayama Red Cross Hospital
 Ogaki Municipal Hospital
 Gero City Kanayama Hospital

Figure
1B**Names of All Hospitals Submitting Data to the JTDB. (N=280, Part 2)**

Seirei Mikatahara General Hospital	Rinku General Medical Center	Kure Medical Center
Numazu City Hospital	Osaka Mishima Emergency Medical Center	Fukuyama City Hospital
Shizuoka Red Cross Hospital	Kinki University Hospital	Yamaguchi University Hospital
Shizuoka Saiseikai General Hospital	Kishiwada Tokushukai Hospital	Kanmon Medical Center
Juntendo University Shizuoka Hospital	Osaka University Hospital	Tokuyama Central Hospital
Shizuoka General Hospital	Osaka City General Hospital	Yamaguchi Grand Medical Center
Shizuoka Tokushukai Hospital	Kansai Medical University Takii Hospital	Tokushima Prefectural Miyoshi Hospital
Chutoen General Medical Center	Osaka City University Hospital	Tokushima Prefectural Kaifu Hospital
Fujieda Municipal General Hospital	Saiseikai Senri Hospital	Tokushima Prefectural Central Hospital
Hamamatsu University Hospital	Osaka General Medical Center	Taoka Hospital
Seirei Hamatsu General Hospital	Osaka Medical Center	Tokushima Red Cross Hospital
Aichi Medical University Hospital	Nakakawachi Medical Center of Acute Medicine	Kagawa University Hospital
Nagoya Ekisaikai Hospital	Kansai Medical University Hirakata Hospital	Kagawa Prefectural Central Hospital
Social Insurance Chukyo Hospital	Sakai City Medical Center	Ehime Prefectural Central Hospital
Okazaki City Hospital	Osaka Police Hospital	Ehime University Hospital
Toyohashi Municipal Hospital	Kobe University Hospital	Ehime Prefectural Niihama Hospital
Daiyukai General Hospital	Hyogo Emergency Medical Center	Kochi Medical Center
Fujita Health University Hospital	Toyooka Hospital	Chikamori Hospital
Nagoya City University Hospital	Tajima Emergency & Critical Care Medical Center	Kochi Red Cross Hospital
Handa City Hospital	Public Muraoka Hospital	Kitakyushu General Hospital
Kasugai Municipal Hospital	Kansai Rosai Hospital	Kokura Memorial Hospital
Komaki City Hospital	Hyogo Prefectural Nishinomiya Hospital	Saiseikai Fukuoka General Hospital
Nagoya Medical Hospital	Hyogo Prefectural Kakogawa Medical Center	Fukuoka University Hospital
Japanese Red Cross Nagoya Daini Hospital	Hyogo Prefectural Awaji Hospital	St. Maria's Hospital
Mie University Hospital	Hospital of Hyogo College of Medicine	Kurume University Hospital
Mie Prefectural General Medical Center	Kobe City Medical Center General Hospital	Iizuka Hospital
Toyama Prefectural Central Hospital	Steel Memorial Hirohata Hospital	Ohtemachi Hospital
Toyama University Hospital	Himeji Emergency, Trauma and Critical Center	Kitakyushu Municipal Yahata Hospital
Kouseiren Takaoka Hospital	Nara Prefectural General Medical Center	Kyushu University Hospital
Tonami General Hospital	Nara Medical University Hospital	Fukuoka Wajiro Hospital
Ishikawa Prefectural Central Hospital	Kindai University Nara Hospital	Fukuoka Red Cross Hospital
Fukui Prefectural Hospital	Wakayama Medical University Hospital	Fukuoka Higashi Medical Center
University of Fukui Hospital	Japanese Red Cross Wakayama Medical Center	Shinyukhashi Hospital
Omihashiman Community Medical Center	Tottori University Hospital	Kyushu Medical Center
Saiseikai Shigaken Hospital	Shimane University Hospital	Saga-ken Medical Center Koseikan
Kyoto Daini Red Cross Hospital	Shimane Prefectural Central Hospital	Saga University Hospital
Kyoto Medical Center	Okayama University Hospital	Ureshino Medical Center
Rakuwakai Otowa Hospital	Tsuyama Chuo Hospital	Nagasaki Medical Center
Fukuchiyama City Hospital	Kawasaki Medical School Hospital	Nagasaki University Hospital
Kyoto Daiichi Red Cross Hospital	Kurashiki Central Hospital	Arao Municipal Hospital
Uji-Tokushukai Medical Center	Hiroshima Prefectural Hospital	Kumamoto Red Cross Hospital
Kyoto Prefectural University of Medicine	Chugoku Rosai Hospital	Kumamoto Medical Center
Kyoto Okamoto Memorial Hospital	Hiroshima University Hospital	Saiseikai Kumamoto Hospital
Kyoto University Hospital		

**Figure
1C****Names of All Hospitals Submitting Data to the JTDB. (N=280, Part 3)**

Oita University Hospital
Almeida Memorial Hospital
Miyazaki Prefectural Miyazaki Hospital
Miyazaki University Hospital
Miyazaki Zenjinkai Hospital
Miyakonojo Regional Medical Center
Osumikanoya Hospital
Kagoshima City Hospital
Yonemori Hospital
Urasoe General Hospital
Nakagami Hospital
Okinawa Prefectural Chubu Hospital
Okinawa Prefectural Hokubu Hospital
Ryukyu University Hospital
Tomishiro Central Hospital
Okinawa Prefectural Nanbu Medical Center / Nanbu Child
Medical Center

The JTDB report 2019 was published using cases of all registered hospitals from 2004 to 2015 and using cases registered in 2016, 2017, and 2018 at only 161 hospitals which accepted trauma patients' registry in each ethical committee before June 25th, 2019.

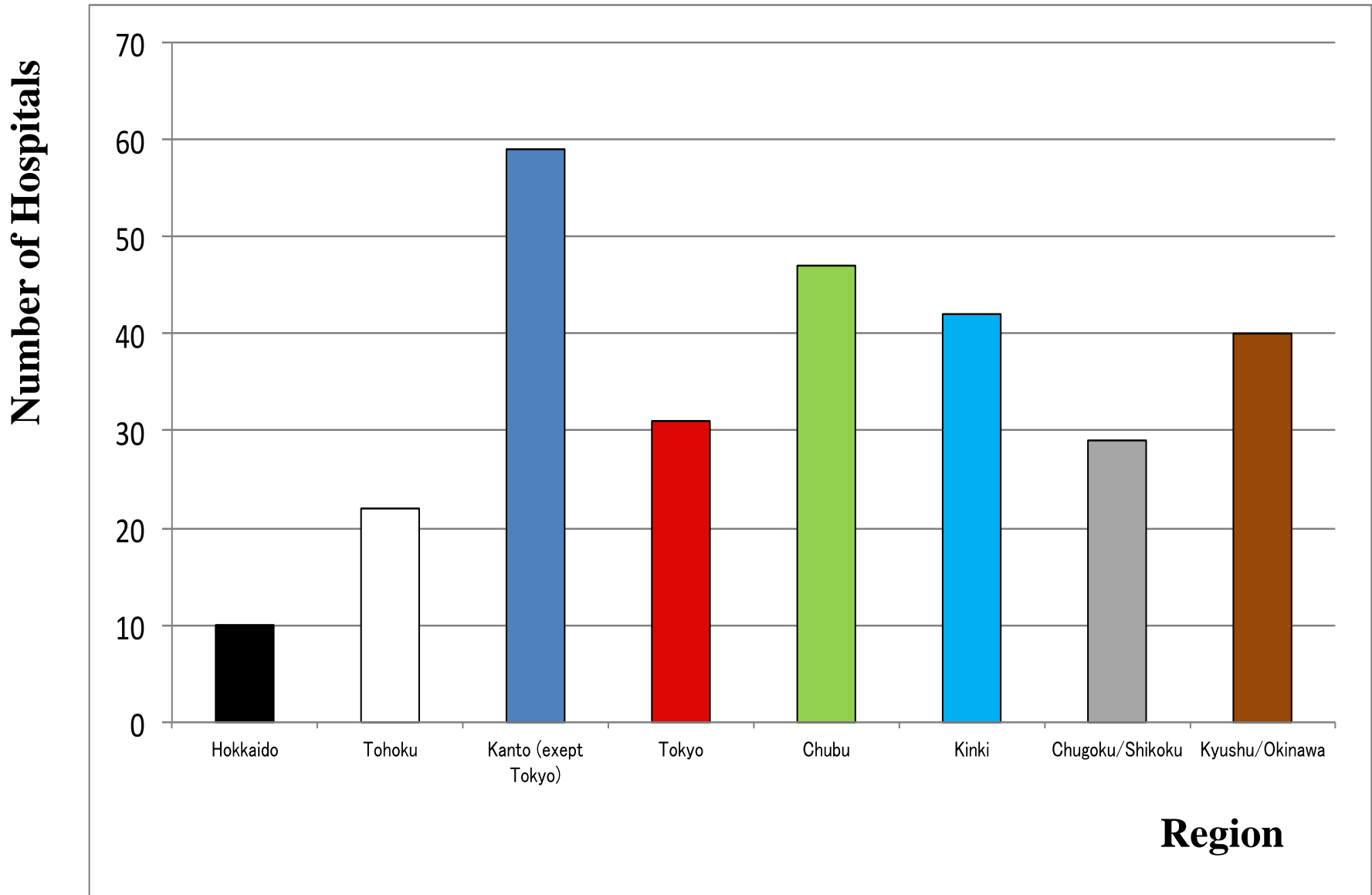
**Figure
2****Number of Hospitals Submitting to the JTDB by Region.**

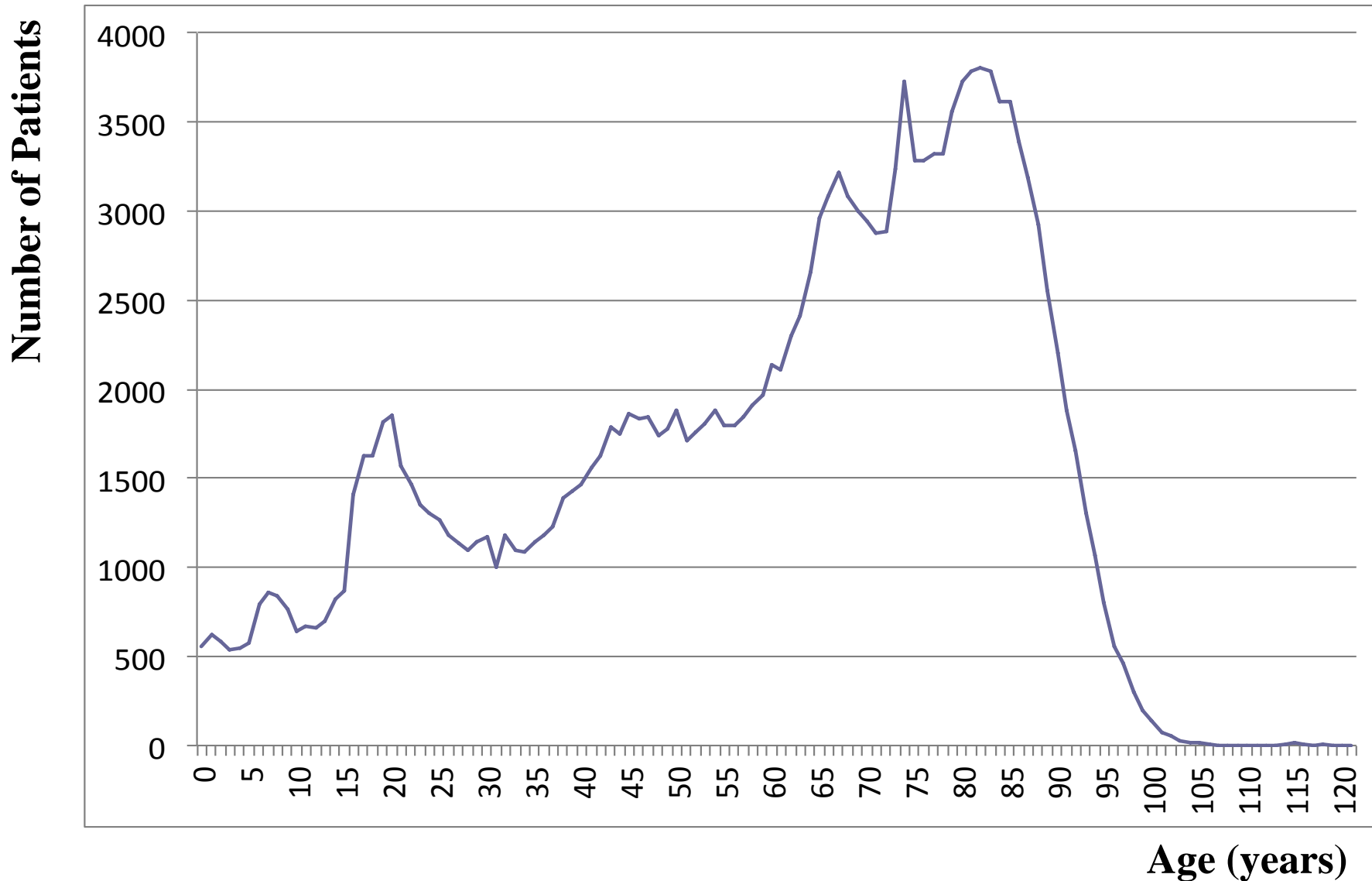
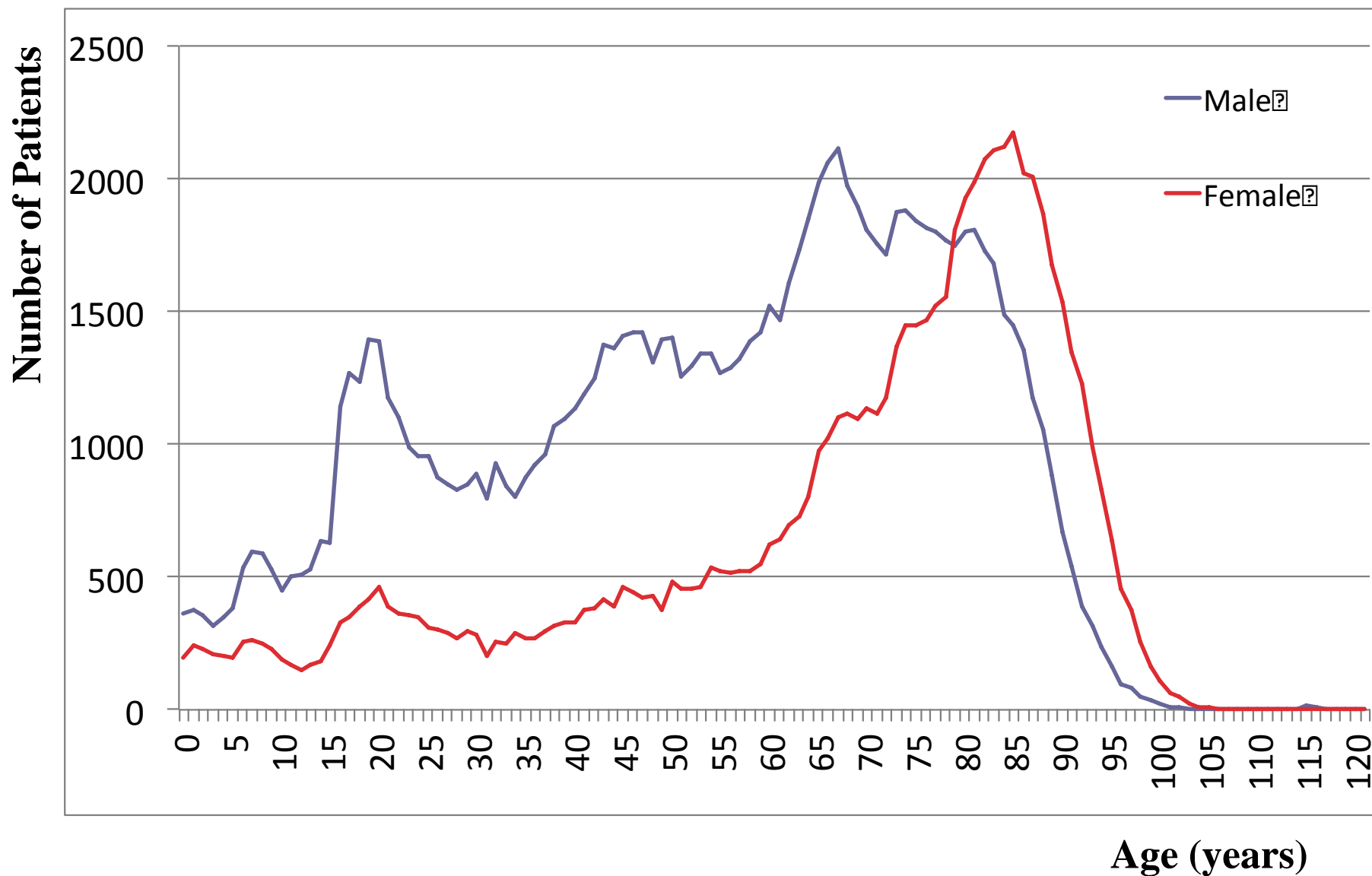
Figure
3**Number of Patients by Age.**

Figure
4**Patients by Age and Gender.**

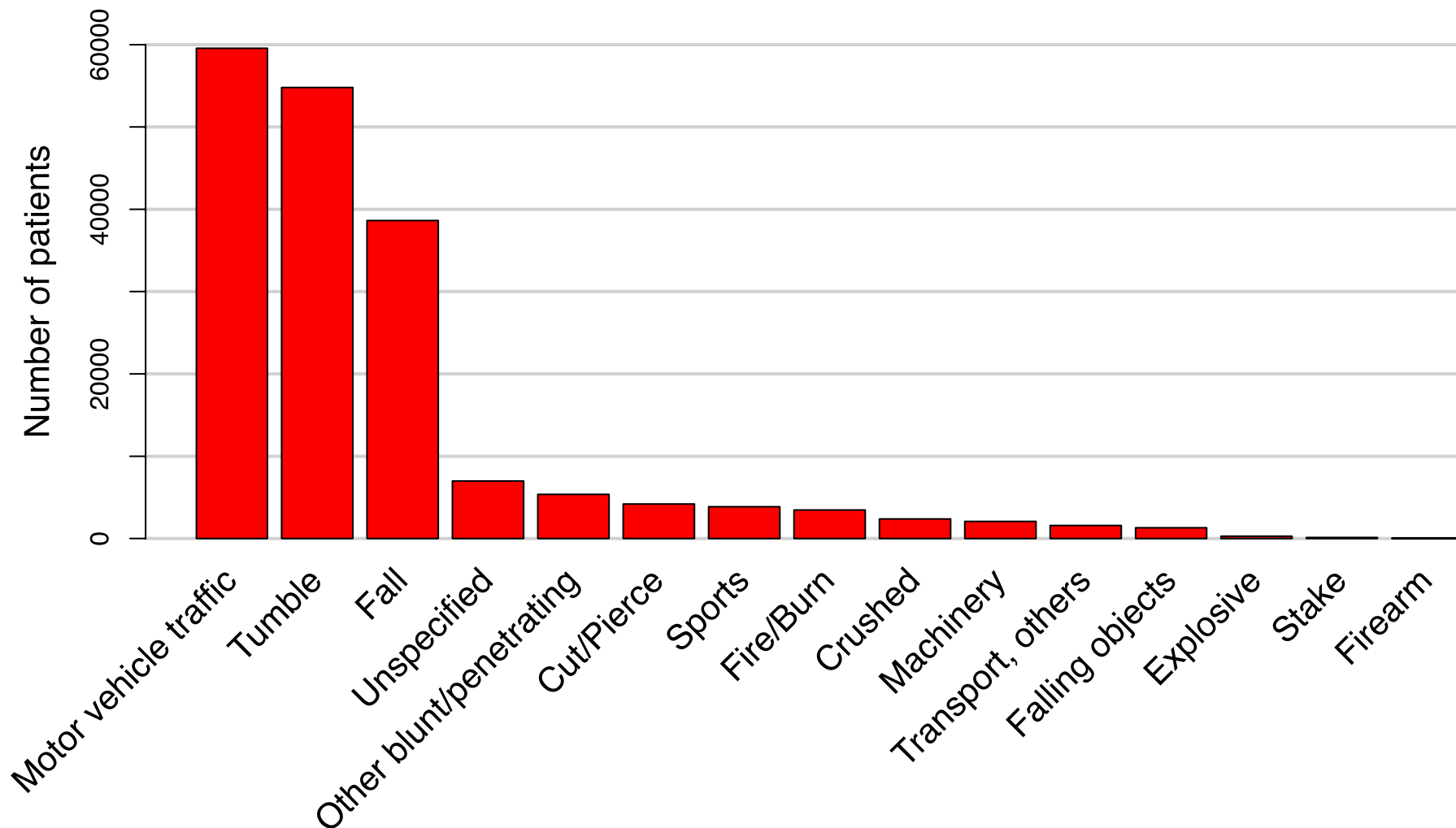
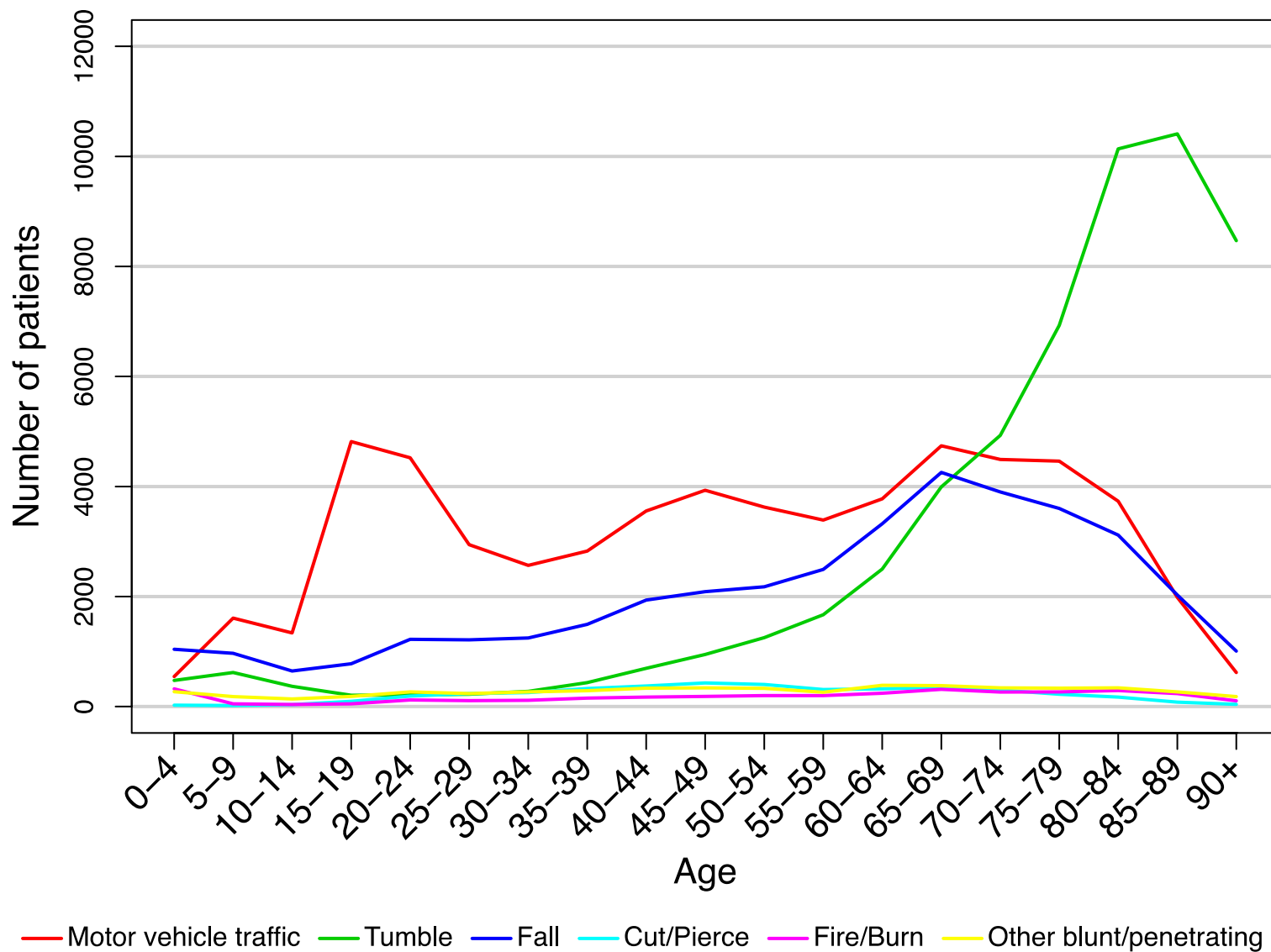
**Figure
5****Patients by mechanism of injury**

Table
5**Patients by mechanism of injury**

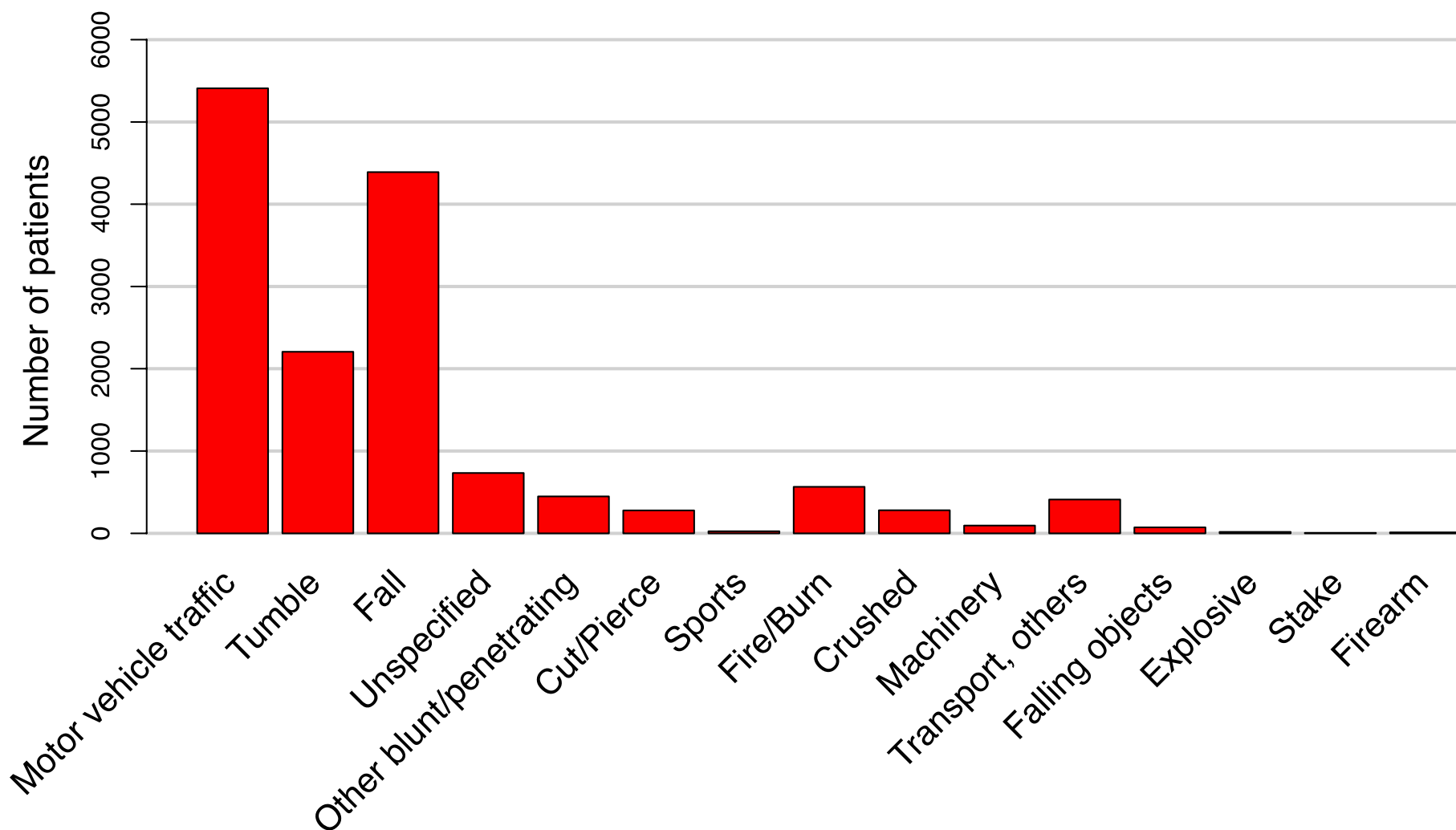
Mechanism of injury	Patients (n)	Patients by mechanism of injury (%)
Motor vehicle traffic	59563	32.3
Tumble	54794	29.7
Fall	38625	20.9
Unspecified	6977	3.8
Others	5353	2.9
Cut/Pierce	4200	2.3
Sports	3862	2.1
Fire/Burn	3461	1.9
Crushed	2374	1.3
Machinery	2086	1.1
Transport, others	1594	0.9
Falling objects	1302	0.7
Explosive	274	0.1
Stake	130	0.1
Firearm	36	0.0

Figure
6**Mechanism of injury by age**

Figure

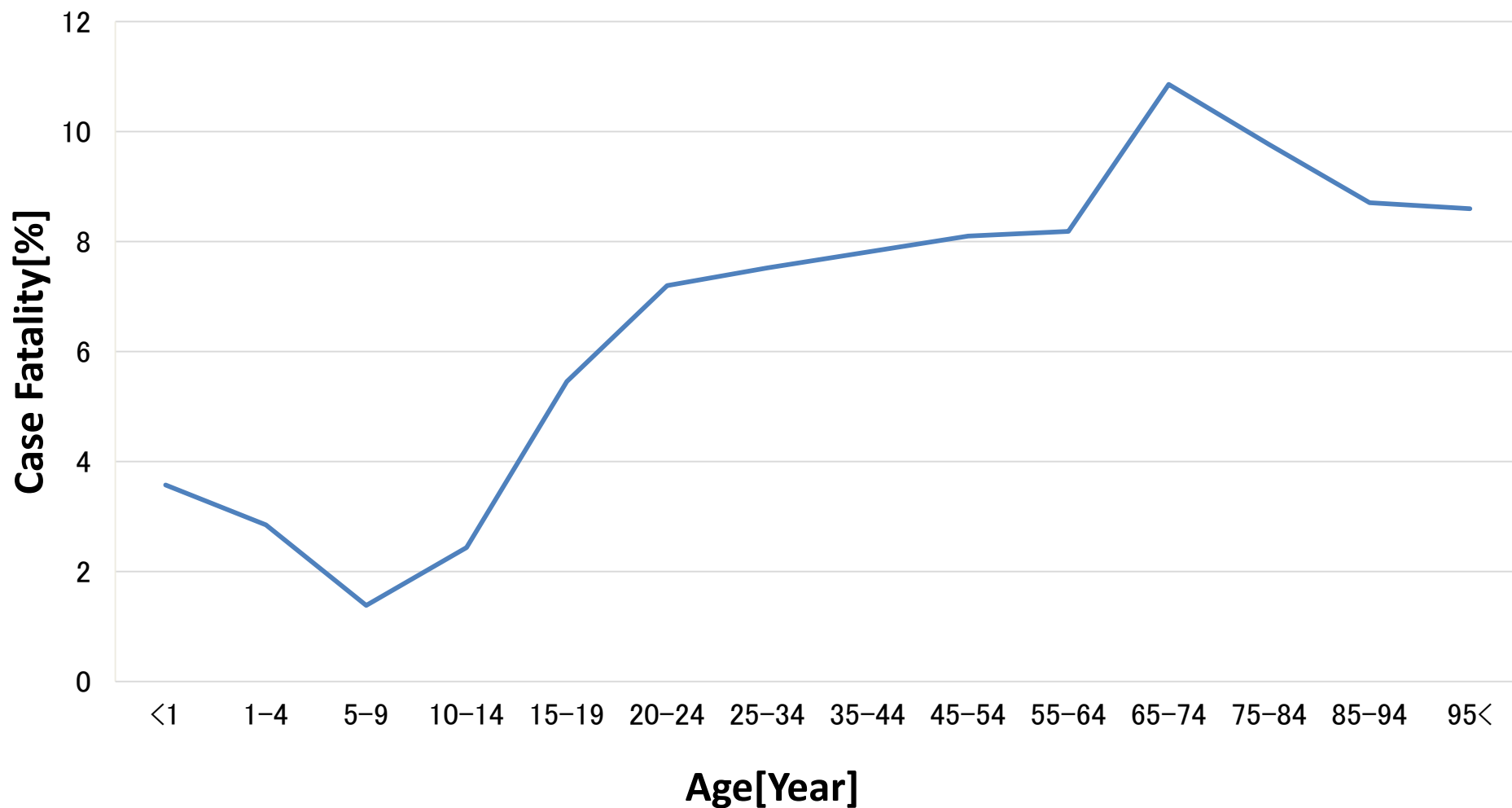
7

Death by mechanism of injury



**Figure
8**

Case Fatality by age



Case fatality at each age category (Case Fatality=number of deaths divided by the number of patients at each category x 100 by age)

Figure
9

Case Fatality by age and gender

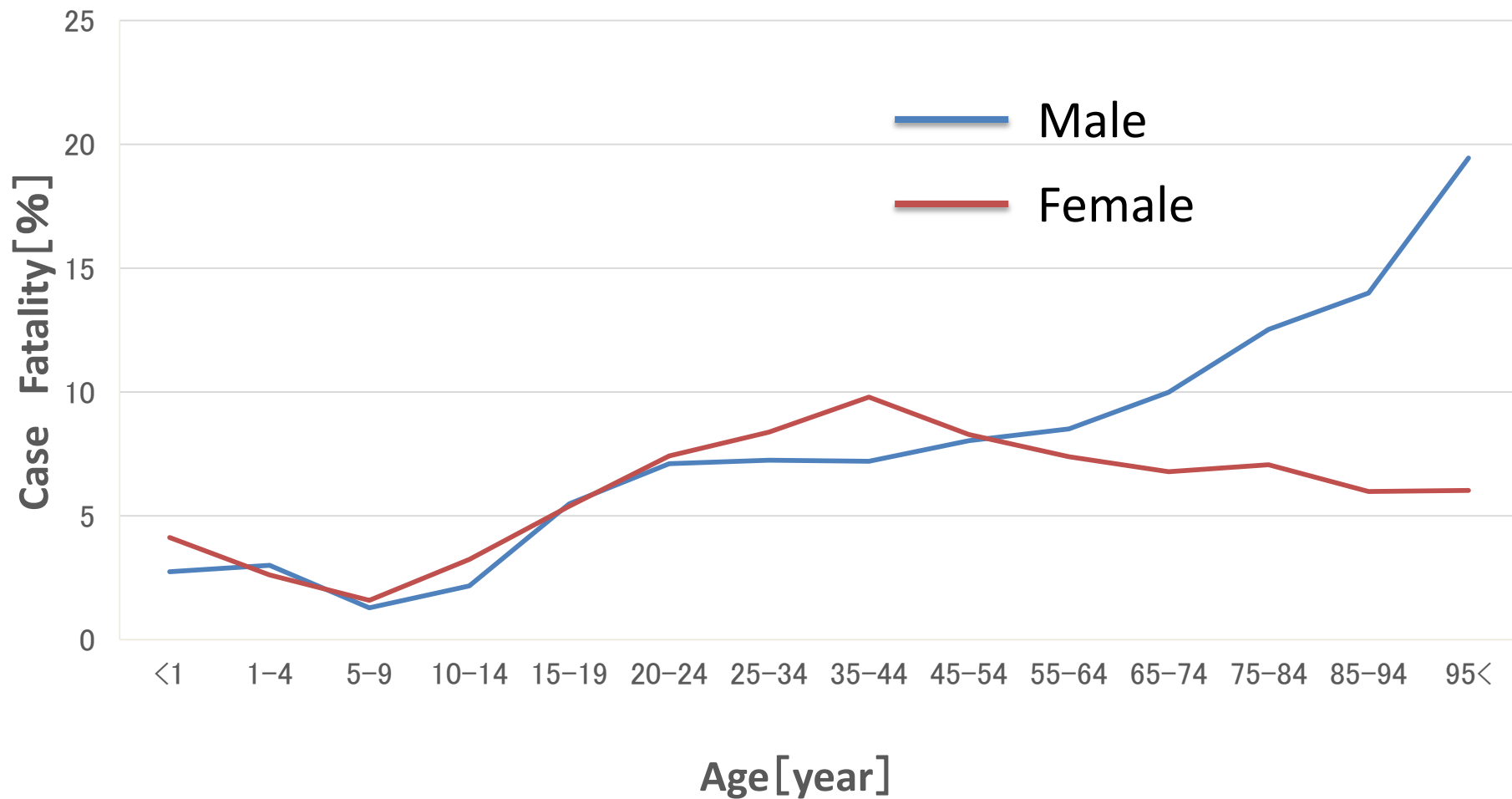
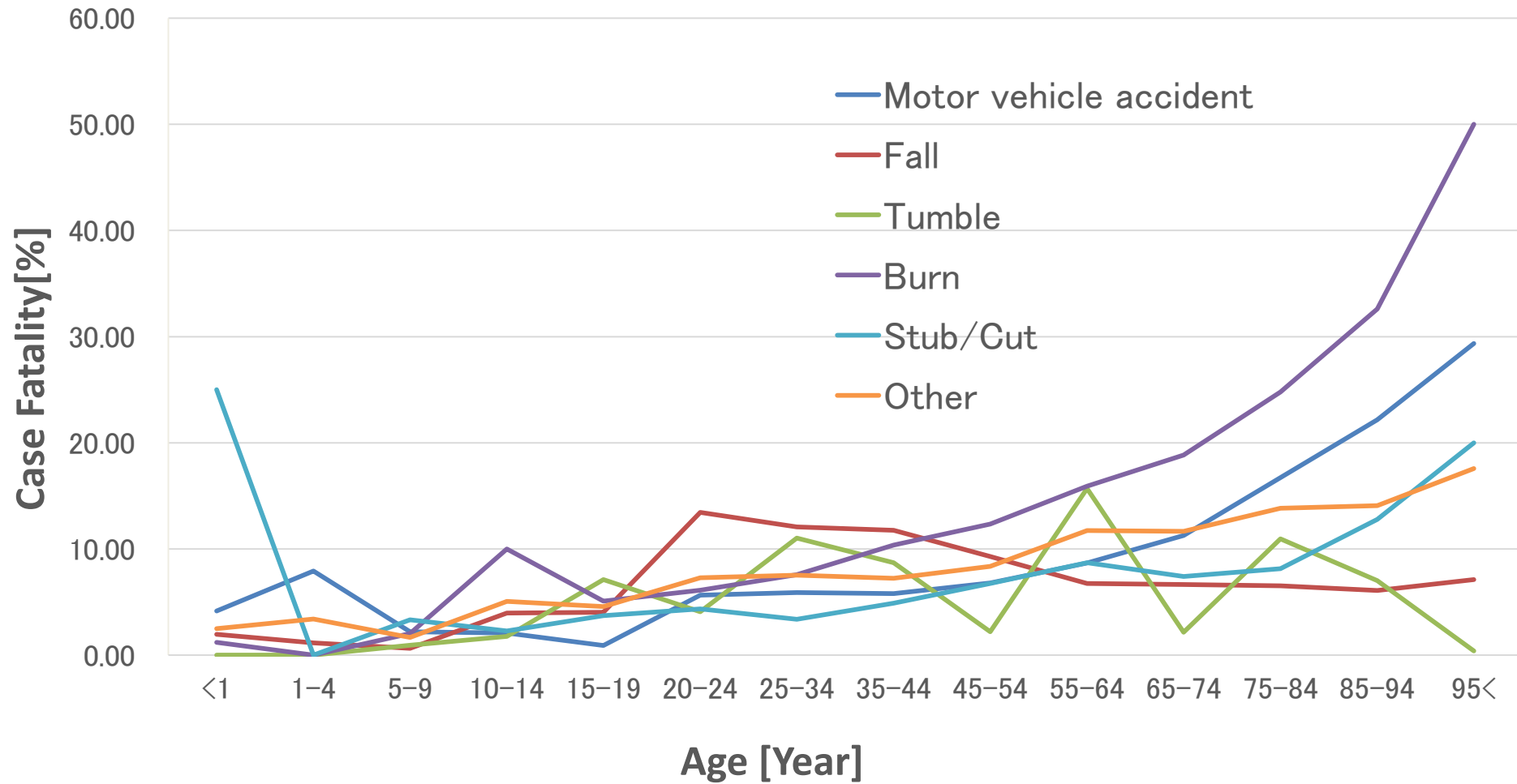
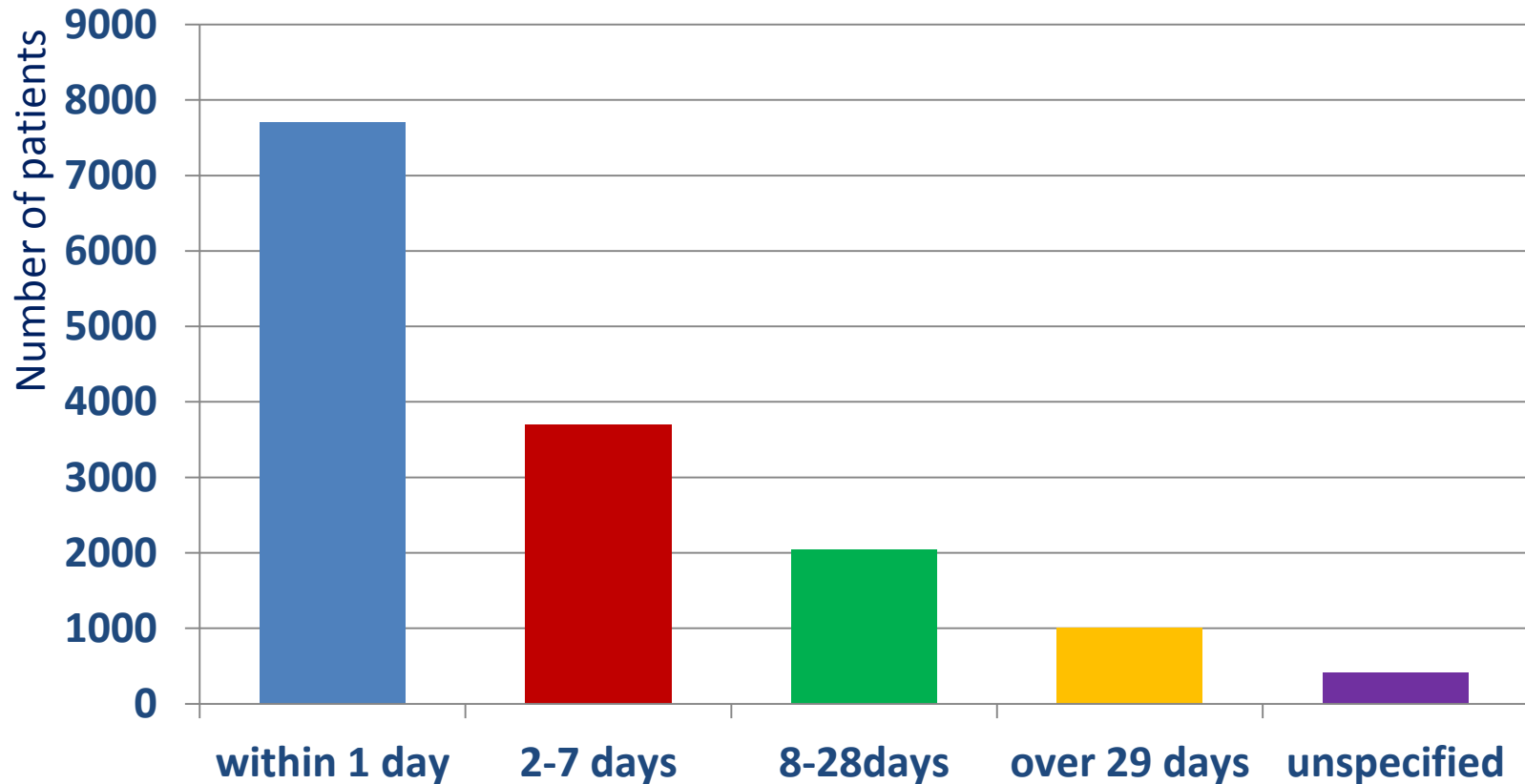


Figure
10

Case Fatality by mechanism of injury and age



**Figure
11A****Proportional distribution of hospitalized days in death cases n =14,851**

The category within 1 day includes CPAOA patients.

Figure
11B

Proportional distribution of hospitalized days by mechanism of injury in death cases n =14,851

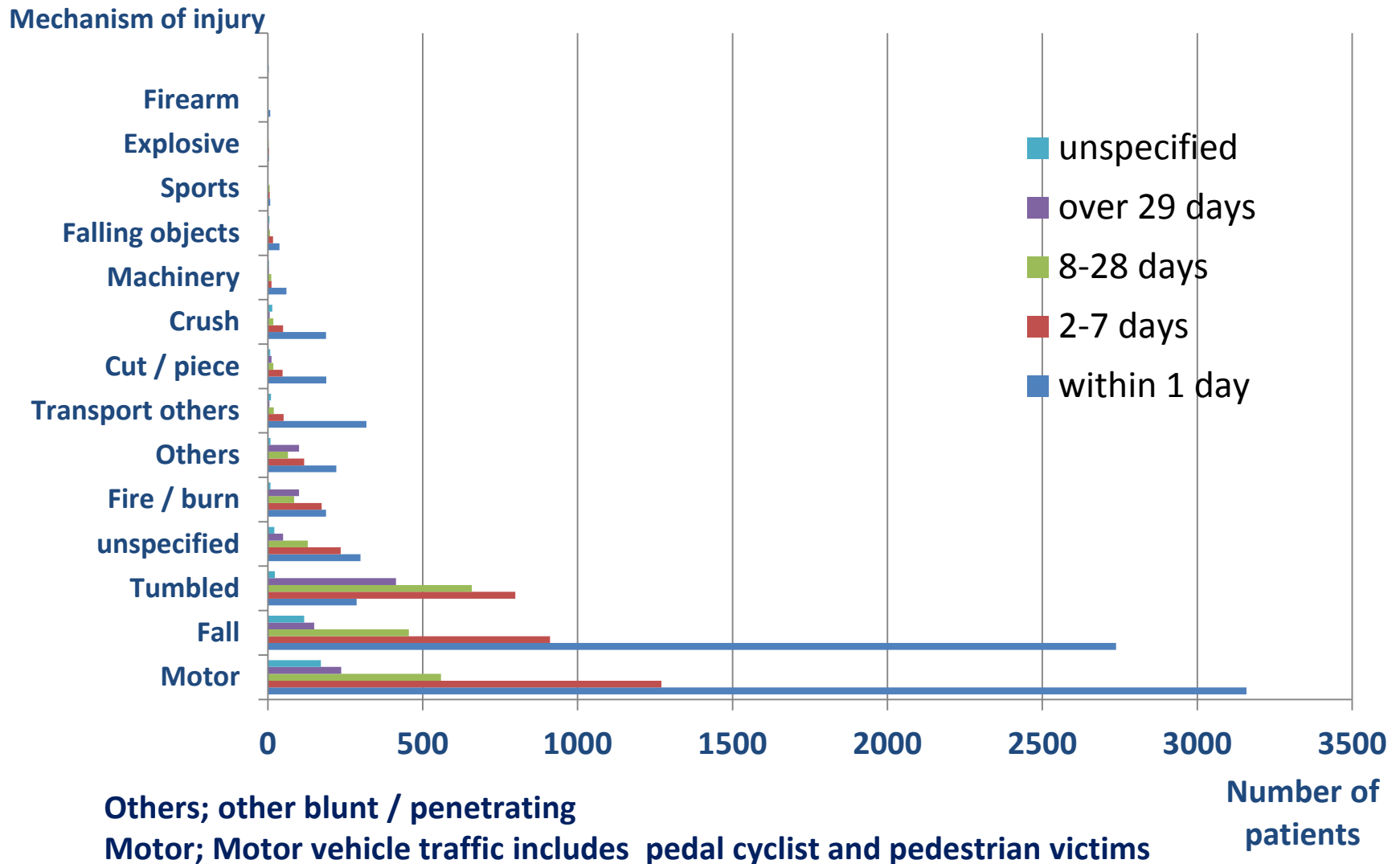
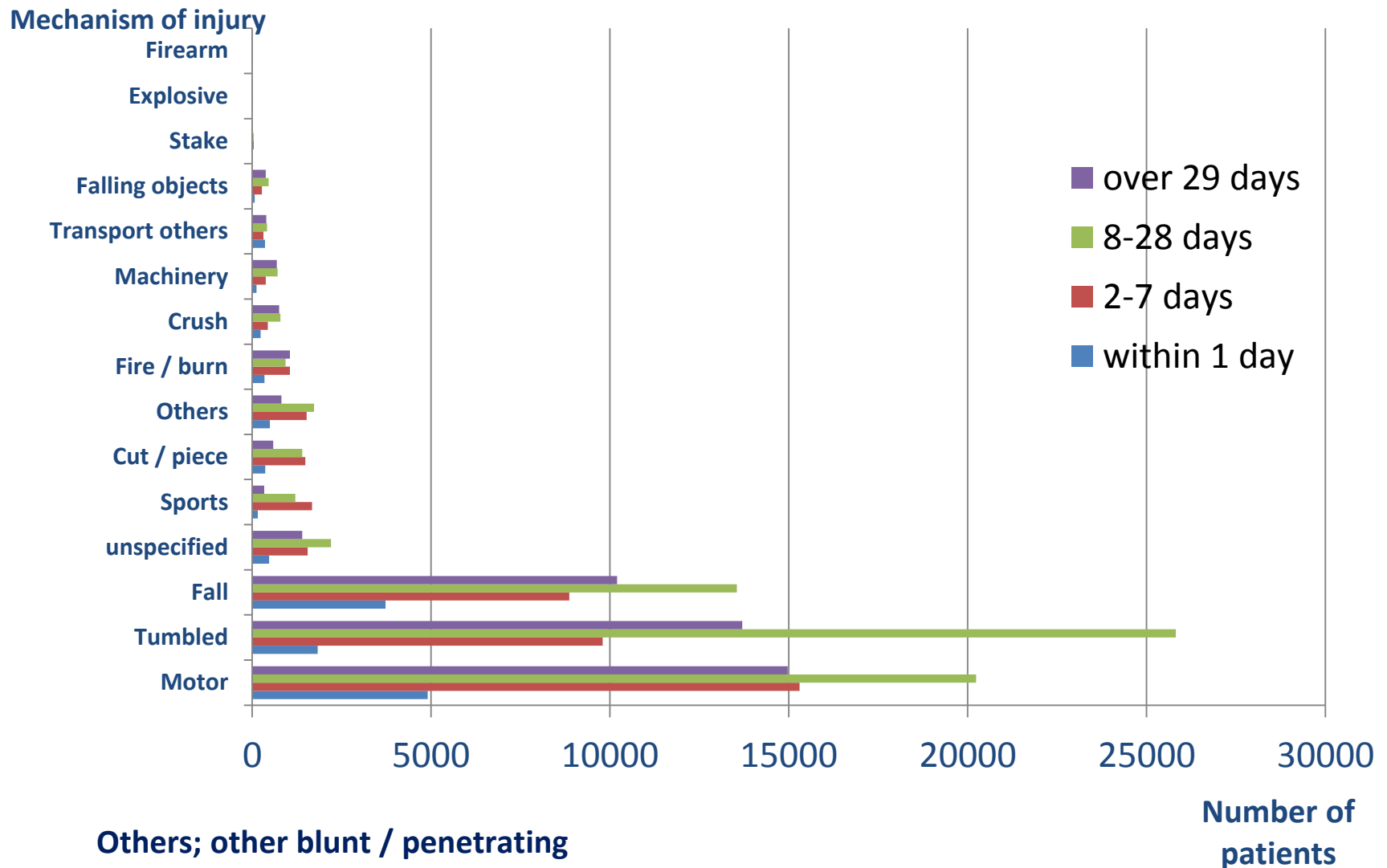


Figure
12**Proportional distribution of hospitalized days,
grouped by mechanism of injury n =170,666**

Others; other blunt / penetrating

Motor; Motor vehicle traffic includes pedal cyclist and pedestrian victims.

Table
12

Proportional distribution of hospitalized days, grouped by mechanism of injury. n = 170,666

	Motor Vehicle traffic	Tumbled	Fall	unspecified	Sports	Cut / piece	Other blunt/penet rating	Fire / burn
within 1 day	4903	1843	3730	474	158	369	492	341
2—7days	15299	9795	8865	1548	1675	1484	1525	1052
8-28days	20235	25819	13551	2208	1204	1397	1733	930
over 29 days	14967	13696	10200	1398	338	589	817	1059
Total	55404	51144	36346	5628	3375	3839	4567	3382

	Crush	Machinery	Transport others	Falling objects	Stake	Explosive	Firearm	Total
within 1 day	240	123	358	72	9	3	8	13114
2—7days	436	380	317	275	45	17	8	42721
8-28days	792	713	415	460	45	17	5	69524
over 29 days	756	686	392	379	9	13	8	45307
Total	2224	1902	1482	1186	108	50	29	170666

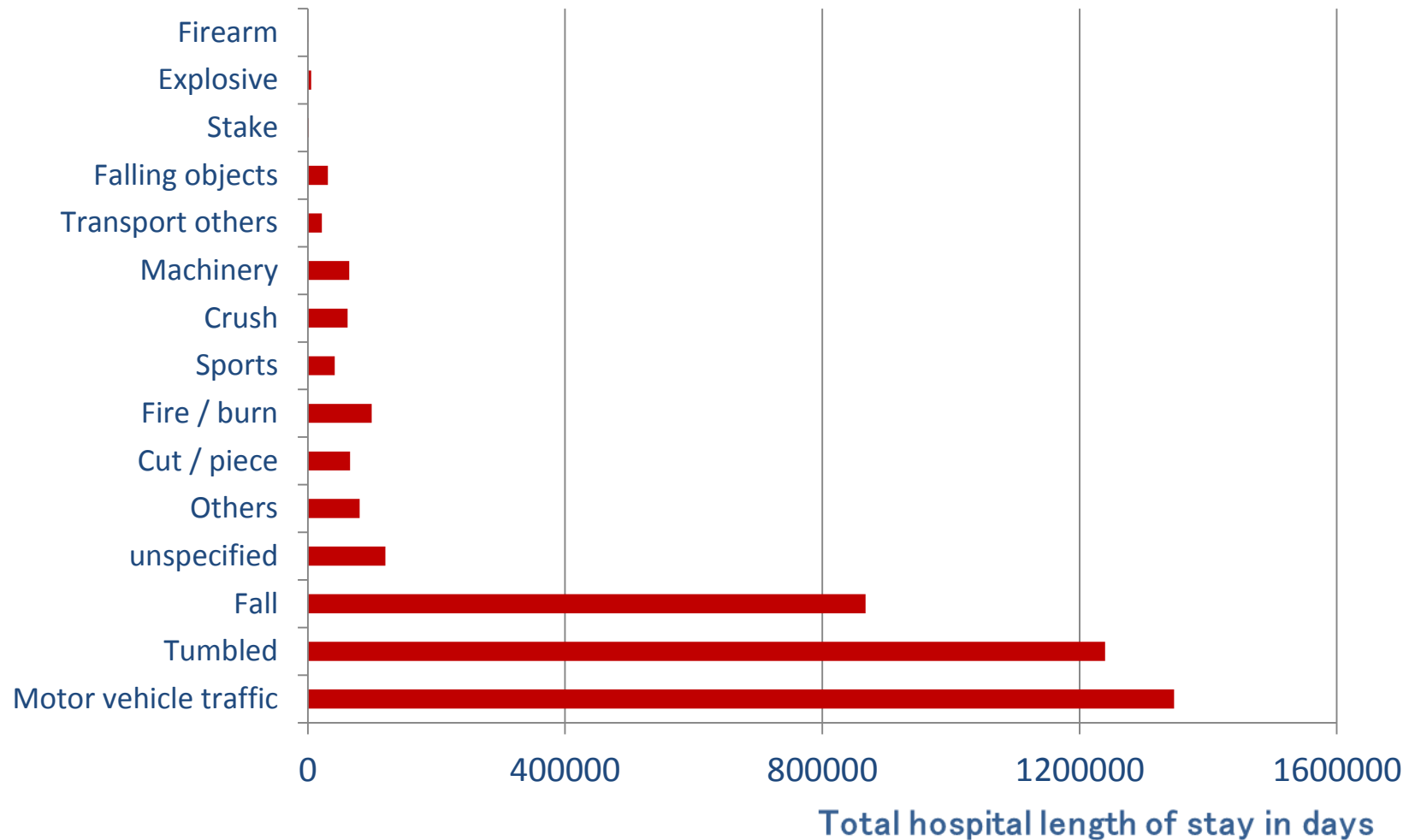
**Figure
13A****Total hospital length of stay by mechanism of Injury****n = 170,666 Over all total hospital length of stay was 4,049,382 days.**

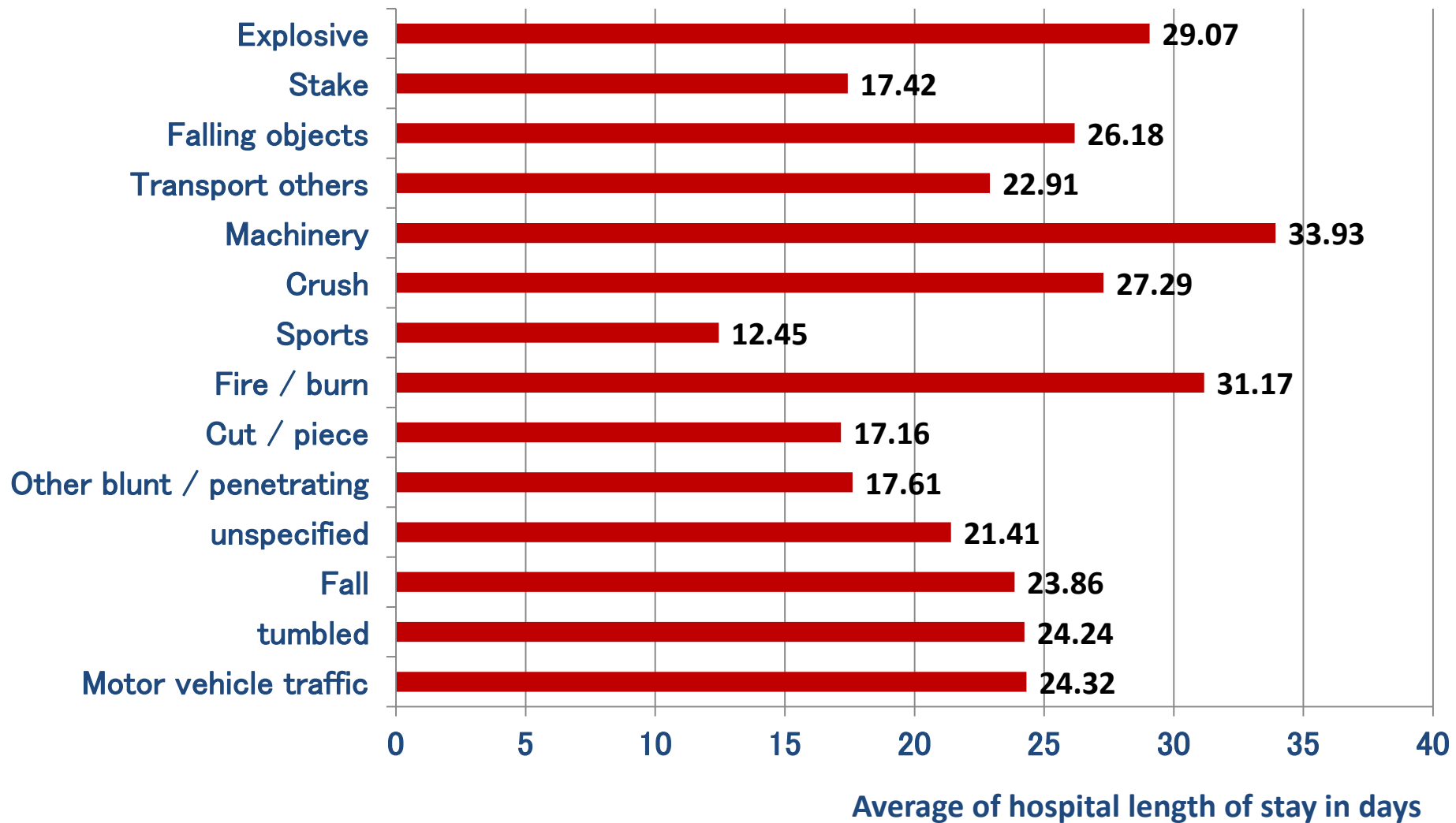
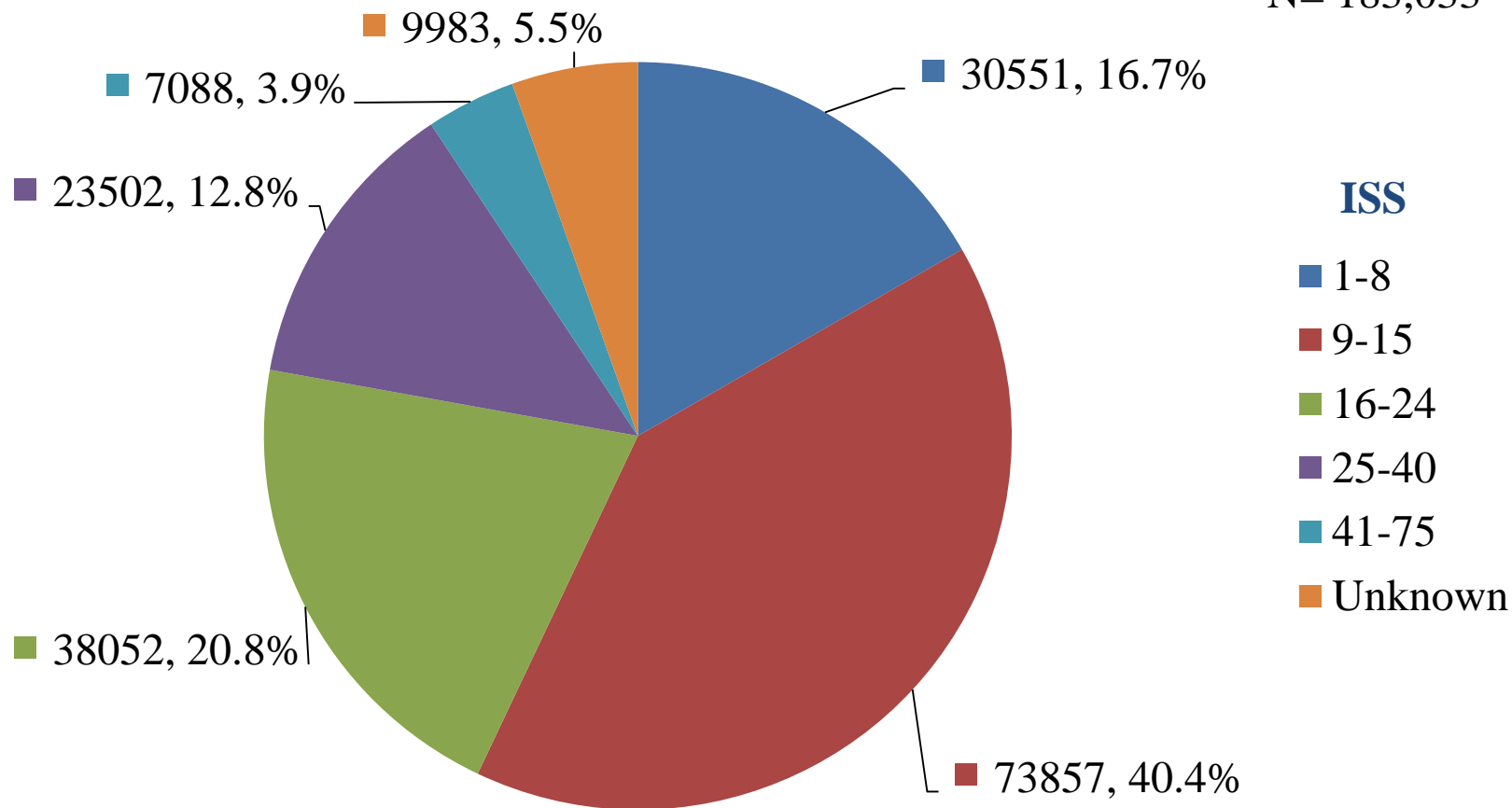
Figure
13B**Average hospital length of stay by mechanism of injury** n = 170,666

Table
13**Total and average hospital length of stay by mechanism of injury n = 170,666**

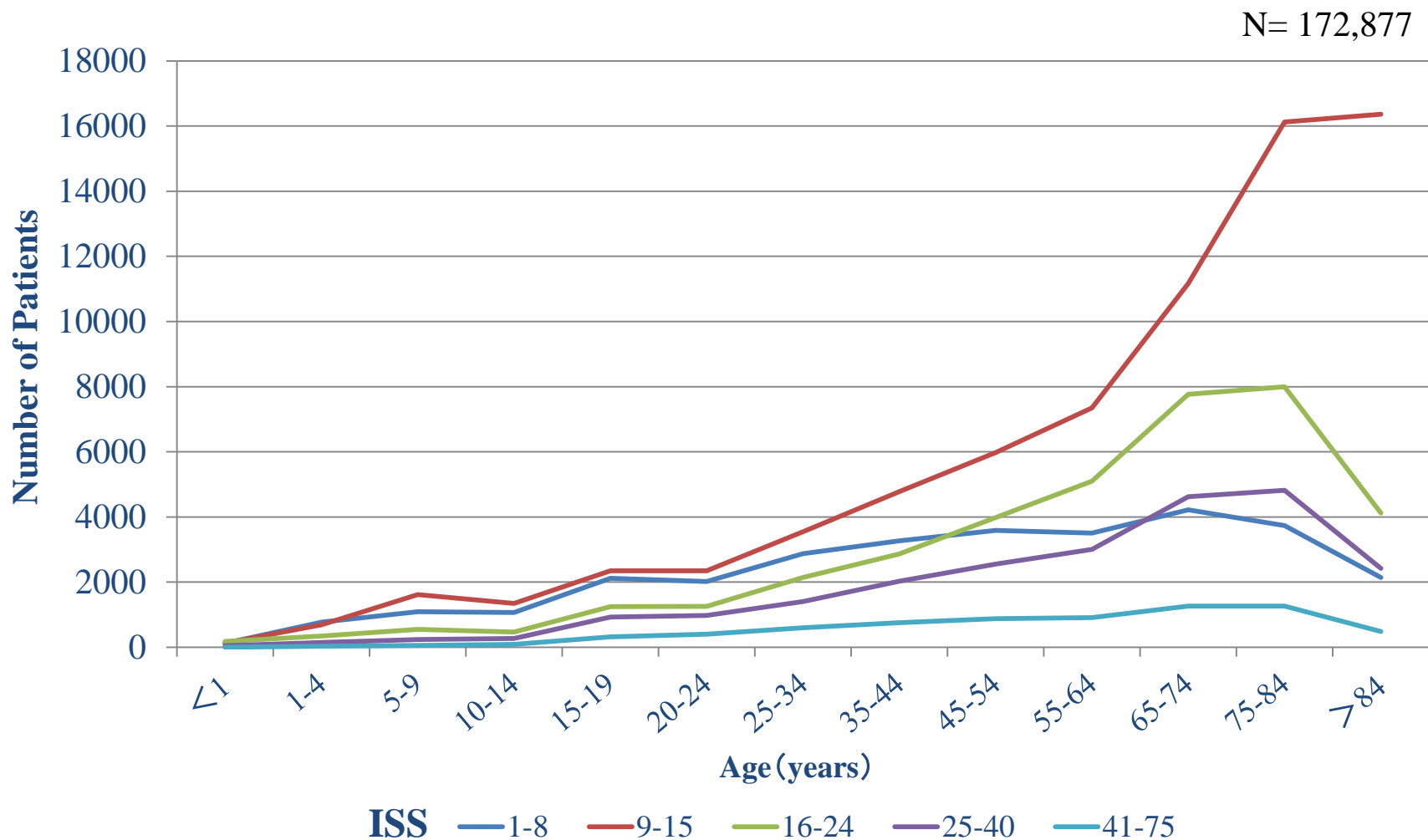
Mechanism of injury	Number of patients / %		Total hospital LOS in days	Average of hospital LOS in days
Motor vehicle traffic	55,404	32.46	1,347,162	24.32
tumbled	51,114	29.97	1,239,710	24.24
Fall	36,346	21.30	867,315	23.86
unspecified	5,628	3.30	120,522	21.41
Other blunt / penetrating	4,567	2.68	80,430	17.61
Cut / piece	3,839	2.25	65,864	17.16
Fire / burn	3,382	1.98	99,535	31.17
Sports	3,375	1.98	42,028	12.45
Crush	2,244	1.30	61,795	27.79
Machinery	1,902	1.11	64,530	33.93
Transport others	1,482	0.87	21,929	22.91
Falling objects	1,186	0.69	31,055	26.18
Stake	108	0.06	1,313	17.42
Explosive	50	0.03	5,447	29.07
Firearm	29	0.02	747	25.76
Total	170,666	100%	4,049,382	23.81

Figure
14**Patients and Injury Severity Score (ISS)**

N= 183,033



**Proportional distribution of patients grouped by categories of the ISS range.
The number of patients of ISS 9-15 category was the most of all categories.**

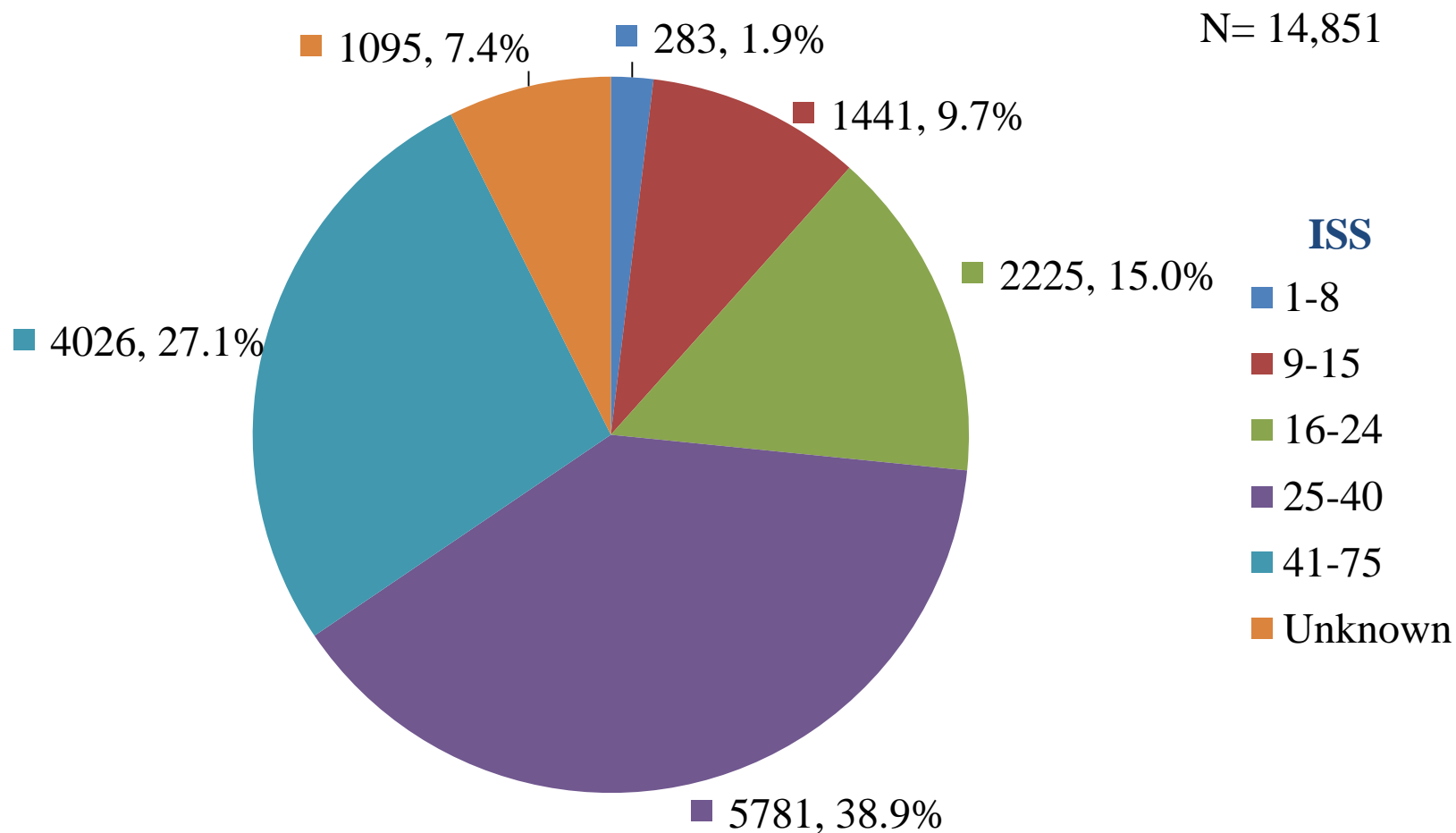
Figure
15**Patients by ISS and Age**

Number of injured patients grouped by ISS range at each age.

The peaks of the number of patients based on age distribution were seen at over 75 ages of ISS 9-15, and at 65-84 ages of another ISS categories.

Table
15**Patients by ISS and Age**

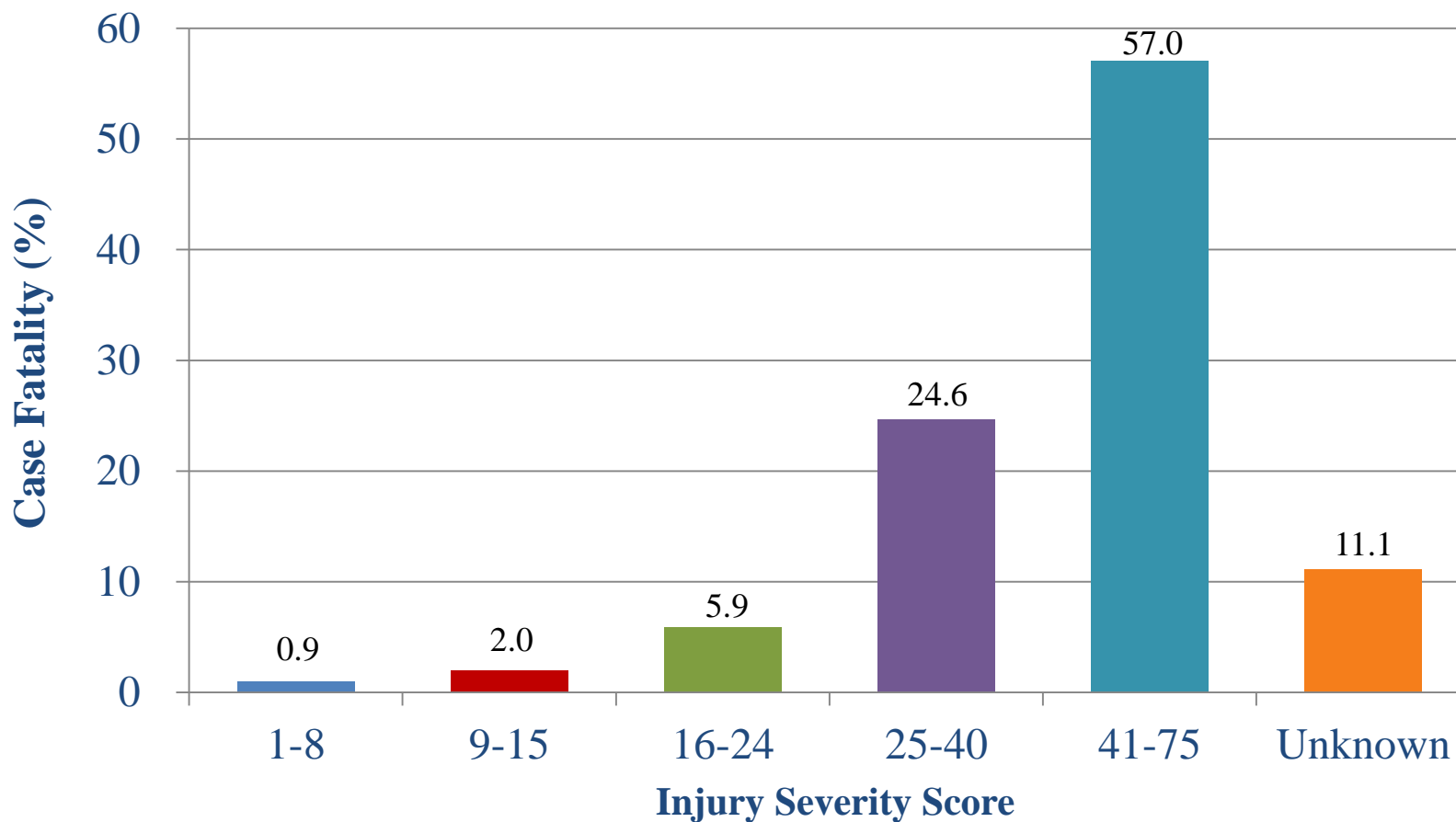
Age ISS	0	1-4	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65-74	75-84	85-	Unknown	Total
1-8	120	776	1092	1070	2117	2020	2876	3265	3590	3502	4217	3739	2143	24	30551
9-15	134	693	1615	1346	2350	2347	3550	4776	5974	7347	11168	16127	16366	64	73857
16-24	181	344	549	471	1249	1258	2146	2867	3981	5096	7765	7993	4124	28	38052
25-40	53	152	240	270	926	981	1401	2026	2550	3007	4626	4819	2422	29	23502
41-75	3	31	57	89	319	405	603	752	877	914	1266	1263	481	28	7088
Unknown	68	287	282	244	444	530	790	909	1120	1129	1588	1562	948	82	9983
Total	559	2283	3835	3490	7405	7541	11366	14595	18092	20995	30630	35503	26484	255	183033

Figure
16A**Deaths and Injury Severity Score (ISS)**

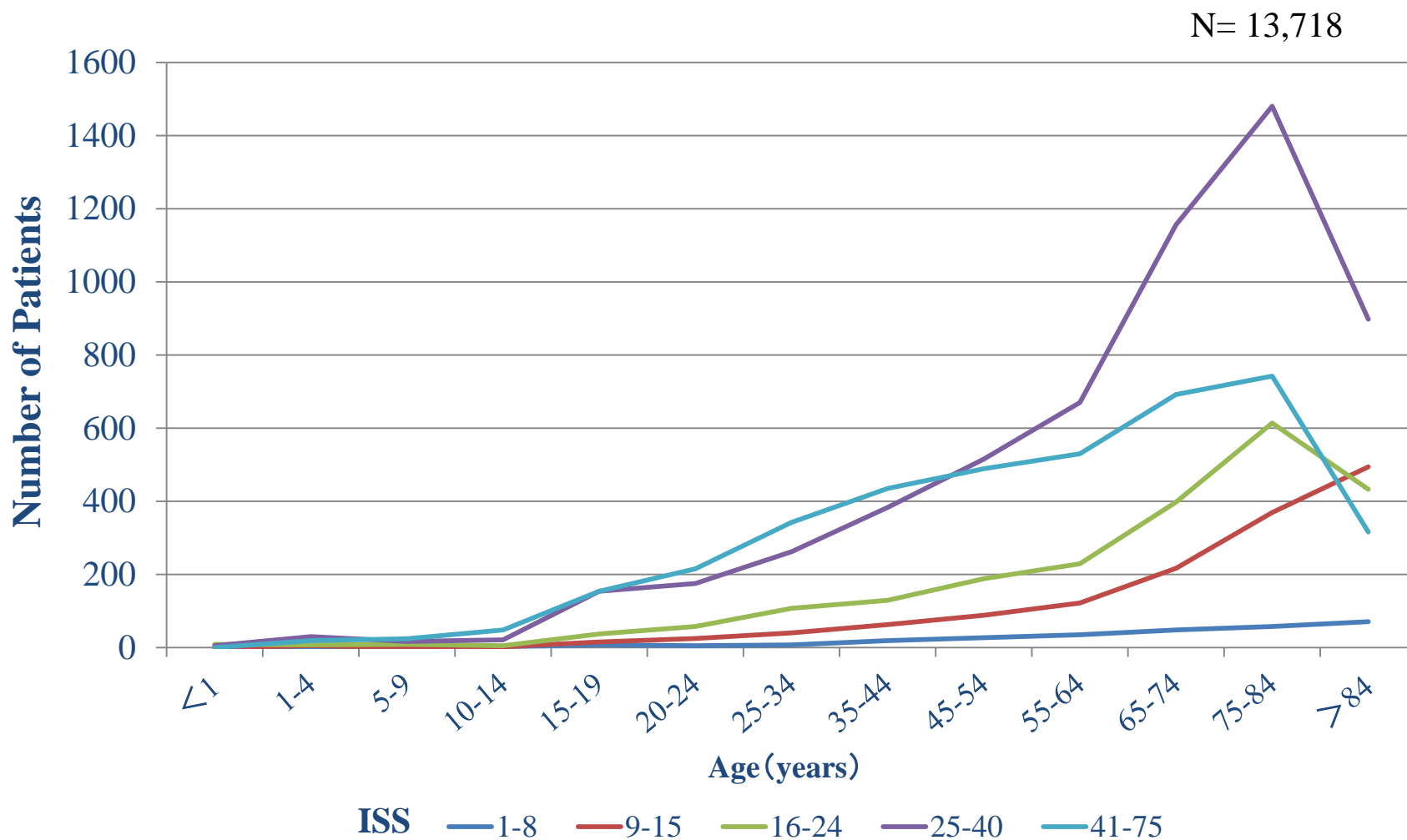
**Proportional distribution of deaths grouped by categories of ISS range.
Deaths in ISS 25-40 category were the highest.**

Figure
16B**Case Fatality by Injury Severity Score (ISS) Range**

N= 14,851



Case fatality grouped by ISS range was higher in severe trauma category.
(Case fatality = number of deaths divided by the number of patients \times 100 by ISS range).

Figure
17**Deaths by ISS and Age**

The peak was seen at elderly ages in all ISS categories.

Table
17**Deaths by ISS and Age**

Age ISS	0	1-4	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65-74	75-84	85-	Unknown	Total
1-8	1	2	0	3	7	5	7	19	27	35	48	58	71	0	283
9-15	0	5	0	2	15	25	40	63	88	122	217	369	494	1	1441
16-24	9	7	9	5	37	58	107	129	188	229	398	614	433	2	2225
25-40	5	30	17	21	154	175	262	383	515	670	1156	1480	898	15	5781
41-75	0	19	24	48	154	215	342	435	489	530	692	742	316	20	4026
Unknown	3	2	3	6	37	65	97	111	158	132	180	203	91	7	1095
Total	18	65	53	85	404	543	855	1140	1465	1718	2691	3466	2303	45	14851

Figure
18**Deaths by Age and Gender (ISS \leq 15)**

N=99281

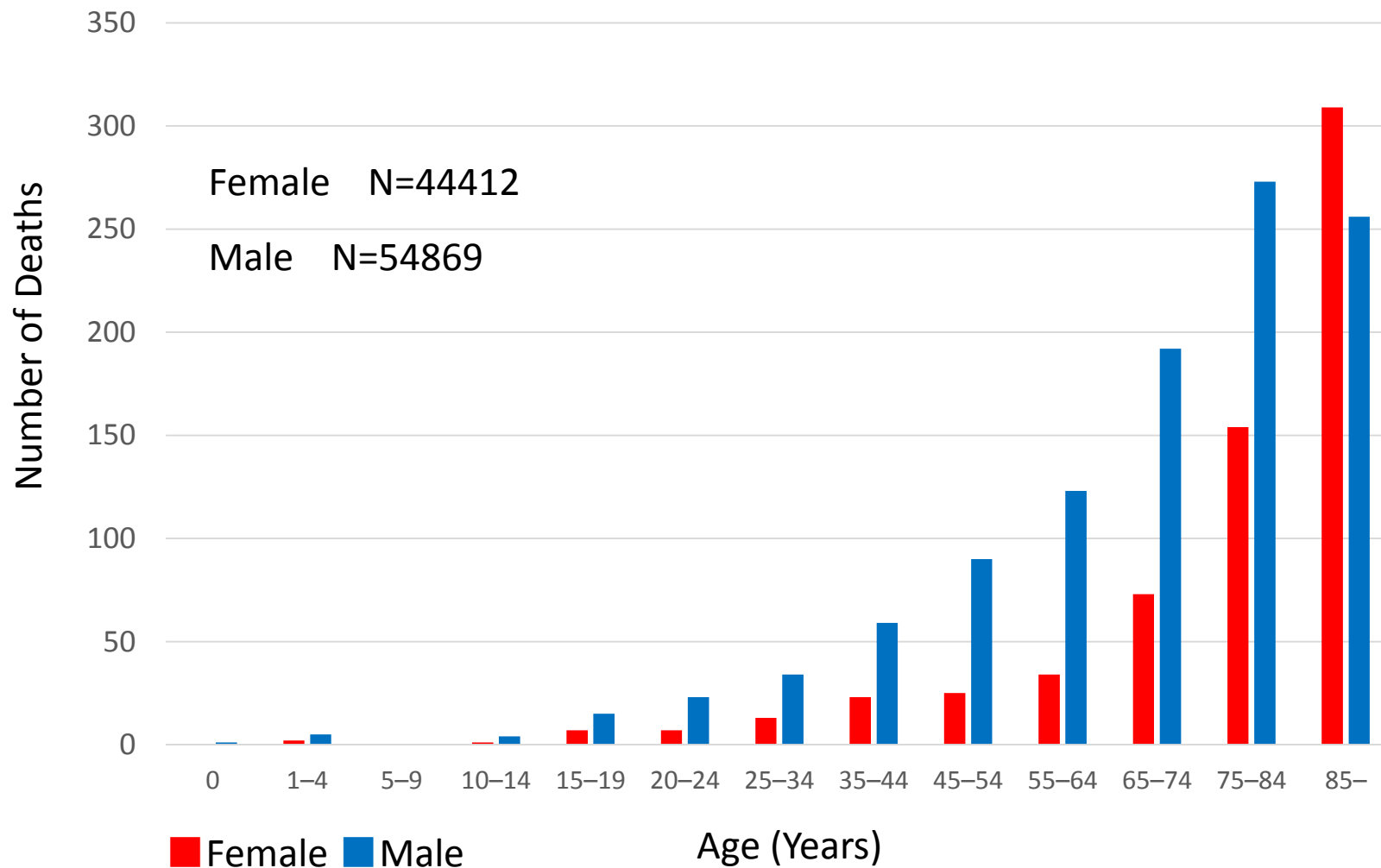
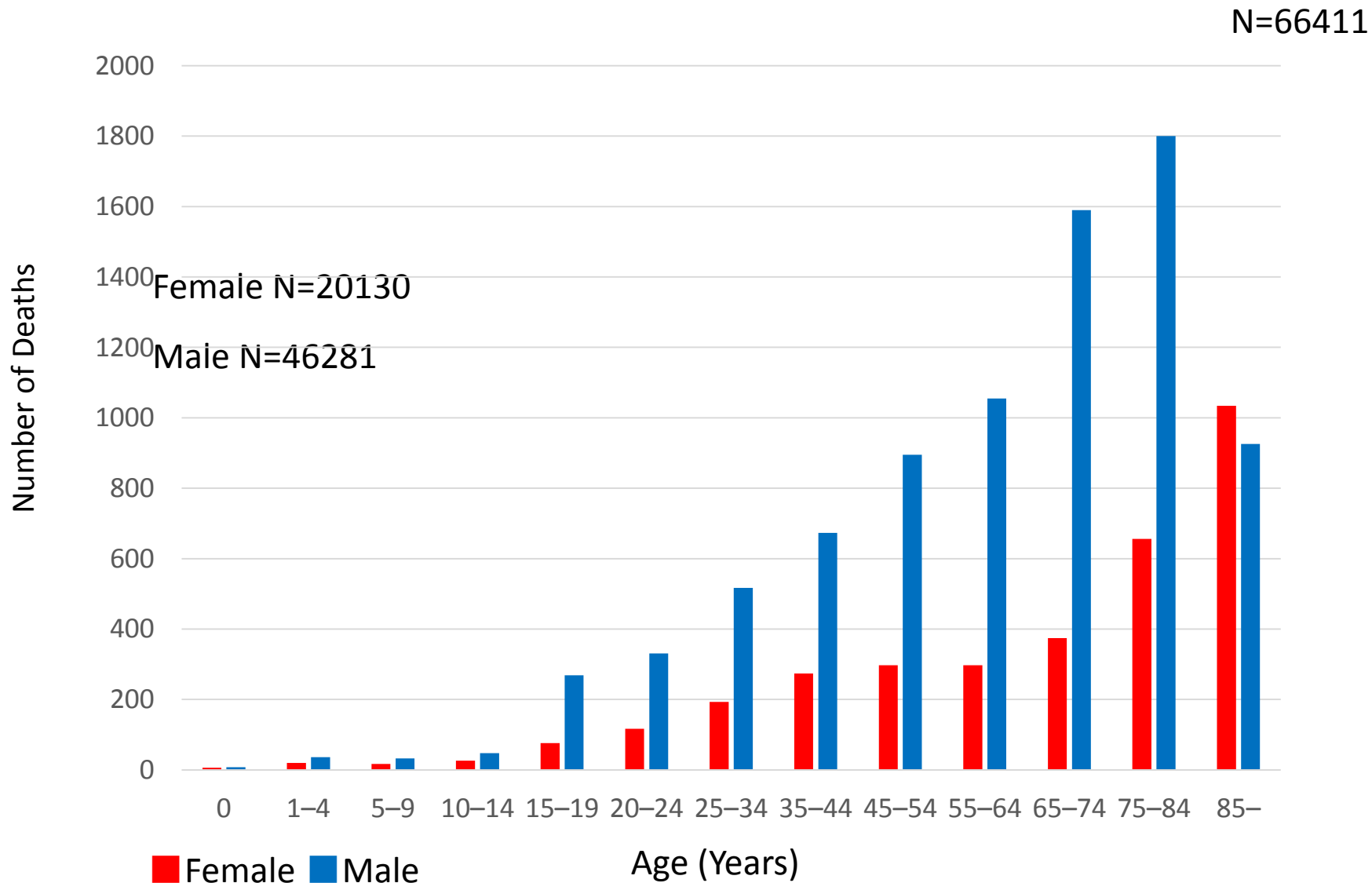
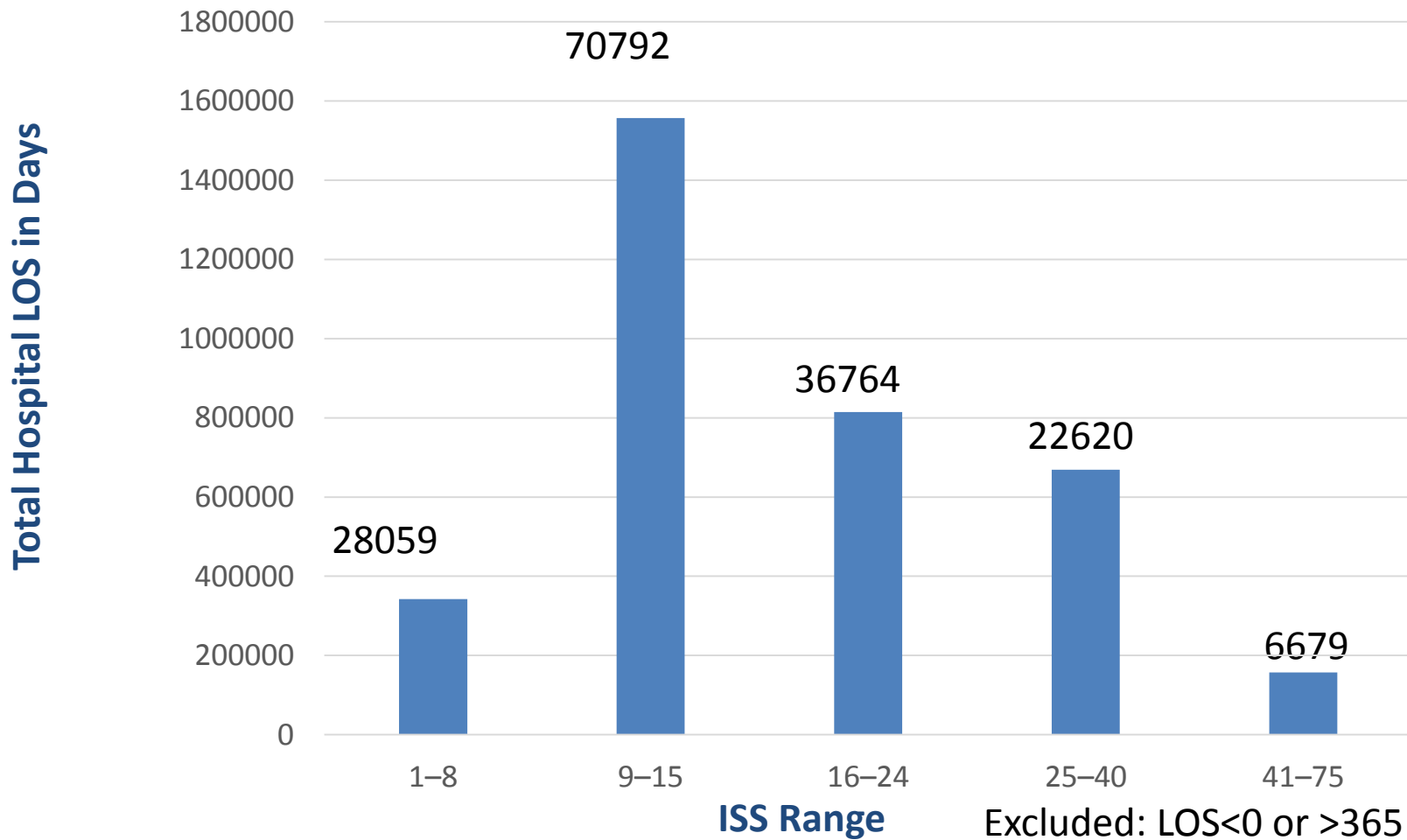
**Deaths for patients with ISS \leq 15 for males and females at each age category.**

Figure
19**Deaths by Age and Gender (ISS>15)**

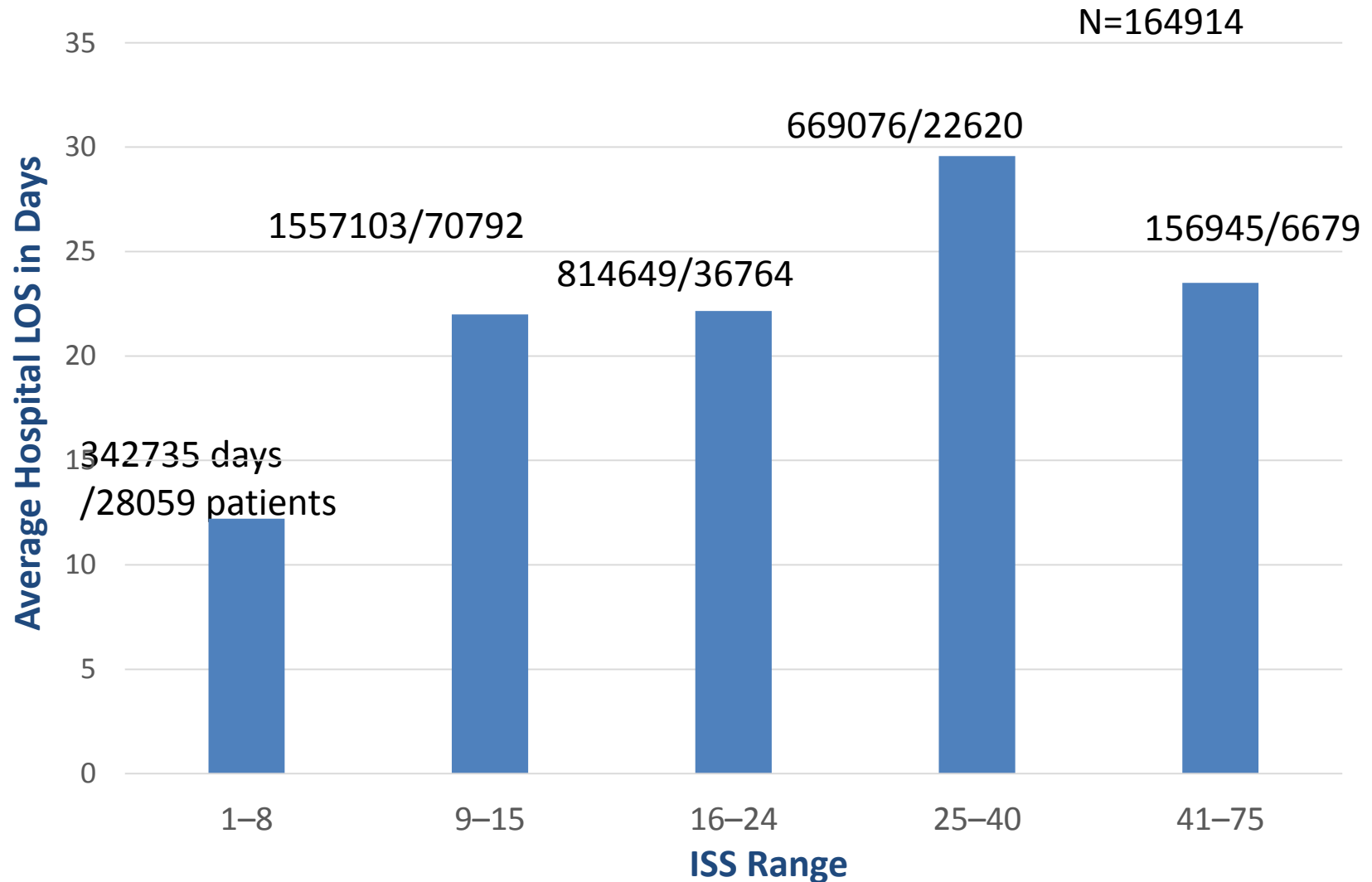
Deaths for patients with ISS>15 for males and females at each age category.

Figure
20A**Total Hospital LOS and Injury Severity Score (ISS)**

N=164914



Proportional distribution of total hospital length of stay for patients, grouped by ISS range.

**Figure
20B****Average Hospital LOS and Injury Severity Score**

Average hospital length of stay for each category of ISS range. (Average hospital length of stay = total hospital length of stay for each ISS range divided by the total number of patients).

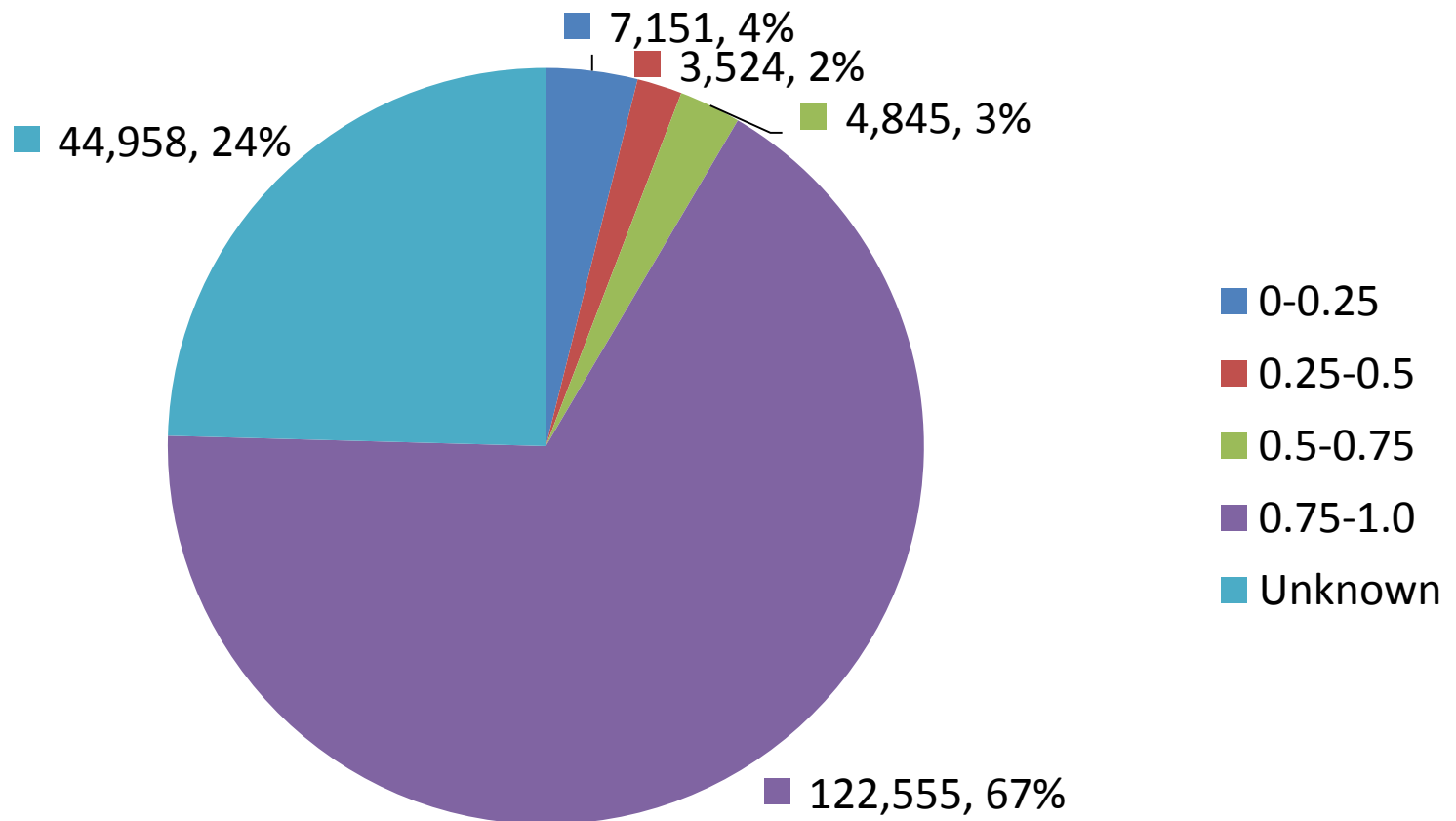
Figure
21**Distribution of patients by probability of survival (Ps)**

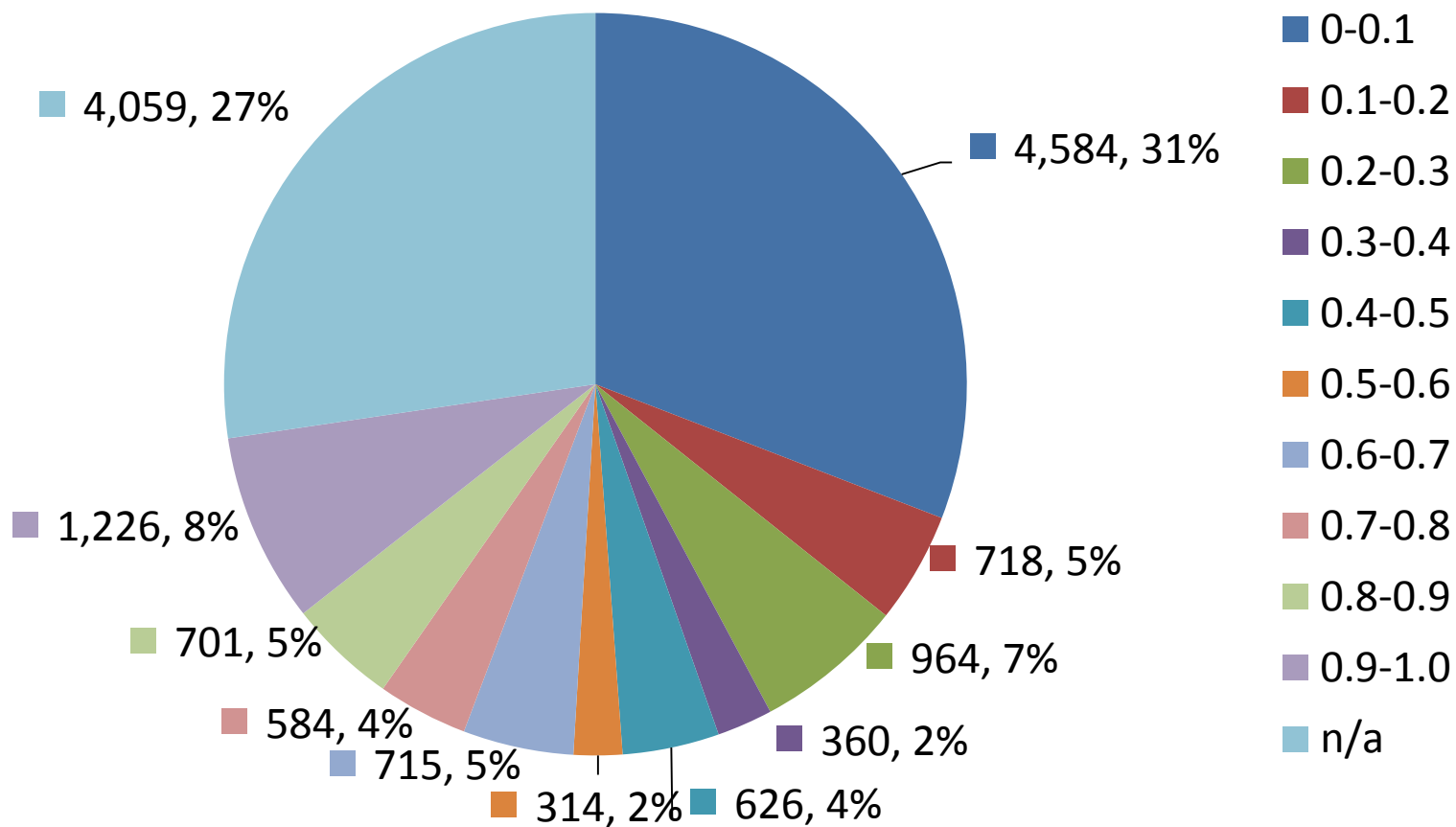
Figure
22A**Distribution of deaths by probability of survival (Ps)**

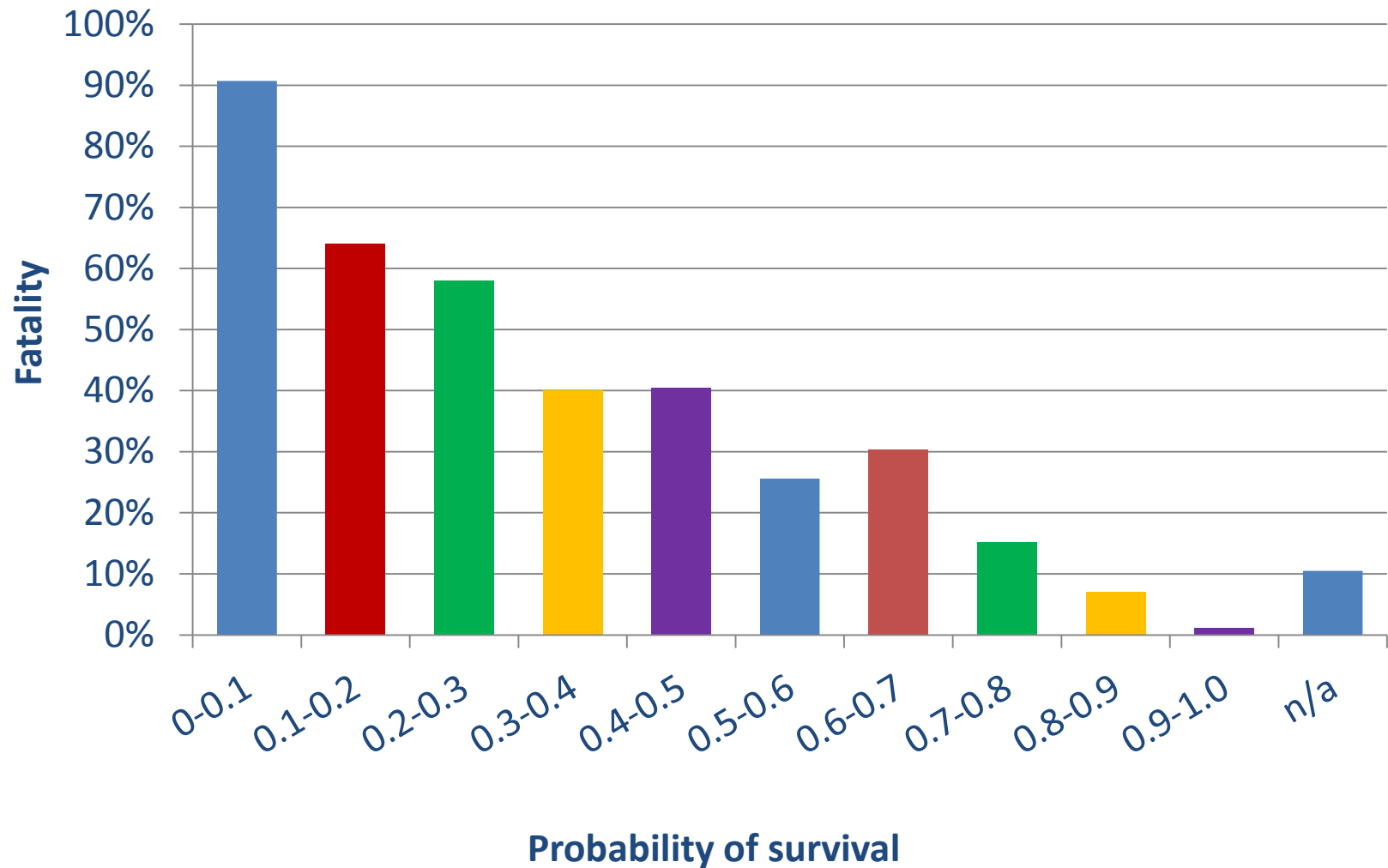
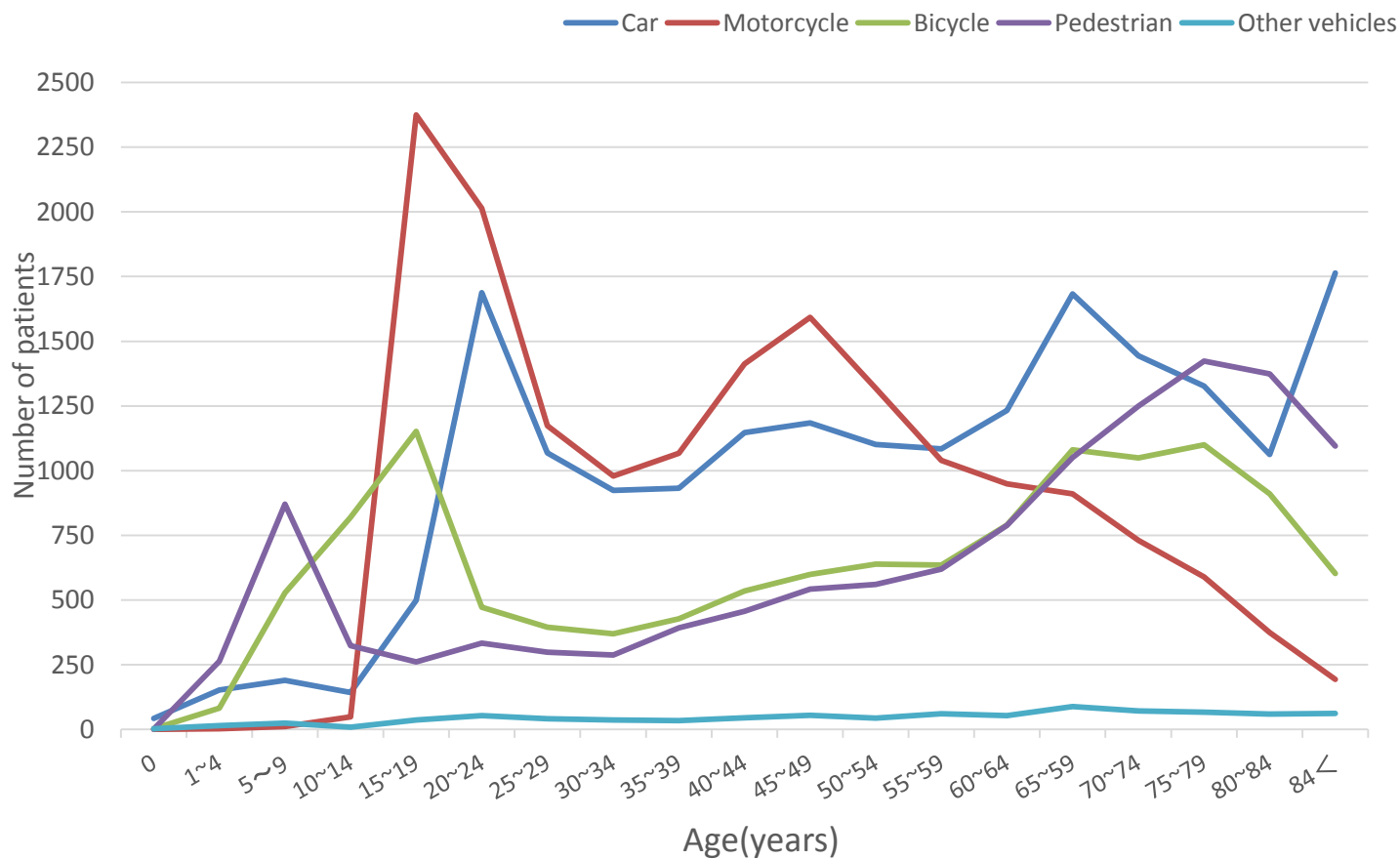
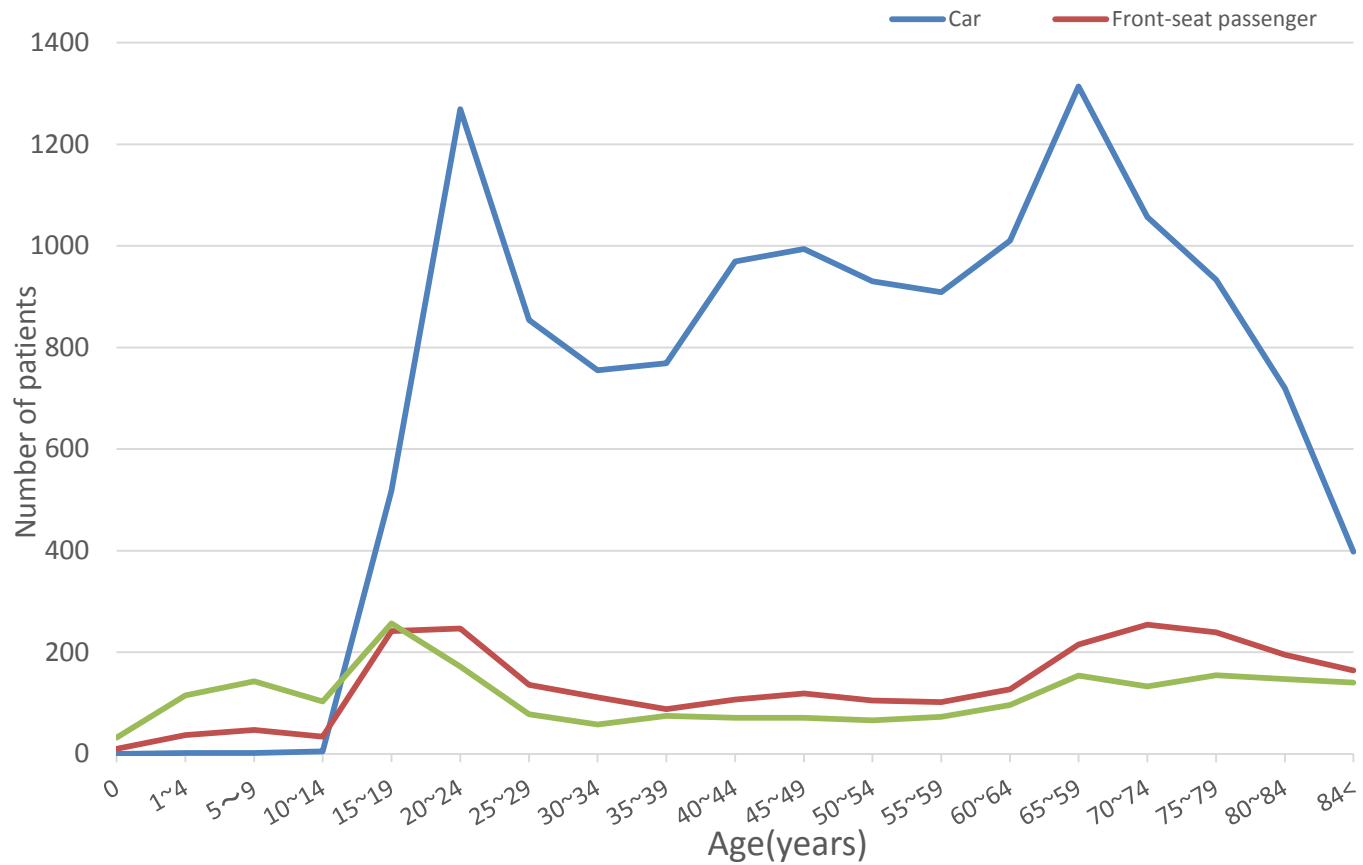
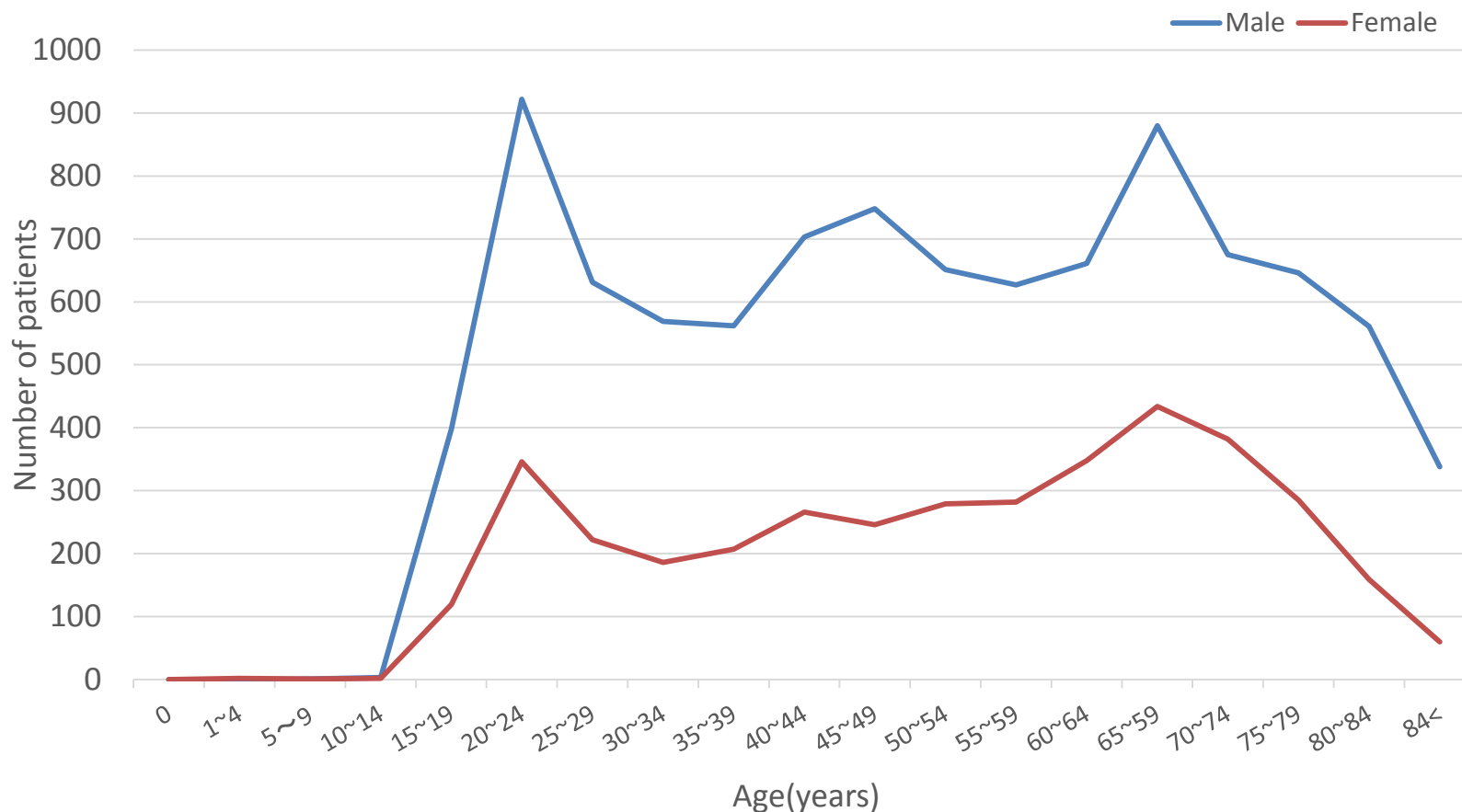
Figure
22B**Case fatality by probability of survival (Ps)**

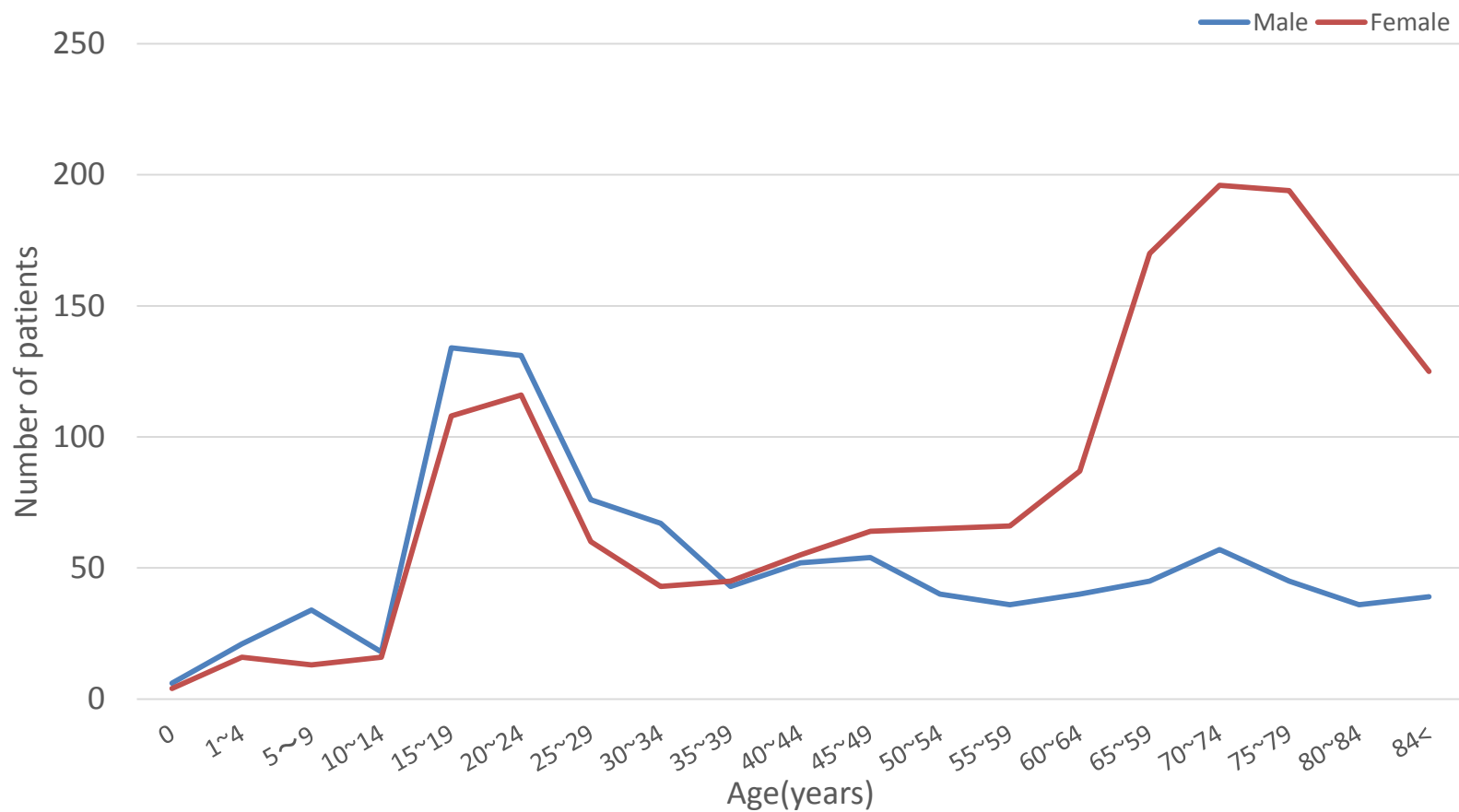
Figure
23

The number of patients in traffic accidents by types of vehicle and age



**Figure
24****The number of patients in car accident by drivers and passengers and age**

**Figure
25****The number of patients in car accident (driver) by gender and age**

**Figure
26****The number of patients in car accident (passenger) by gender and age**

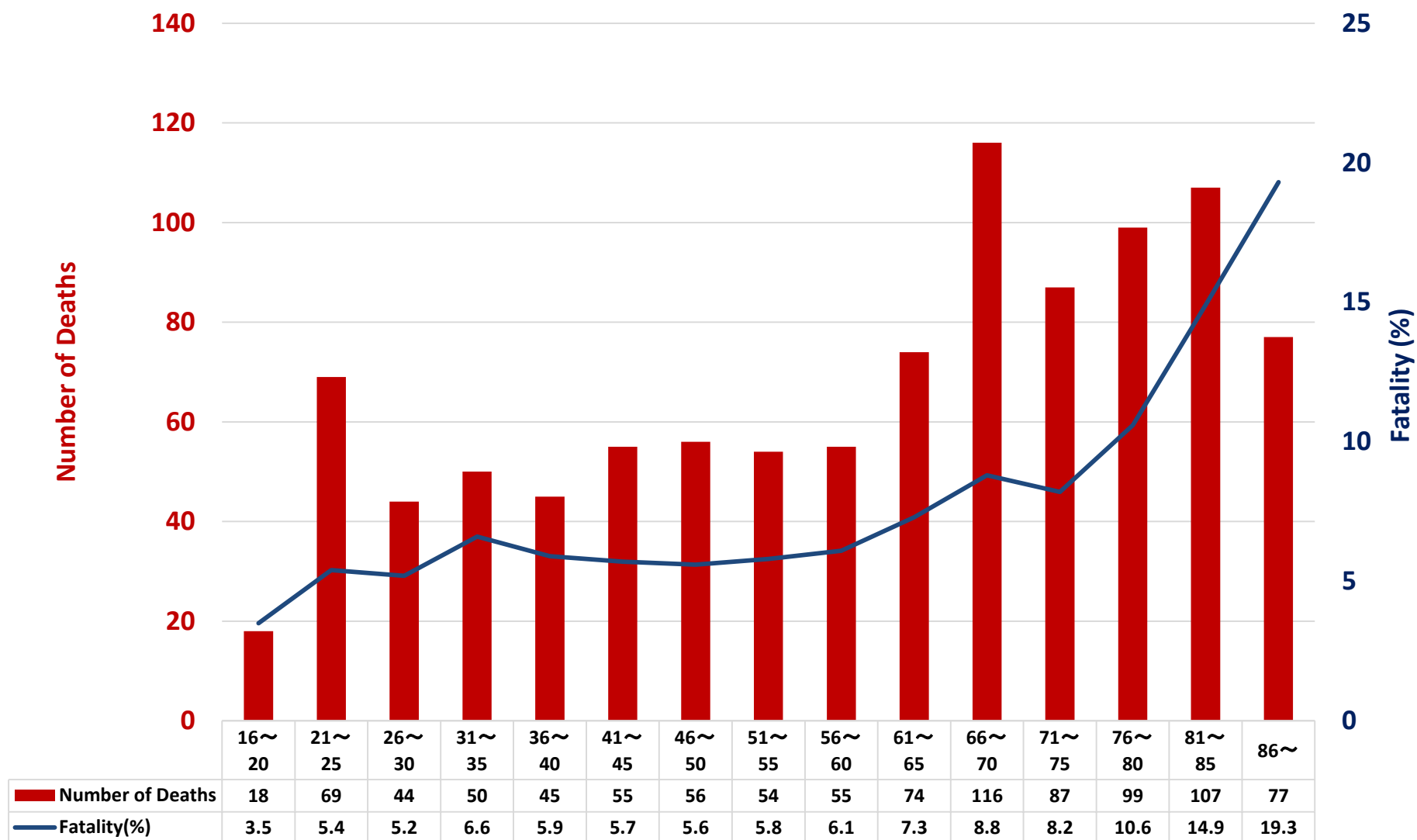
**Figure
27****Number of Deaths and Fatalities of Motor Vehicular Drivers by Age**

Figure
28

Number of Deaths of Motor Vehicular Drivers by Age and Genders

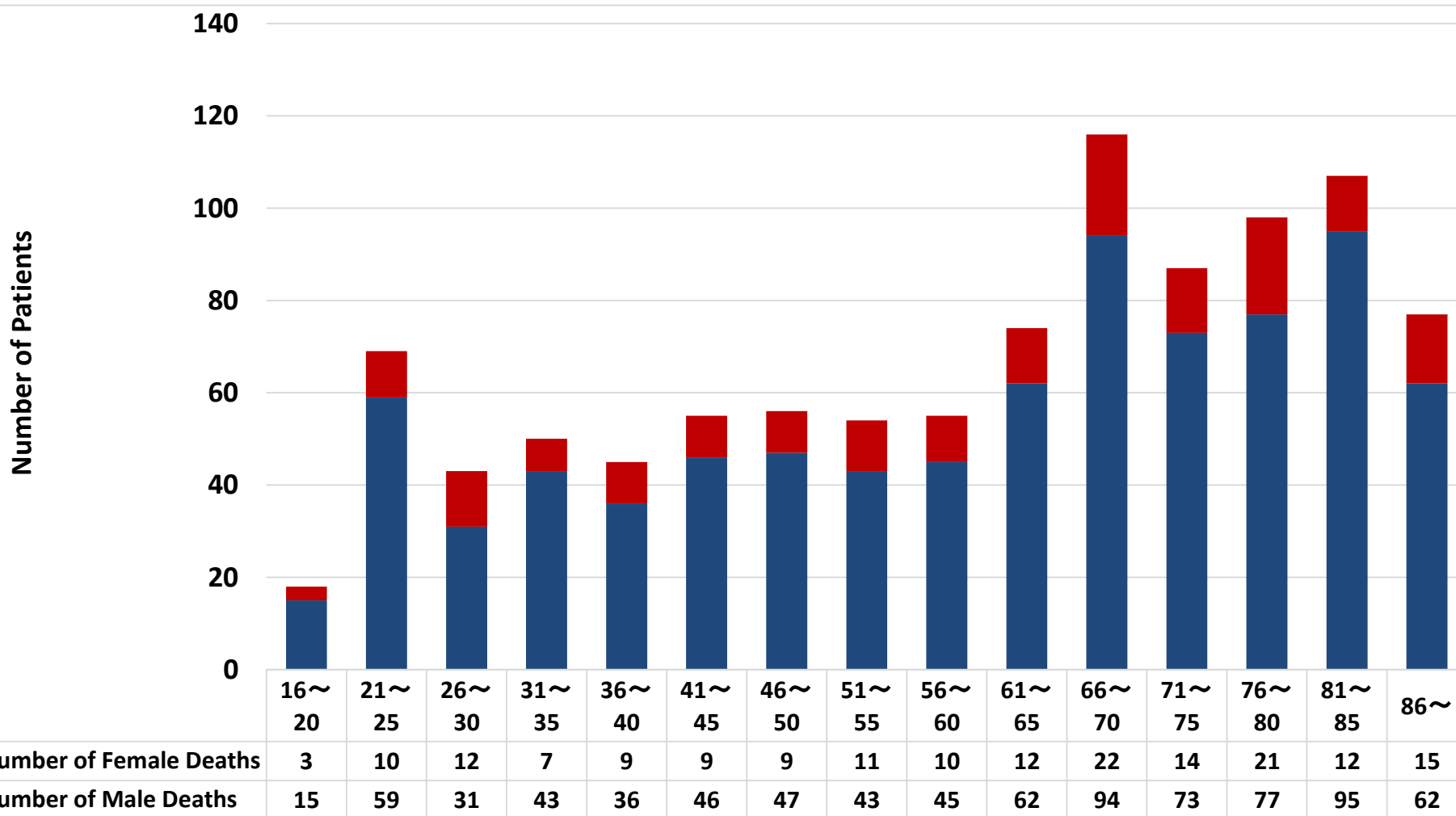
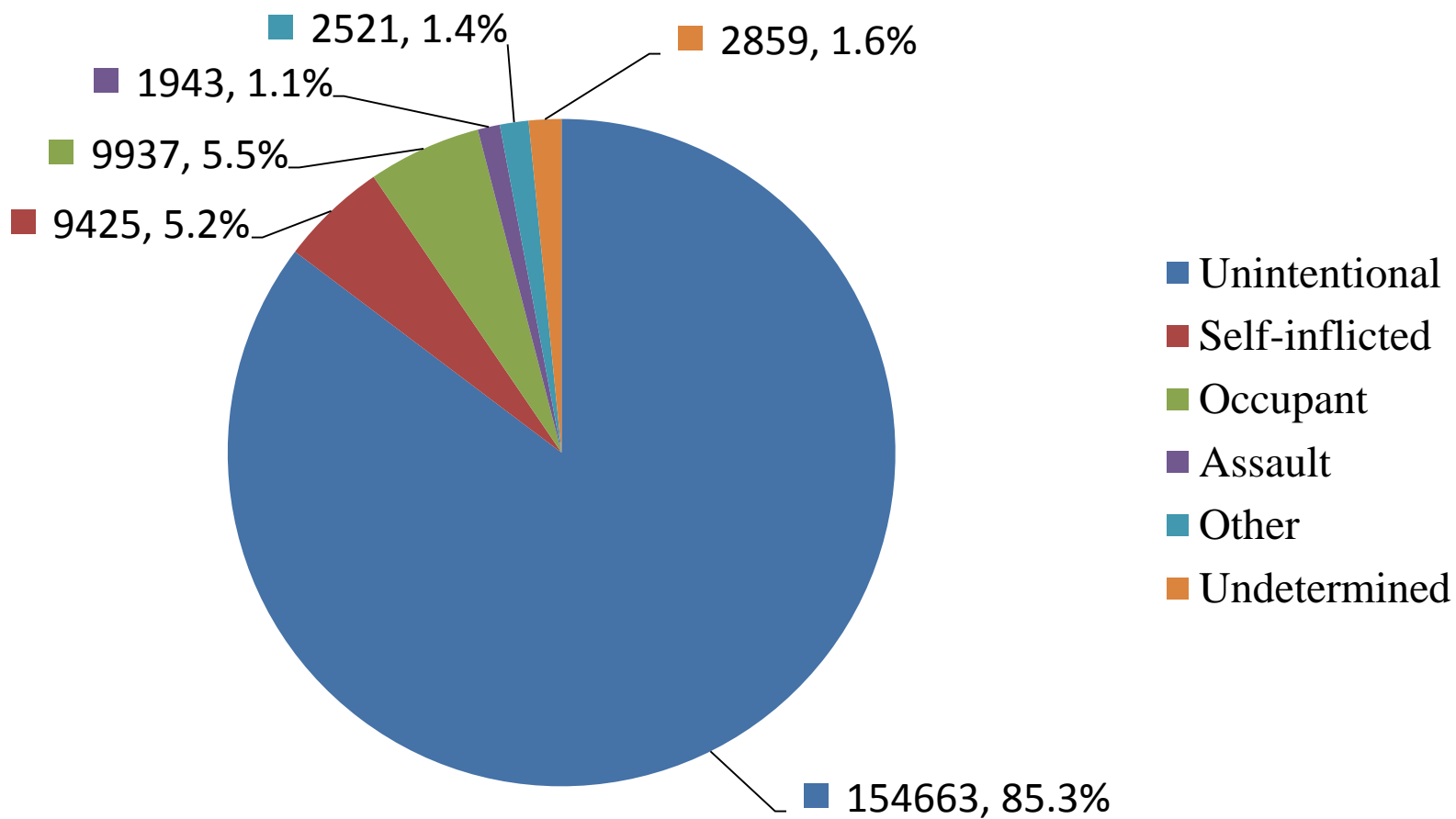
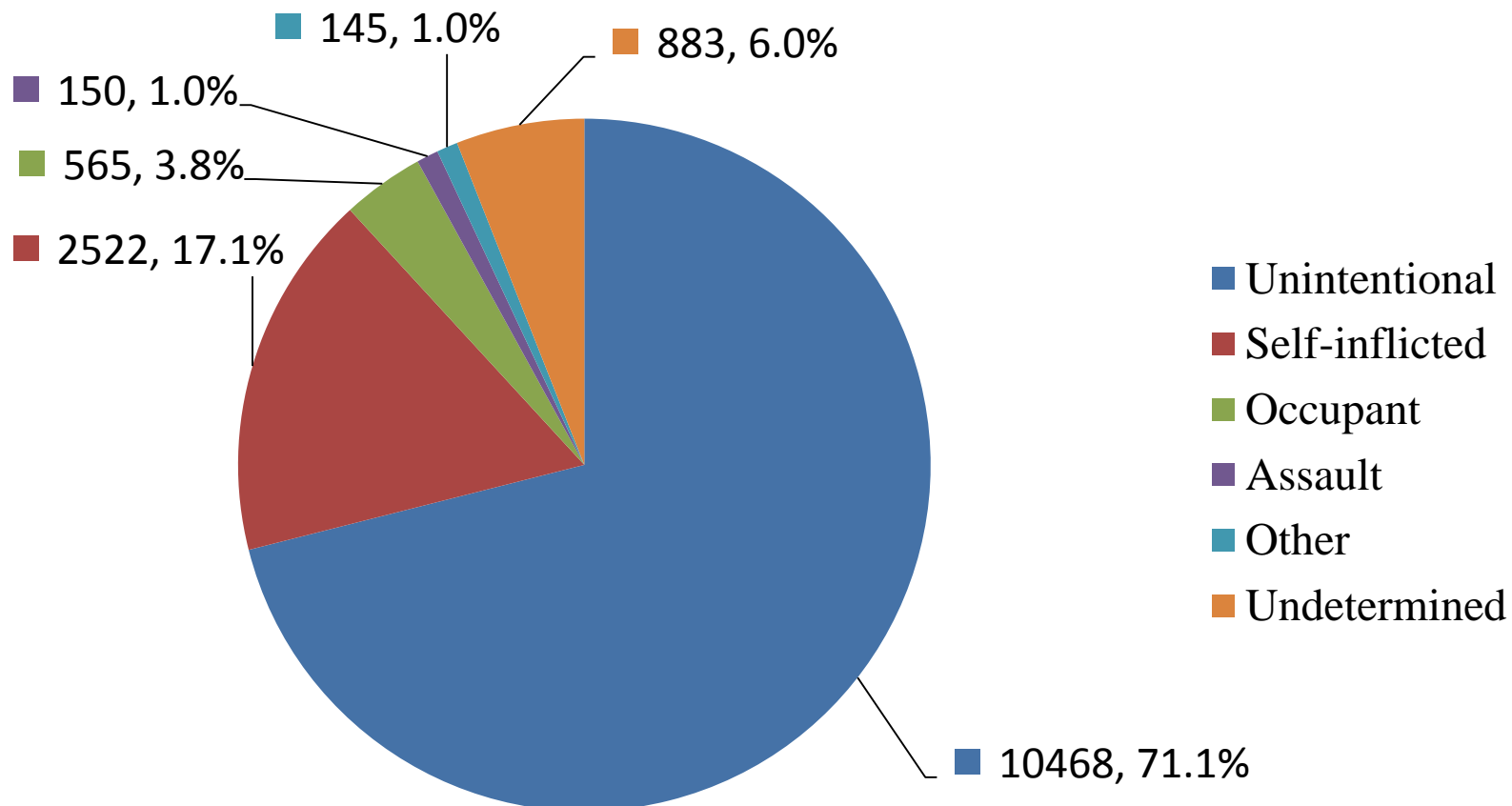


Figure
29**Proportional distribution of registered patients, groped by intent**

**Figure
30****Proportional distribution of deaths, grouped by intent**

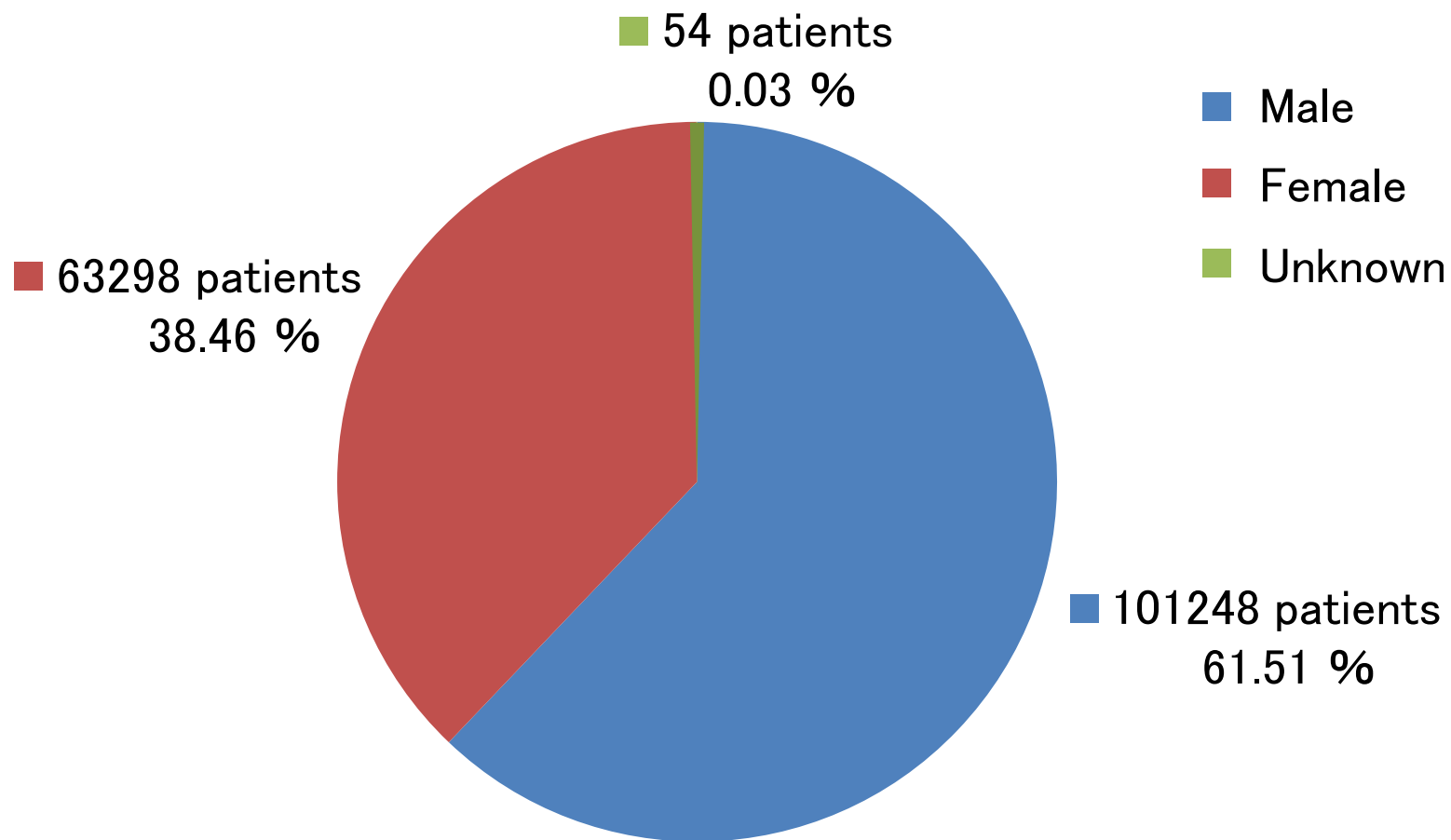
**Figure
31****Gender proportion of Unintentional and Occupant**

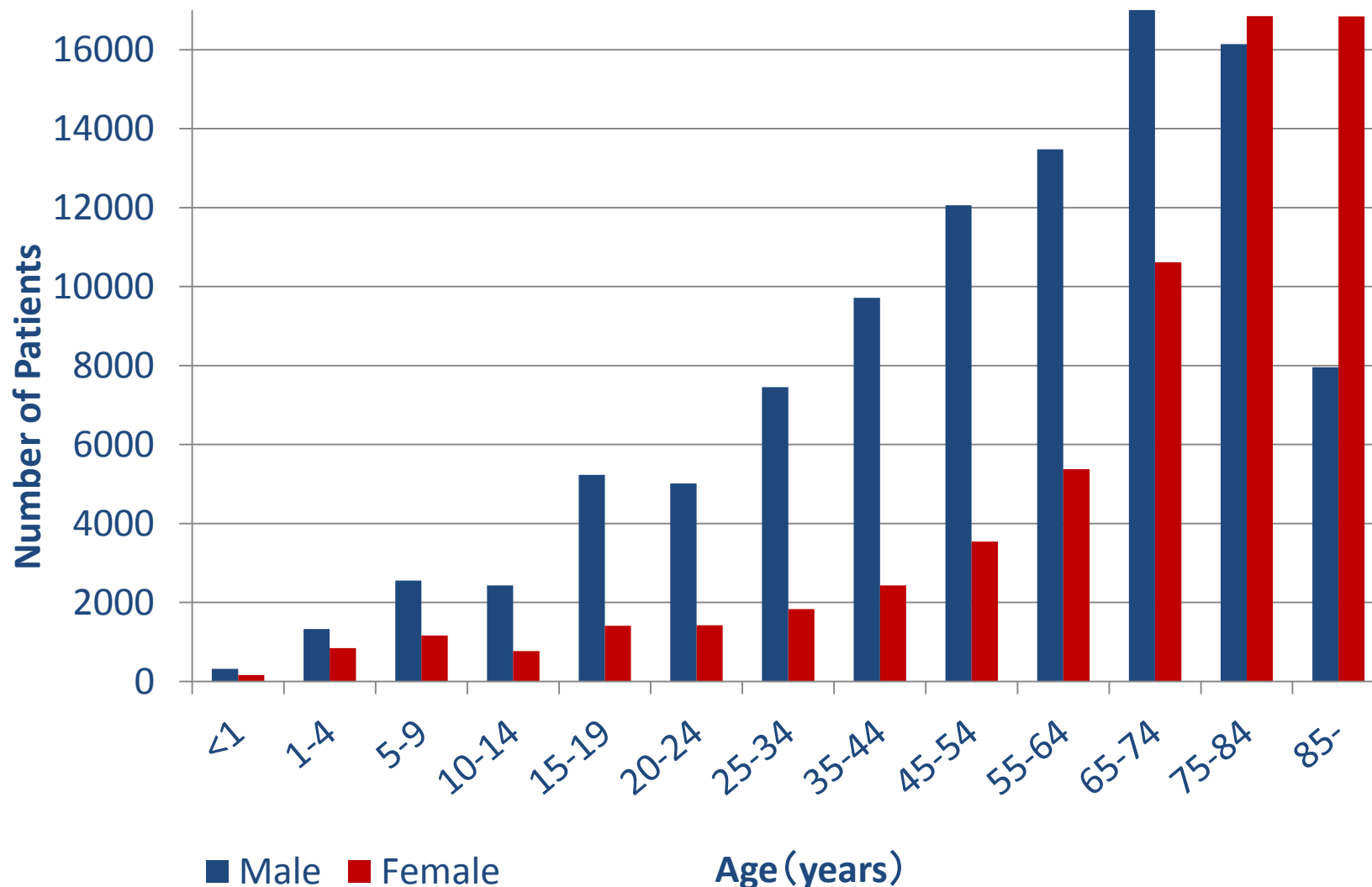
Figure
32**Unintentional and Occupant by Age and Gender**

Table
32**Unintentional and Occupant by Age and Gender**

Age	Male	Female	Total
< 1	318	163	481
1- 4	1326	843	2169
5- 9	2554	1166	3720
10-14	2429	765	3194
15-19	5234	1411	6645
20-24	5011	1420	6431
25-34	7452	1830	9282
35-44	9716	2434	12150
45-54	12061	3543	15604
55-64	13479	5375	18854
65-74	17478	10618	28096
75-84	16143	16848	32991
85-	7960	16841	24801
Unknown	87	41	128
Total	101248	63298	164546

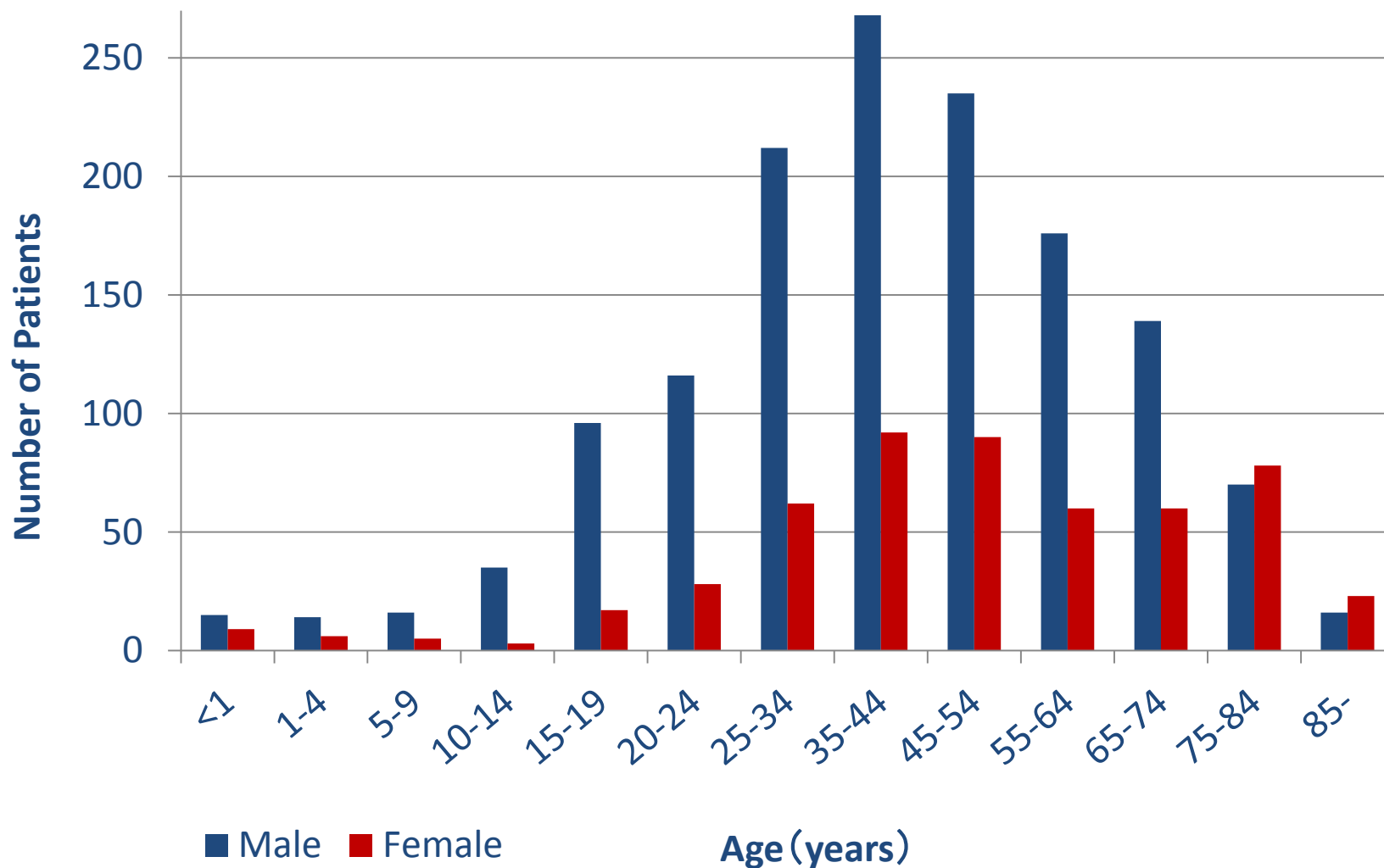
Figure
33**Assault by Age and Gender**

Table
33**Assault by Age and Gender**

Age	Male	Female	Total
< 1	15	9	24
1- 4	14	6	20
5- 9	16	5	21
10-14	35	3	38
15-19	96	17	113
20-24	116	28	144
25-34	212	62	274
35-44	268	92	360
45-54	235	90	325
55-64	176	60	236
65-74	139	60	199
75-84	70	78	148
85-	16	23	39
Unknown	2	0	2
Total	1410	533	1943

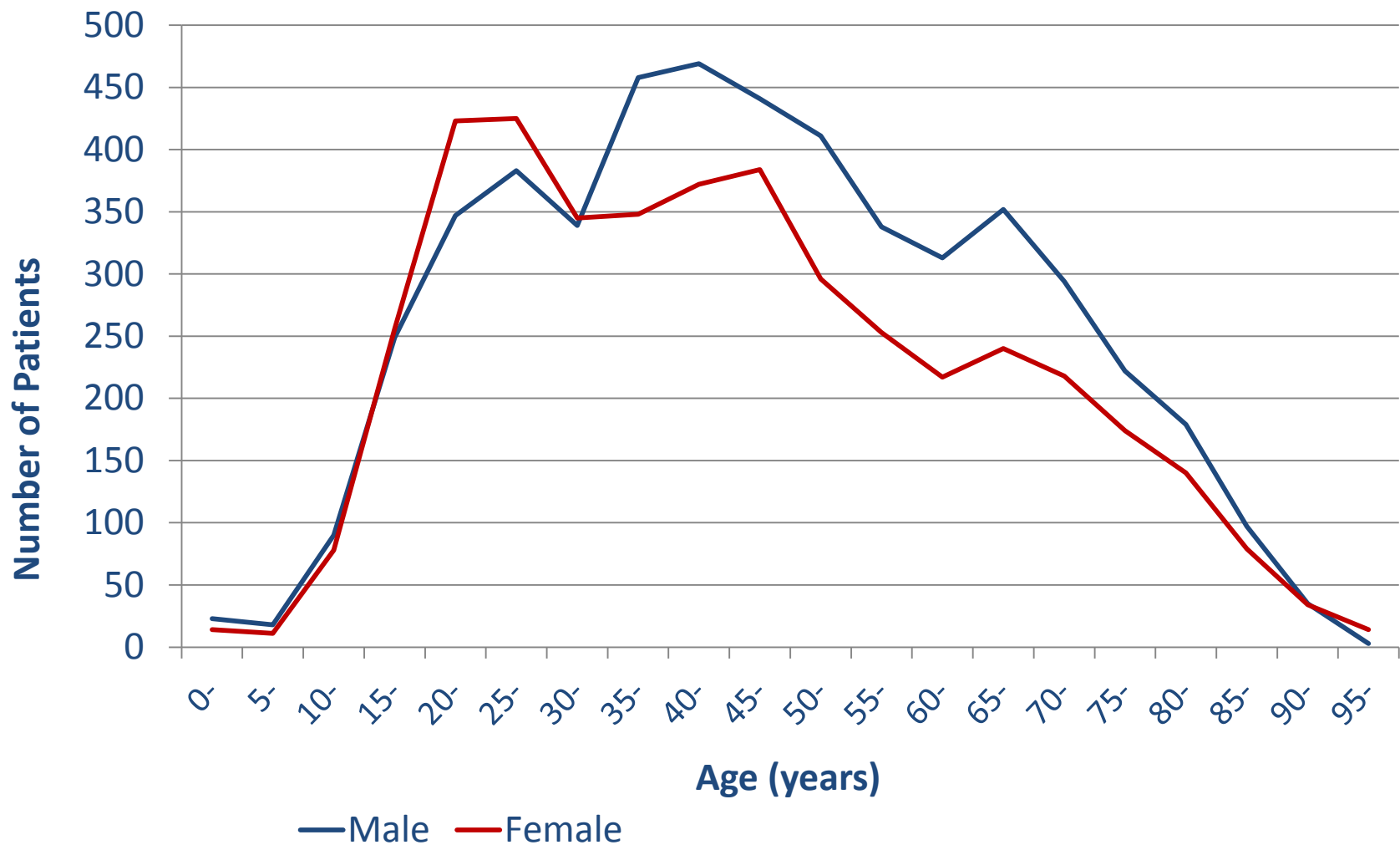
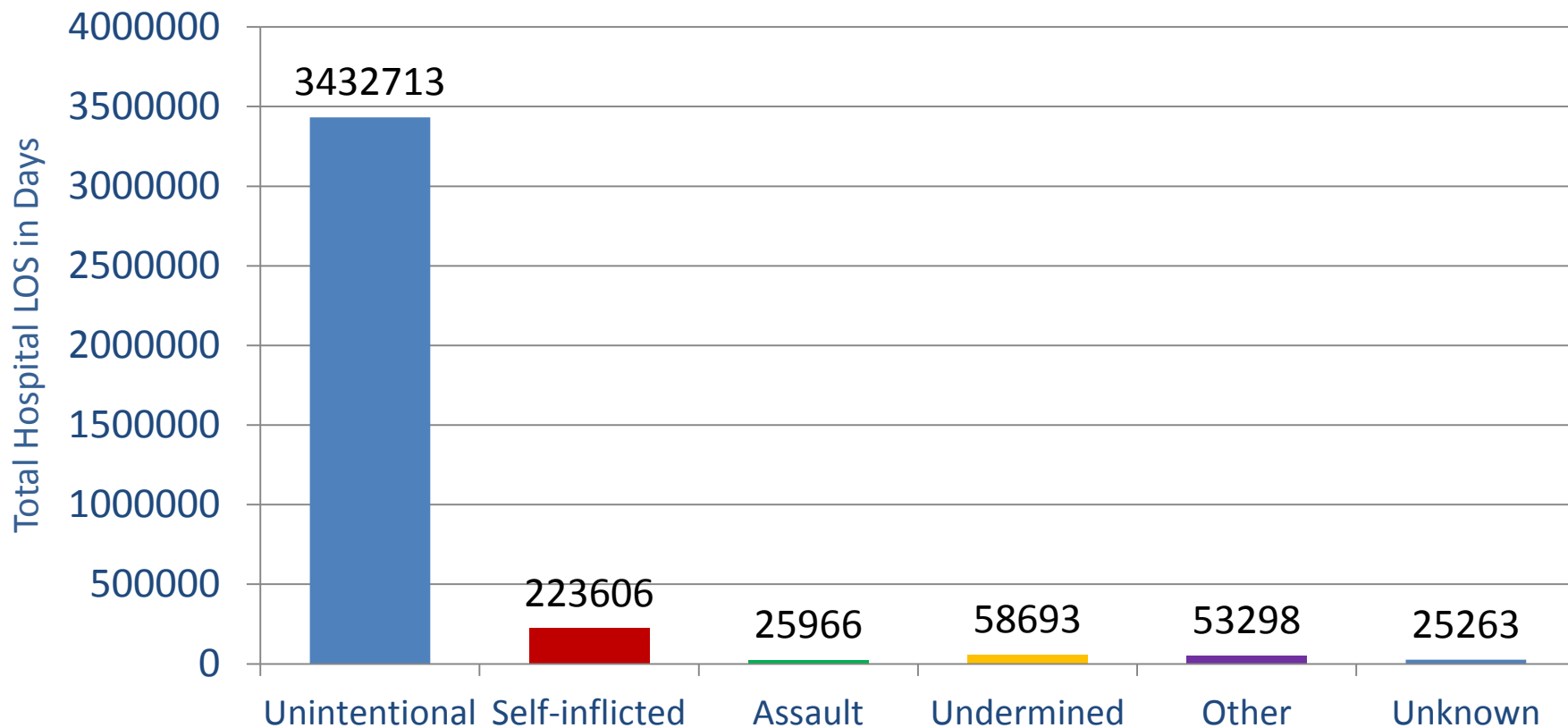
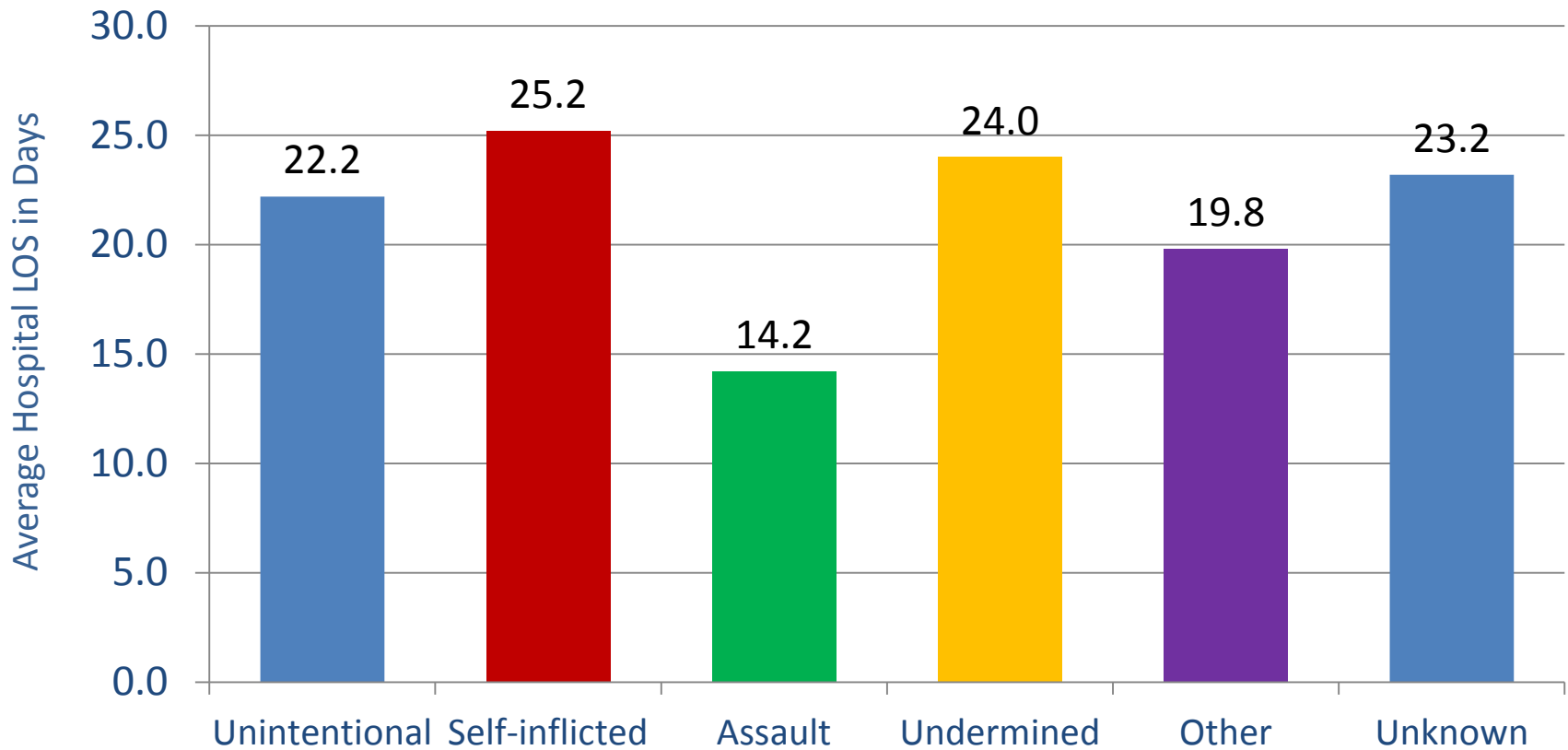
Figure
34**Self-inflicted by Age and Gender**

Table
34**Self-inflicted by Age and Gender**

	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-	Unkno wn	Total
Female	14	11	78	256	423	425	345	348	372	384	296	253	217	240	218	174	140	79	34	14	6	4327
Male	23	18	90	249	347	383	339	458	469	441	411	338	313	352	294	222	179	97	35	3	36	5097
Total	37	29	168	505	770	808	684	806	841	825	707	591	530	592	512	396	319	176	69	17	42	9424

Figure
35A**Total Hospital LOS by Intent**

Industrial accident was included in the category of “Unintentional”.

Figure
35B**Average Hospital LOS by Intent**

Average hospital length of stay in days = total hospital length of stay divided by the number of patients by intent.

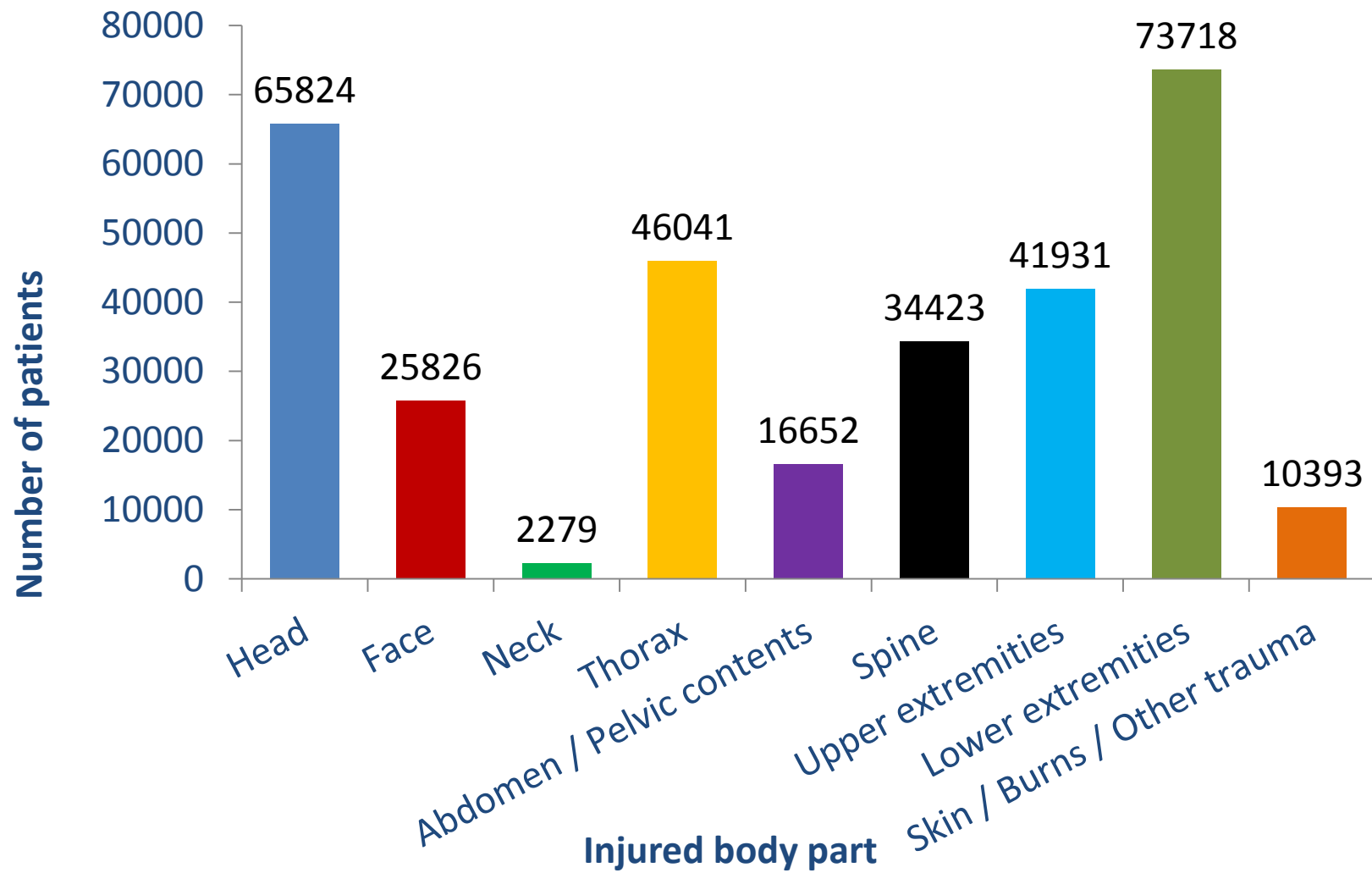
**Figure
36****Number of patients with Injured Body Parts based on AIS**

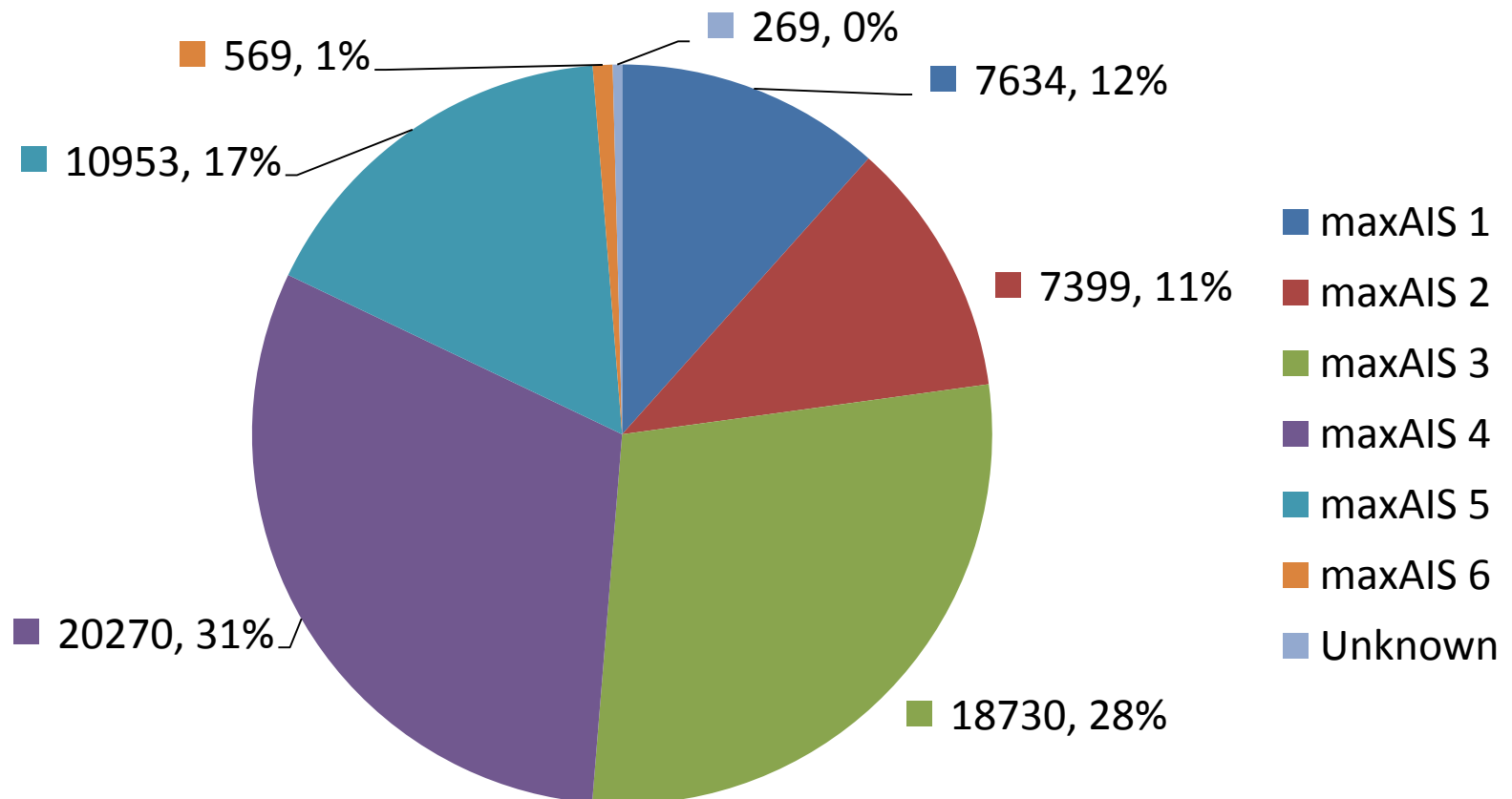
Figure
37A**Head Injury and max AIS Score**

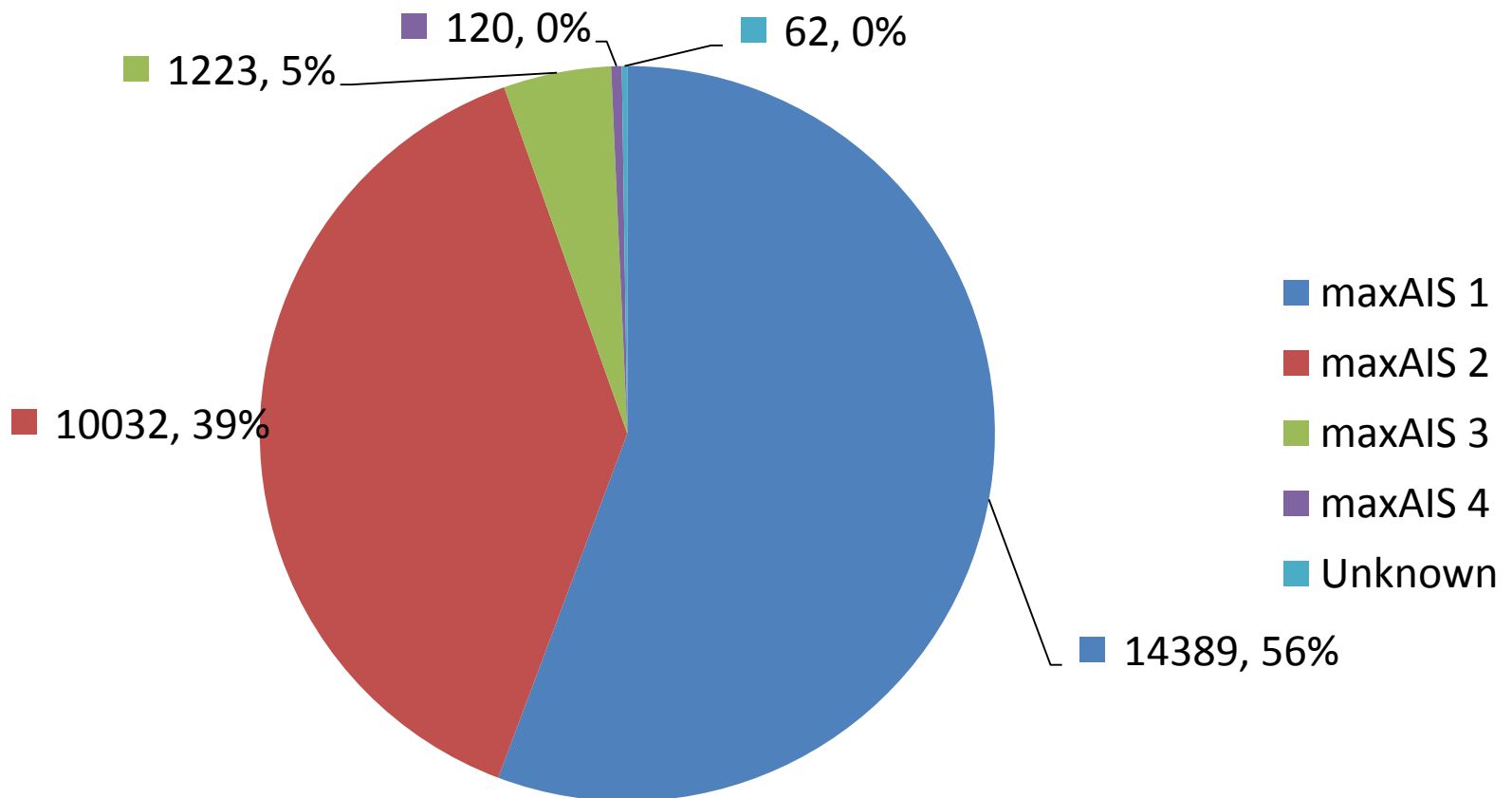
Figure
37B**Facial Injury and max AIS Score**

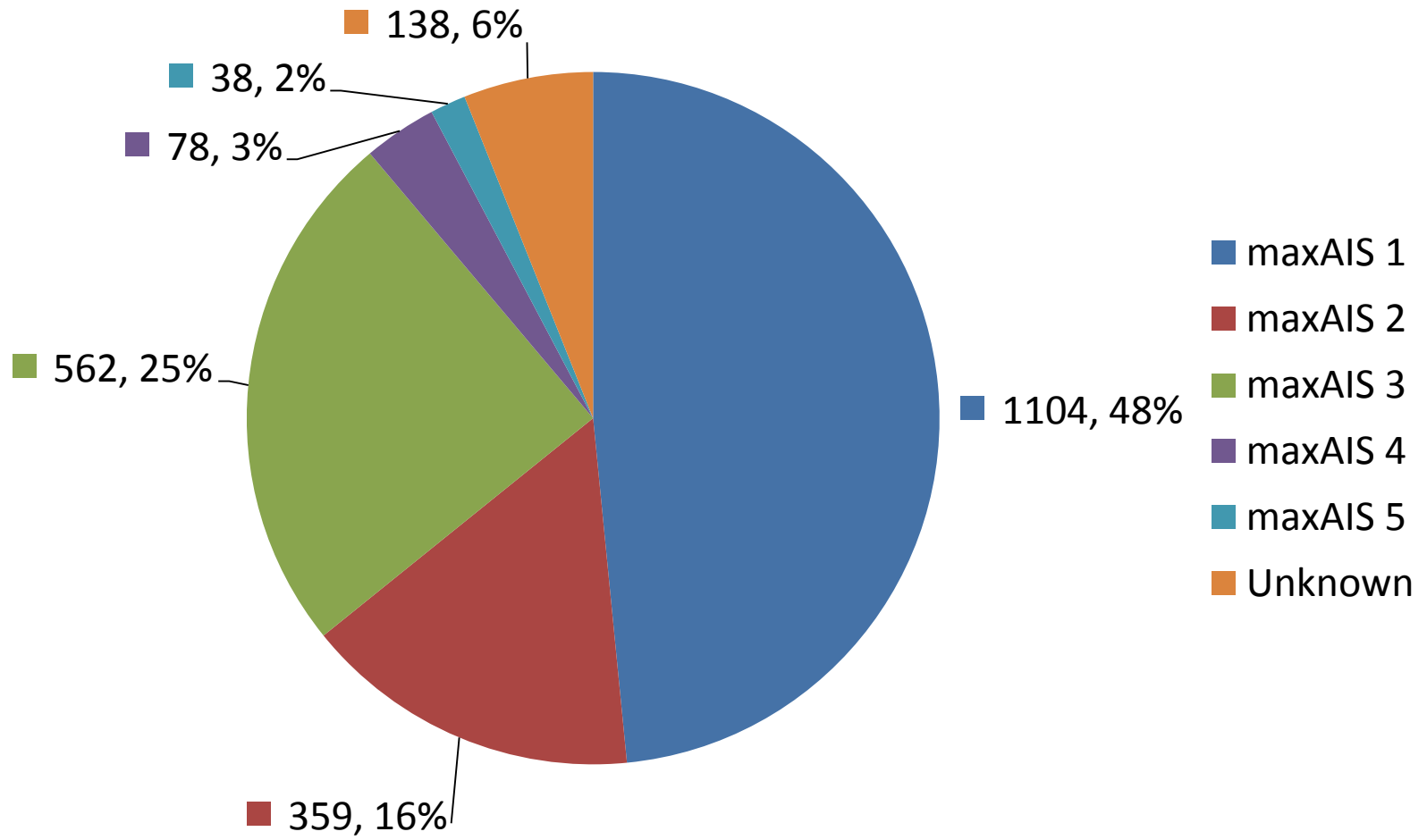
Figure
37C**Neck Injury and max AIS Score**

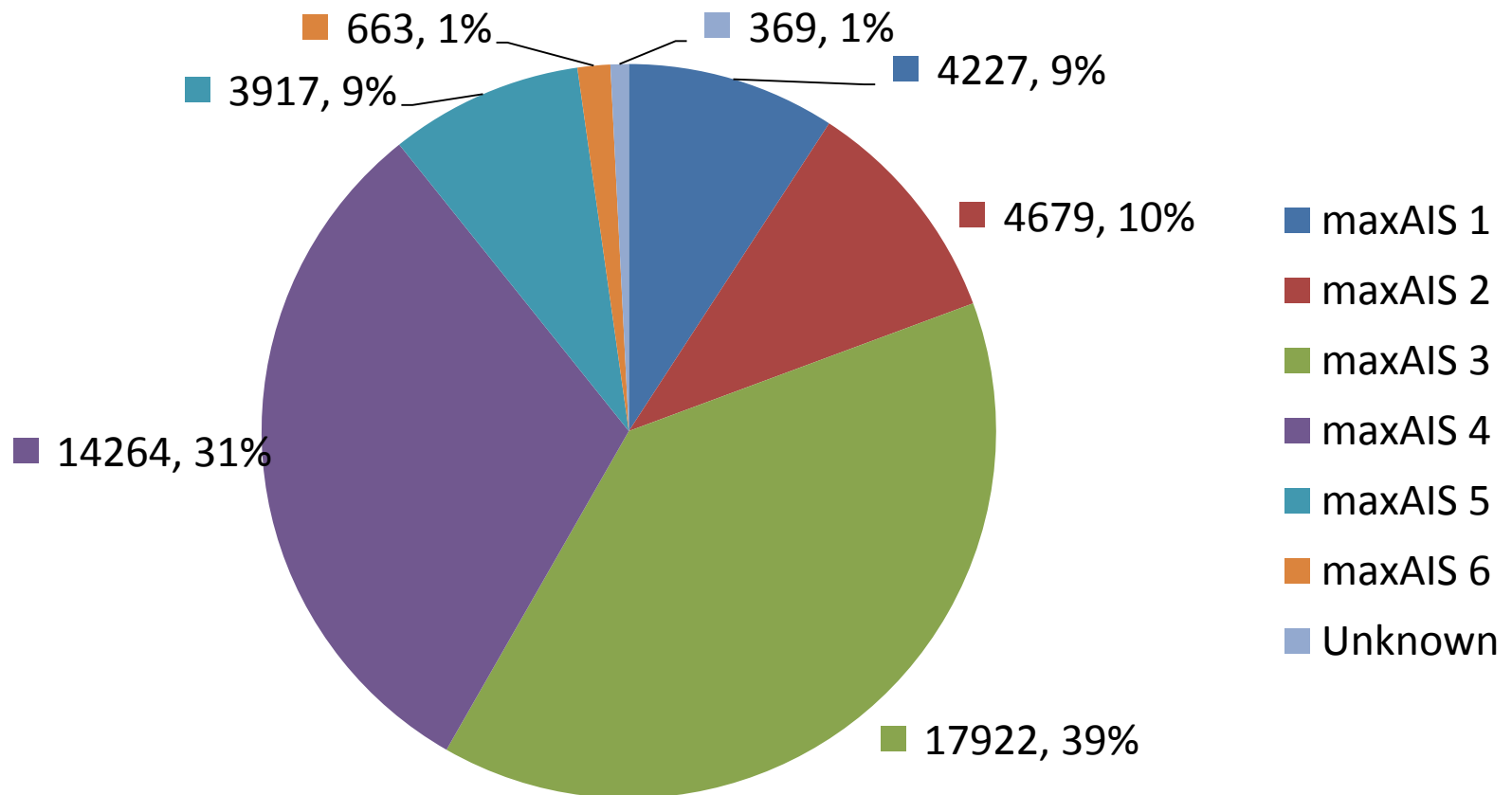
Figure
37D**Thoracic Injury and max AIS Score**

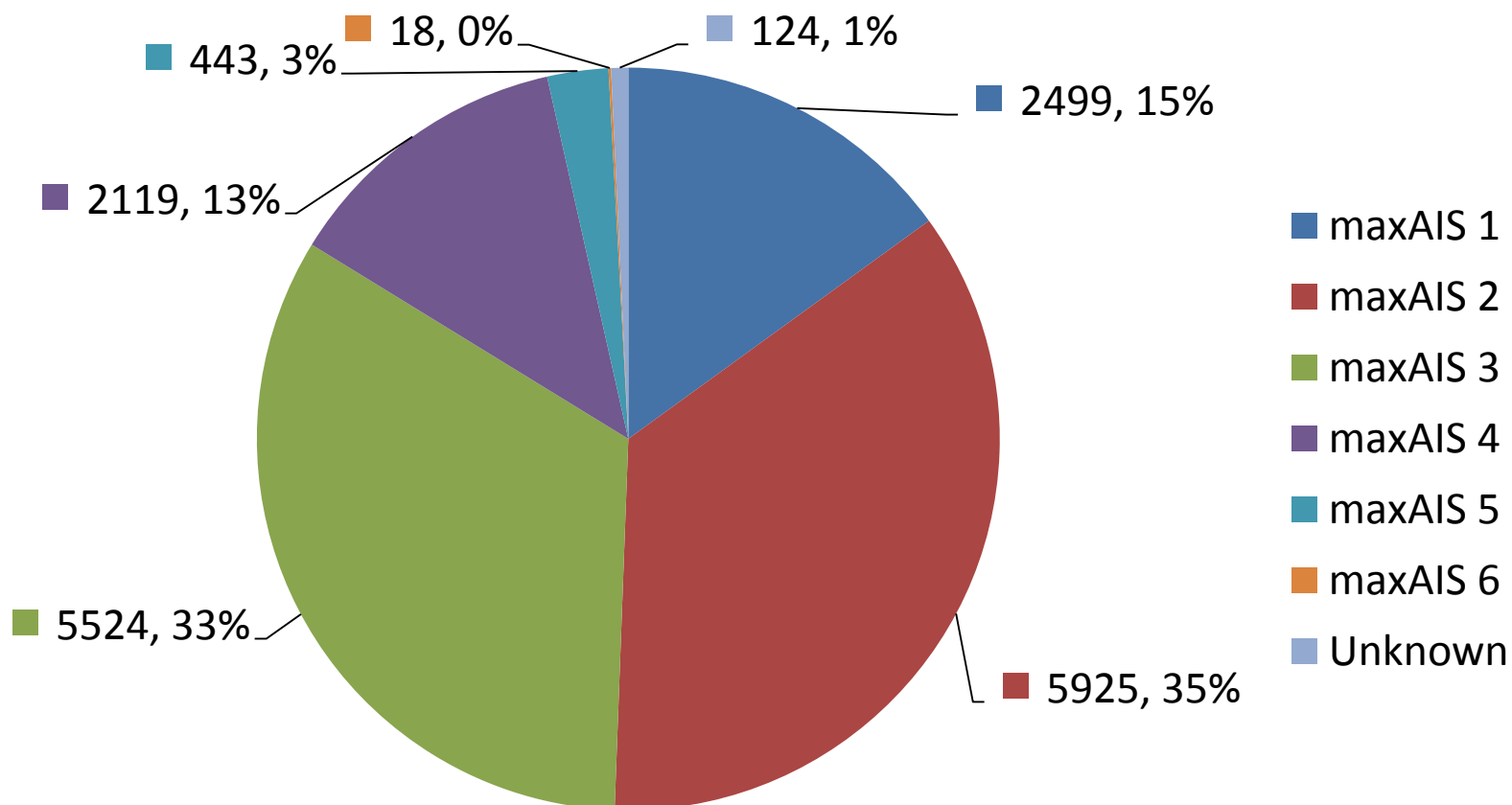
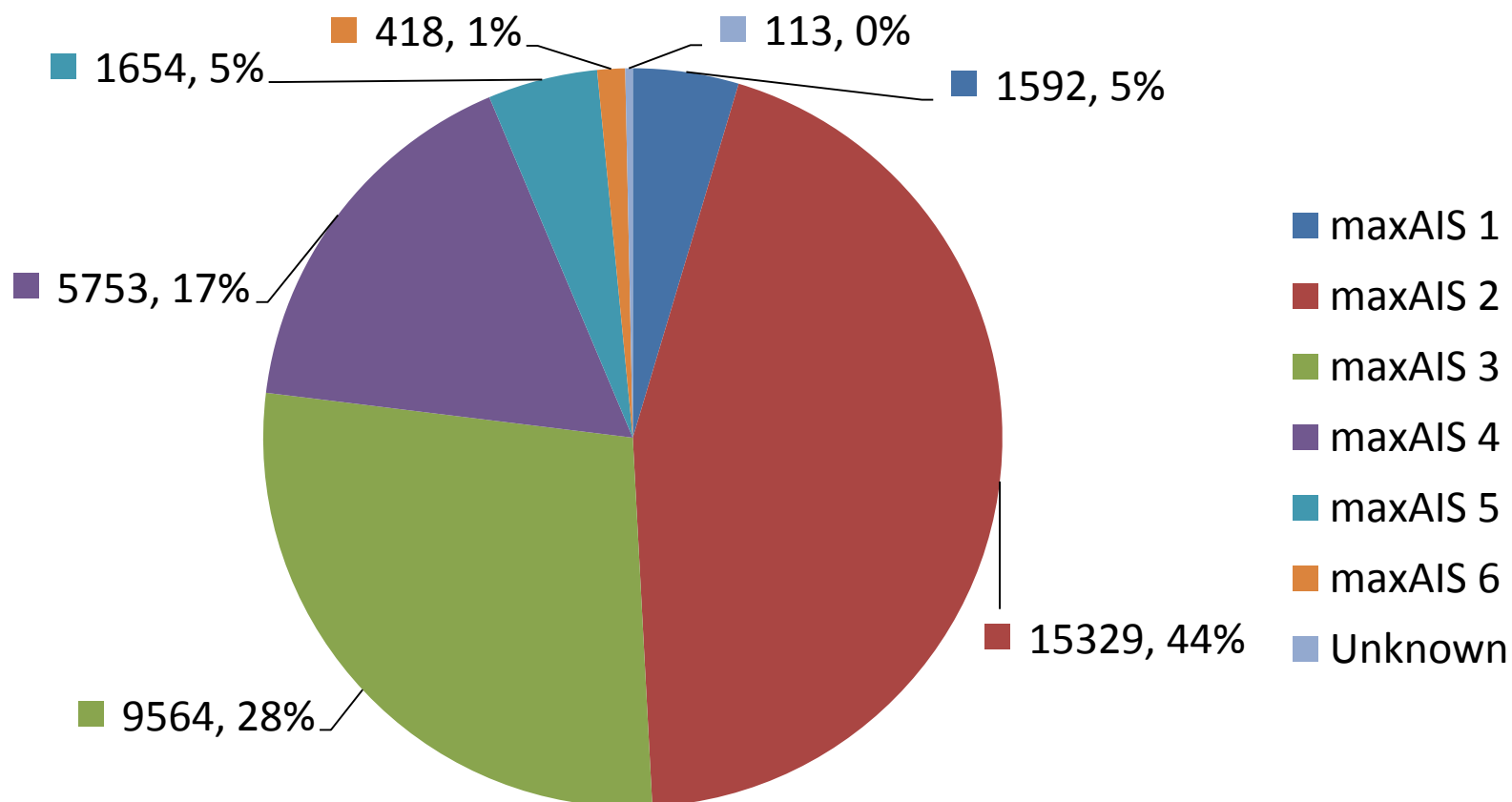
Figure
37E**Injury of Abdomen/Pelvic Contents and max AIS Score**

Figure
37F**Spinal Injury and max AIS Score**

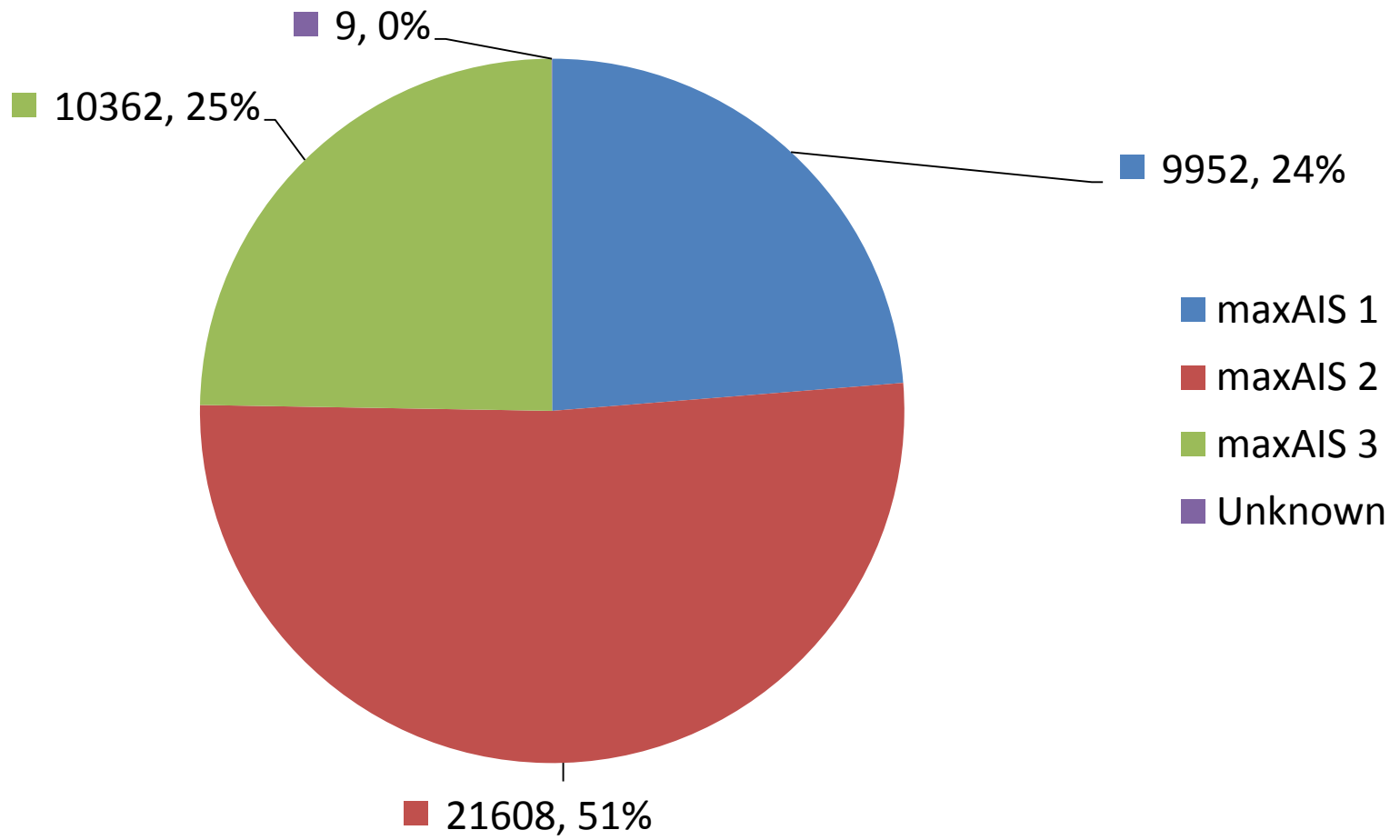
**Figure
37G****Injury of Upper Extremities and max AIS Score**

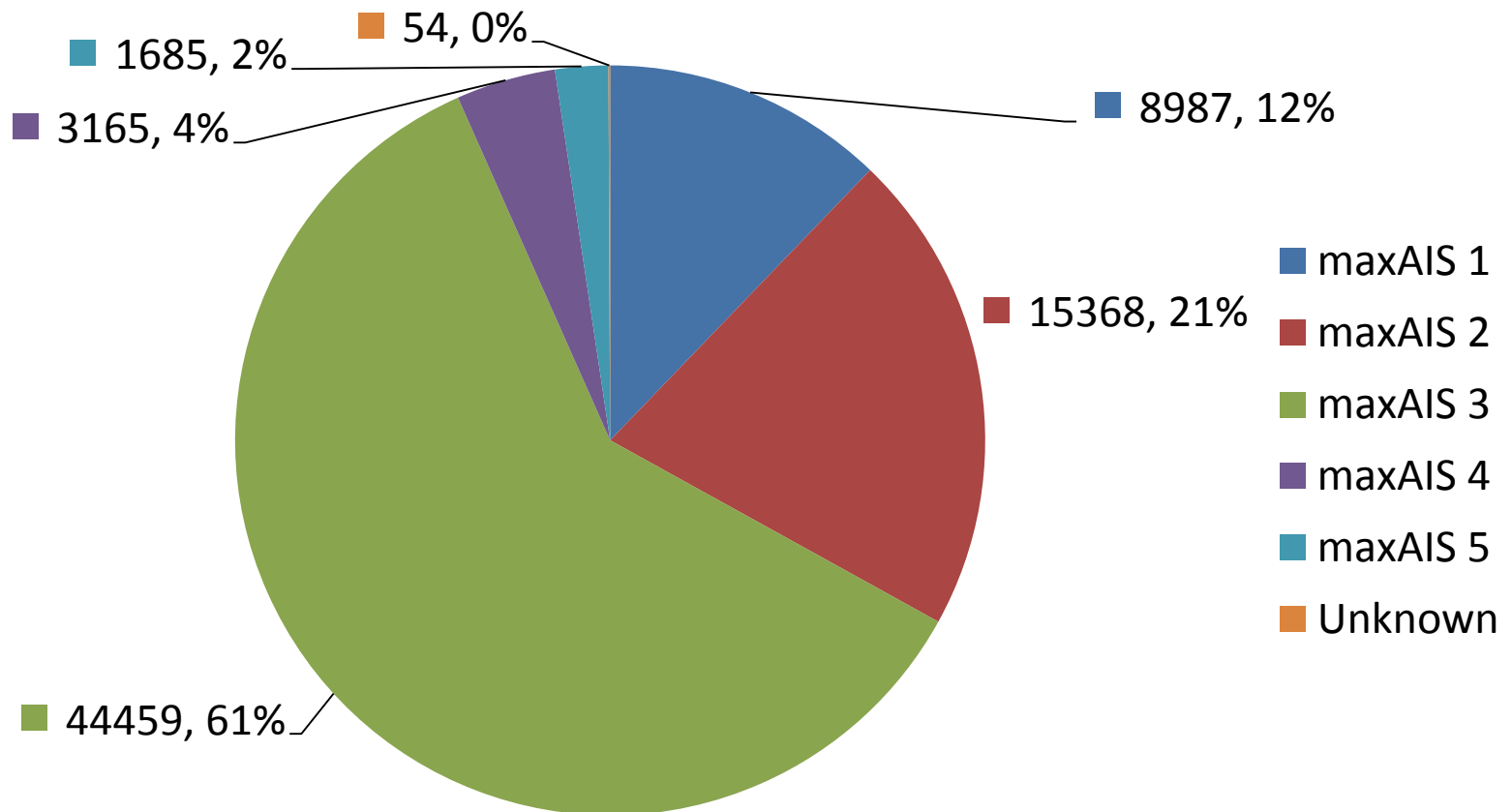
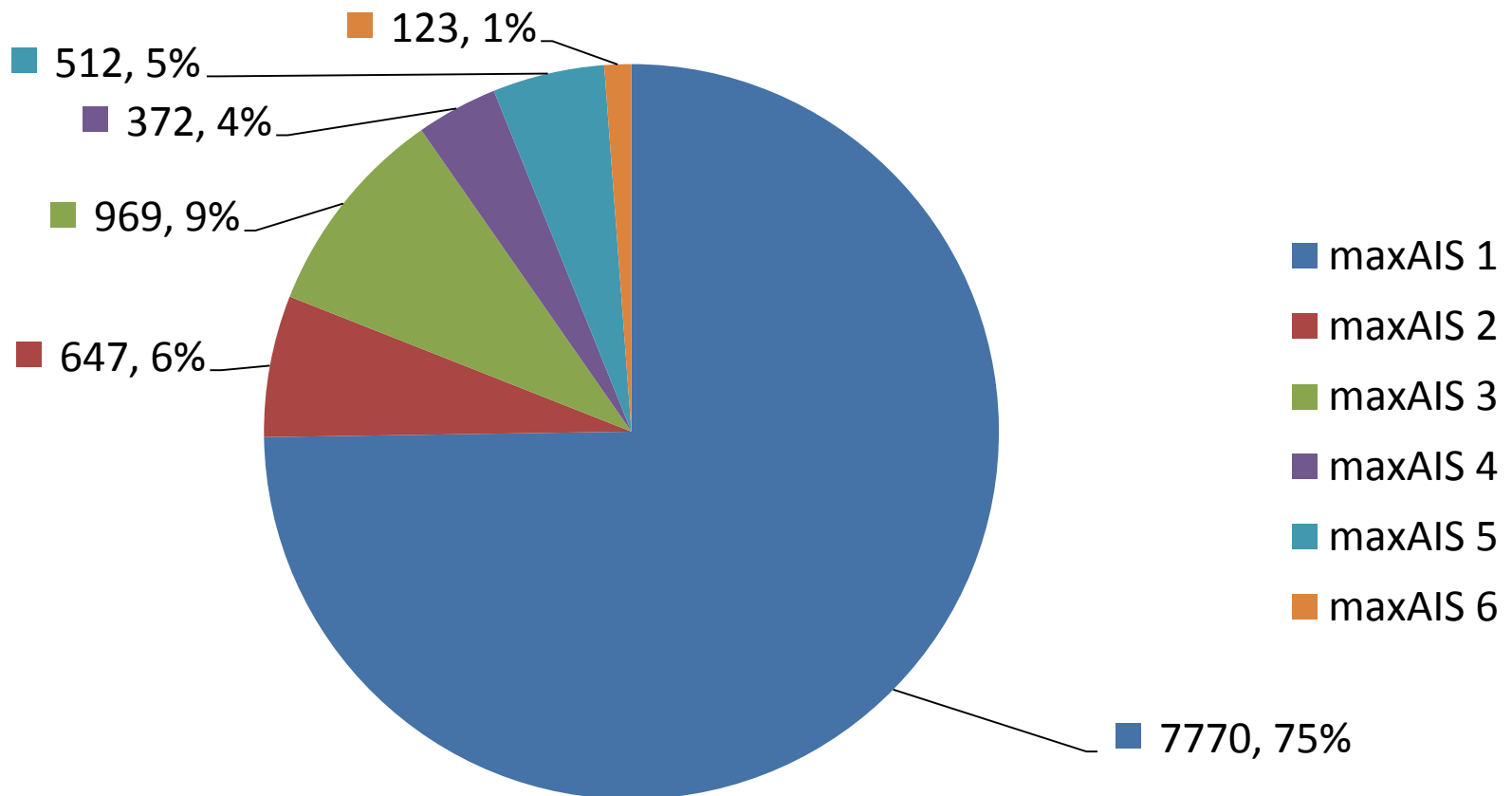
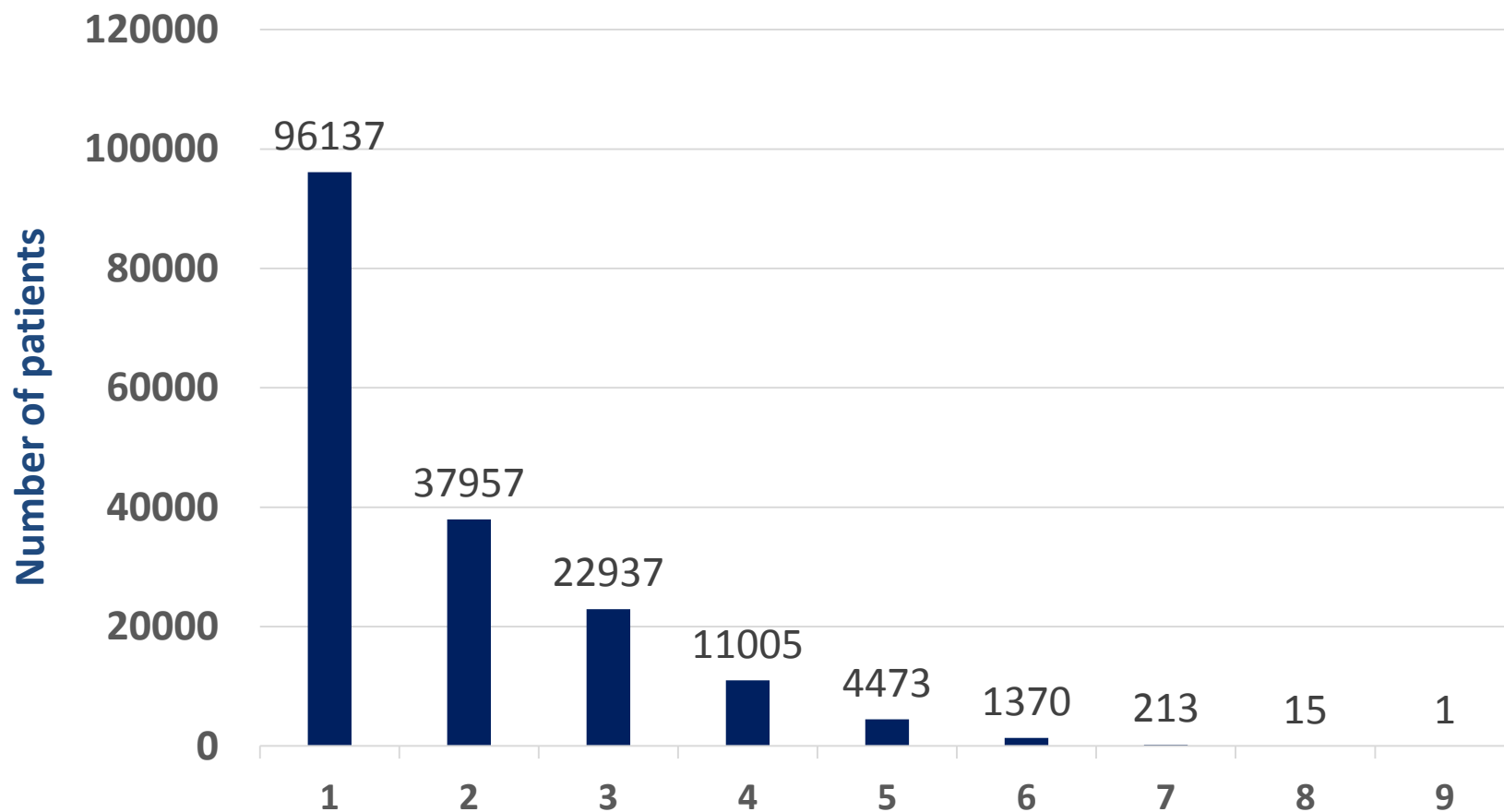
Figure
37H**Injury of Lower Extremities and max AIS Score**

Figure
37I**Skin/Burns/Other Trauma and max AIS Score**

**Figure
38****Number of Patients and Injured Body Parts based on AIS**

November 16, 2019

**JAPAN TRAUMA DATA BANK
REPORT 2019 (2014-2018)**



The Japanese Association for Acute Medicine

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Chairman: Naoto Morimura, MD



The Japanese Association for the Surgery of Trauma

Chairman: Daizoh Saitoh, MD

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