

Japan Trauma Data Bank Report 2021 (2019.1-2020.12)

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=292, Part 1)

Sapporo City General Hospital	Ota Memorial Hospital	Keio University Hospital
Nikko Memorial Hospital	Saitama Red Cross Hospital	St. Luke's International Hospital
Sapporo Medical University Hospital	Kawaguchi Municipal Medical Center	Toho University Omori Medical Center
Teine Keijinkai Hospital	Dokkyo Medical University Koshigaya Hospital	University of Tokyo Hospital
Hokkaido University Hospital	National Defense Medical College Hospital	Showa General Hospital
Hokuto Hospital	Saitama Medical University Medical Center	Tokyo Saiseikai Central Hospital
Hokkaido Medical Center	Saitama Medical University International Medical Center	National Center for Child Health and Development
Asahikawa Red Cross Hospital	Kuki General Hospital	Shirahigebashi Hospital
Sapporo Tokushukai Hospital	Fukaya Red Cross Hospital	Japanese Red Cross Medical Center
Hakodate Municipal Hospital	Jichi Medical University Saitama Medical Center	Tokyo Metropolitan Tama Medical Center
Sapporo Higashi Tokushukai Hospital	Saitama City Hospital	Kokushikan University
Kushiro City General Hospital	Funabashi Municipal Medical Center	Juntendo University Nerima Hospital
Hachinohe City Hospital	Asahi General Hospital	Showa University Northern Yokohama Hospital
Hirosaki University School of Medicine & Hospital	Nippon Medical School Chiba Hokusoh Hospital	Yokohama Medical Center
Aomori Prefectural Central Hospital	Chiba Emergency Medical Center	St. Marianna University School of Medicine Hospital
Iwate Medical University Hospital	Kameda General Hospital	Kanto Rosai Hospital
Iwate Prefectural Kuji Hospital	Kimitsu Chuou Hospital	Yokohama City University Medical Center
Iwate Prefectural Central Hospital	Juntendo University Urayasu Hospital	Tokai University Hospital
Osaki Citizen Hospital	Chiba University Hospital	Showa University Fujigaoka Hospital
Tohoku University Hospital	Matsudo City General Hospital	Kitasato University Hospital
Sendai City Hospital	Jikei University Kashiwa Hospital	Yokosuka General Hospital Uwamachi
Ishinomaki Red Cross Hospital	Tokyo Women's Medical University Yachiyo Medical Center	Yokohama City Minato Red Cross Hospital
Sendai Medical Center	Tokyo Bay Urayasu Ichikawa Medical Center	Nippon Medical School Musashikosugi Hospital
South Miyagi Medical Center	Chiba Rosai Hospital	Saiseikai Yokohama-city East Hospital
Akita Red Cross Hospital	Eastern Chiba Medical Center	Shonan Kamakura General Hospital
Akita University Hospital	Goi Hospital	Yokohama Municipal Citizens Hospital
Yamagata Prefectural Central Hospital	Showa University Hospital	Odawara Municipal Hospital
Nihonkai General Hospital	Tokyo Medical Center	Yokosuka Kyosai Hospital
Ohta Nishinouchi Hospital	Department of Social Medicine, School of Medicine, Nihon University	Hiratsuka City Hospital
Aizu Central Hospital	National Disaster Medical Center	Fujisawa City Hospital
Fukushima Medical University Hospital	Musashino Red Cross Hospital	Yokohama Rosai Hospital
Niigata City General Hospital	Nippon Medical School Tama Nagayama Hospital	Yokohama Sakae Kyosai Hospital
Niigata University Medical & Dental Hospital	Teikyo University Hospital	Shin-Yurigaoka General Hospital
Niigata Prefectural Shibata Hospital	National Center for Global Health and Medicine	Ebina General Hospital
Uonuma Kikan Hospital	Tokyo Women's Medical University Medical Center East	Kawasaki Municipal Hospital
Tsukuba Medical Center Hospital	Nippon Medical School Hospital	Saiseikai Yokohama-shi Nanbu Hospital
Ibaraki Seinan Medical Hospital	Kyorin University Hospital	Yamanashi Prefectural Central Hospital
Mito Medical Center	Surugadai Nihon University Hospital	Saku Central Hospital Advanced Care Center
University of Tsukuba Hospital	Tokyo Women's Medical University Hospital	Shinshu University Hospital
Ibaraki Prefectural Central Hospital	Ohme Municipal General Hospital	Aizawa Hospital
Mito Saiseikai General Hospital	Nihon University Itabashi Hospital	Suwa Red Cross Hospital
Dokkyo Medical University Hospital	Tokyo Medical and Dental University Hospital	Iida Municipal Hospital
Jichi Medical University Hospital	Tokyo Metropolitan Bokutoh Hospital	Ina Central Hospital
Saiseikai Utunomiya Hospital	Tokyo Metropolitan Hiroo Hospital	Nagano Red Cross Hospital
Gunma University Hospital	Tokyo Medical University Hospital	Nagano Municipal Hospital
Maebashi Red Cross Hospital	Tokyo Medical University Hachioji Medical Center	Chuno Kosei Hospital
Takasaki General Medical Center		Gifu University Hospital

Figure
1B

Names of all hospitals submitting data to the JTDB. (N=292, Part 2)

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

**Figure
1C****Names of all hospitals submitting data to the JTDB. (N=292, Part 3)**

Ureshino Medical Center
Nagasaki Medical Center
Nagasaki University Hospital
Arao Municipal Hospital
Kumamoto Red Cross Hospital
Kumamoto Medical Center
Saiseikai Kumamoto Hospital
Oita University Hospital
Almeida Memorial Hospital
Miyazaki Prefectural Miyazaki Hospital
Miyazaki University Hospital
Miyazaki Zenjinkai Hospital
Miyakonojo Regional Medical Center
Miyazaki Prefectural Nobeoka Hospital
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

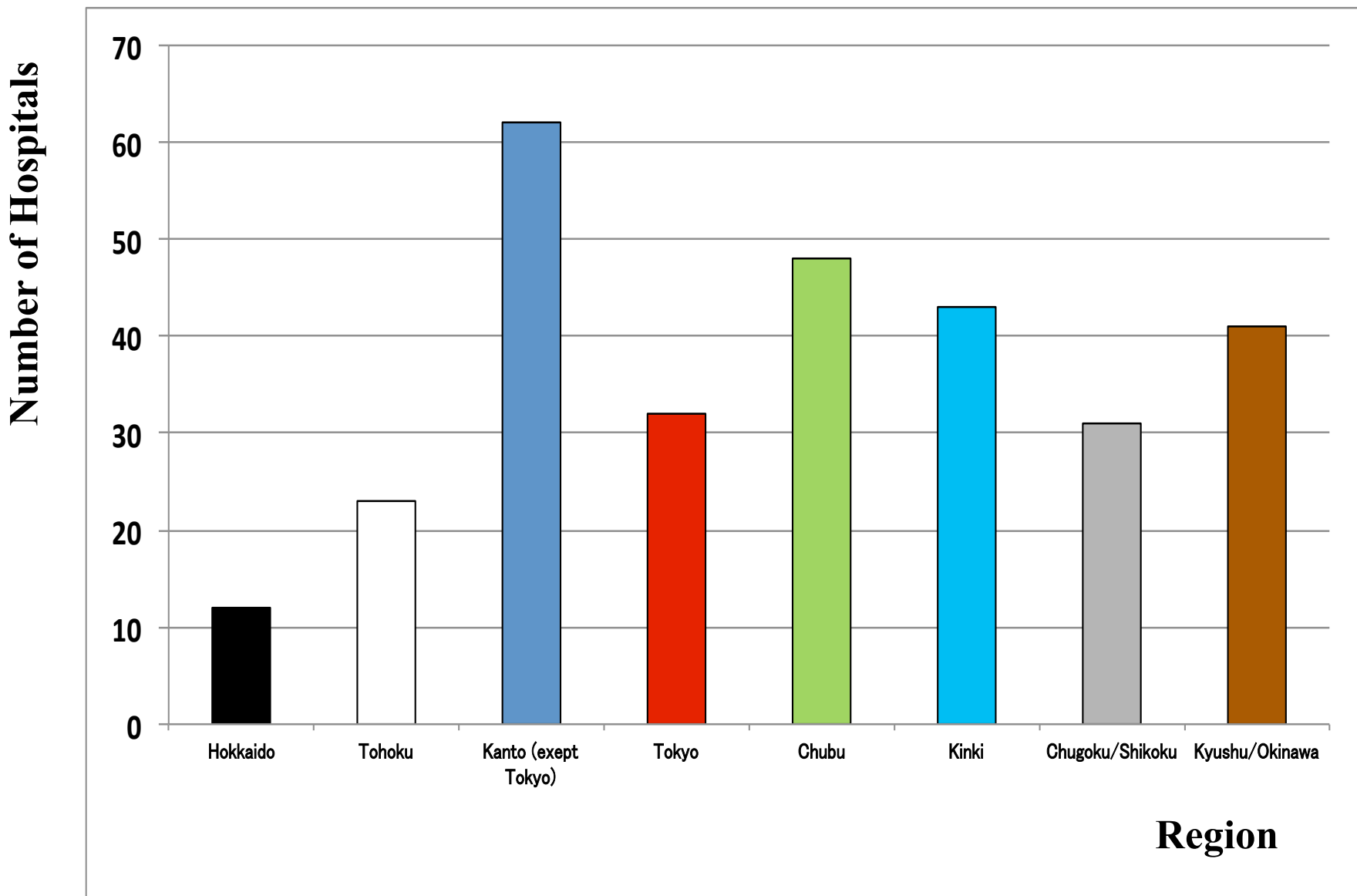
Figure
2**Number of Hospitals Submitting to the JTDB by Region.**

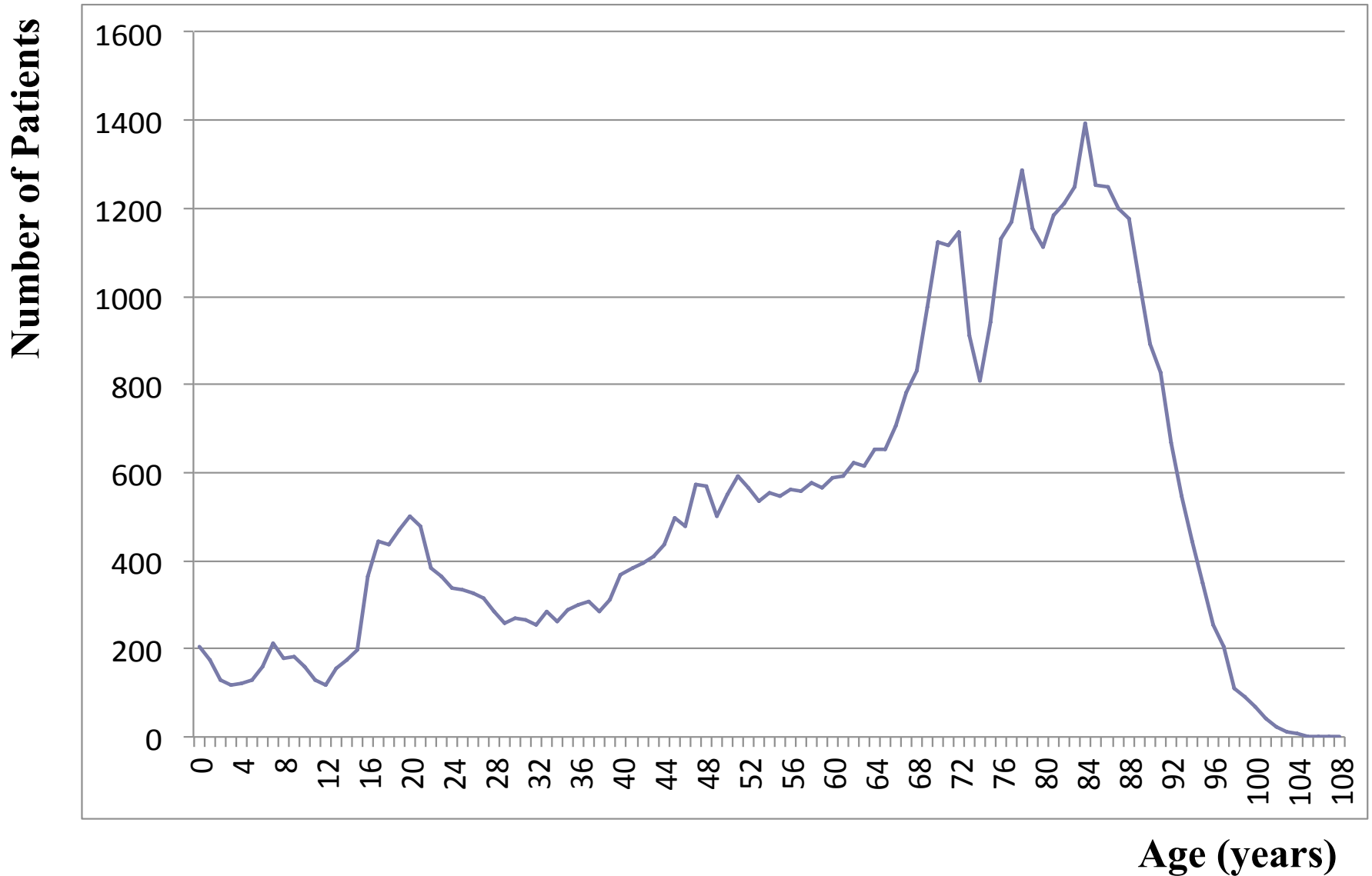
Figure
3**Number of Patients by Age.**

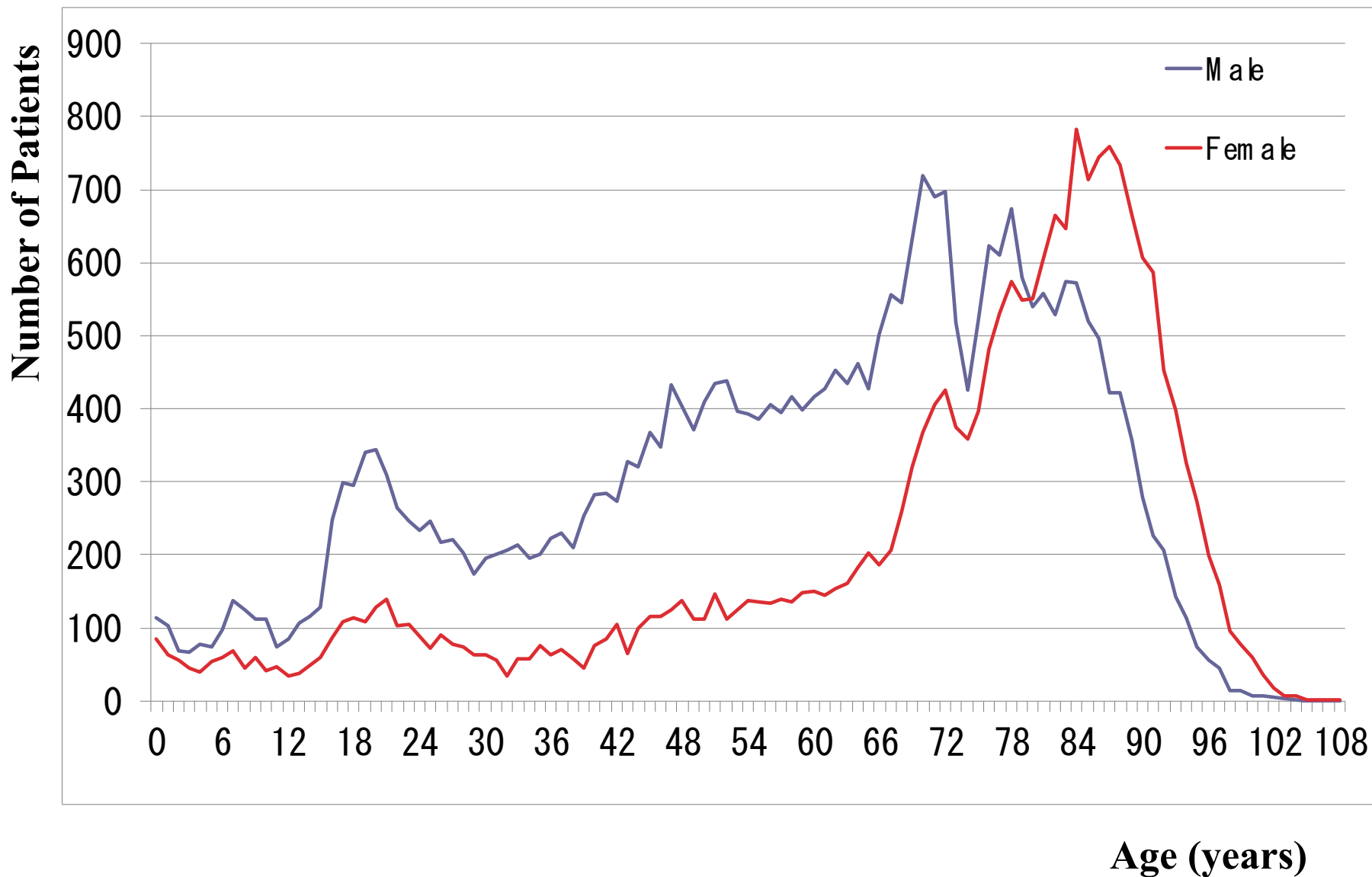
Figure
4**Patients by Age and Gender.**

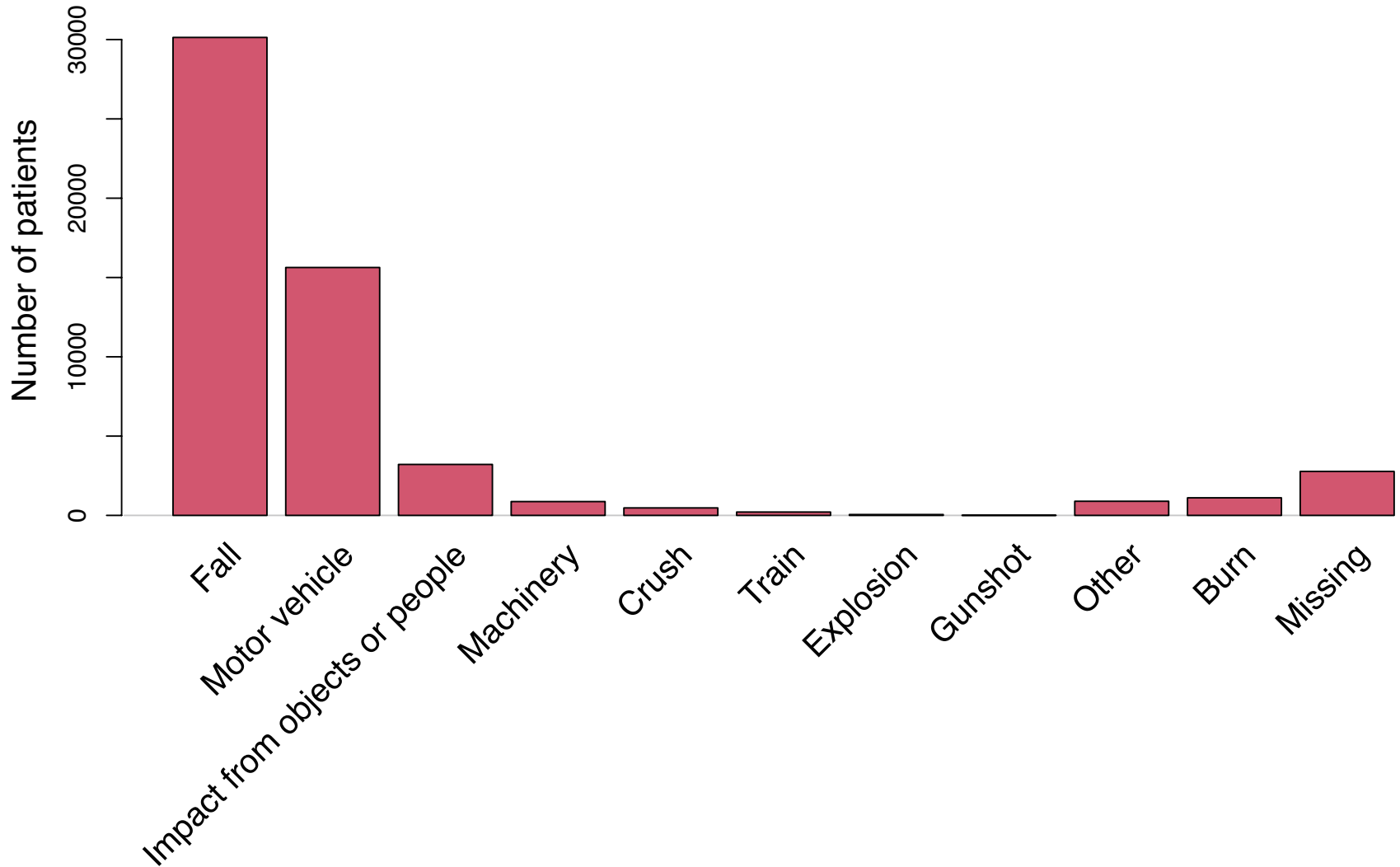
Figure
5**Patients by mechanism of injury**

Table
5**Patients by mechanism of injury**

Mechanism of injury	Patients (n)	Patients by mechanism of injury (%)
Fall	30137	54.4
Motor vehicle	15631	28.2
Impact from objects or people	3213	5.8
Machinery	872	1.6
Crush	472	0.9
Train	211	0.4
Explosion	54	0.1
Gunshot	7	0.0
Other	892	1.6
Burn	1109	2.0
Missing	2771	5.0

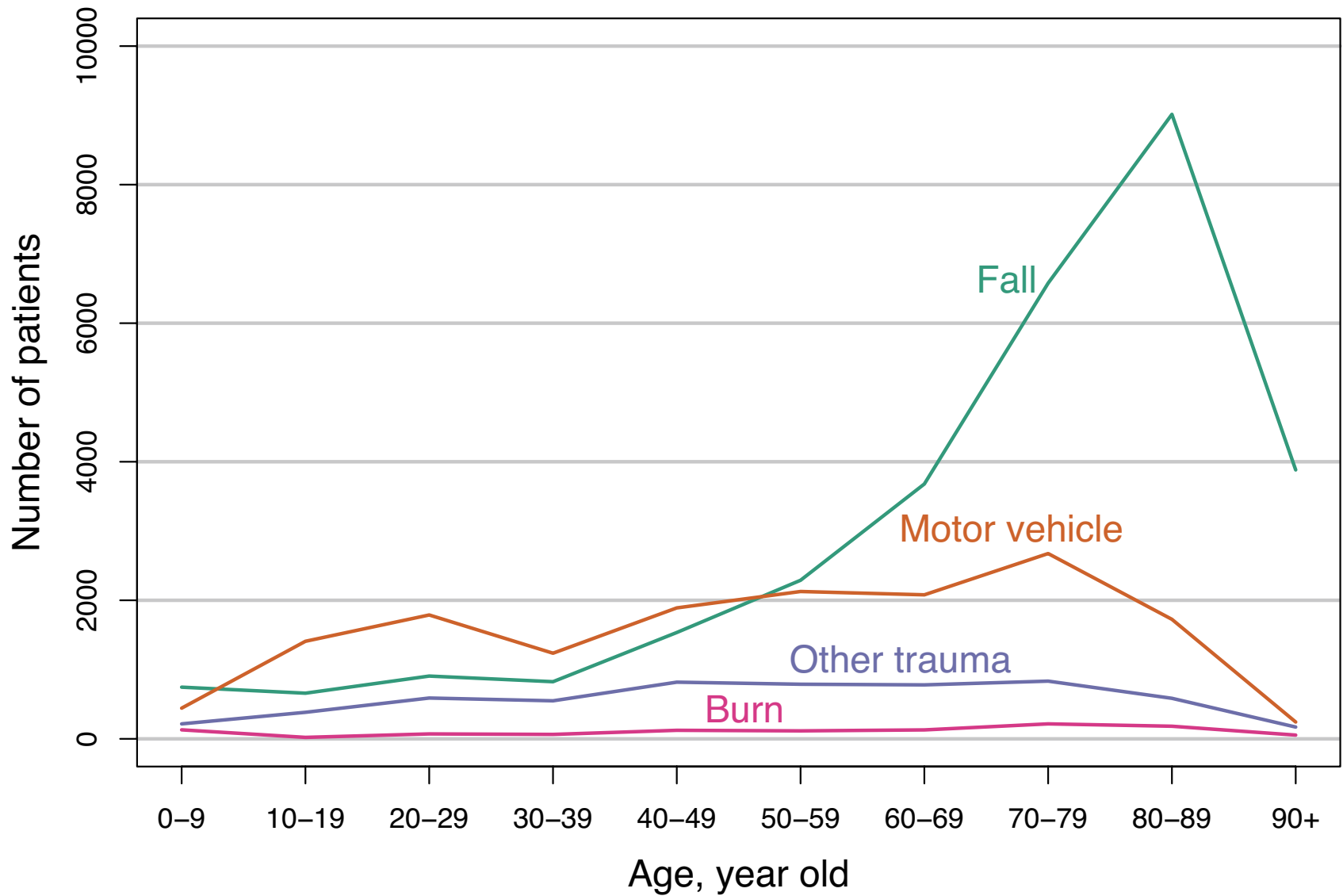
Figure
6**Mechanism of injury by age**

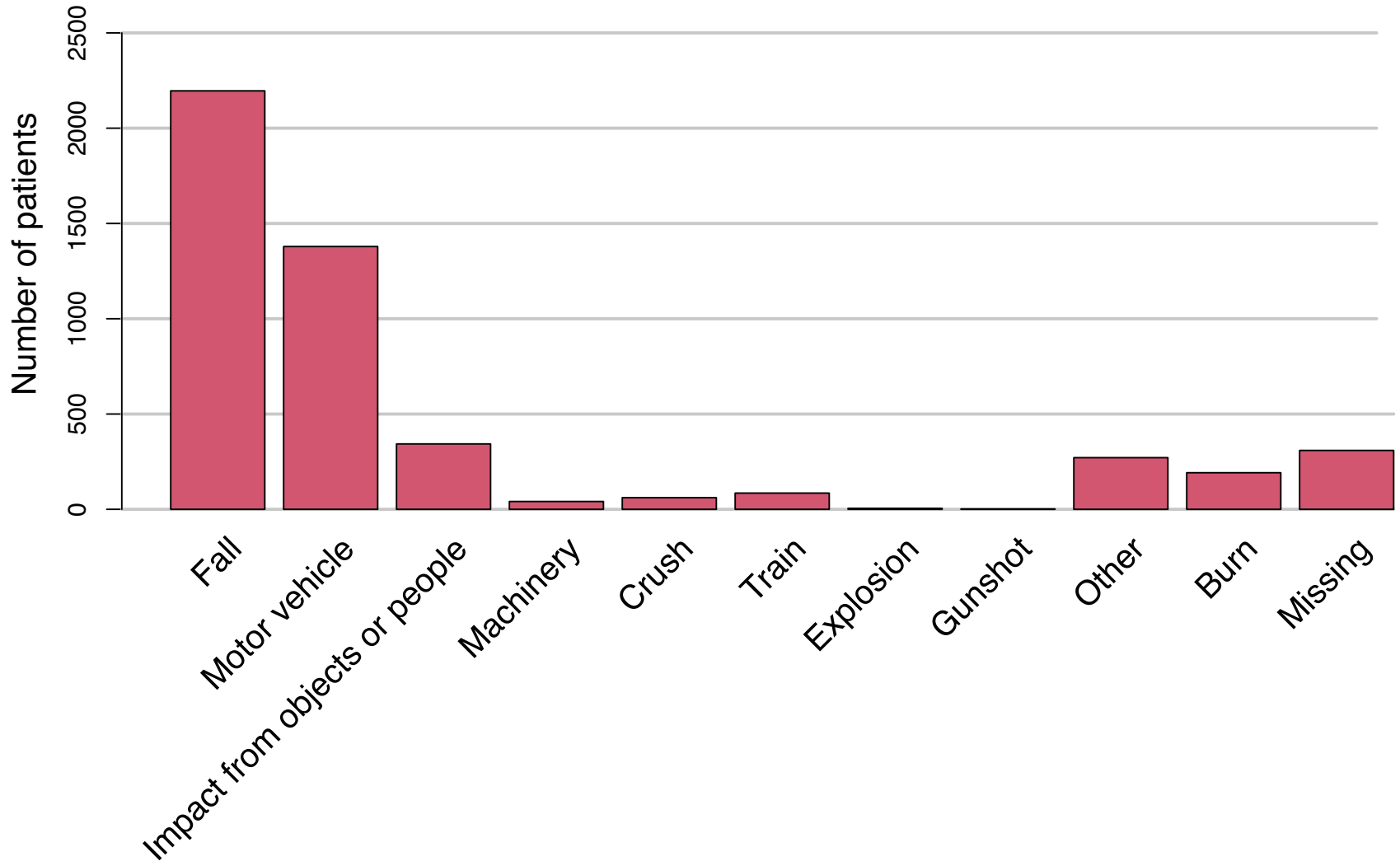
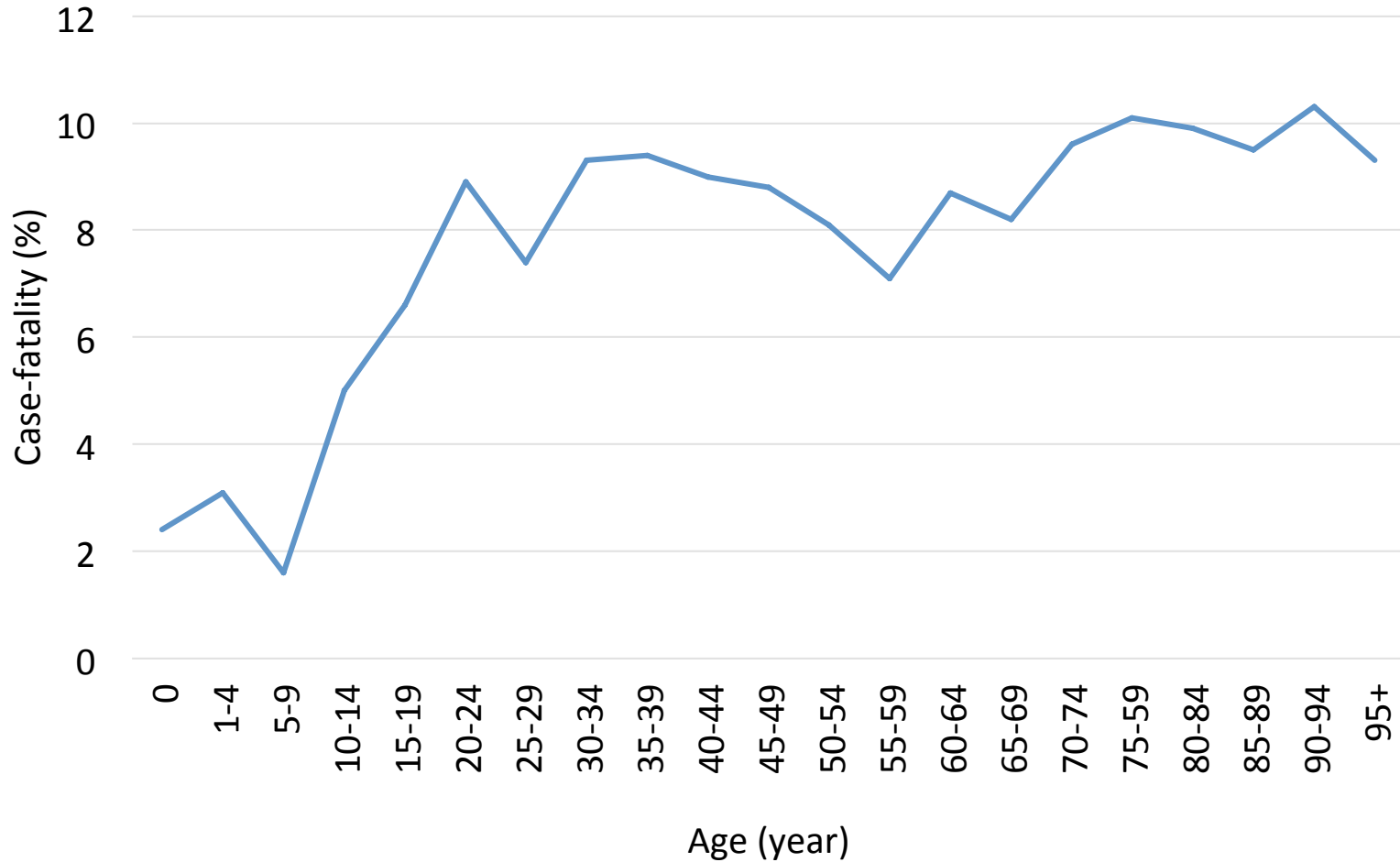
Figure
7**Death by mechanism of injury**

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)

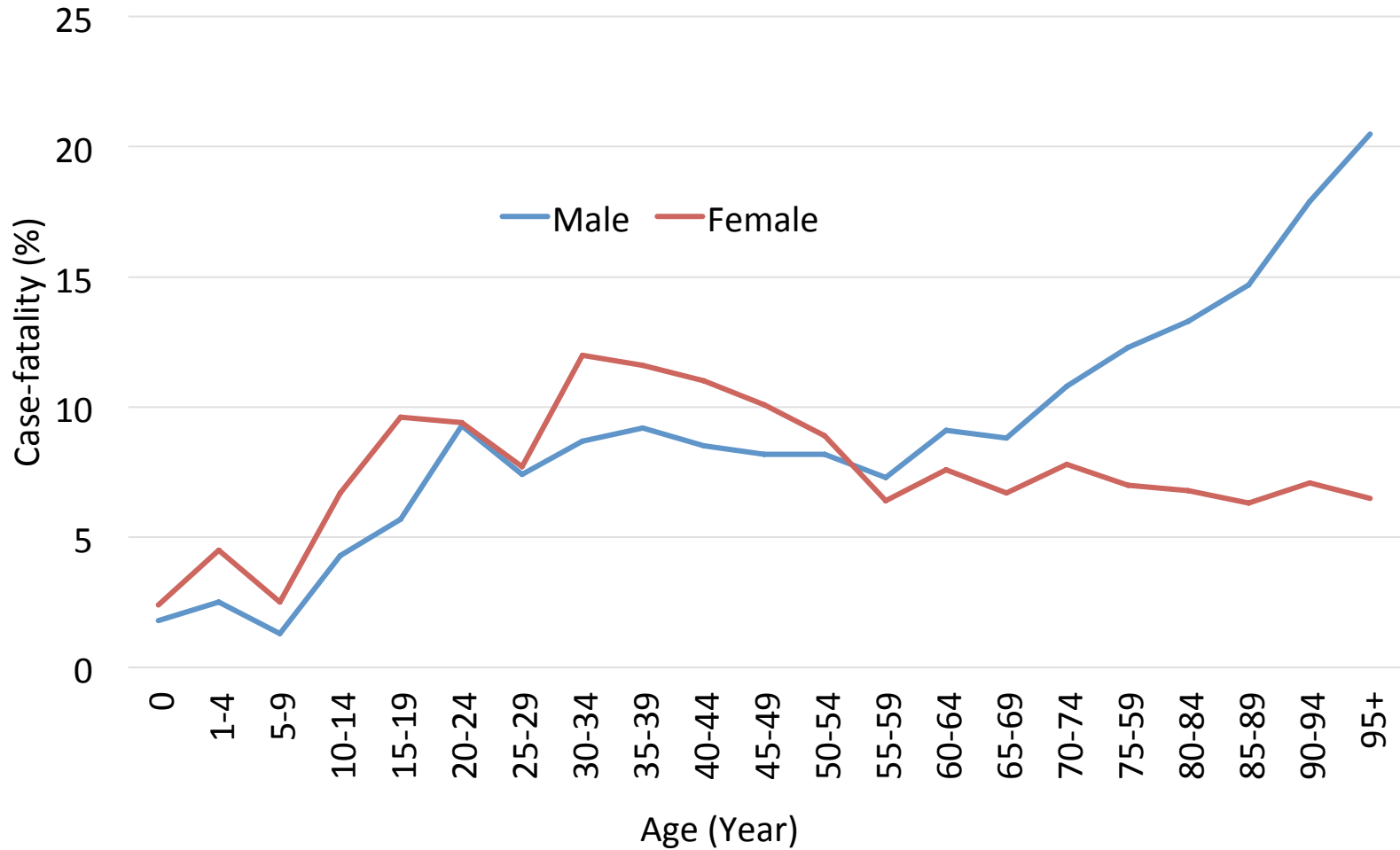
Figure
9**Case fatality by age and gender**

Figure 10

Case fatality by mechanism of injury and age

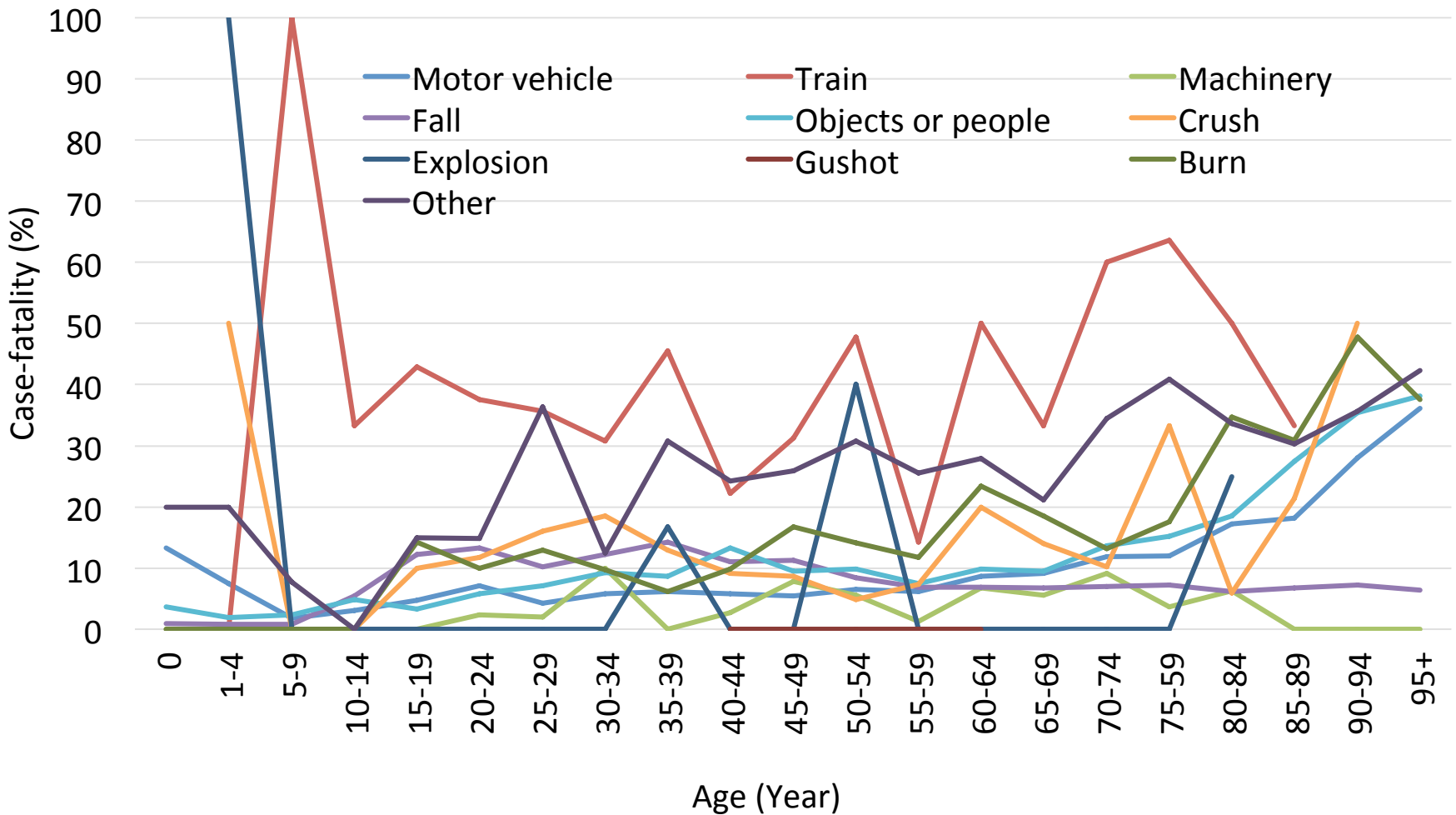


Figure 11A

Proportional distribution of hospitalized days in death cases n =4,884

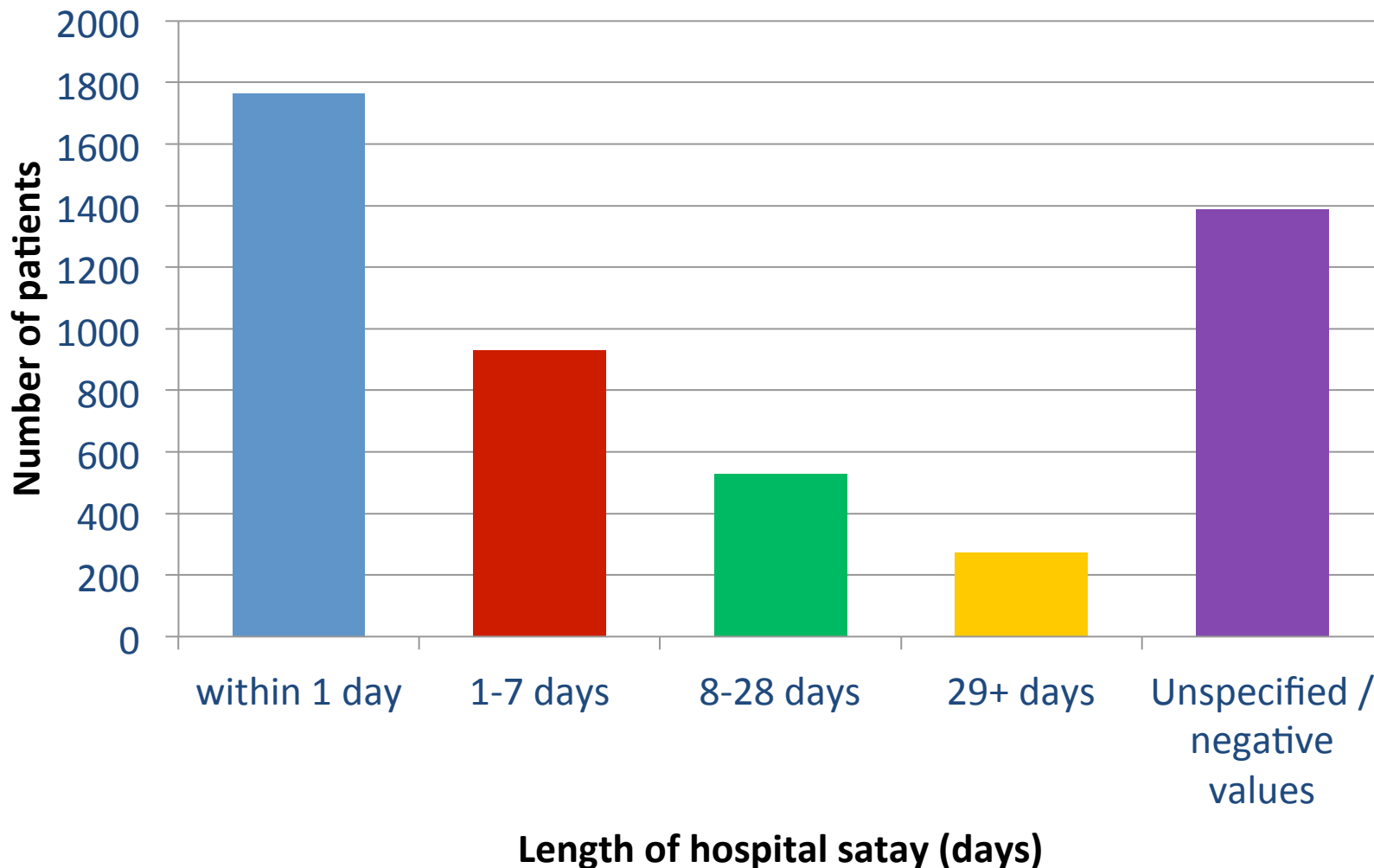


Figure 11B

Proportional distribution of hospitalized days, grouped by mechanism of injury

n =4884

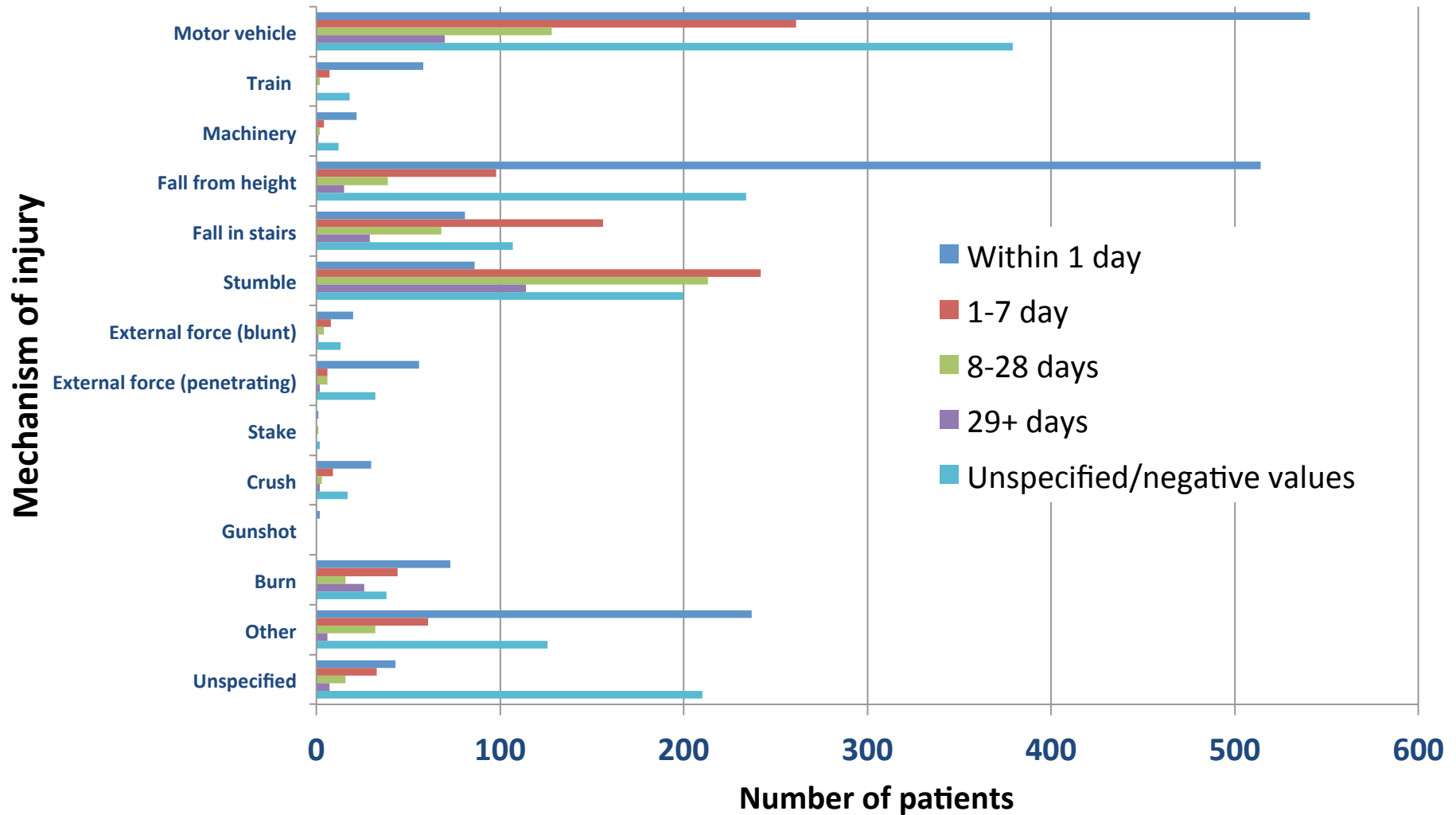


Table
12

Proportional distribution of hospitalized days, grouped by mechanism of injury.

n =55369

	Motor vehicle	Train	Machinery	Fall from height	Fall in stairs	Stumble	External force (blunt)	External force (penetrating)
Within 1 day	992	73	53	575	296	478	76	105
1-7 day	4380	25	255	795	2034	3499	527	430
8-28 days	5610	39	323	1360	3113	10078	473	390
29+ days	3959	50	215	1301	1641	3922	195	183
Unspecified	690	24	26	353	218	474	39	71

	Stake	Crush	Explosion (blunt)	Explosion (penetrating)	Gunshot	Burn	Other	Unspecified
Within 1 day	6	44	0	1	2	122	286	58
1-7 day	35	77	3	0	1	363	443	194
8-28 days	32	165	7	0	4	276	422	415
29+ days	8	159	4	0	0	329	228	196
Unspecified	5	27	0	0	0	58	151	1908

Figure 13A

Total hospital length of stay by mechanism of Injury n = 51312
Over all total hospital length of stay was 1,075,416 days.
 Excluded: LOS<0 or >365

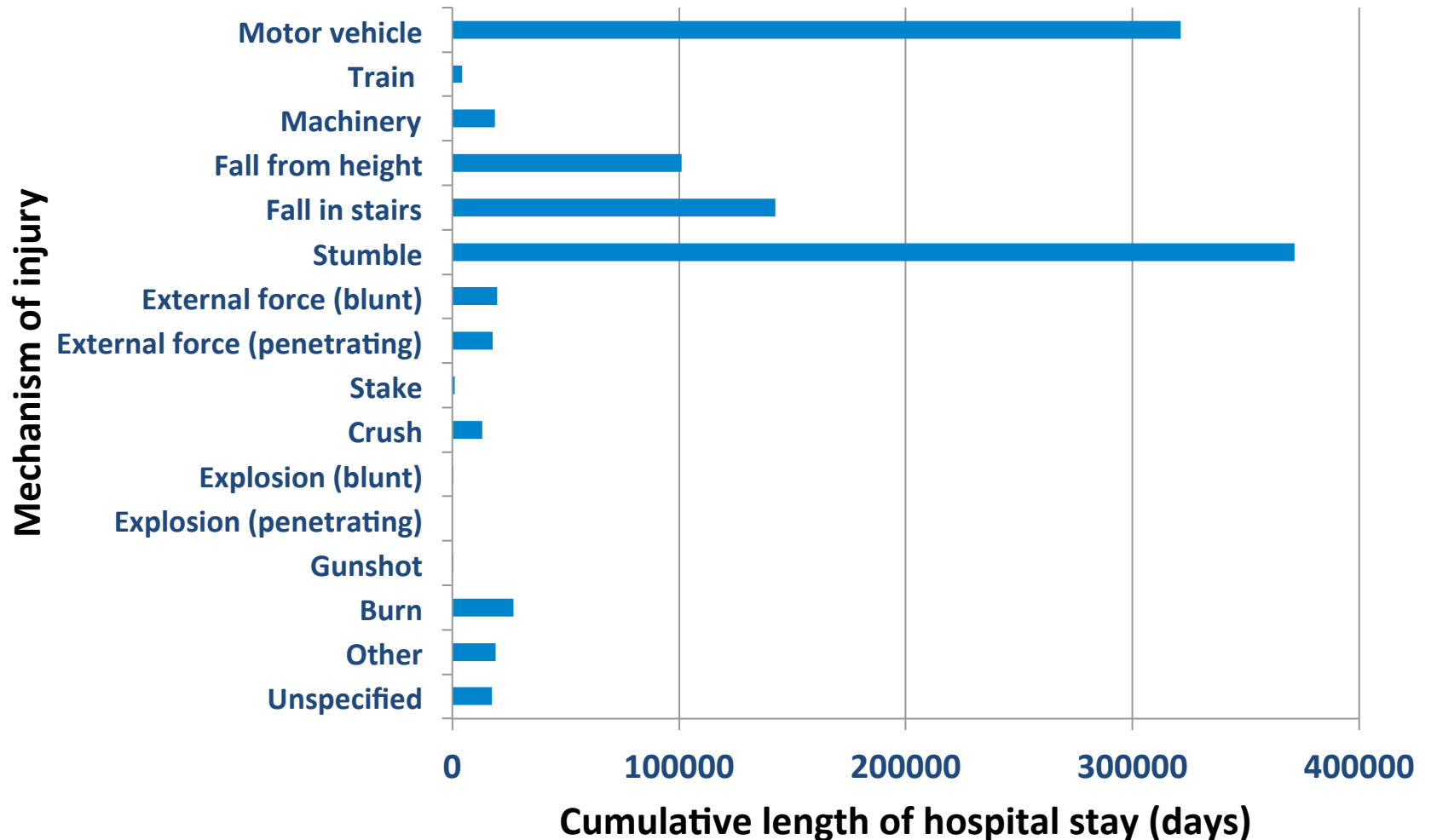
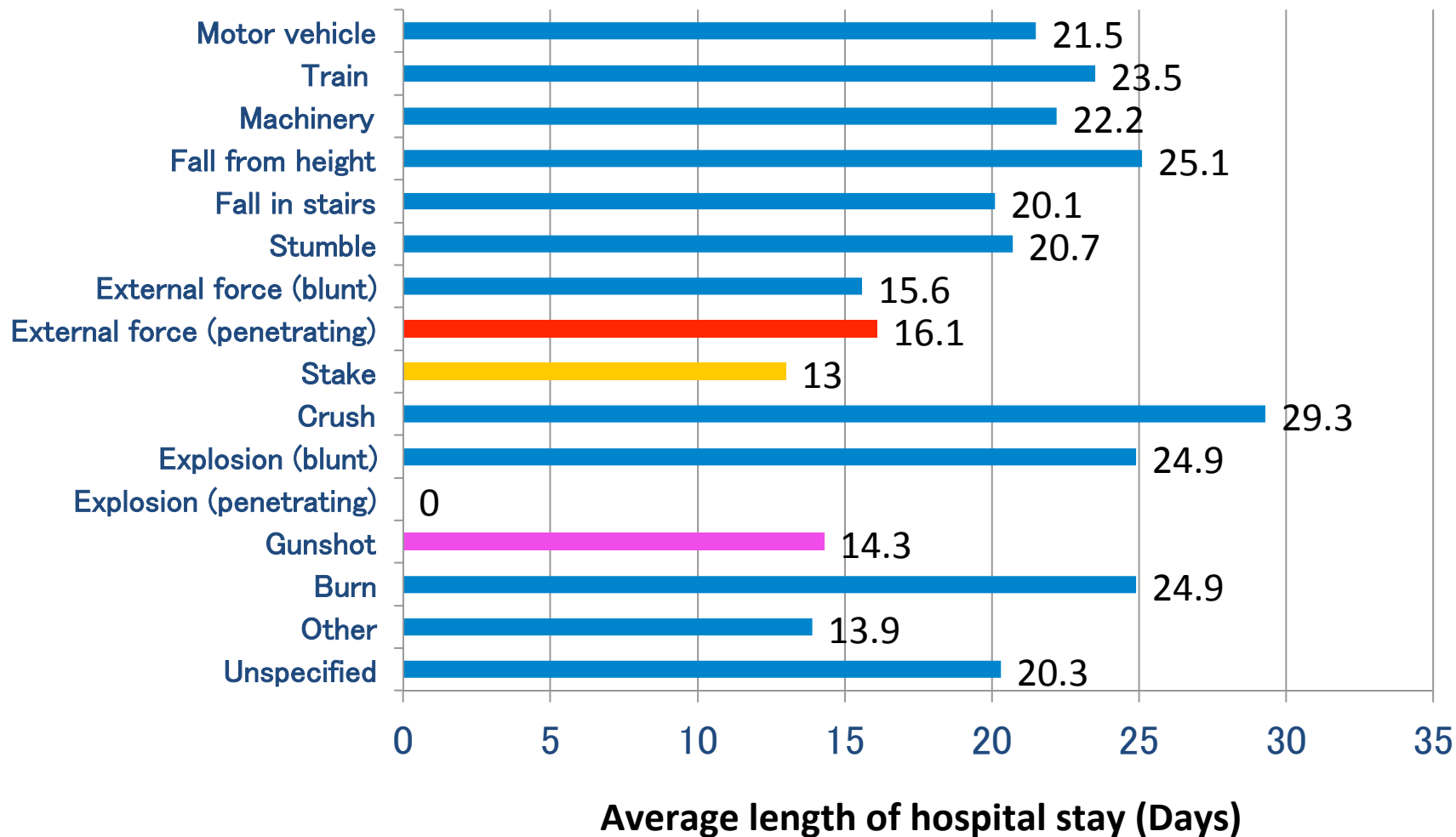


Figure
13B**Average hospital length of stay by mechanism of injury** n = 51312

Mechanism of injury

Excluded: LOS<0 or >365



"hospitalization within 1 day" is set as "0", the average length of hospitalization may be underestimated.

Table
13**Total and average hospital length of stay by mechanism of injury n = 51312**

Excluded: LOS<0 or >365

	Number of patients	%	Total	Average
Motor vehicle	14935	29.1	321222	21.5
Train	187	0.4	4400	23.5
Machinery	846	1.6	18765	22.2
Fall from height	4030	7.9	101200	25.1
Fall in stairs	7084	13.8	142405	20.1
Stumble	17971	35.0	371382	20.7
External force (blunt)	1271	2.5	19860	15.6
External force (penetrating)	1108	2.2	17819	16.1
Stake	81	0.2	1057	13.0
Crush	445	0.9	13034	29.3
Explosion (blunt)	14	0.0	348	24.9
Explosion (penetrating)	1	0.0	0	0.0
Gunshot	7	0.0	100	14.3
Burn	1090	2.1	27107	24.9
Other	1379	2.7	19205	13.9
Unspecified	863	1.7	17512	20.3

"hospitalization within 1 day" is set as "0", the average length of hospitalization may be underestimated.

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

N= 55,369

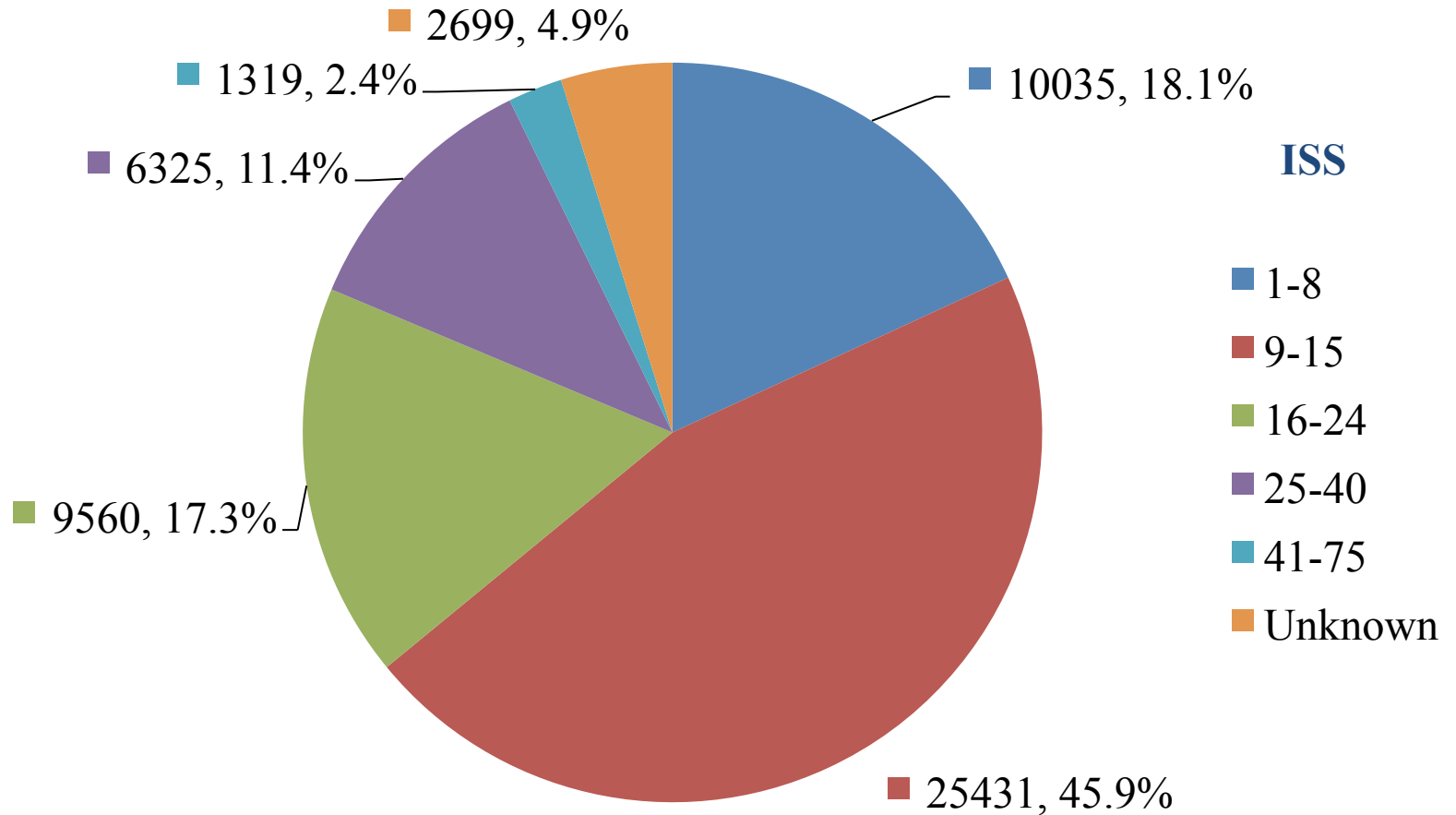


Figure
15**Patients by ISS and Age**

N= 52,616

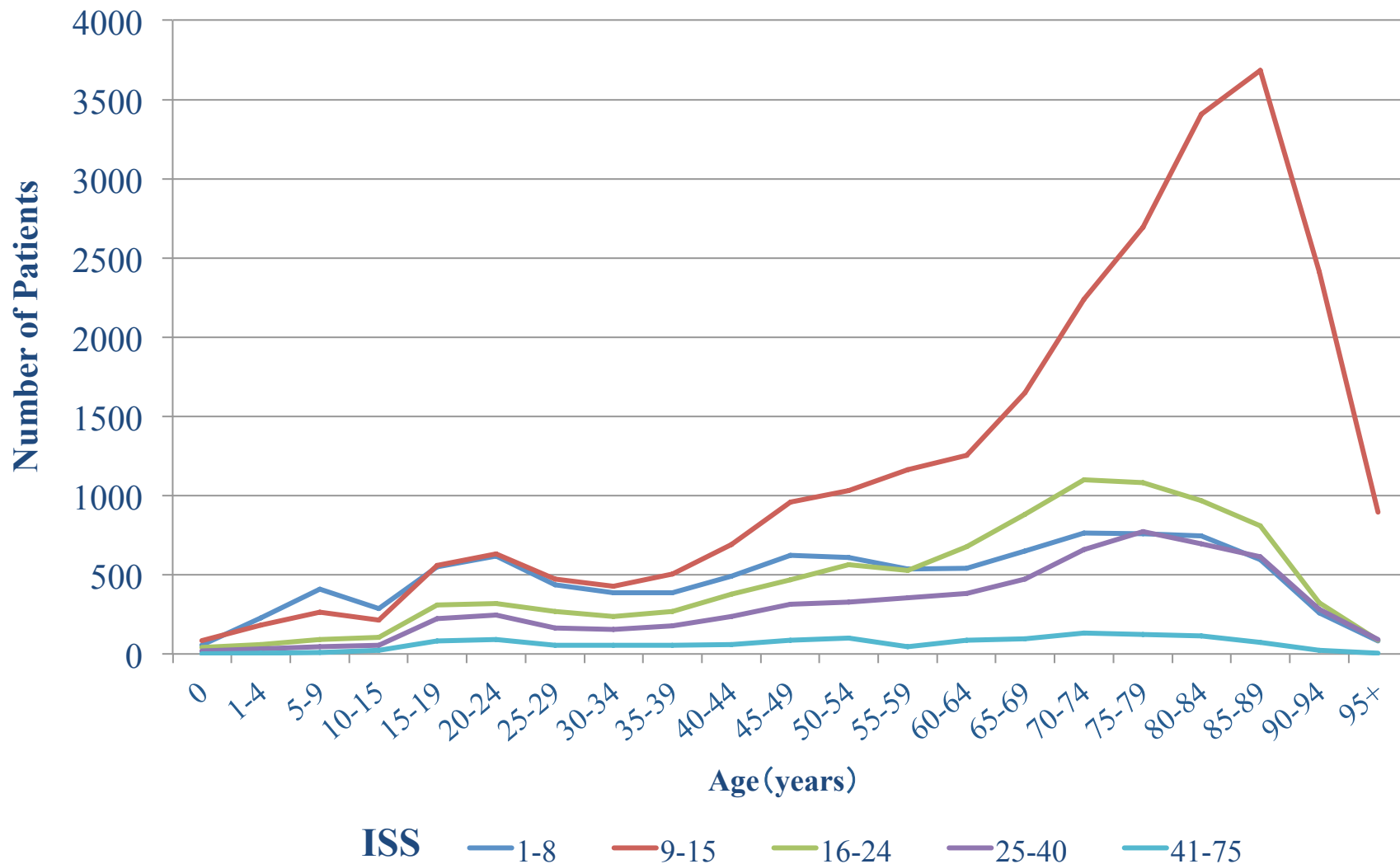


Table
15**Patients by ISS and Age**

Age ISS	0	1-4	5-9	10-15	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+	Unknown	Total
1-8	56	227	409	287	549	619	438	385	388	493	621	610	535	540	652	764	761	747	594	261	82	17	10035
9-15	84	184	262	212	559	631	471	428	505	691	960	1033	1164	1256	1650	2238	2693	3405	3686	2410	893	16	25431
16-24	40	58	90	103	308	320	270	235	266	376	470	563	527	678	882	1098	1080	969	807	324	85	11	9560
25-40	19	34	47	57	221	245	162	155	178	238	313	326	356	381	473	659	773	695	615	282	90	6	6325
41-75	1	4	9	25	81	89	57	56	54	58	87	98	47	85	97	130	124	115	72	22	4	4	1319
Unknown	6	37	43	54	197	164	123	78	103	139	170	169	175	130	194	216	253	219	135	78	13	3	2699
Total	206	544	860	738	1915	2068	1521	1337	1494	1995	2621	2799	2804	3070	3948	5105	5684	6150	5909	3377	1167	57	55369

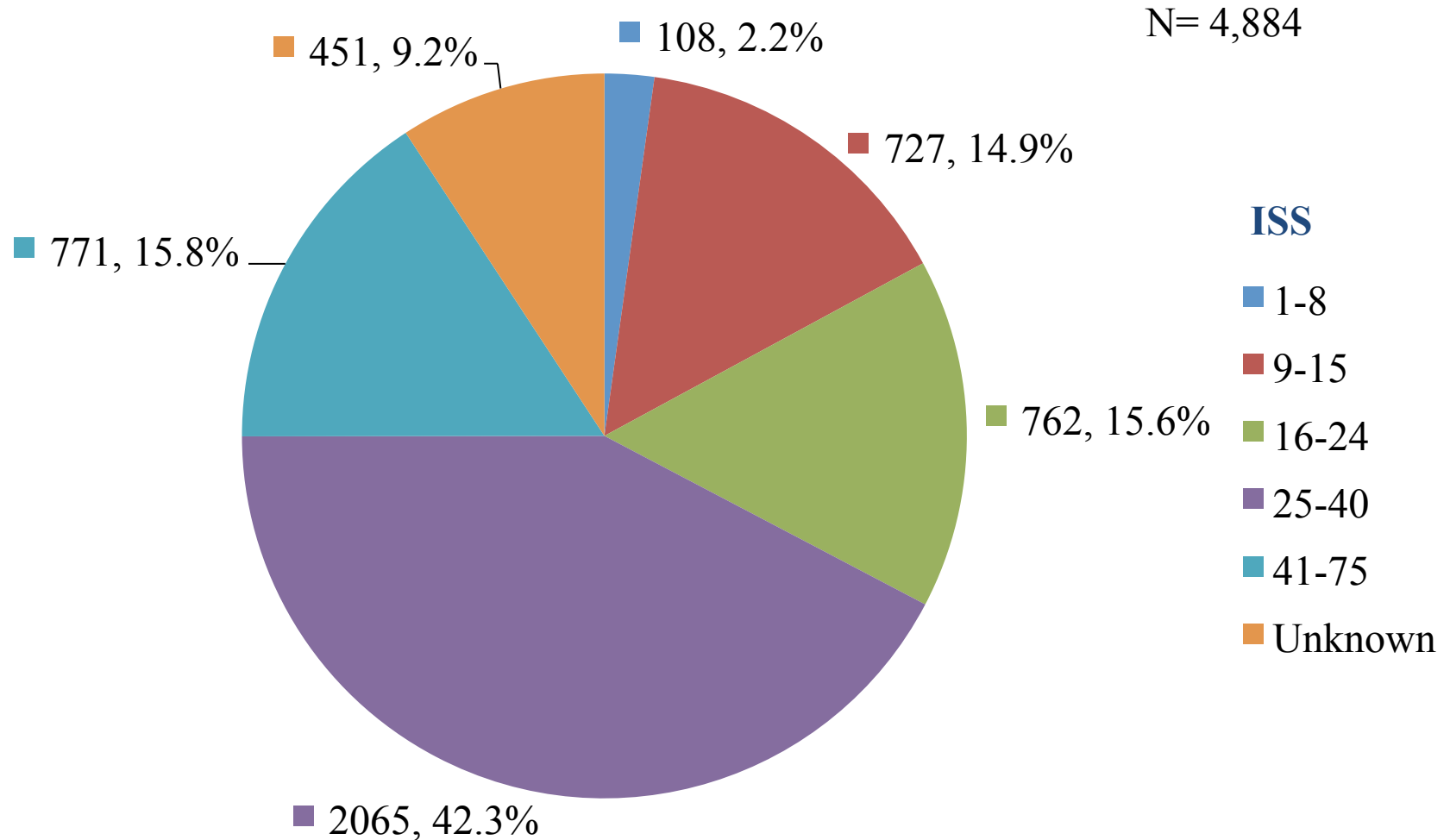
Figure
16-A**Deaths and Injury Severity Score (ISS)**

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

N= 55,369

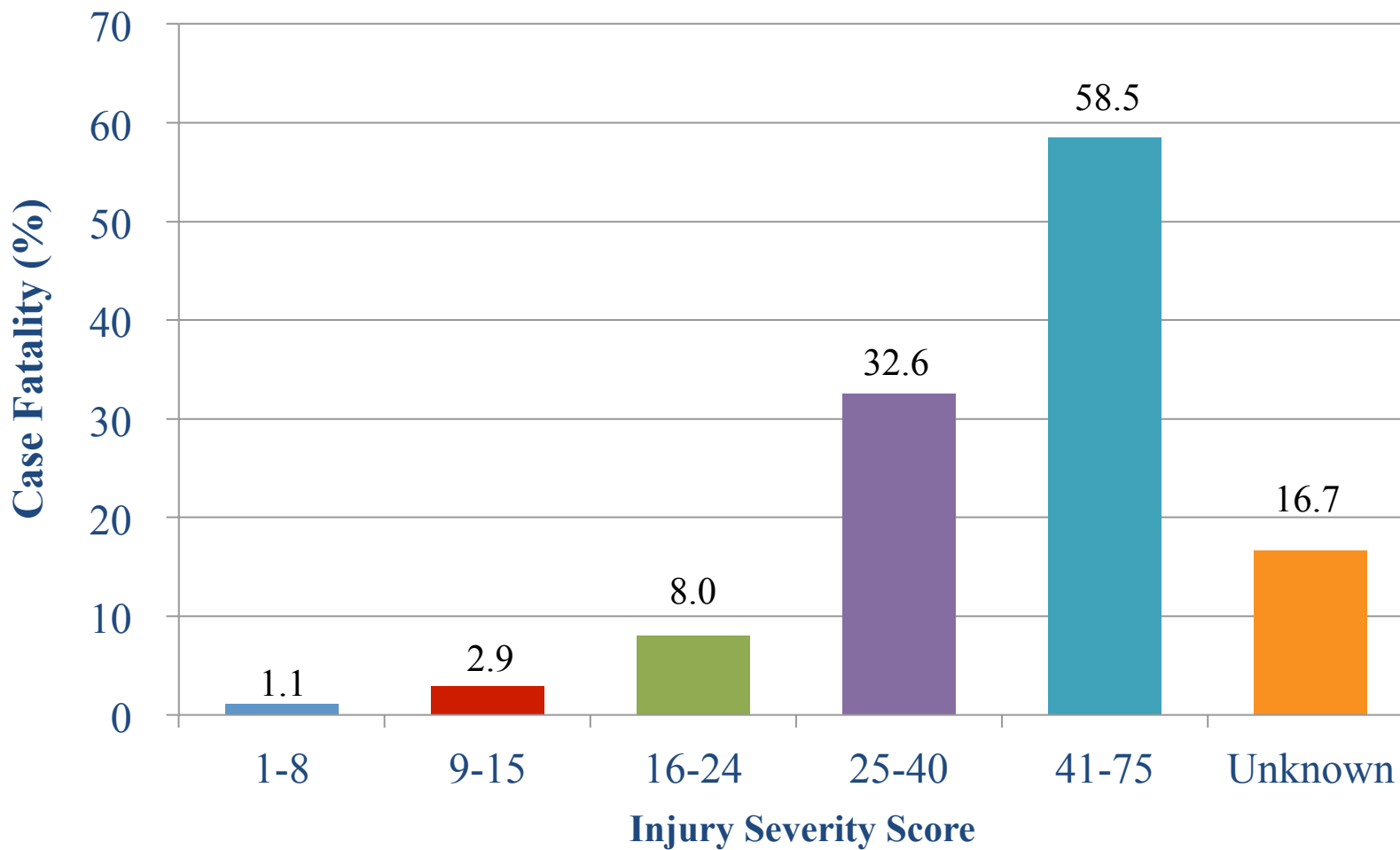


Figure 17

Deaths by ISS and Age

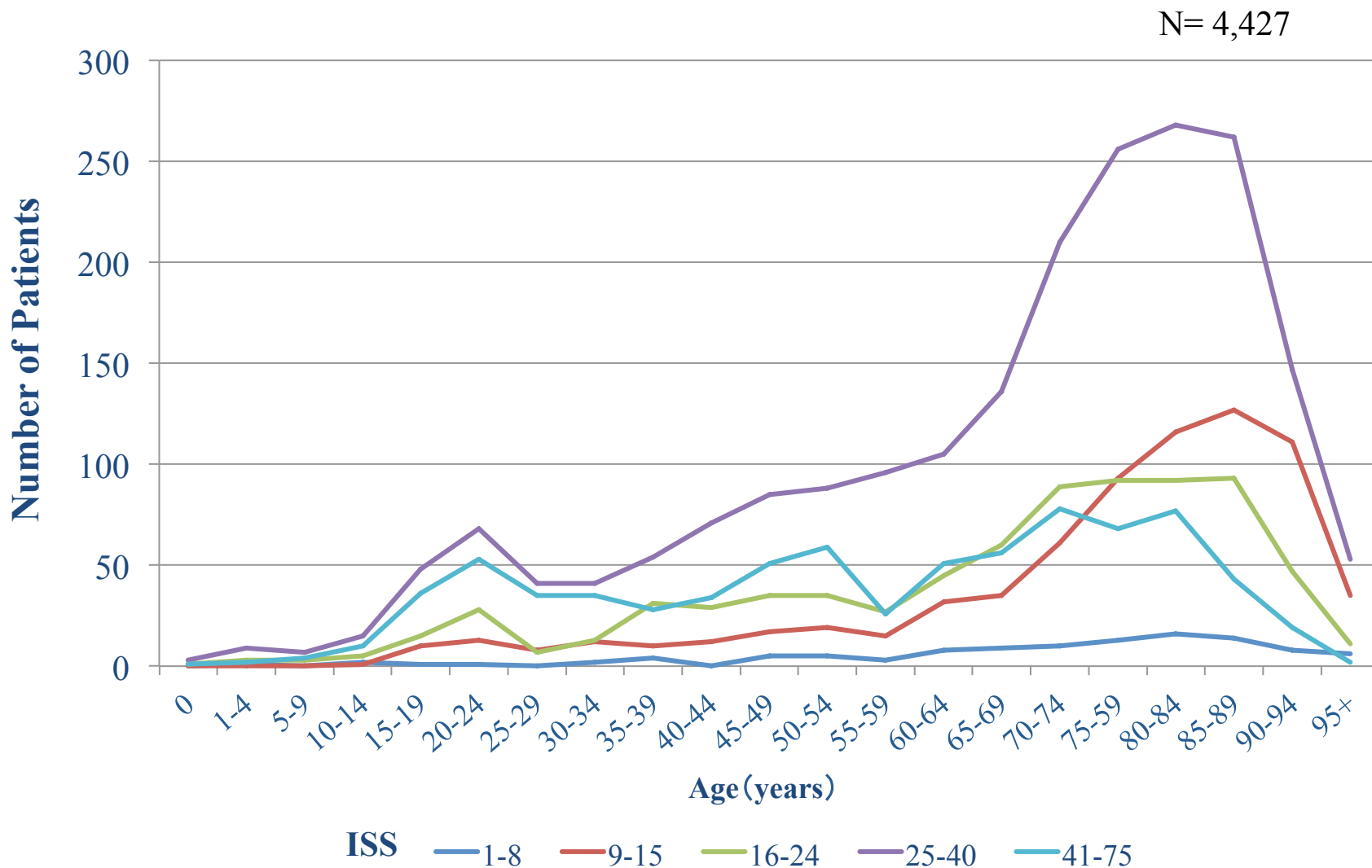
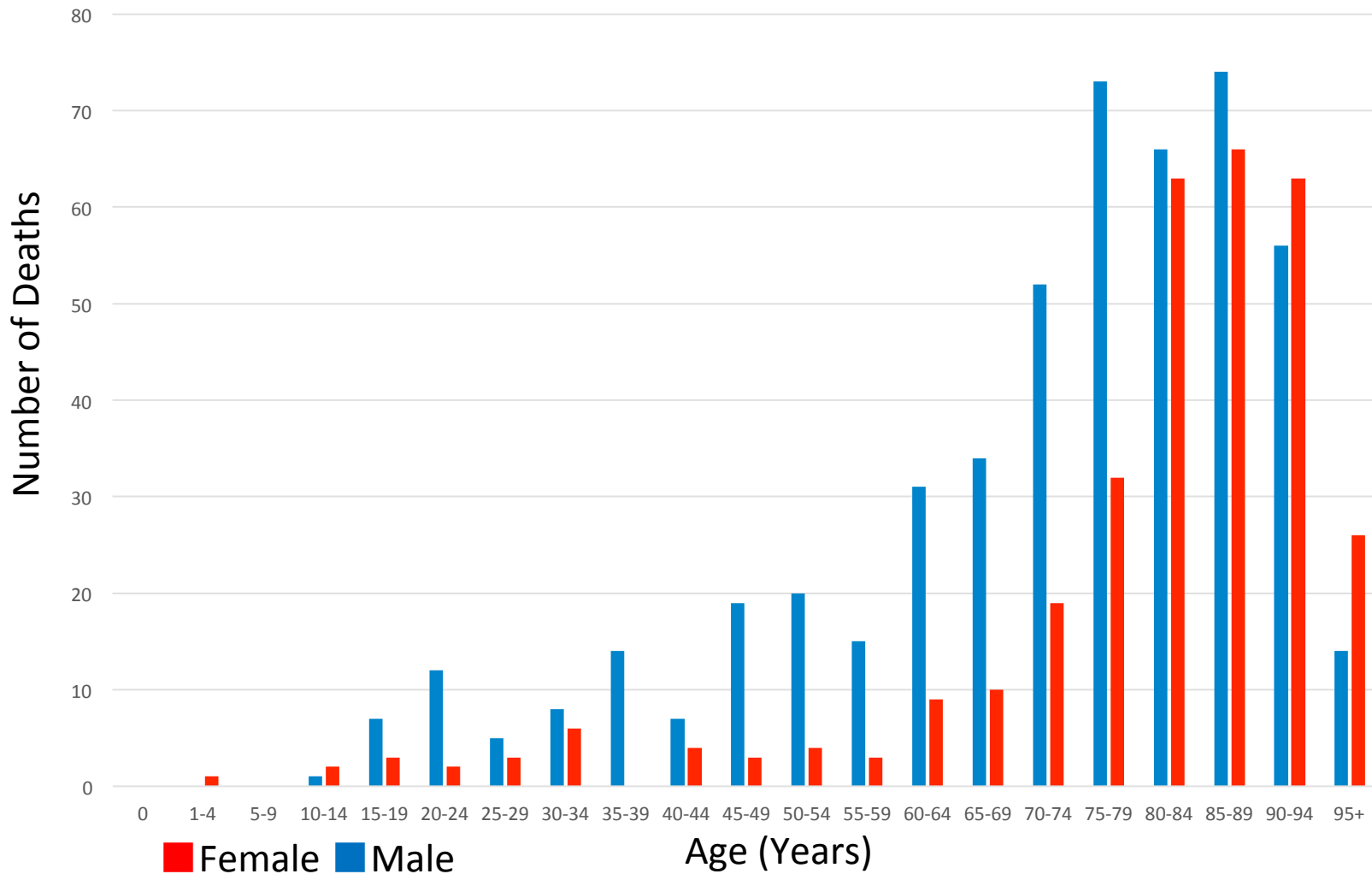
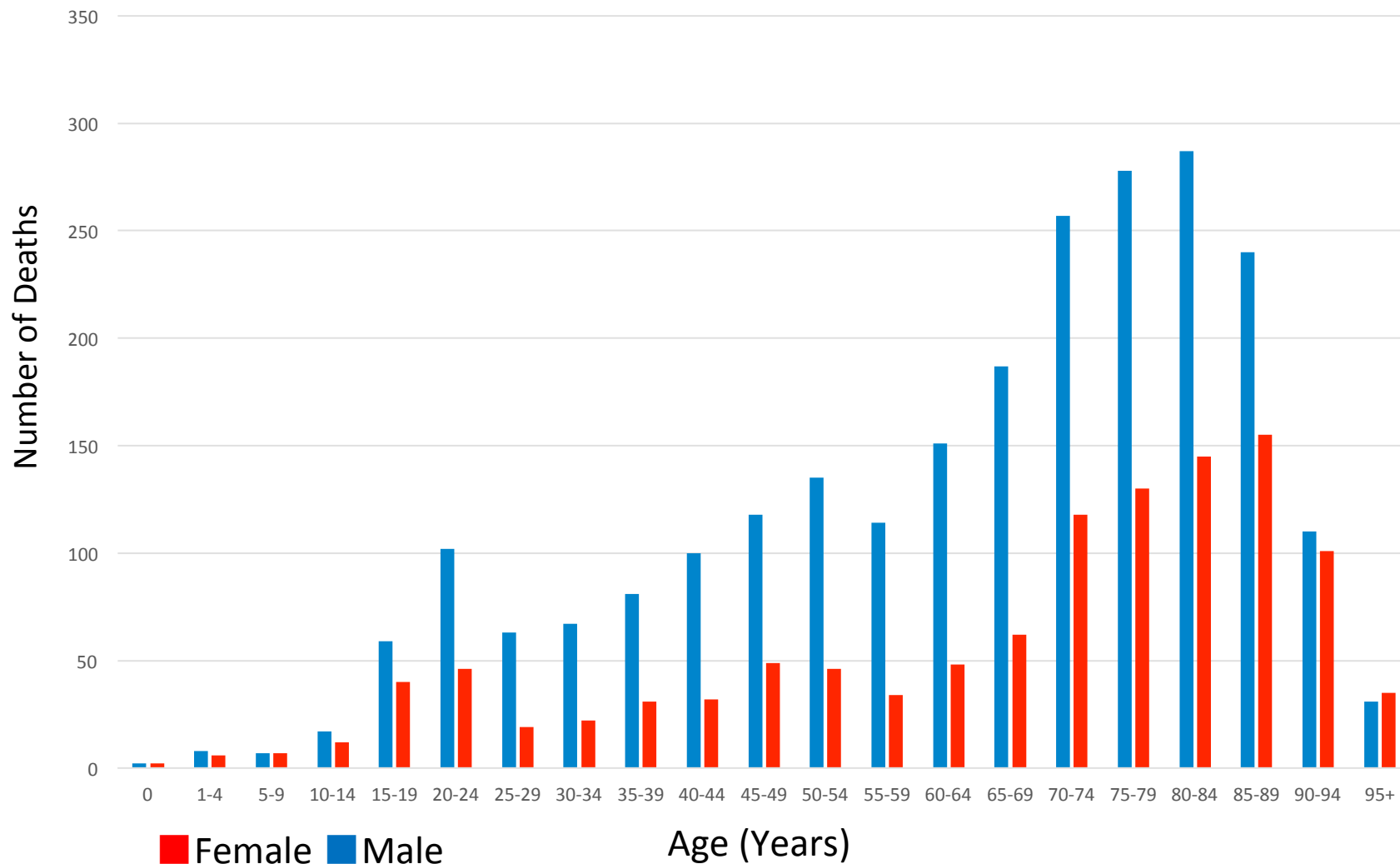


Table
17**Deaths by ISS and Age**

AGE ISS	0	1-4	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+	Total
1-8	0	1	0	2	1	1	0	2	4	0	5	5	3	8	9	10	13	16	14	8	6	108
9-15	0	0	0	1	10	13	8	12	10	12	17	19	15	32	35	61	93	116	127	111	35	727
16-24	1	3	3	5	15	28	7	13	31	29	35	35	27	45	60	89	92	92	93	47	11	761
25-40	3	9	7	15	48	68	41	41	54	71	85	88	96	105	136	210	256	268	262	147	53	2063
41-75	1	2	4	10	36	53	35	35	28	34	51	59	26	51	56	78	68	77	43	19	2	768
Total	5	15	14	33	110	163	91	103	127	146	193	206	167	241	296	448	522	569	539	332	107	4427

Figure
18**Deaths by age and gender (ISS \leq 15)**

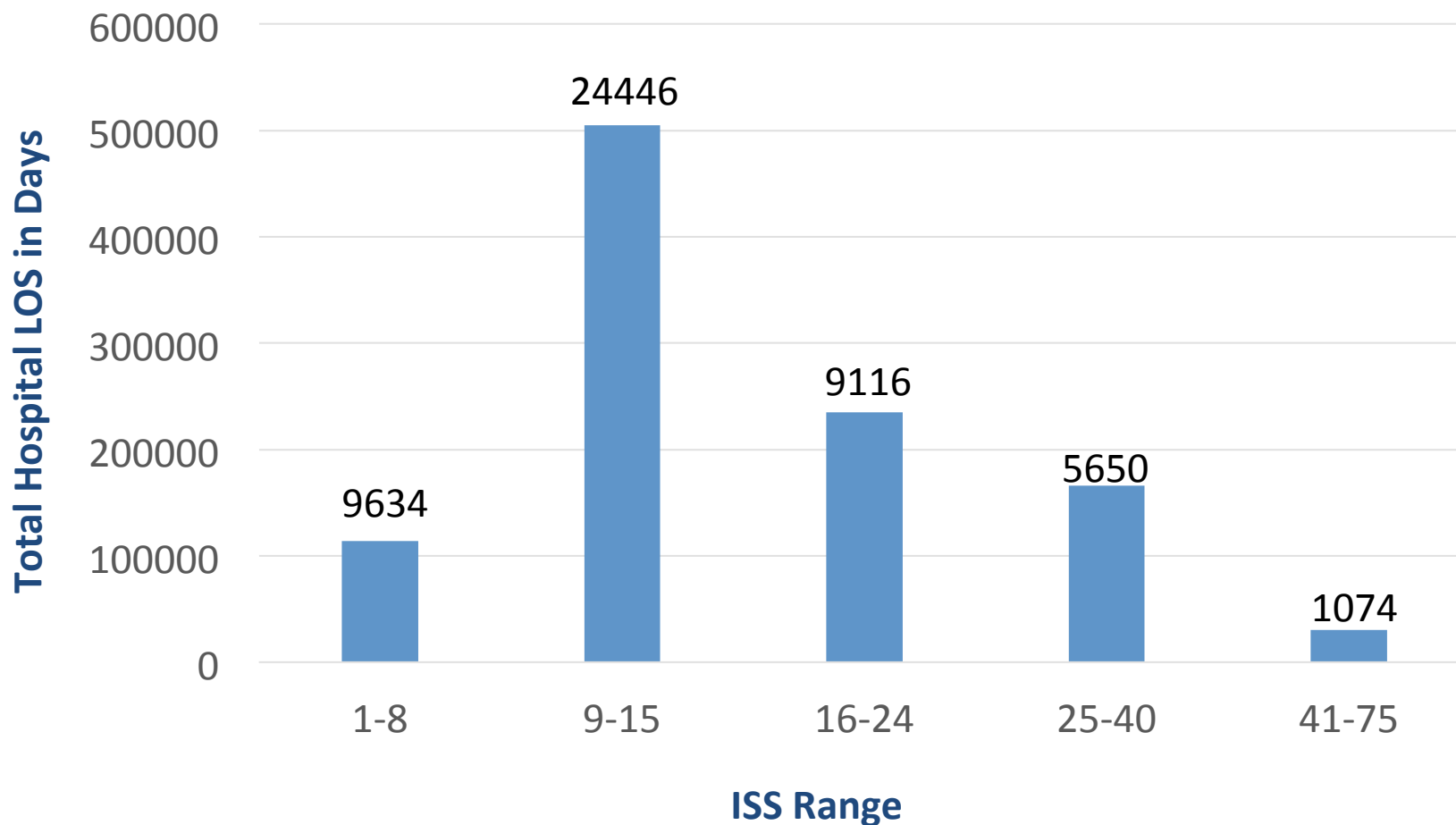
Deaths for patients with ISS \leq 15 for males and females at each age category.

Figure
19**Deaths by age and gender (ISS>15)**

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

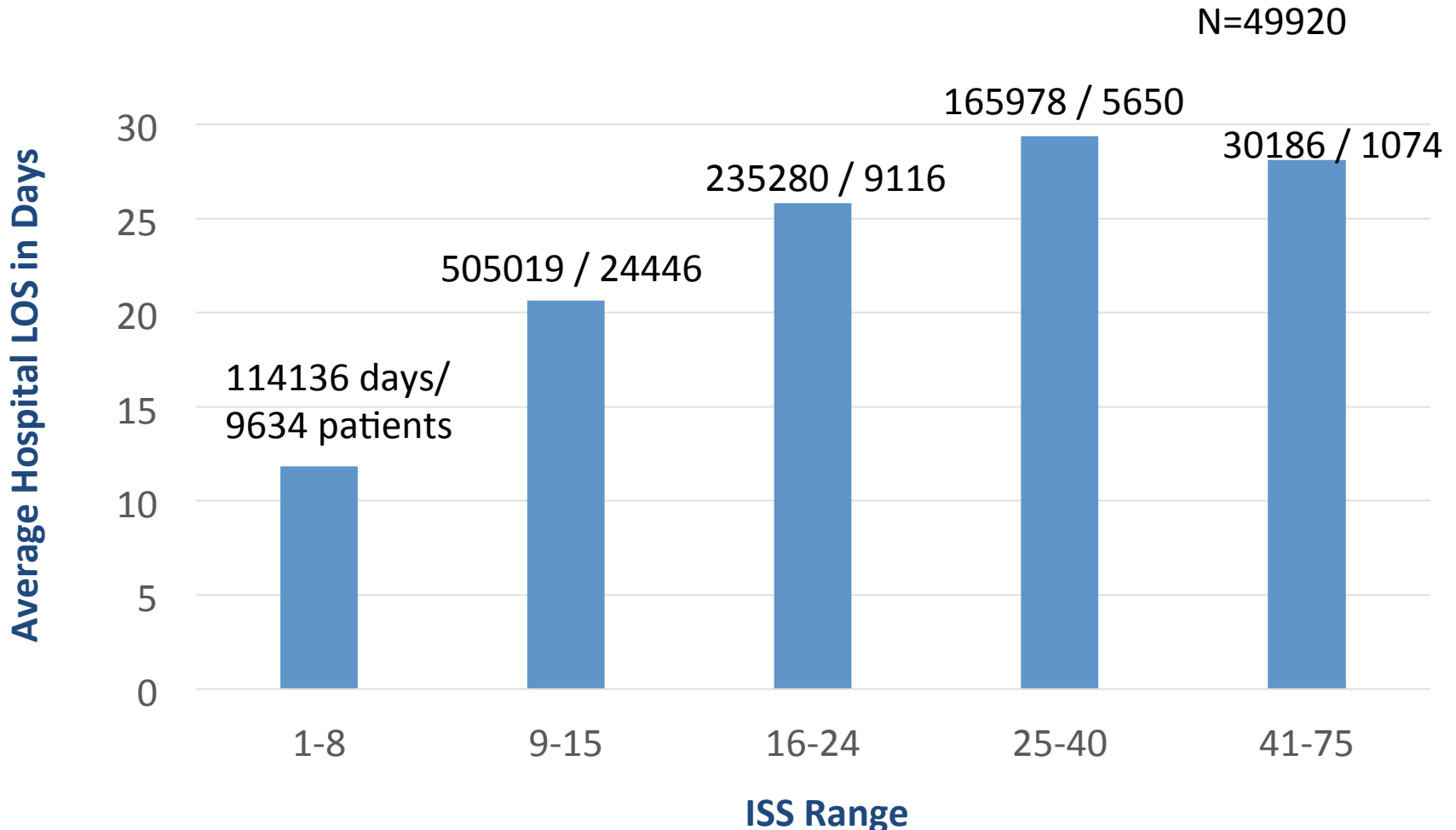
Figure
20A**Total hospital LOS and Injury Severity Score (ISS)**

N=49920



Excluded: LOS<0 or >365; ISS unknown

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

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

Excluded: LOS<0 or >365; ISS unknown

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).

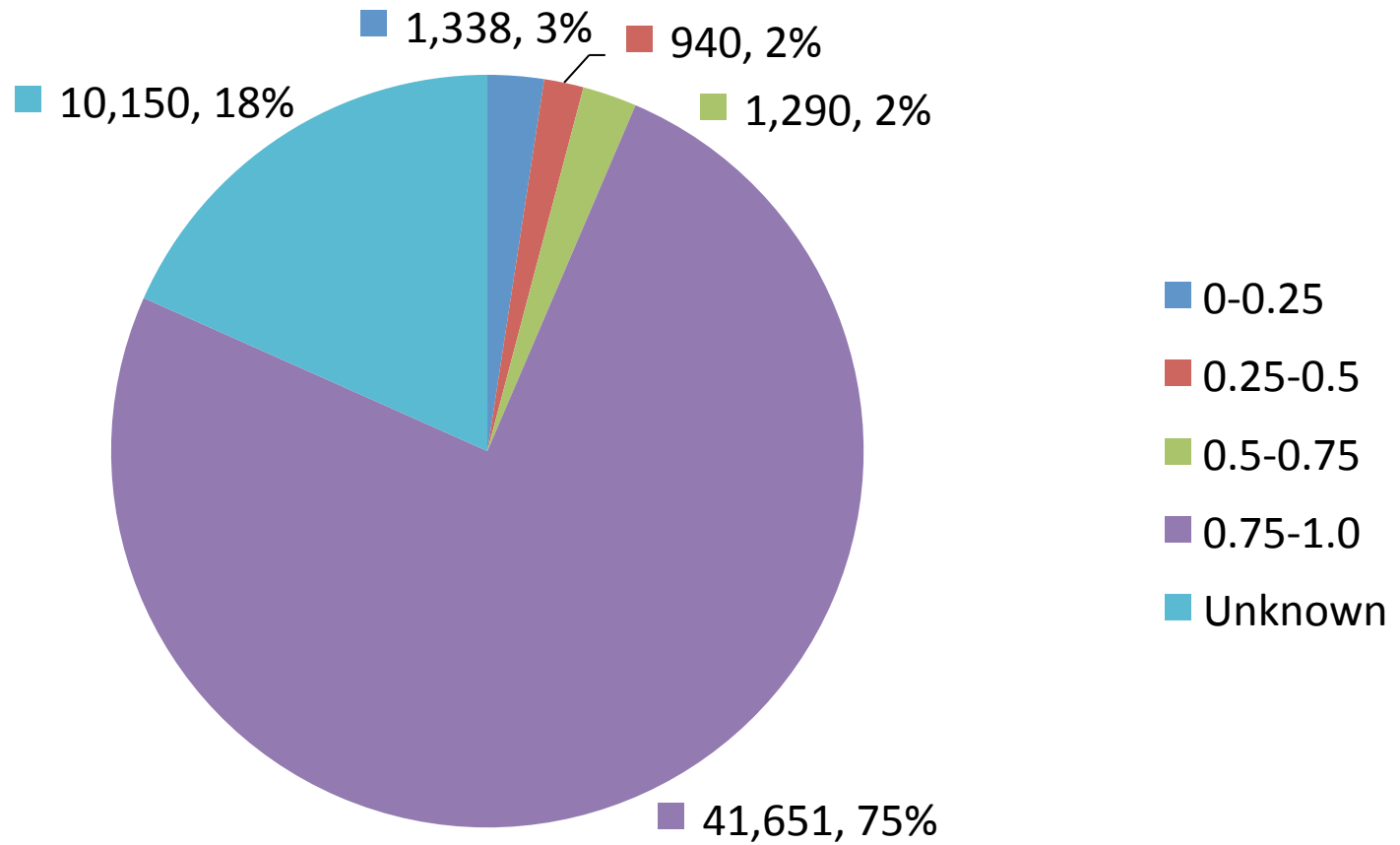
Figure
21**Distribution of patients by probability of survival (Ps)**

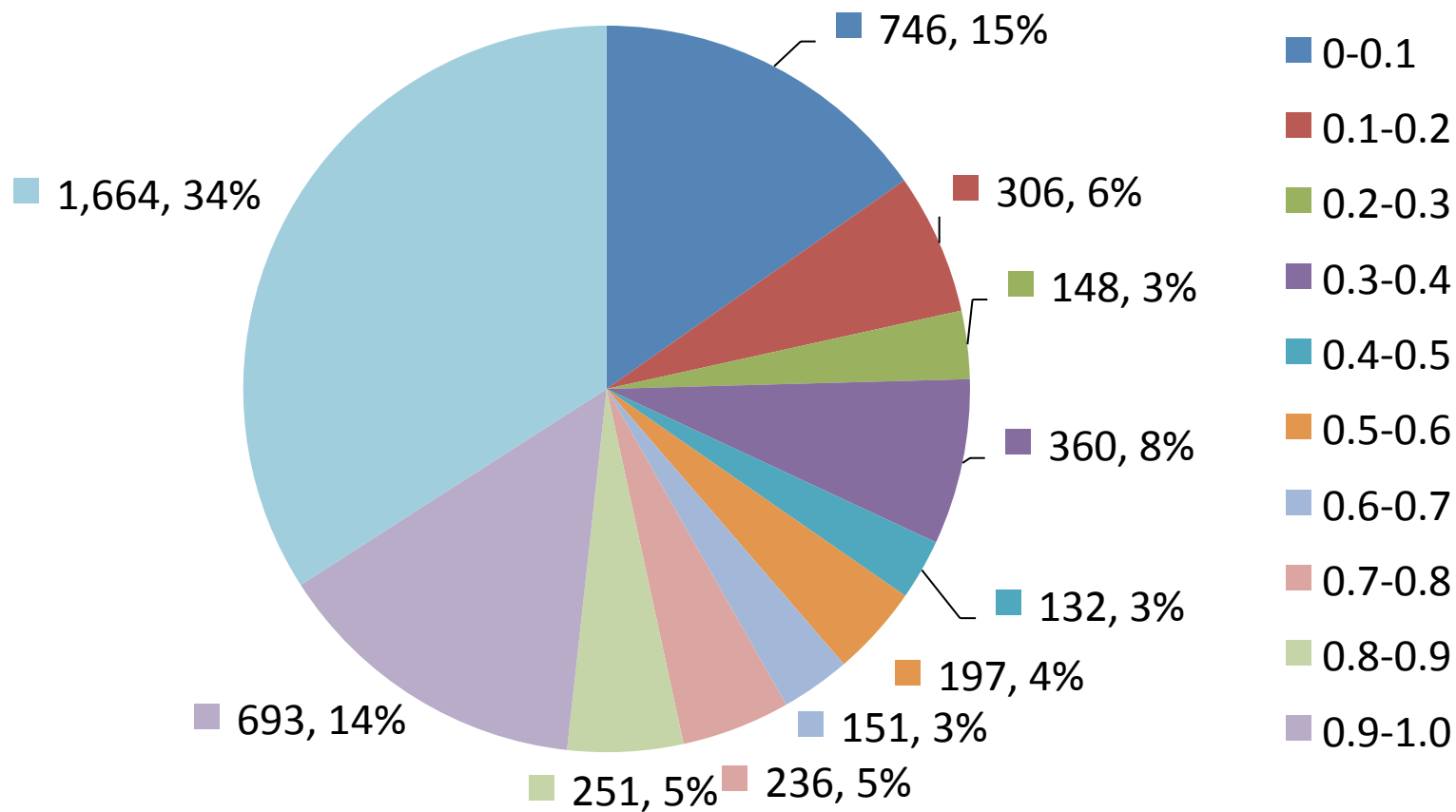
Figure
22A**Distribution of deaths by probability of survival (Ps)**

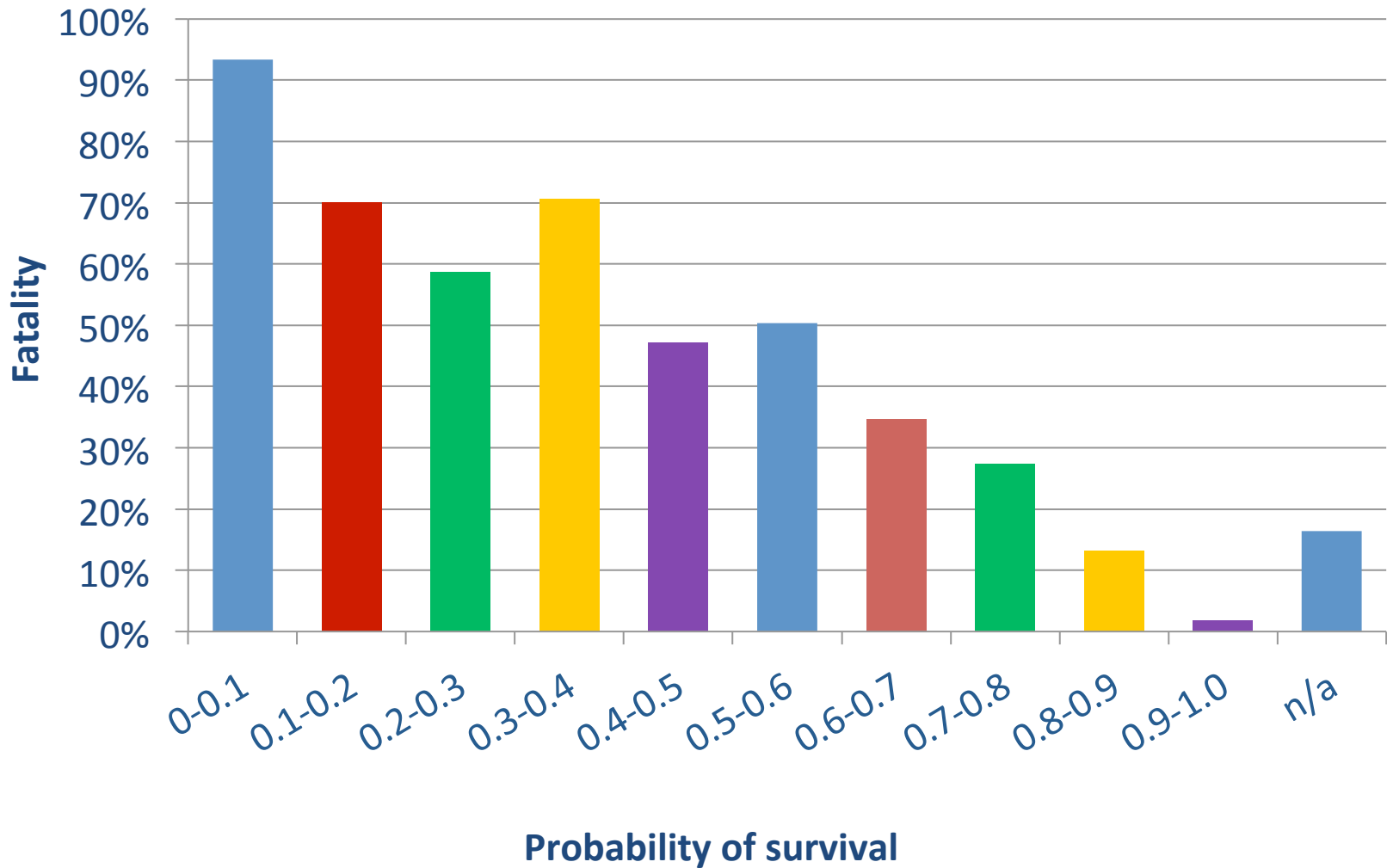
Figure
22B**Case fatality by probability of survival (Ps)**

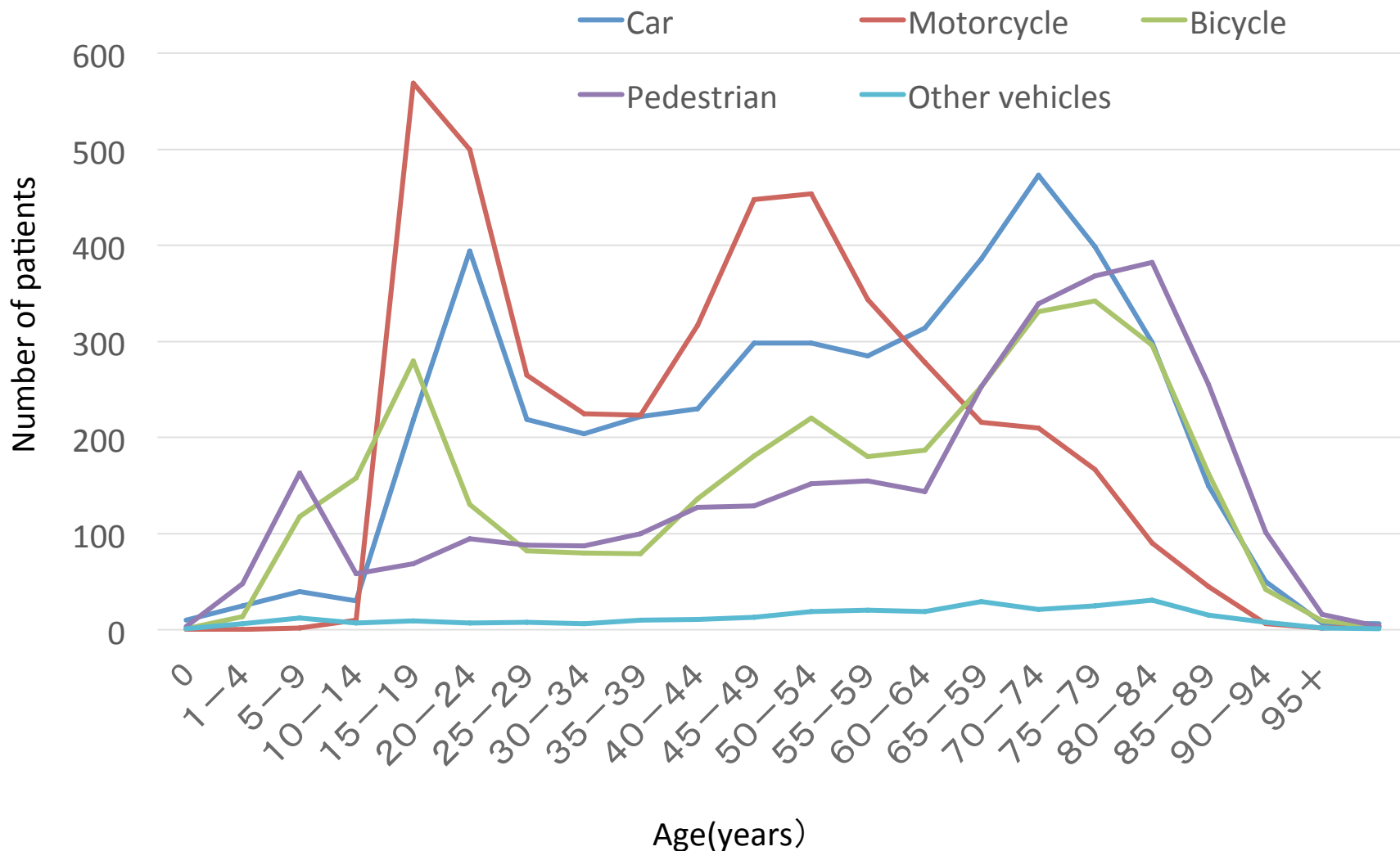
Figure
23**The number of patients in traffic accidents by types of vehicle and age**

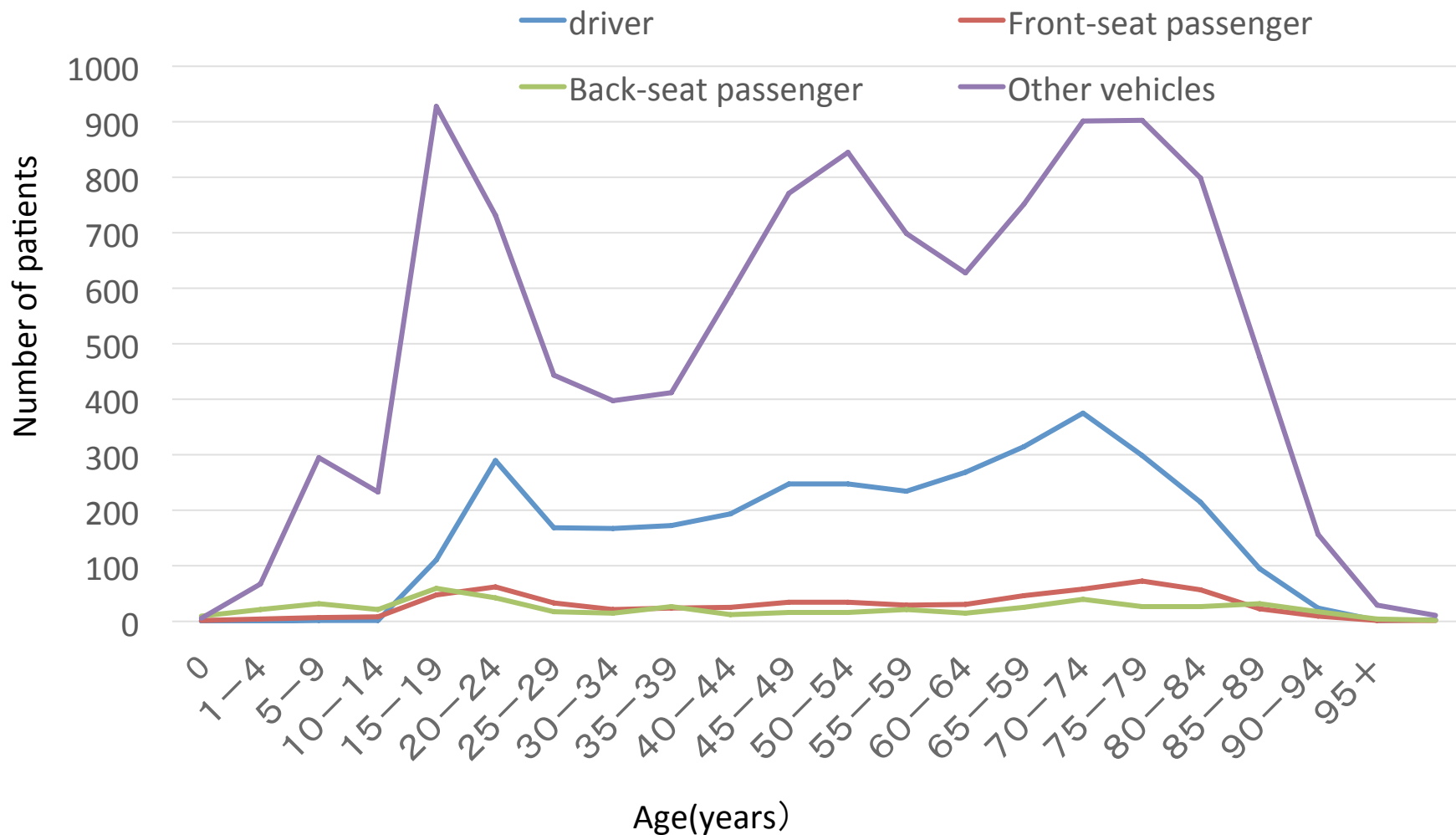
Figure
24**The number of patients in car accident by driver and passengers and age**

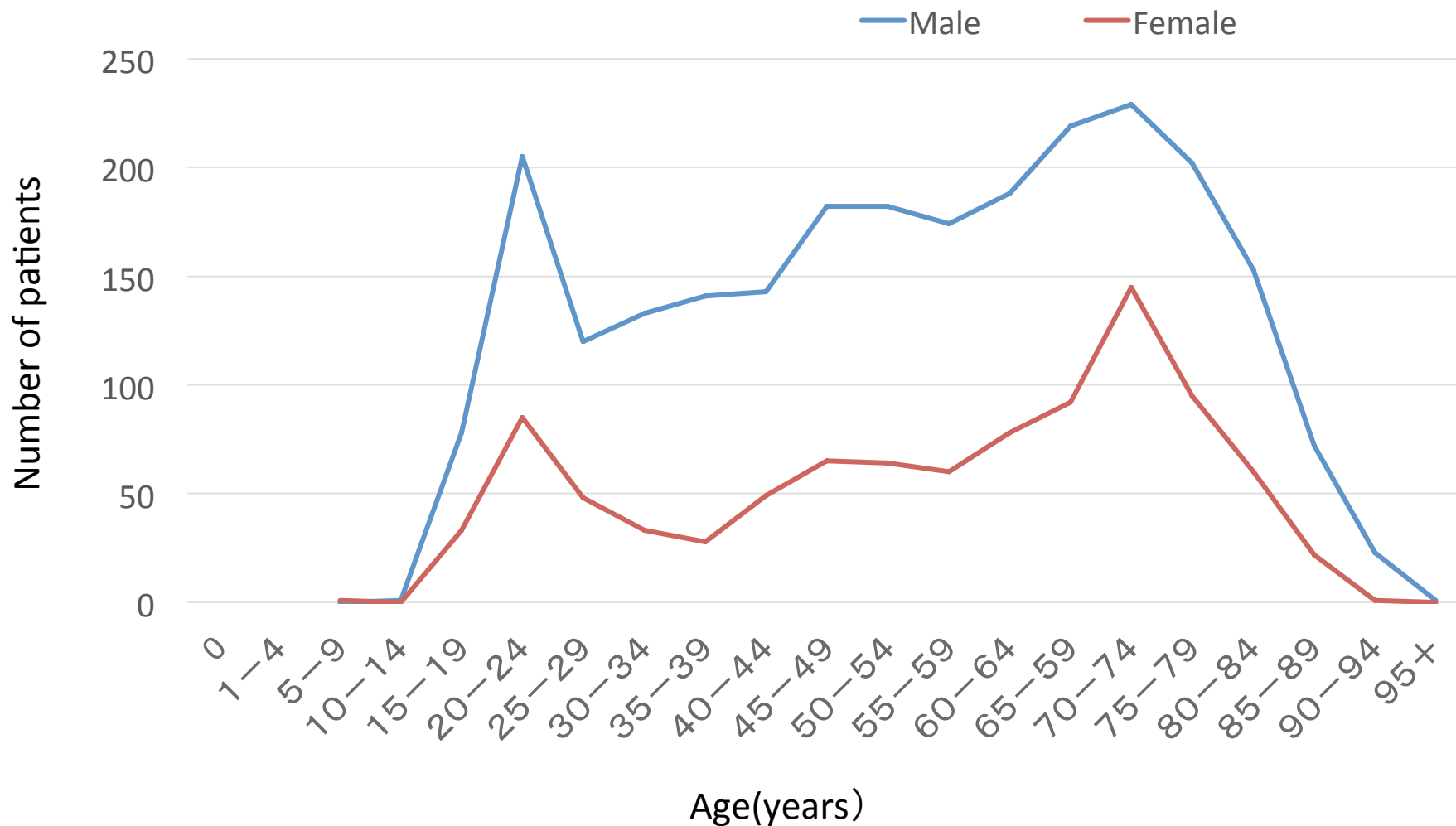
Figure
25**The number of patients in car accident (driver) by gender and age**

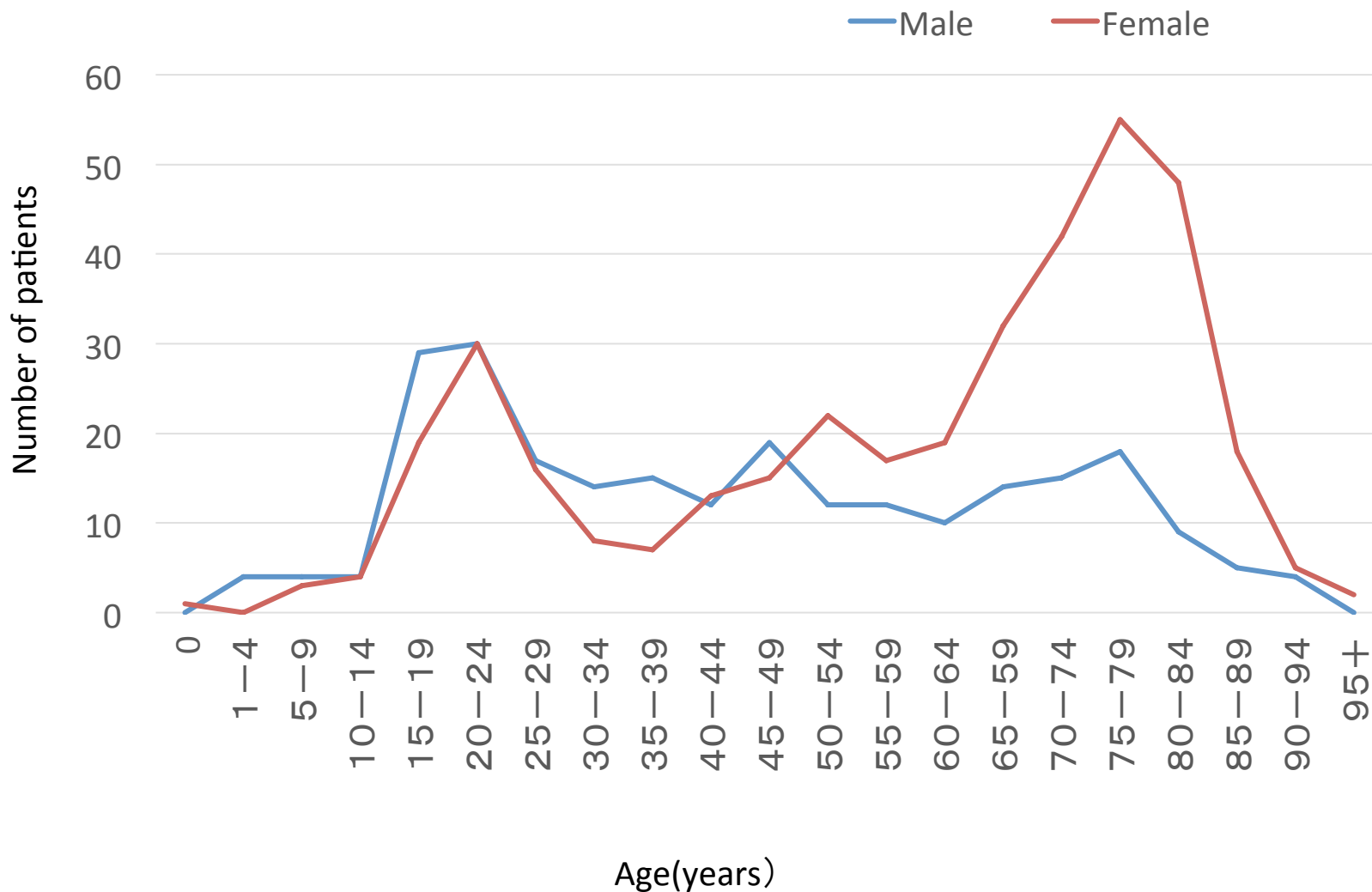
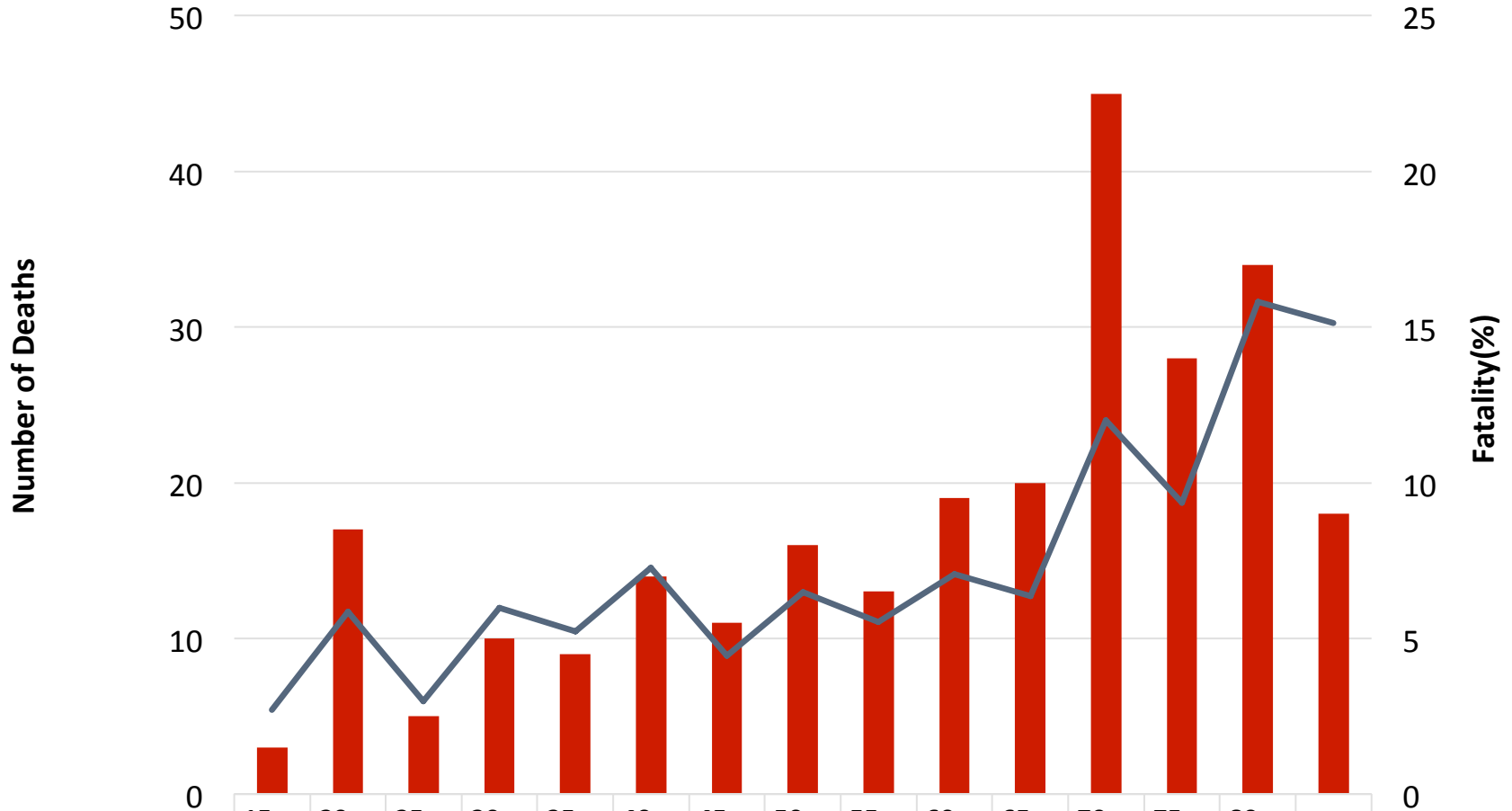
Figure
26**The number of patients in car accident (passenger) by gender and age**

Figure 27

Number of Deaths and Fatalities of Motor Vehicular Drivers by Age



	15~	20~	25~	30~	35~	40~	45~	50~	55~	60~	65~	70~	75~	80~	85~
Number of Deaths	3	17	5	10	9	14	11	16	13	19	20	45	28	34	18
Fatality(%)	2.7	5.9	3.0	6.0	5.2	7.3	4.4	6.5	5.5	7.1	6.3	12.0	9.4	15.8	15.1

Figure 28

Number of Deaths of Motor Vehicular Drivers by Age and Genders

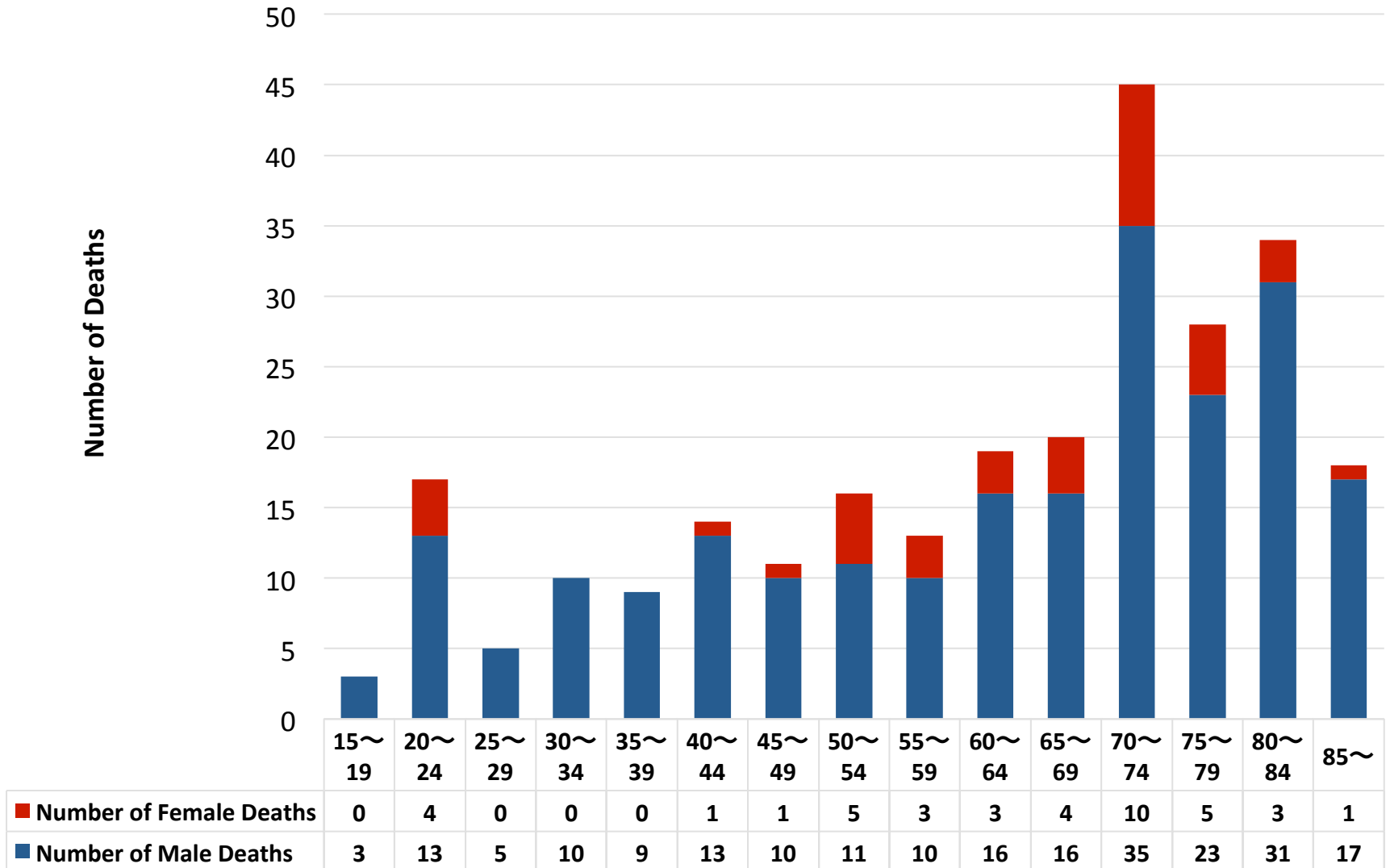


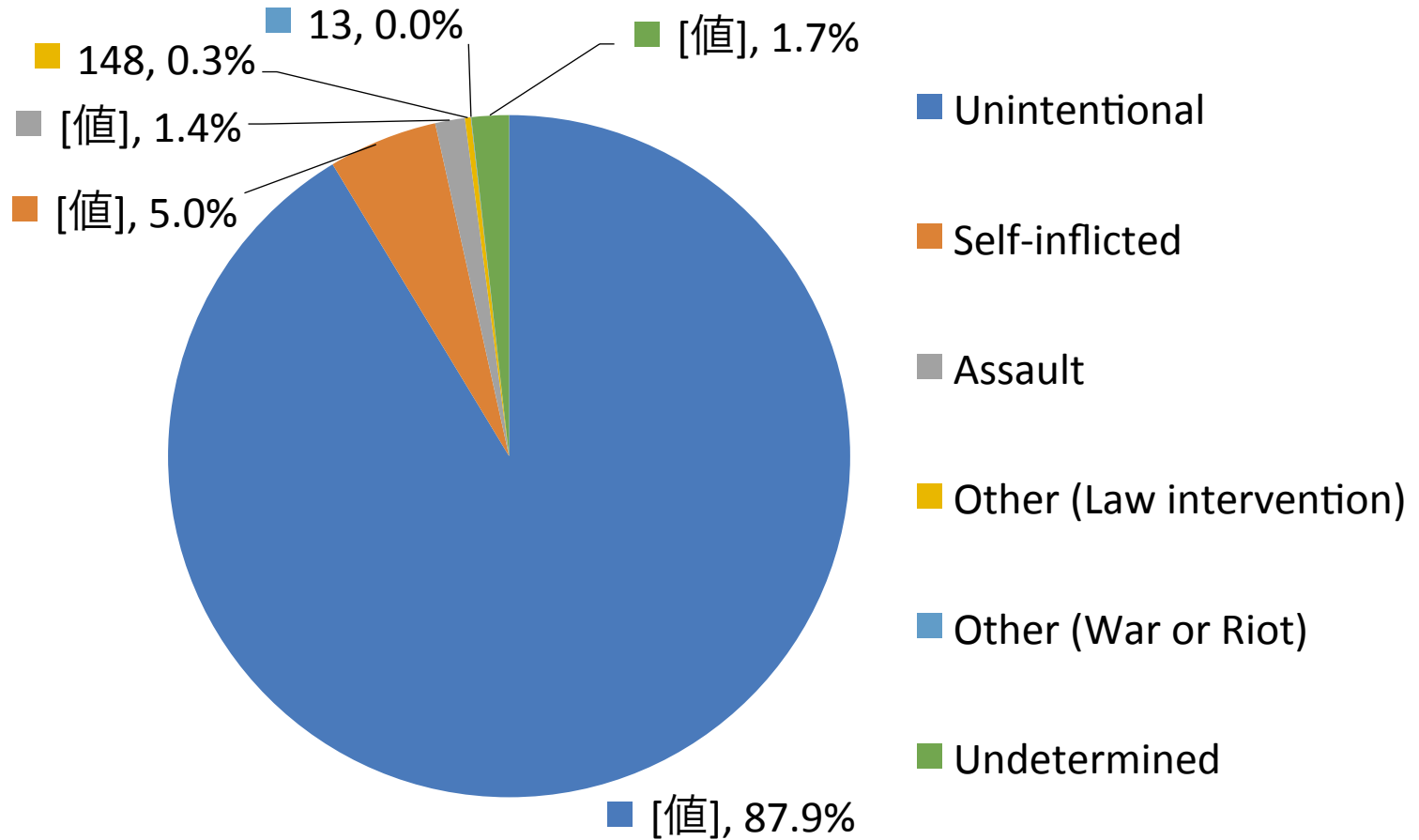
Figure
29**Proportional distribution of registered patients, grouped by intent**

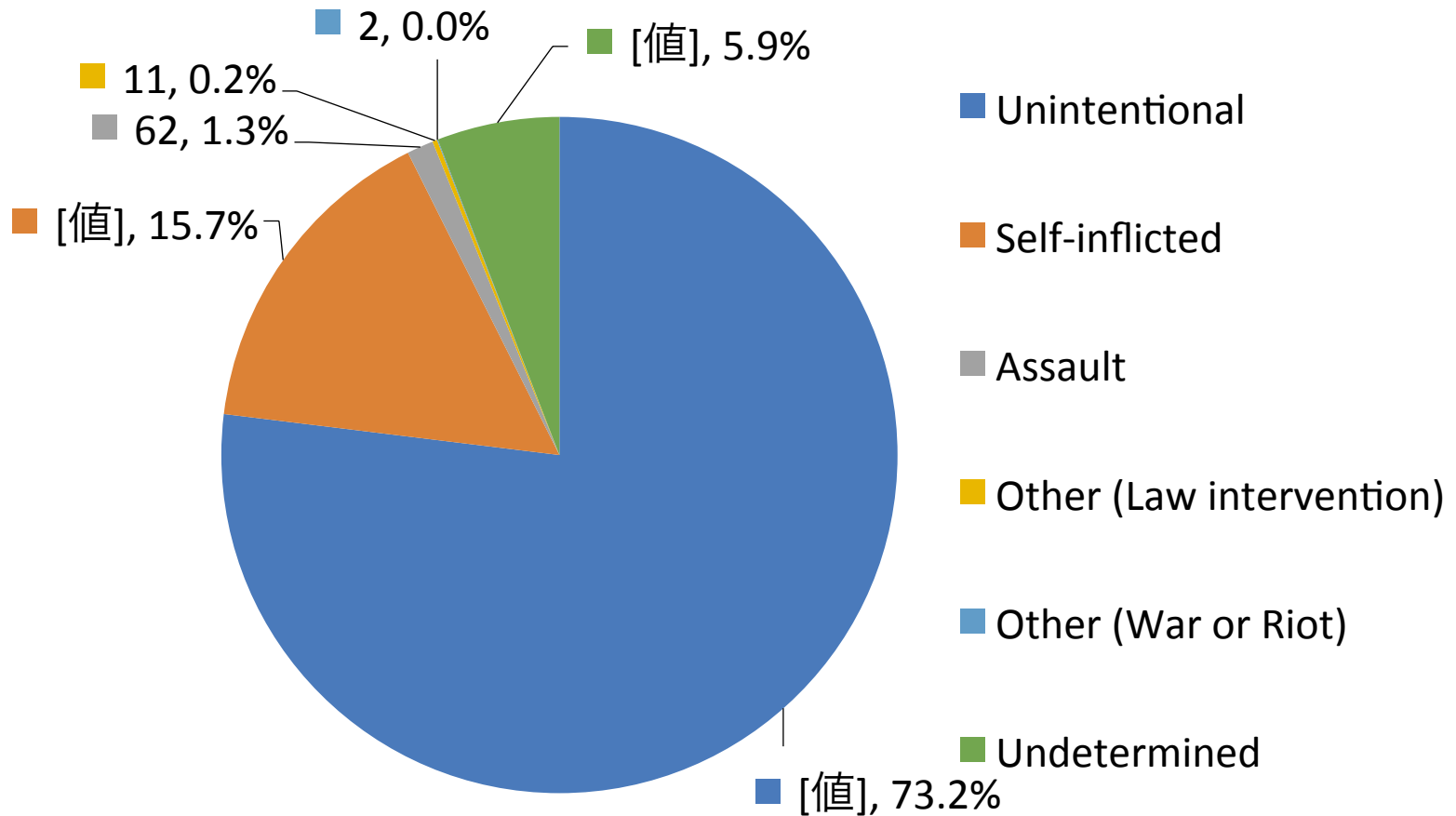
Figure
30**Proportional distribution of deaths, grouped by intent**

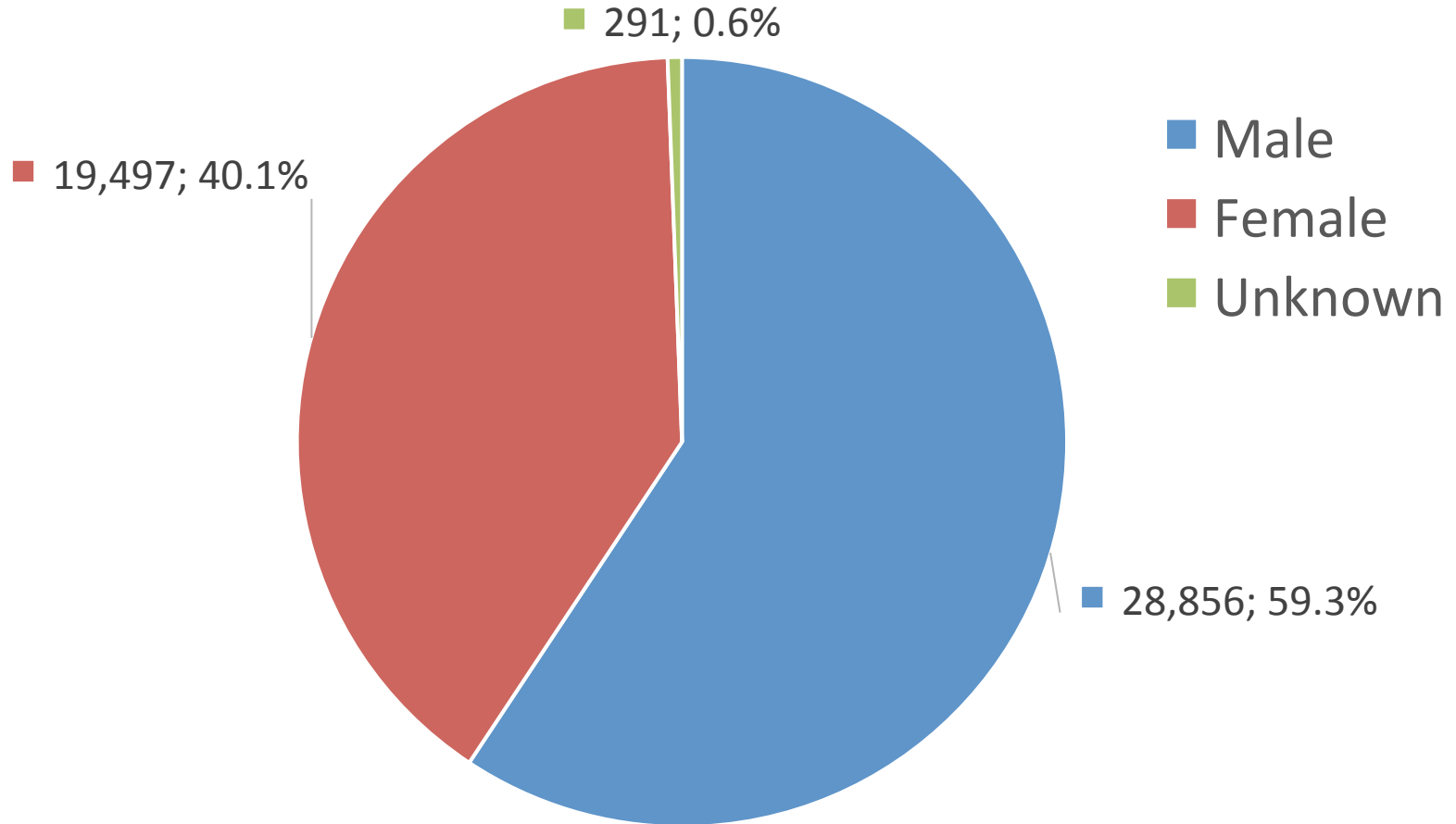
Figure
31**Gender proportion of unintentional**

Figure
32

Unintentional by age and gender

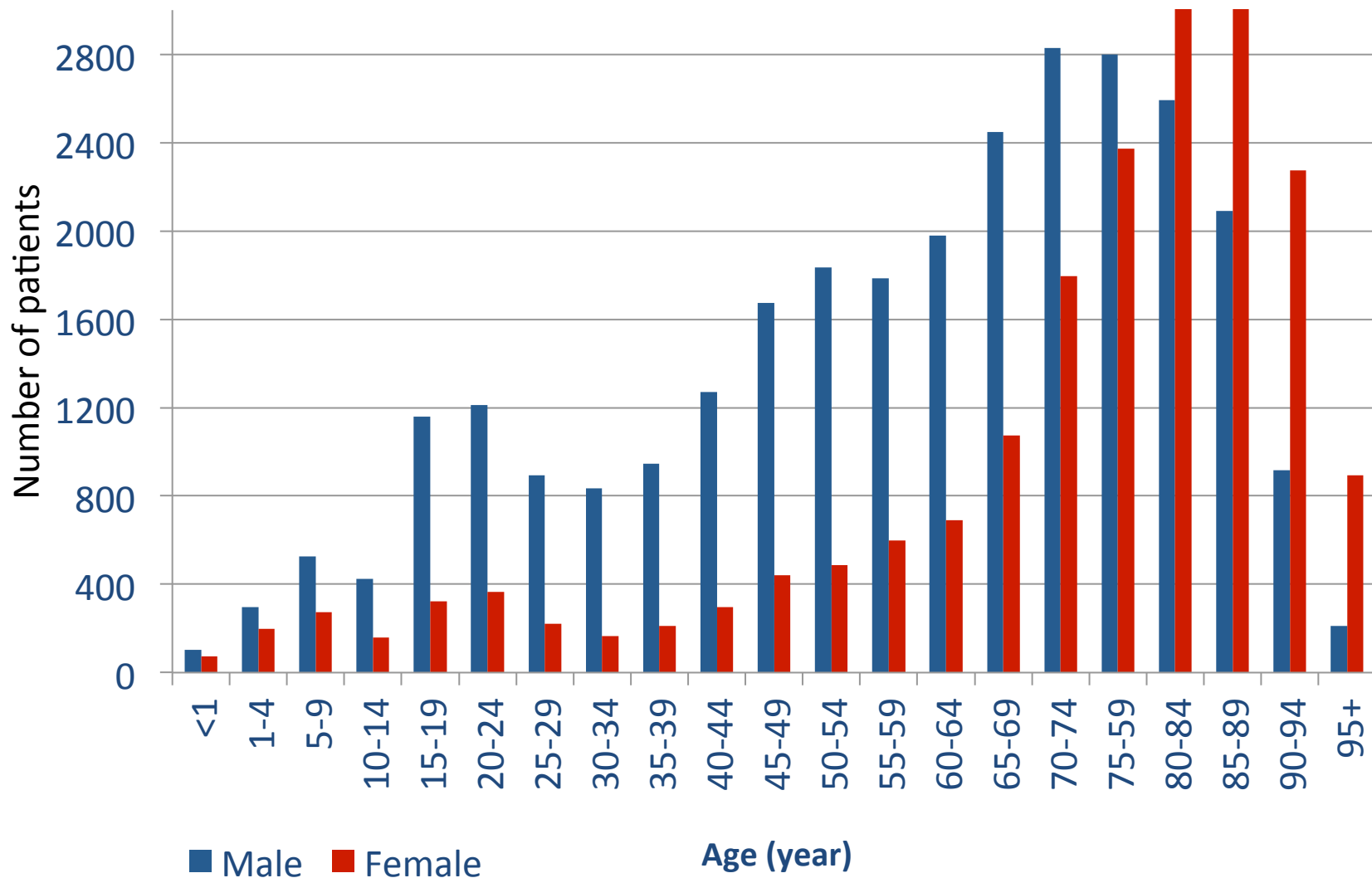


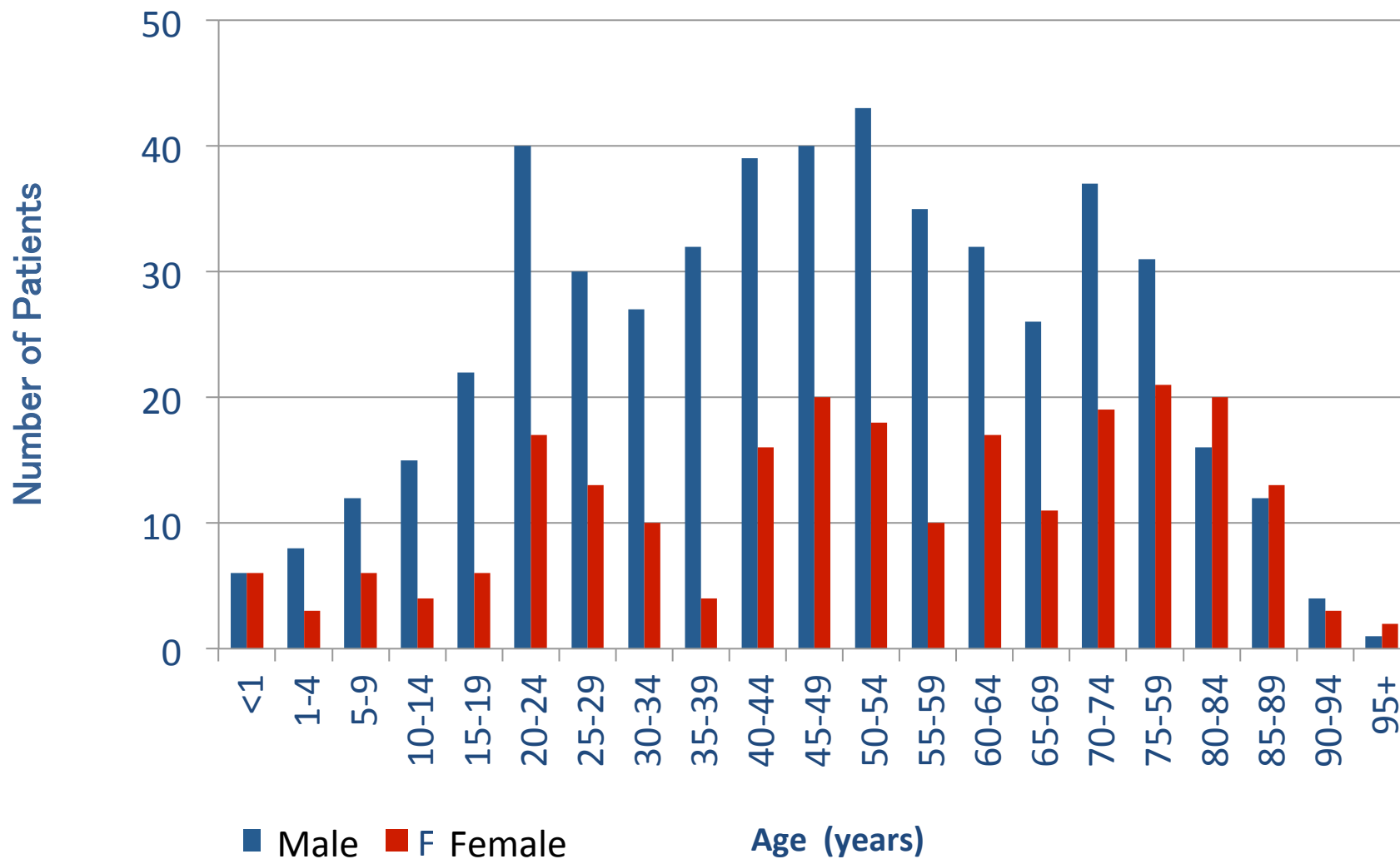
Figure
33**Assault by age and gender**

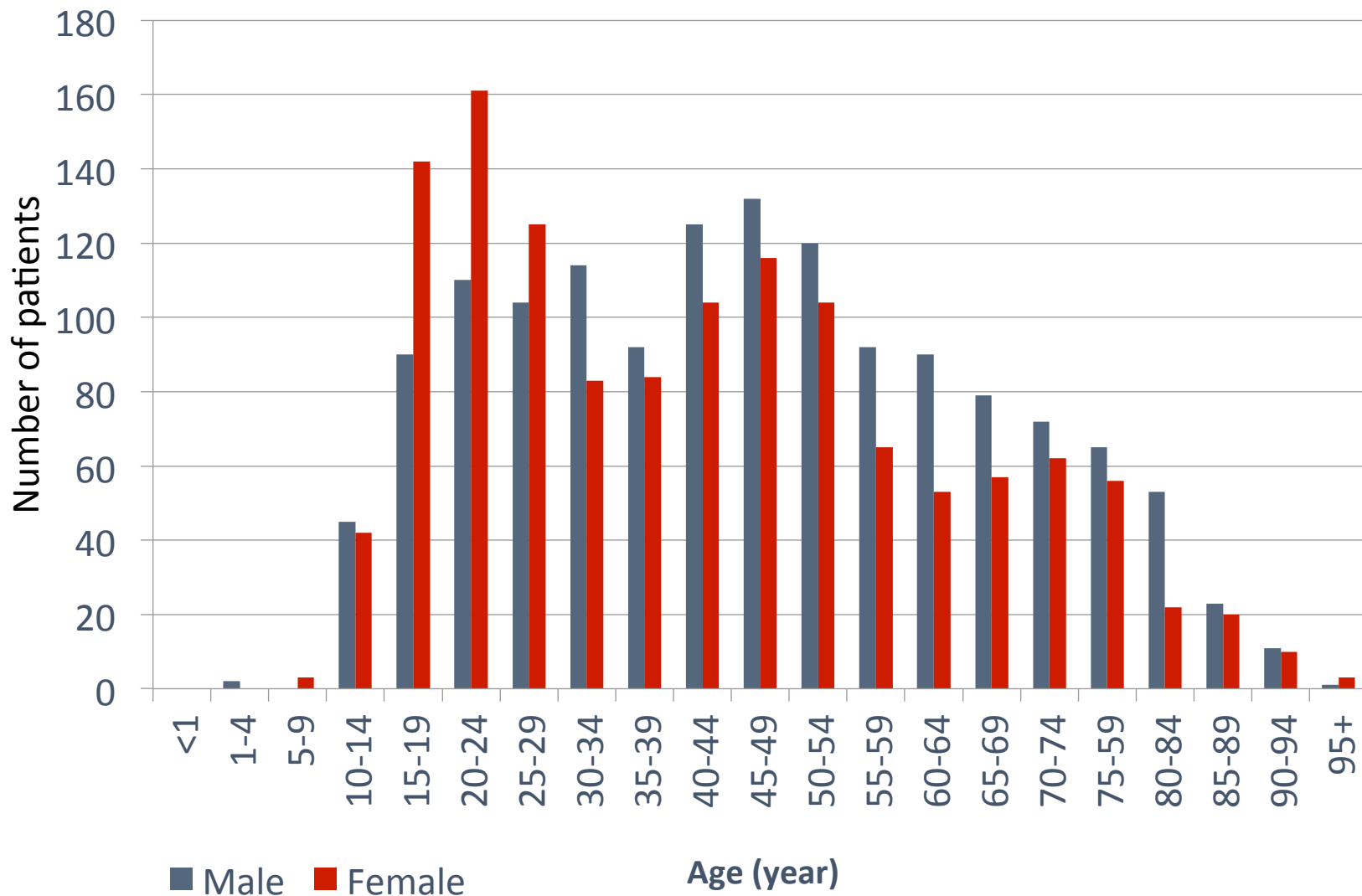
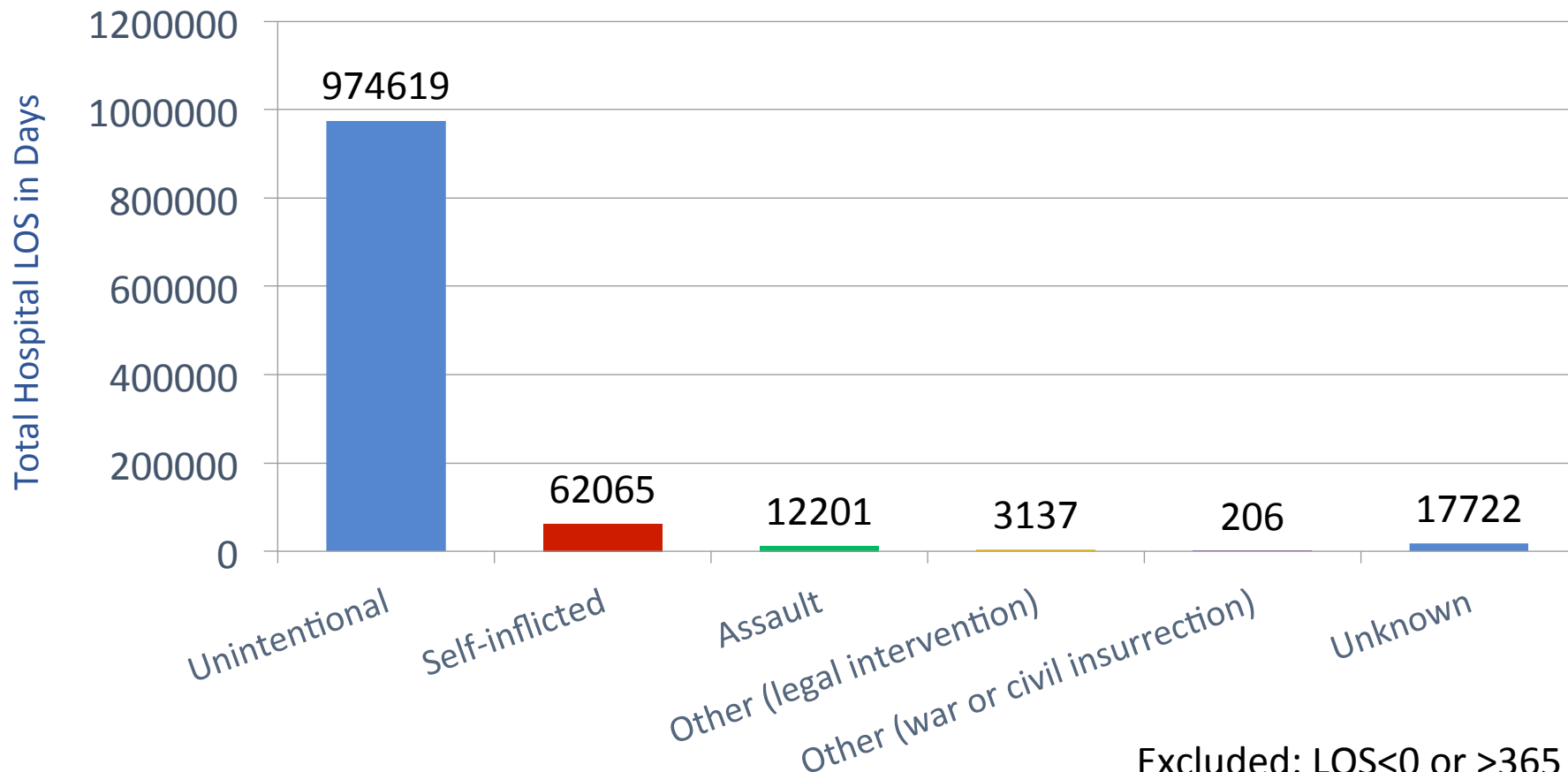
Figure
34**Self-inflicted by age and gender**

Figure
35A**Total hospital LOS by intent**

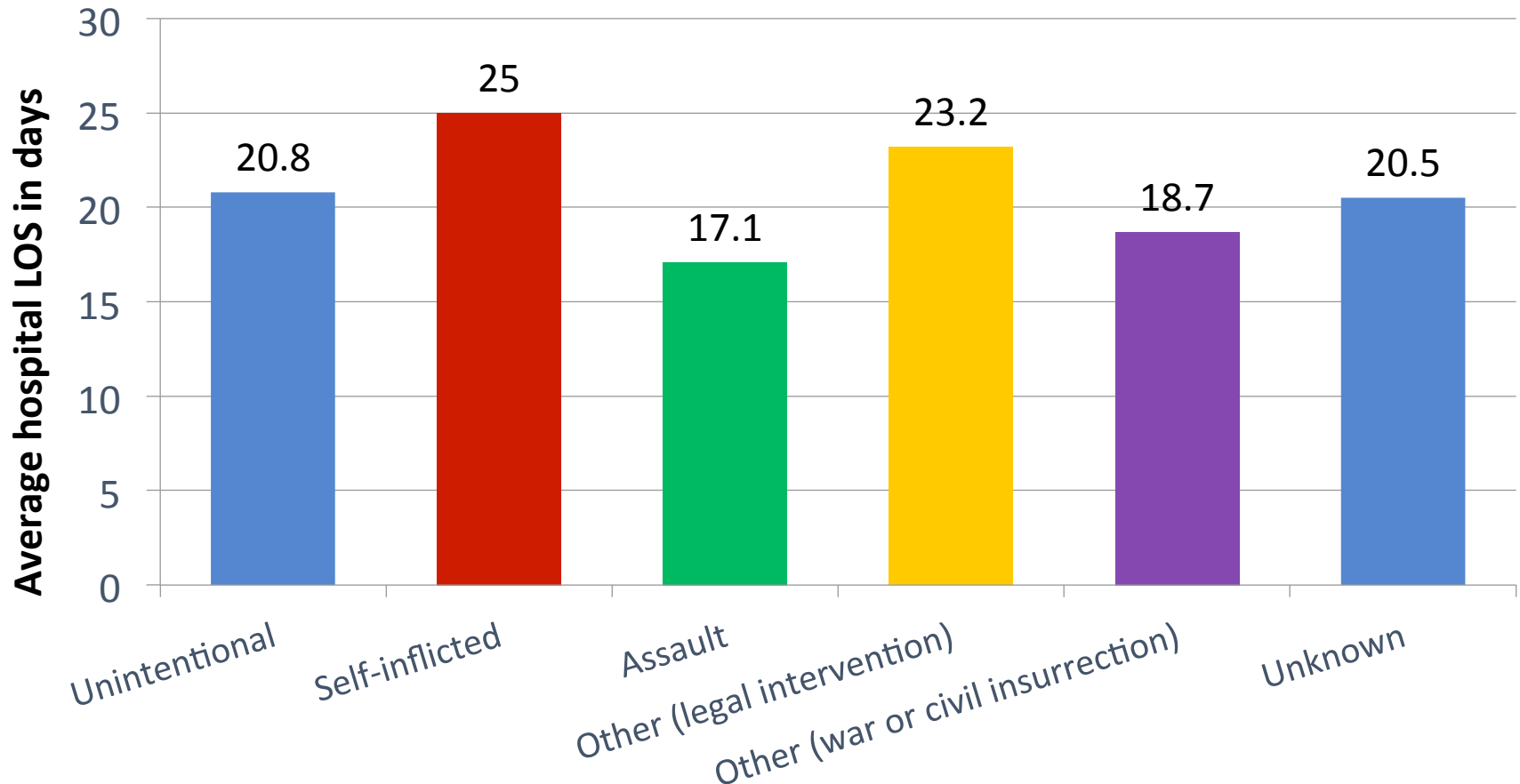
n = 51083



Excluded: LOS < 0 or > 365
Industrial accident was included in the category of “Unintentional”.

Figure
35B**Average hospital LOS by intent**

n=51083



Excluded: LOS<0 or >365

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

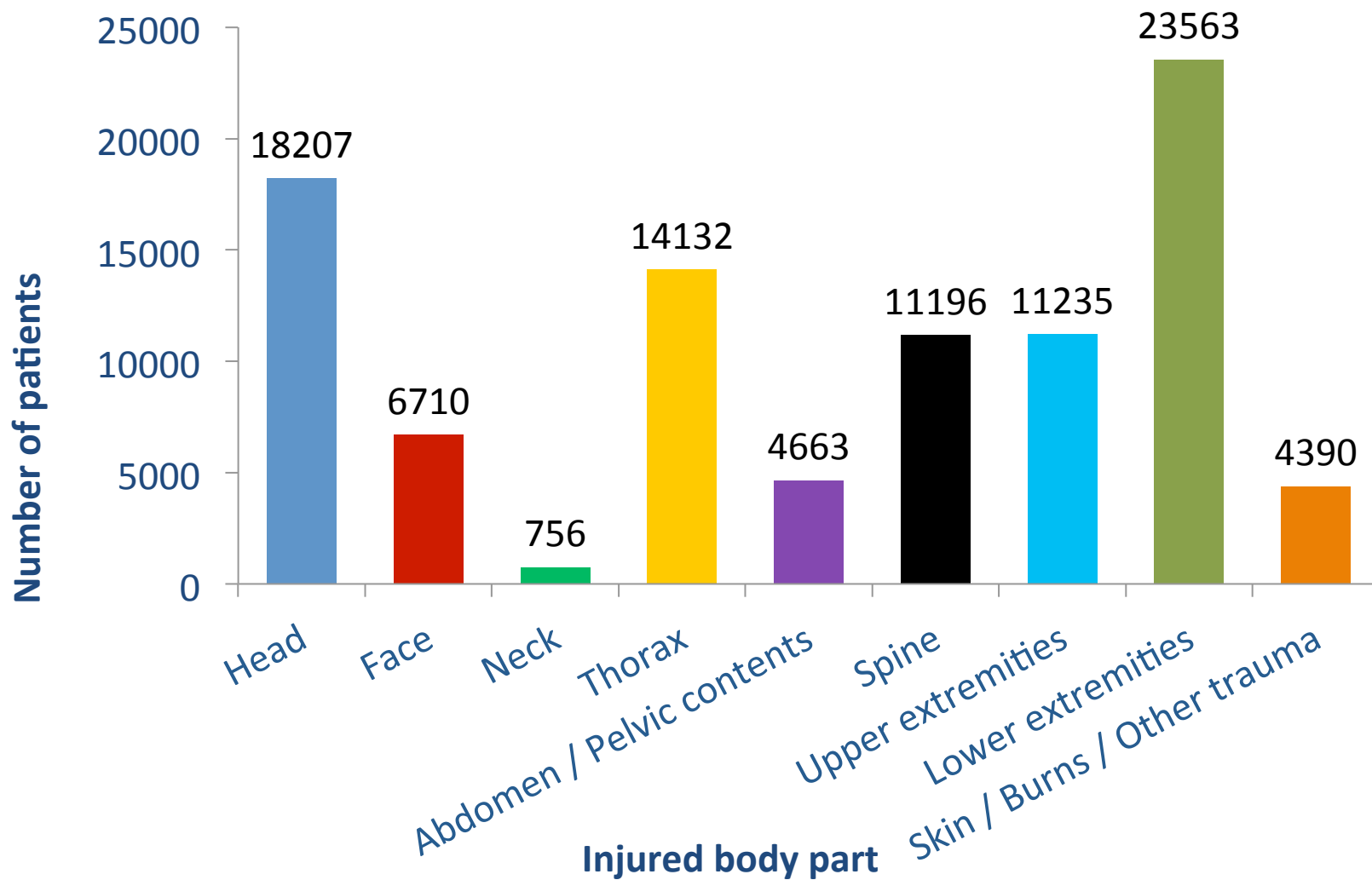
Figure
36**Number of patients with injured body parts based on AIS**

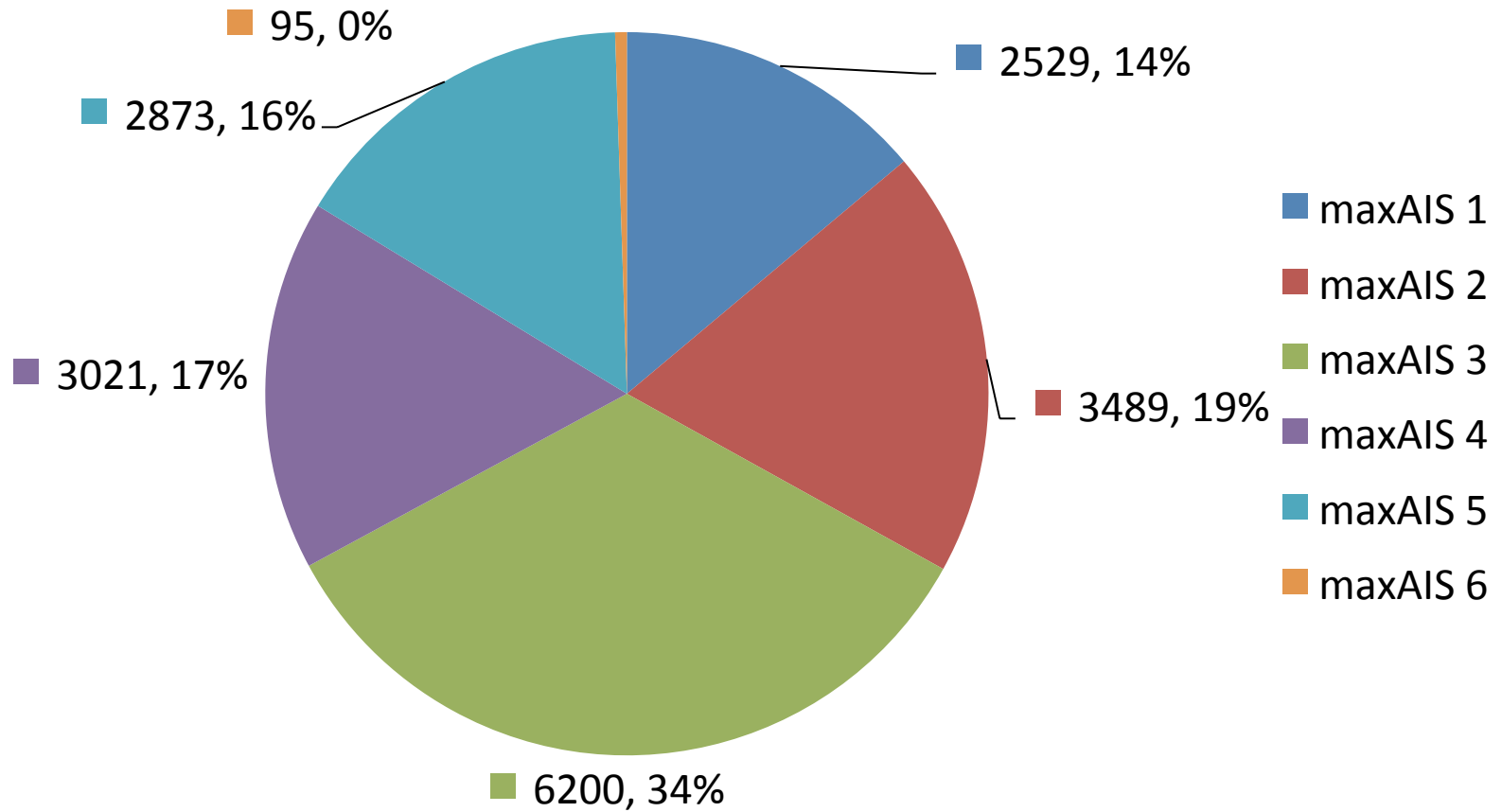
Figure
37A**Head injury and max AIS score**

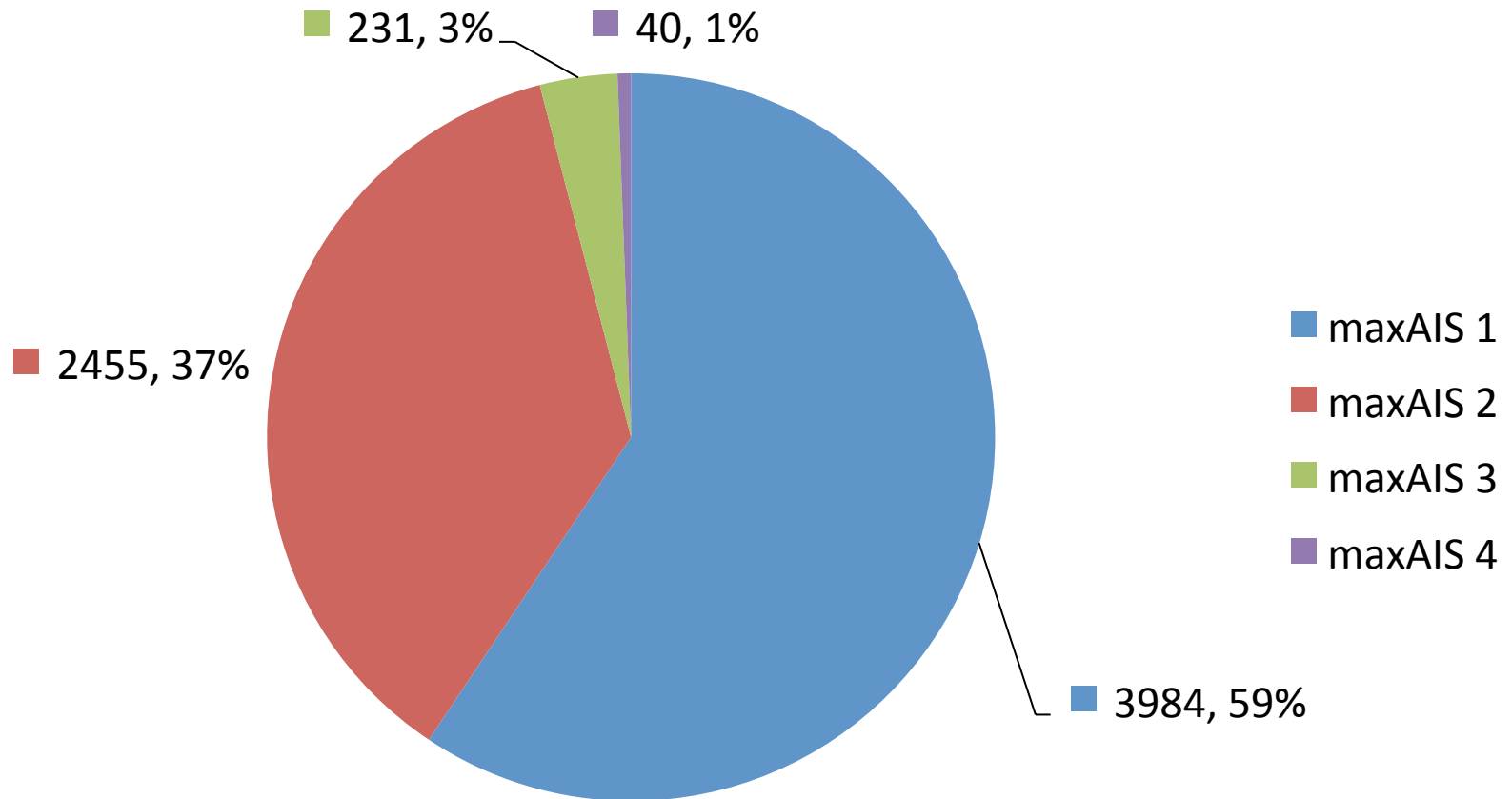
Figure
37B**Facial injury and max AIS score**

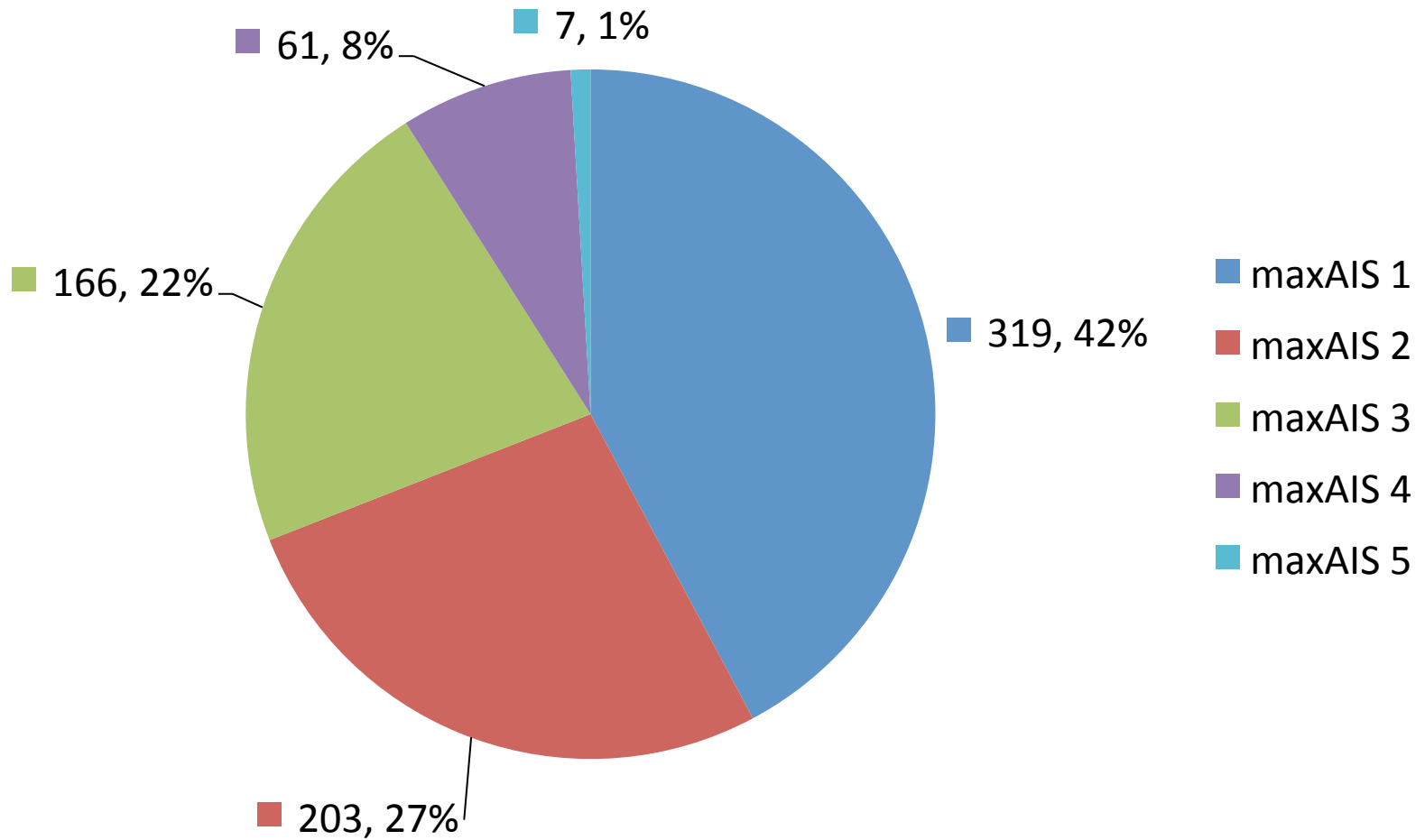
Figure
37C**Neck injury and max AIS score**

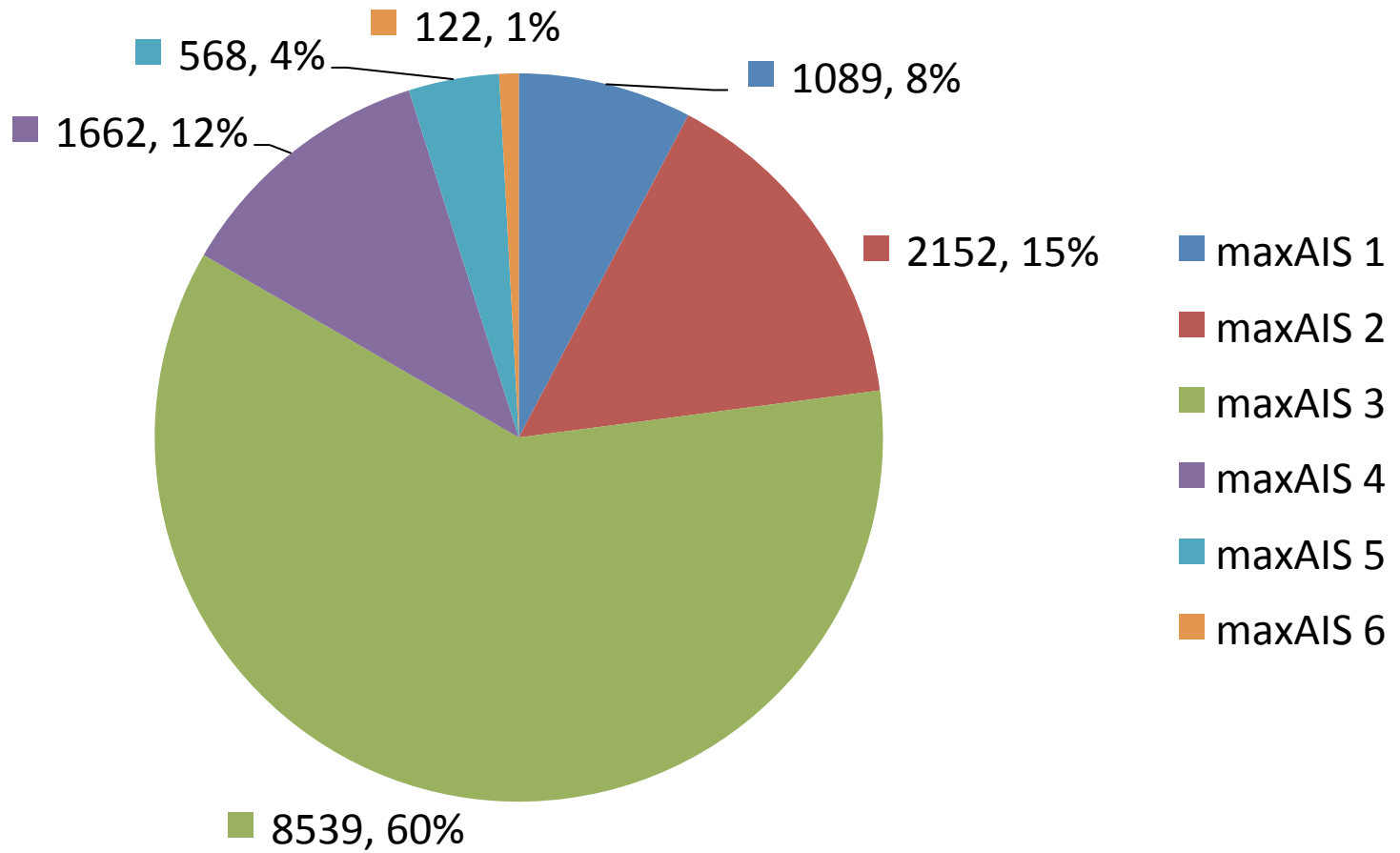
Figure
37D**Thoracic injury and max AIS score**

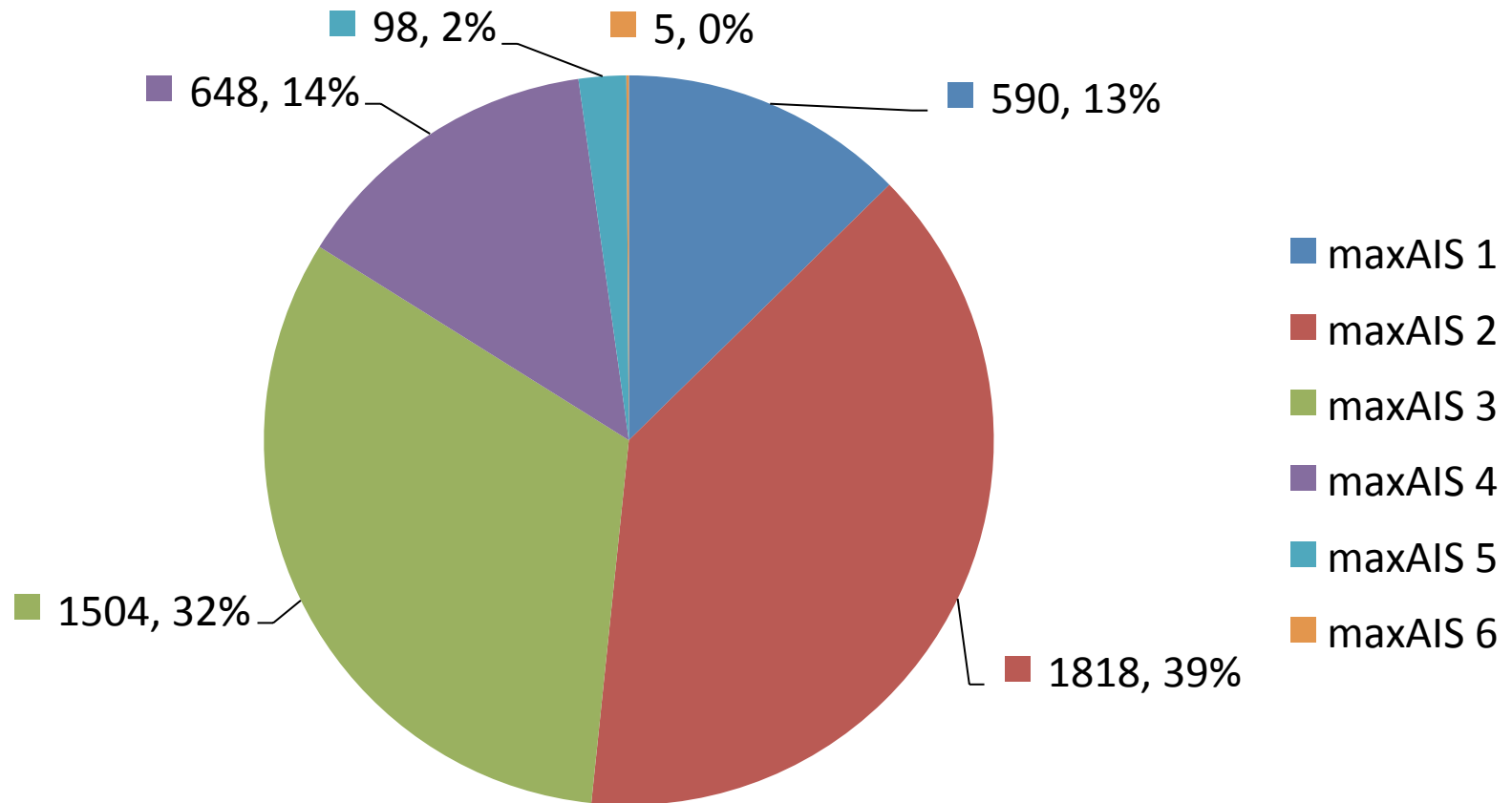
Figure
37E**Injury of abdomen/pelvic contents and max AIS score**

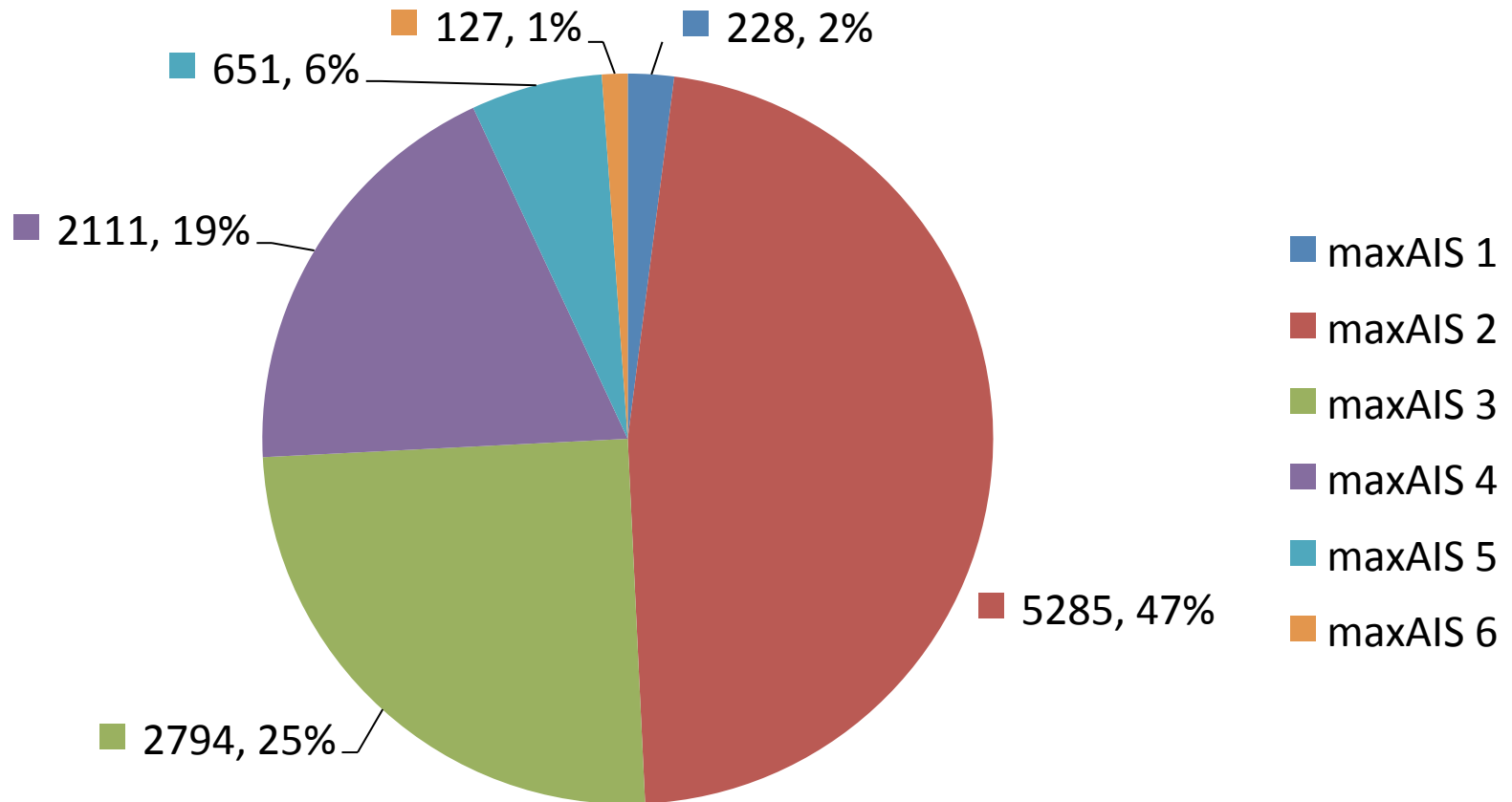
Figure
37F**Spinal injury and max AIS score**

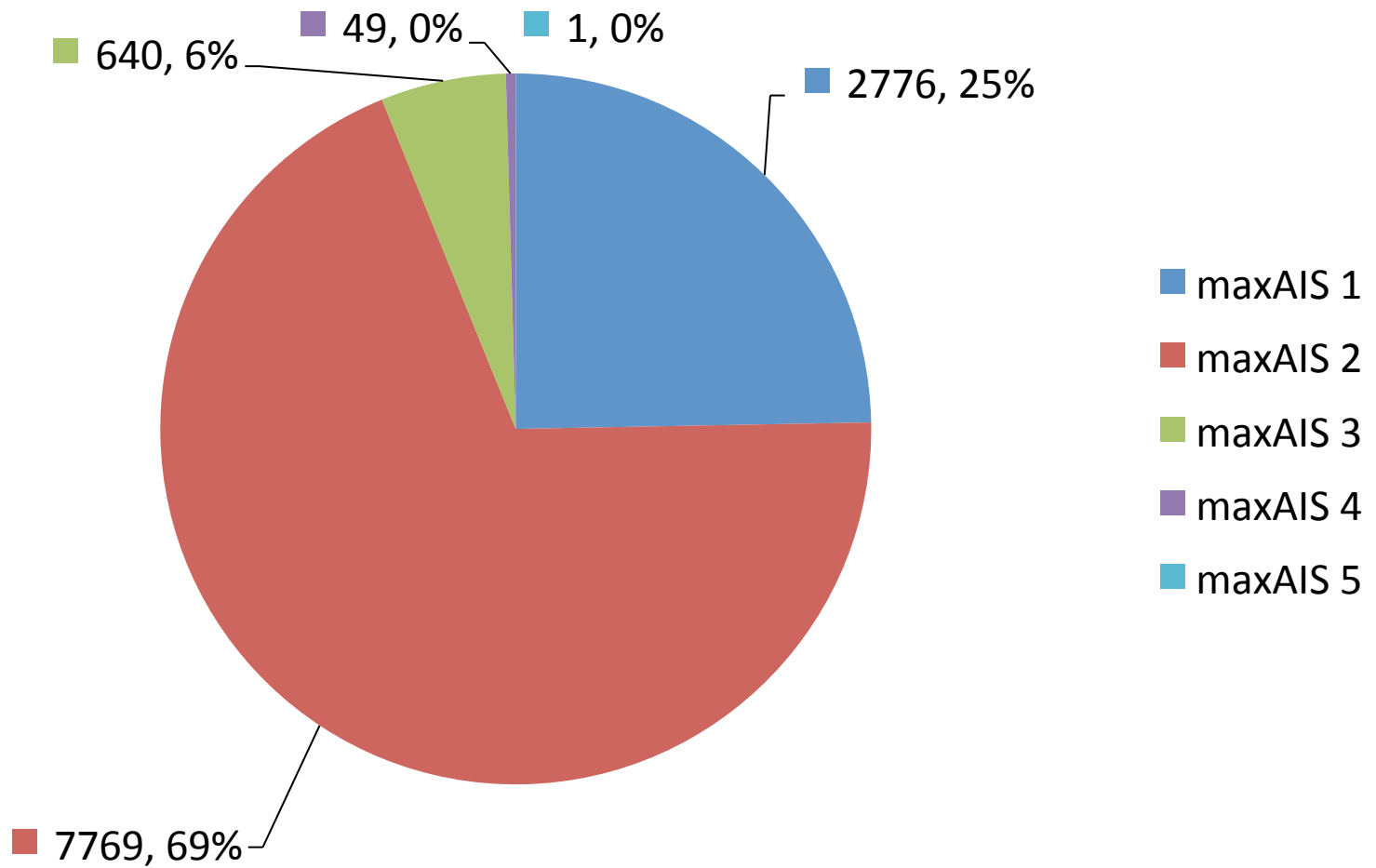
Figure
37G**Injury of upper extremities and max AIS score**

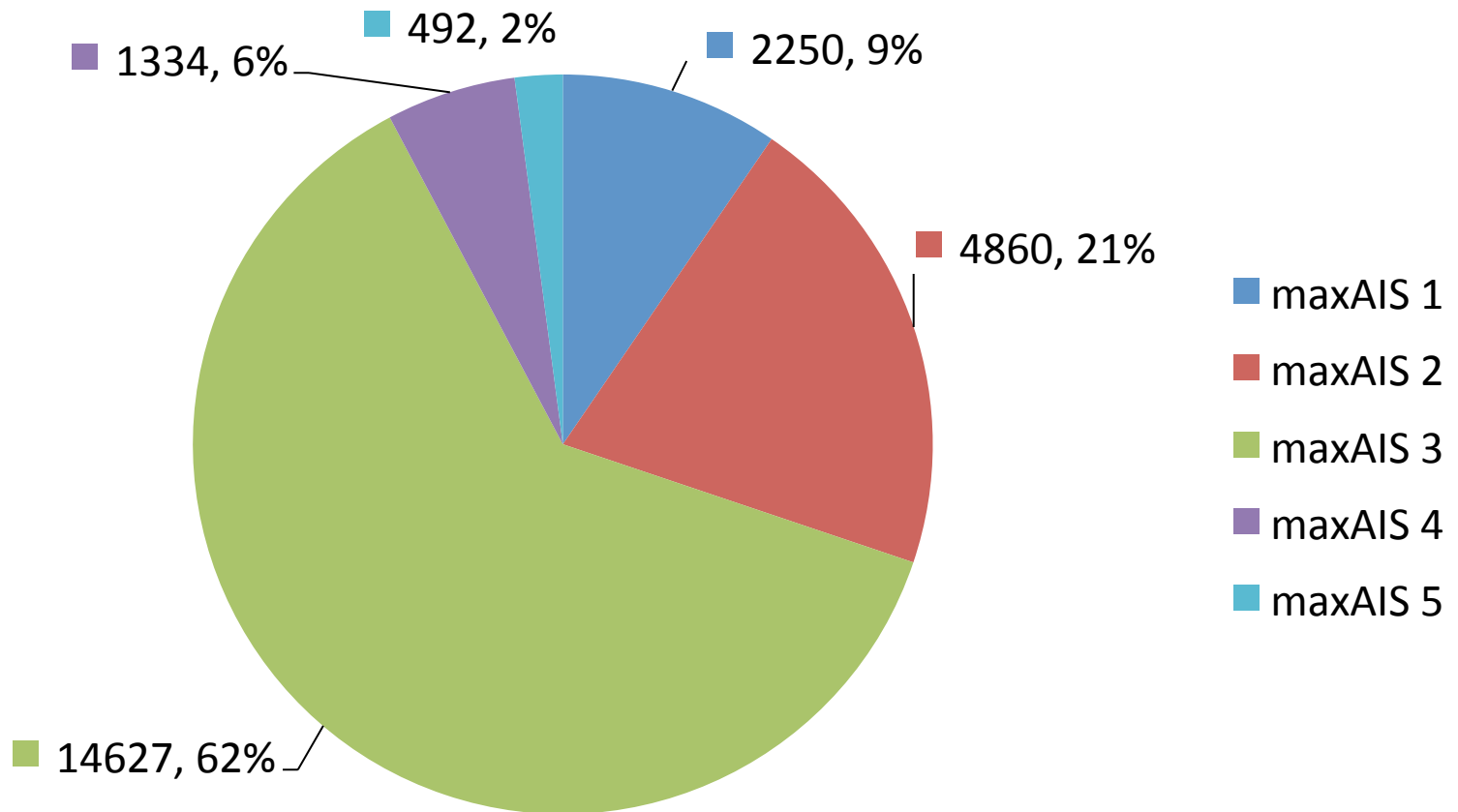
Figure
37H**Injury of lower extremities and max AIS score**

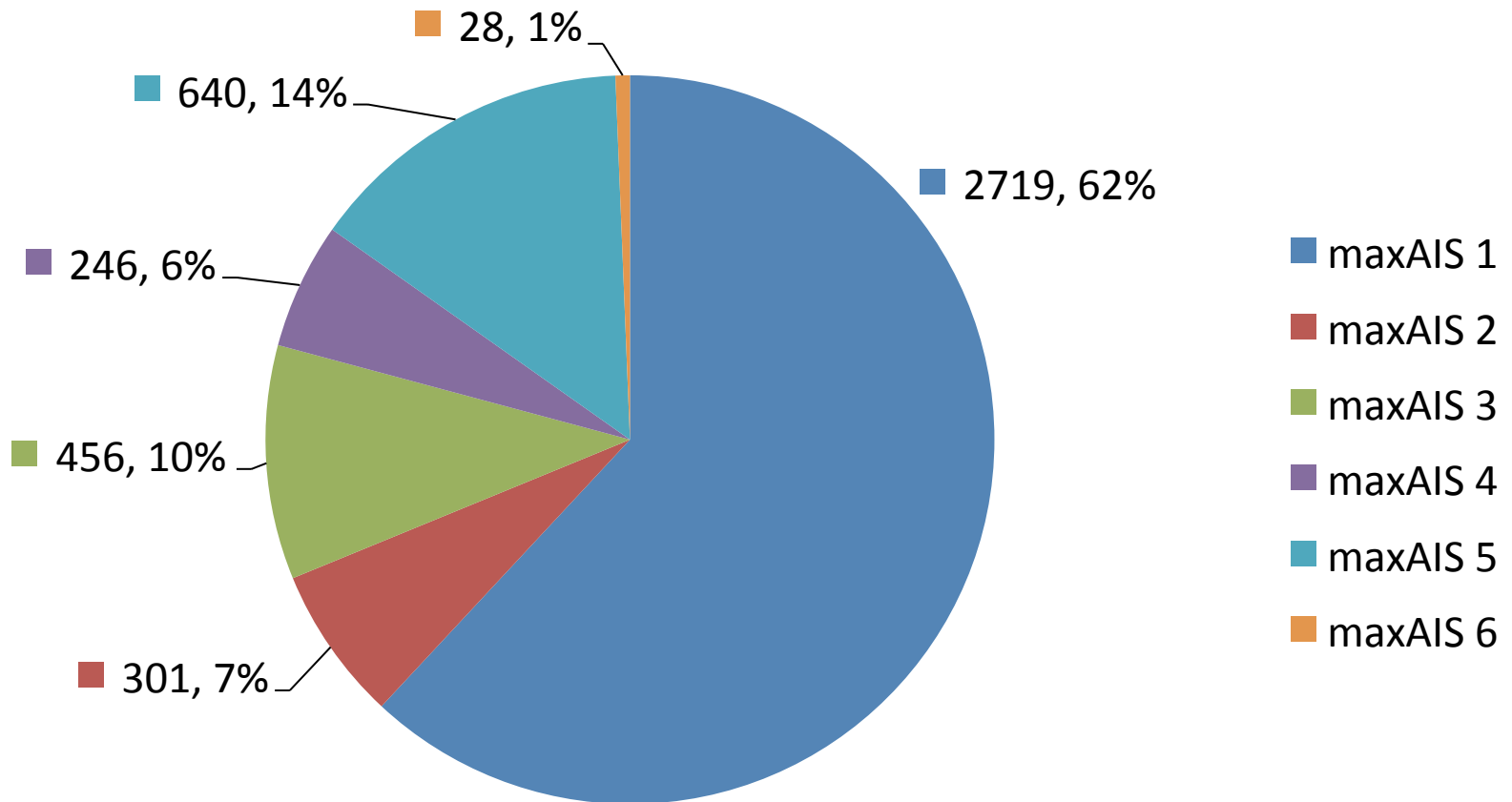
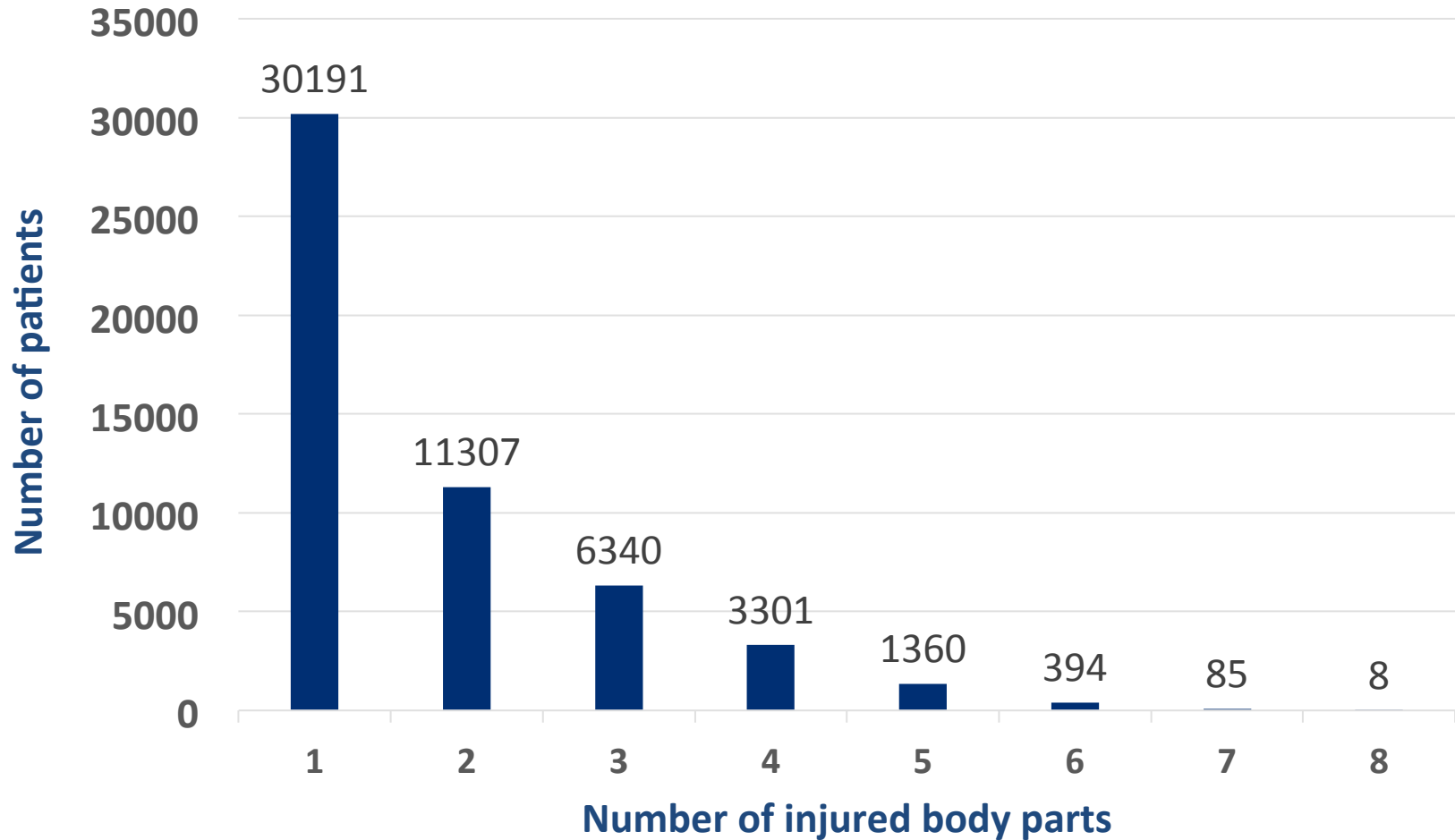
Figure
37I**Skin/burns/other trauma and max AIS score**

Figure
38**Number of patients and injured body parts based on AIS**

December, 2021

**JAPAN TRAUMA DATA BANK
REPORT 2022021019.1-2020.12)**



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