National Trauma Database

improving trauma care

National Trauma Database

January to December 2007

Second Report

National Trauma Database

Ministry of Health Malaysia

NATIONAL TRAUMA DATABASE
JANUARY TO DECEMBER 2007
SECOND REPORT

Edited by

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We would like to especially thank the following:

1. All centre coordinators, doctors, medical assistants and staff nurses from the Emergency Departments and Surgery/Neurosurgery Departments of the participating hospitals. Without their commitment, hard work, timely data collection and submission, this report would not be possible.

2. The Clinical Research Centre for its technical support, especially Dr Lim Teck Onn and Dr Jamaiyah Haniff for their continuous support and guidance.

3. The Ministry of Health, Malaysia for the research grants to set up the registry.

INTRODUCTION

The purpose of this report is to provide a descriptive analysis of patients hospitalised with major trauma in participating Ministry of Health (MOH) hospitals in Malaysia for 2007. The data source for this report is the National Trauma Database (NTrD). Major trauma cases were selected based on the following criteria:

i. Patients who died from injuries after admission.
ii. Patients with Injury Severity Score (ISS) of > 15.
iii. Patients admitted to Intensive care Units (ICU) or High Dependency Wards (HDW) for > 24 hours and mechanically ventilated.
iv. Urgent surgery within 24 hours for intracranial, intra-thoracic, intra-abdominal, or fixation for pelvic or spinal injuries.
v. All severe head injury patients rated 3-8 on the Glasgow Coma Scale (GCS)
vi. All moderate head injury patients rated 9-12 on the GCS.

The National Trauma Database 2007 – Second Report provides information about the profile of persons with major trauma who were admitted to participating hospitals throughout Malaysia.

The report is presented in Five Chapters:

Chapter 1 provides an overview on the demographics of the patients, including gender, age group, race, admission time, admission day, and admission type.

Chapter 2 examines the injury details of the patients, such as injury mechanisms, injury intent, injury causes, injury places, medical reviewers, disposition, ICU admission, and systolic BP. The patients were also rated on the Glasgow Coma Scale (GCS), Revised Trauma Score (RTS), Abbreviated Injury Scale (AIS) and Injury Severity Score (ISS). Data on Traumatic Brain Injuries including, number, type and percentages, are also presented.

Chapter 3 describes the operative management carried out on patients including the management of operations and procedures.

Chapter 4 provides information about the outcome of the patients, which is then categorised according to age groups, injury mechanisms, injury causes, injury places, admission types, systolic BP, GCS, RTS, AIS, ISS, and ICU admission. The probability of survival is also measured using the Trauma Score-Injury Severity Score (TRISS) methodology which includes the RTS, ISS, mechanism of injuries and patient's age.

Chapter 5 includes the total length of stay in hospital and ICU.

The limitations of the study are:

i. Under reporting - The data reported comes from less than the actual number of cases.

ii. Missing data - Missing values not included in the analysis makes the sample size for some of the time periods shorter than others.

Hopefully the information in this report will be used to implement strategies to strengthen and improve trauma care in the country.

About NTrD

The National Trauma Database (NTrD) is a service initiated and supported by the Ministry of Health (MOH) to collect information about trauma incidence in Malaysia, and to evaluate its risk factors and treatment in the country. Such information will be of use to the MOH, Non-Governmental Organisations, private healthcare providers and the other interested parties in programme planning and evaluation, leading to trauma prevention and control.

The NTrD is co-sponsored by the following organisations of the Ministry of Health Malaysia:

i. Emergency Medical and Trauma Services
ii. Neurosurgery Services
iii. Surgery Services
iv. Clinical Research Centre

The objectives of the NTrD are to:

1. To determine the frequency, mechanism of injuries and distribution of major trauma in Malaysia. The statistics and data will be of importance in determining precisely the private and public resources utilised in its management.
2. To determine the outcome and probability of survival of trauma patients.
3. To evaluate major trauma management practices in the participating hospitals and to come up with guidelines for improved trauma care.
4. To determine the effectiveness and impact of the introduction of improved practices.
5. To stimulate and facilitate research on major trauma and its management.

The key data sources identified for this database are:

- All Emergency Physicians and Neurosurgeons in Malaysia beginning with those currently working in the MOH, and later extending to those beyond MOH (private, universities and Armed Forces) for data on Major Trauma and Head Injury patients in the country.

METHOD OF DATA COLLECTION

Coverage

In 2007 there were five MOH hospitals. The number of participating centres is the same as with the previous report involving the May 2006 to April 2007 cases.

Registration method

One Notification Form, called the Case Report Form (CRF), is employed in data collection (Refer to Appendix A). The CRF gathers information on patient demography, admission, injury details, clinical details, diagnostic and operative procedures, in-hospital outcome and Injury Severity Scores. The CRFs are used as part of the clinical record. The completed forms are sent to NTrD where the data is analysed, interpreted and presented in regular reports and disseminated to the users. The participation of Source Data Providers (SDPs) is entirely voluntary.

The data transferred to NTrD is kept strictly confidential with access only to authorised individuals working in the NTrD.

Statistical analysis

This report is a descriptive analysis. All data is described in terms of percentages except continuous data like length of stay (LOS). Missing data was ignored and the analysis confined to available data. The TRISS methodology is used for the probability of survival which incorporate ISS, RTS, mechanism of injury and the patient's age.

MEMBERS OF THE STEERING COMMITTEE OF THE NTrD

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ABBREVIATIONS

AIS	Abbreviated Injury Scales
BP	Blood Pressure
CRC	Clinical Research Centre
CRF	Case Report Form
GCS	Glasgow Coma Score
HDW	High Dependency Ward
ICU	Intensive Care Unit
ISS	Injury Severity Score
MOH	Ministry of Health
NTrD	National Trauma Database
OP	Operation Procedure
RTS	Revised Trauma Score
SDP	Source Data Providers
TRISS	Trauma-Score Injury Severity Score

GLOSSARY

Disease Register	The ongoing systemic collection, analysis and interpretation of specific disease data essential to the planning, implementation and evaluation of clinical and public health practice, closely integrated with dissemination of these data to those who need to know. The final link in the chain is the application of these data to the management, prevention and control of the disease. A registration system includes a functional capacity for data collection, analysis and dissemination linked to clinical and public health programmes.
Site	The location of an SDP reporting data on registrable patients to the registry.
Source Data Providers	The individuals or institutions that report the required data to the registry.
Sponsor	The individuals or institutions that own the registry.
Expert Panel	Individuals who are subject matter experts i.e. Emergency Physicians and Neurosurgeons. The expert group will keep abreast of the latest development in this area. They should be convened to decide on the initial data collection process, develop the Performa and data content as well as a guide for future development. They ensure that the database have a sound technical as well as scientific basis.

EDITORIAL TEAM

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CONTENTS

REPORT SUMMARY

This second report is based on 584 major trauma cases reported to NTrD by five hospitals in 2007. In the event of a patient being transferred from one centre to another, he would be counted as two records/cases, one for each centre.

1 DEMOGRAPHICS

There were a total of 114,032 trauma patients admitted to the Emergency Departments(ED) in 2007 in the five centres. Centre B had the highest number with 51,621 patients. Major trauma patients constituted 0.5% of all trauma admissions. Centre B reported the highest number of major trauma cases with 49.4%.

Male patients made up the majority of trauma patients (84.6%). Most of the major trauma patients were young - within the age group of 15-24 (34.5%) and 25-34 (21.3%). Malays accounted for 51.8% of cases while 11% were foreigners.

Most major trauma patients were admitted in the evenings and late nights, between 1801–2400hrs (29.8%) and 0001 – 0600hrs (29.5%). Wednesdays were the busiest days for major trauma cases, making up 15.9% of admissions, followed by Sundays with 15.6%.

More than half (54.5%) of the major trauma cases were referred from other medical facilities with Centre B recording the highest transferred cases (68.1%) while most cases of Centre A were from direct admission. Most of the referred cases were from other hospitals with specialists.

2 INJURY DETAILS

Blunt injuries made up 91.5% of the cases with the majority being unintentional (77.2%). Road/street and highway trauma accounted for 76% of cases with motorcyclists the most commonly injured.

Most major trauma patients were reviewed initially by the medical officer or trainees while only 3% and 8.4% were reviewed by the emergency physician and surgeon respectively. 30.3% of the major trauma patients were sent directly to the General Ward from ED and 17.1% were sent to the operating theatre (OT). During their stay in hospital only 32.2% patients received ICU care. In Centre B, 90% of patients were nursed in the ward only.

More than half (63.3%) had a systolic BP greater than 120mmHg on admission to ED and only 6% had systolic BP of less than 90mmHg. Patients with an initial Glasgow Coma Scale (GCS) of 3-8 accounted for 55.6% of all major trauma cases with Centre E recording 81% of its cases with similar GCS. Of patients with moderate head injuries, (GCS 9-12), 18.4% of cases were not classified as major trauma. Intracranial injuries accounted for 45% of all traumatic brain injuries with traumatic subdural haemorrhages the most common at 28.3%.

Ninety percent of major trauma patients had injuries to the head and neck followed by the extremitis or pelvic girdle (19.7%). The majority of injuries with AIS of ≥3 involved the head and neck (85%).

More than half of the patients (68.7%) had an Injury Severity Score (ISS) between 16-25. Even though 18.8% had an ISS of less than 10, these patients met other criteria for inclusion as major trauma cases

3 OPERATION MANAGEMENT

184 (48.29%) major trauma cases underwent operations with the most common being intracranial surgery (74.74%) with 23.15% for decompressive craniectomy.

4 OUTCOME

The overall mortality in all the participating centres for major trauma was 28.6% and ranged from 23.1% to 38.3%.

Fifty-two percent of survivors were discharged home and 28.6% were transferred to other hospitals for continued care. 9.5% survivors were discharged against medical advice. The majority of survivors were between the ages of 0 to 44 years, while the percentage of deaths were 31.0% to 58.3% for cases between the ages of 45 to 84 years. Survivors from blunt injuries and penetrations were 72.21% and 61.11% respectively.

The majority of major trauma cases were due to road traffic accidents (70.1%), followed by falls from heights (8.3%), assaults (5.2%) and industrial accidents (1.6%). 39.3% of patients who were injured at home died, followed by those injured at industrial/construction sites (37.5%) and road/highway injuries at 27.6%.

The highest percentage of survivors were back seat passengers (83.3%), while pedestrians recorded the highest percentage of deaths at 39.4%, followed by bicyclists (36.3%), motorcycle pillion riders (34.8% and motorcycle riders (24.1%}.

Of the patients who were transferred, 76.5% survived. There was a higher death rate in patients who were admitted directly (33.7%) compared to those who were transferred (24.5%).

Victims who had systolic blood pressure more than 76mmHg at admission to the hospitals had equal or highest percentage of survivals (50-71.32%) compared to deaths. Patients with Glasgow Coma Scale (GCS) ratings of 13-15 and 9-12 had the highest survival percentages at 93.24% and 82.22% respectively. On the other hand, victims with GCS ratings of 3-8 had a survival percentage of 59.82%. Victims with RTS > 5.0 had a survival rate of more than 68.0%, while 74.8% of patients with AIS> 3 survived. Patients with ISS of >40 had a 50% death rate, which rose to 70 % for those not admitted to ICU.

Following TRISS calculations (which determines the probability of survival (Ps) of a patient from the ISS and RTS), 68.6% of major trauma patients were expected to survive (Ps≥0.5) compared to the actual observed survival rate of 71.4%. Of the 89.4% patients

expected to survive from the major trauma cases, only 75.2% of them made it. Forty-five percent of patients expected to die, actually survived.

5 LENGTH OF STAY

The average length of stay (ALOS) for all the five centres ranged from five to 12 days and 52% were discharged home. Centre A and B recorded ALOS of less than six days while the other three centres recorded ALOS between 11 and 12 days.

Patients who survived had a longer ALOS of between 5-15 days compared to non-survivors (3-7 days). The ALOS for those admitted in ICU and survived were between four to eight days. However, those who died after admission to ICU obviously had a shorter ALOS - between 0-5 days.

In term of type of admission and their ALOS, those who were presented directly to the hospitals had a shorter ALOS of eight days compared to those who transferred from other facilities with an ALOS of 10.

Injuries associated with the longest ALOS were road traffic accidents and burns at nine days. This was followed by injuries from assaults at seven days. Industrial accidents, stabbings and falls from less than two metres in height were next with ALOS of five days. Surprisingly falls from more than two metres had a shorter ALOS of three days. Data was not available for the cause of injuries to those who stayed longest with ALOS of 14 days.

NATIONAL TRAUMA DATABASE (NTrD)

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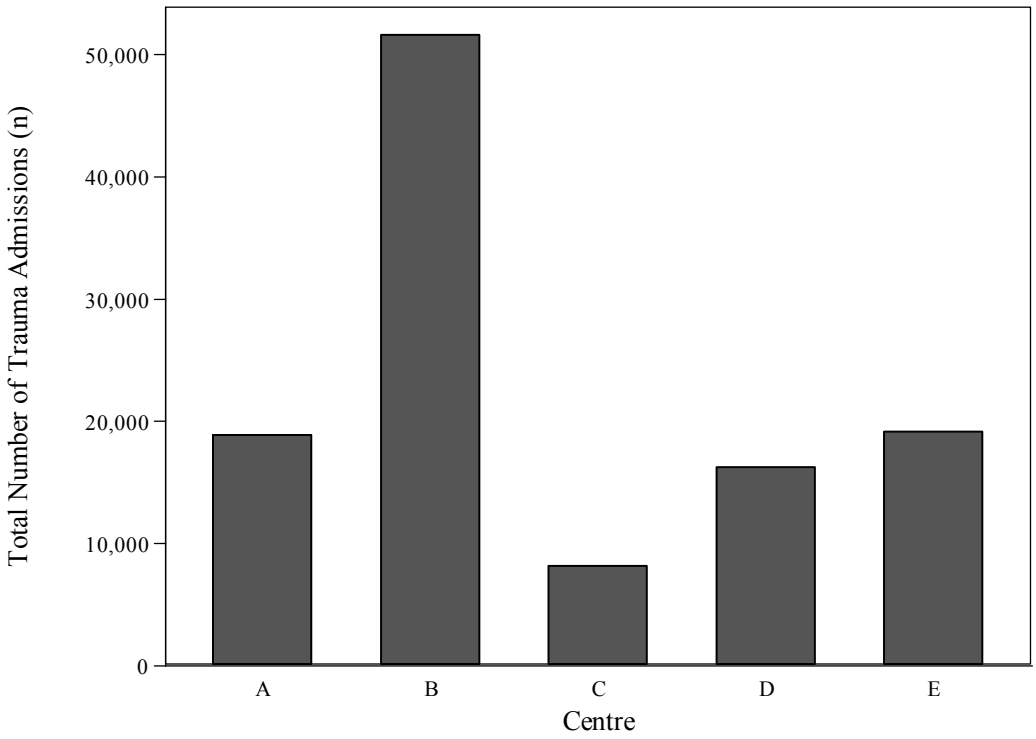


Figure 1.1a. Total Trauma Emergency Department Admissions by Centre

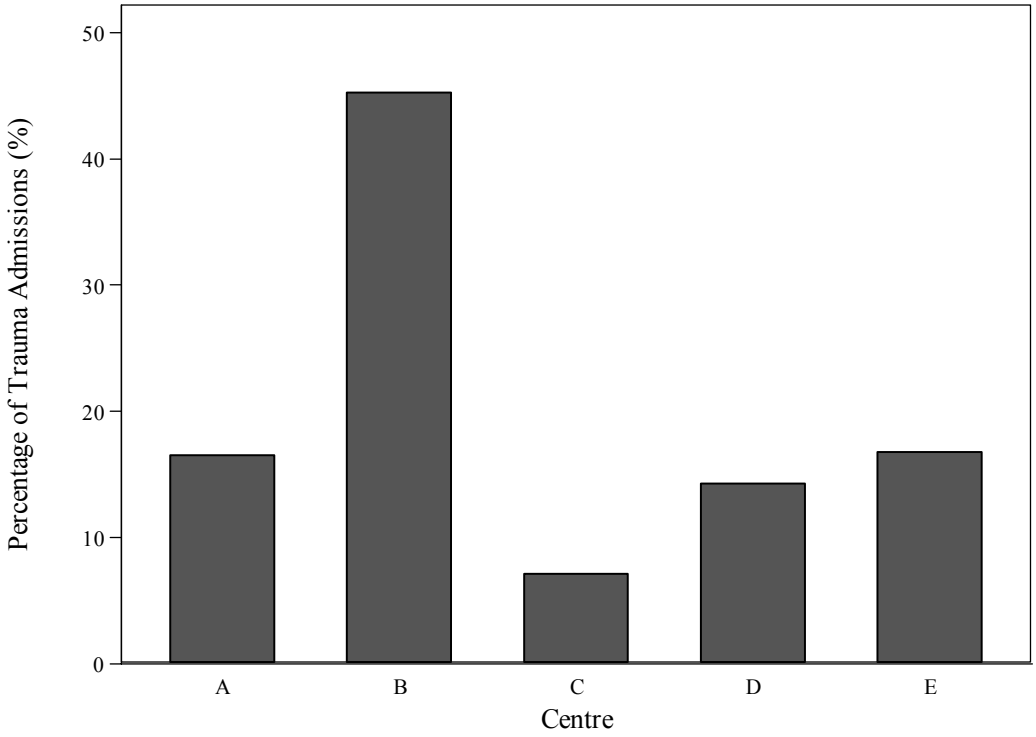


Table 1.1. Total Trauma Emergency Department Admissions by Centre

Centre	No	%
A	18858	16.54
B	51621	45.27
C	8147	7.14
D	16262	14.26
E	19144	16.79
TOTAL	114032	100

Figure 1.2. Major Trauma Cases by Centre

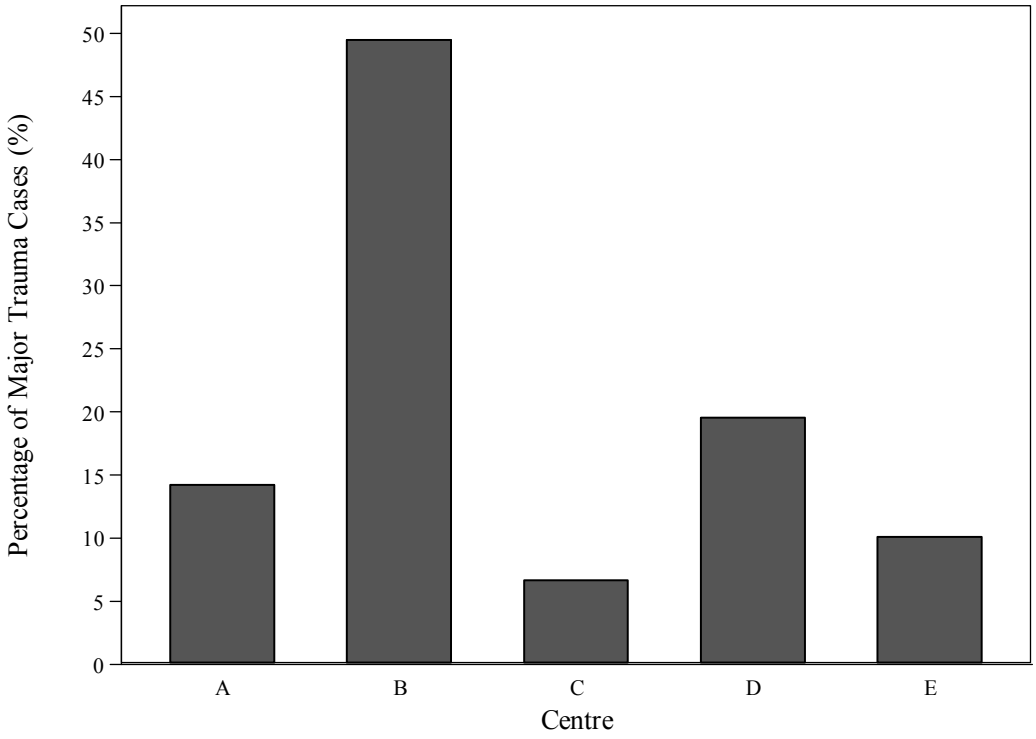


Table 1.2. Major Trauma Cases by Centre

Centre	**No**	**%**
A	83	14.21
B	289	49.49
C	39	6.68
D	114	19.52
E	59	10.1
TOTAL	584	100

Figure 1.3. Major Trauma Cases by Gender

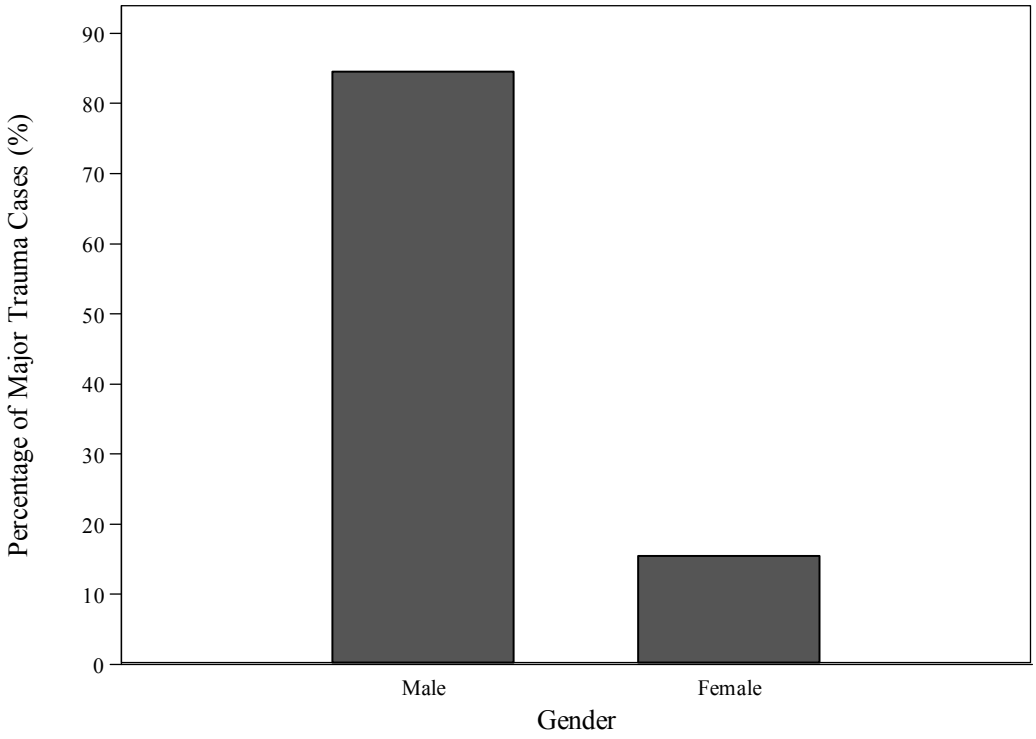


Table 1.3. Major Trauma Cases by Gender

Gender	No	%
Male	493	84.56
Female	90	15.44
TOTAL	583	100

* 1 case has no complete information on gender, IC number and name.

Figure 1.4. Major Trauma Cases by Age Group

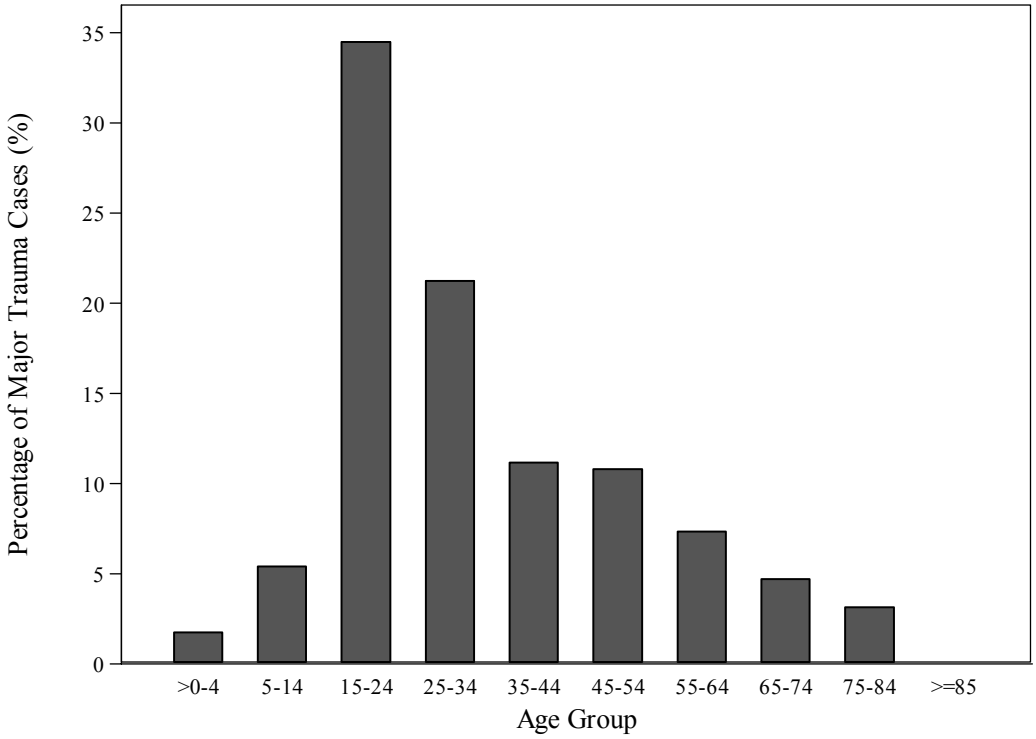


Table 1.4. Major Trauma Cases by Age Group

Age group	No	%
>0-4	10	1.74
5-14	31	5.4
15-24	198	34.49
25-34	122	21.25
35-44	64	11.15
45-54	62	10.8
55-64	42	7.32
65-74	27	4.7
75-84	18	3.14
≥85	0	0
TOTAL	574	100

* 10 cases have incomplete information on counting "Age".

Figure 1.5. Major Trauma Cases by Race

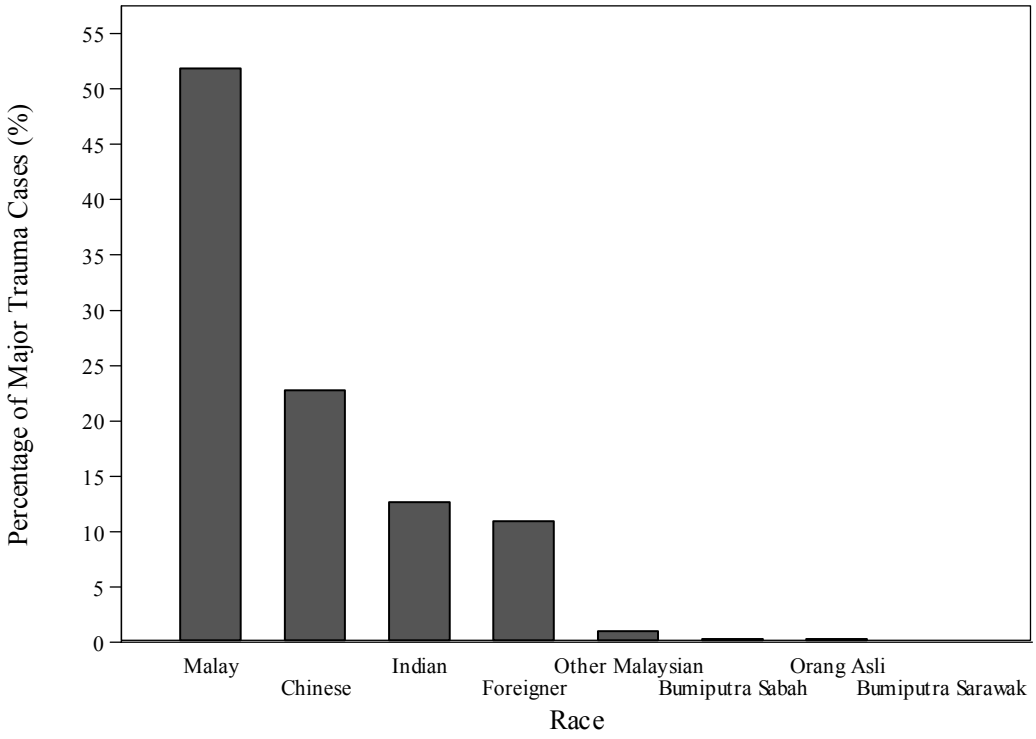


Table 1.5. Major Trauma Cases by Race

Race	**No**	**%**
Malay	298	51.83
Chinese	131	22.78
Indian	73	12.7
Orang Asli	2	0.35
Bumiputra Sabah	2	0.35
Bumiputra Sarawak	0	0
Other Malaysian	6	1.04
Foreigner	63	10.96
TOTAL	575	100

* 9 cases have no information on "Race"

Figure 1.6. Time of Admission for Major Trauma Cases

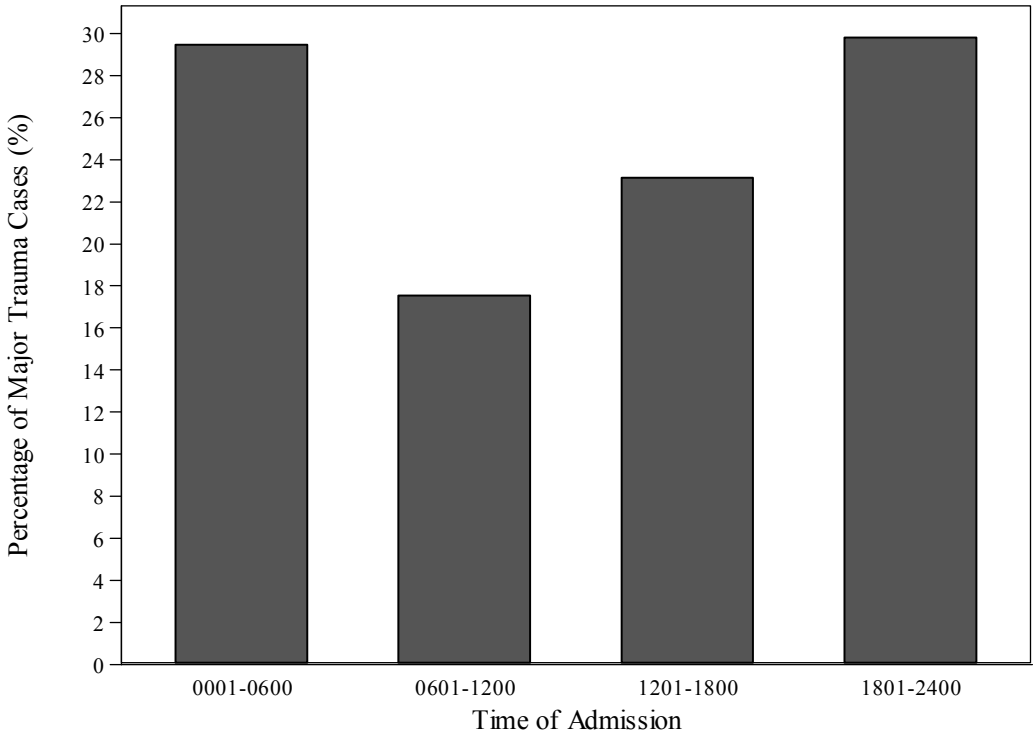


Table 1.6. Time of Admission for Major Trauma Cases

Time of Admission (Hours)	No	%
0001-0600	168	29.47
0601-1200	100	17.54
1201-1800	132	23.16
1801-2400	170	29.82
TOTAL	570	100

* 14 cases have no information on "Time of Admission"

Figure 1.7. Day of Admission for Major Trauma Cases

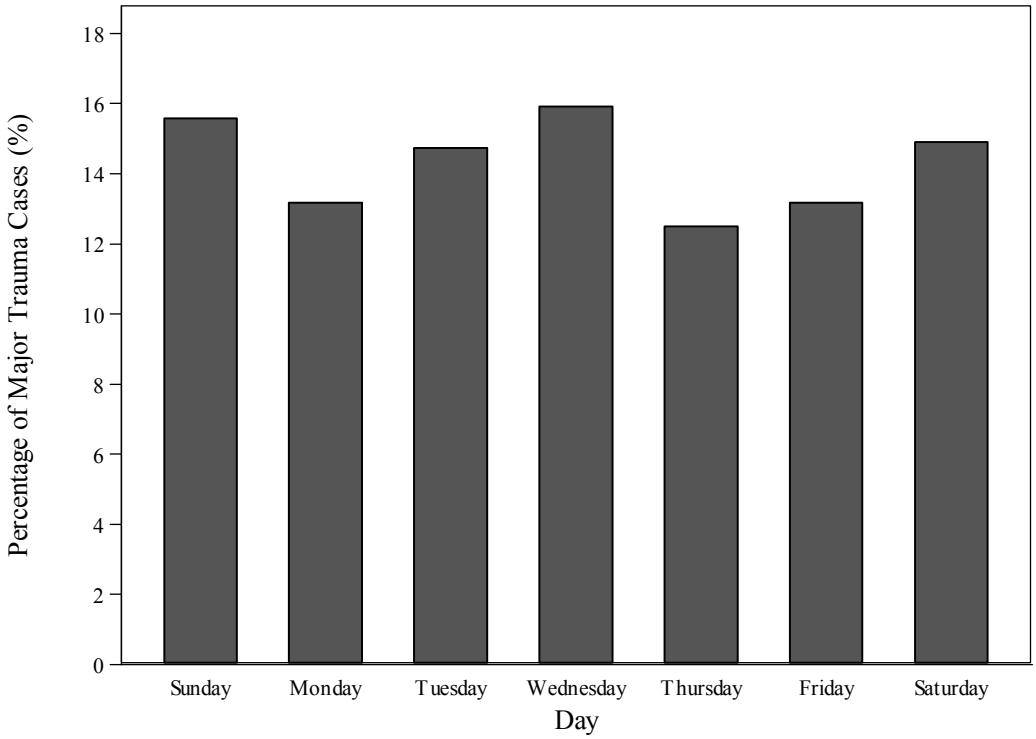


Table 1.7. Day of Admission for Major Trauma Cases

Admission (Days)	**No**	**%**
Sunday	91	15.58
Monday	77	13.18
Tuesday	86	14.73
Wednesday	93	15.92
Thursday	73	12.5
Friday	77	13.18
Saturday	87	14.9
TOTAL	584	100

Figure 1.8. Type of Admission for Major Trauma Cases

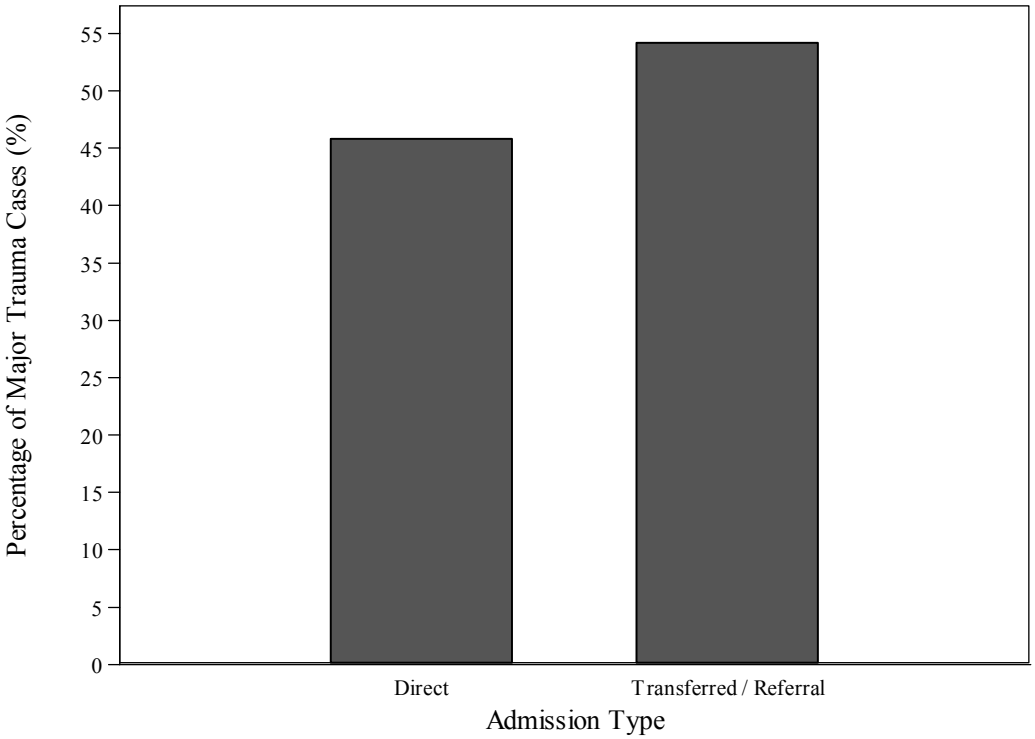


Table 1.8. Type of Admission for Major Trauma Cases

Admission Type	No	%
Direct	267	45.8
Transferred / Referral	316	54.2
TOTAL	583	100.00

*1 case has no information on "Admission Type"

Figure 1.8a. Type of Admission for Major Trauma Cases by Centre

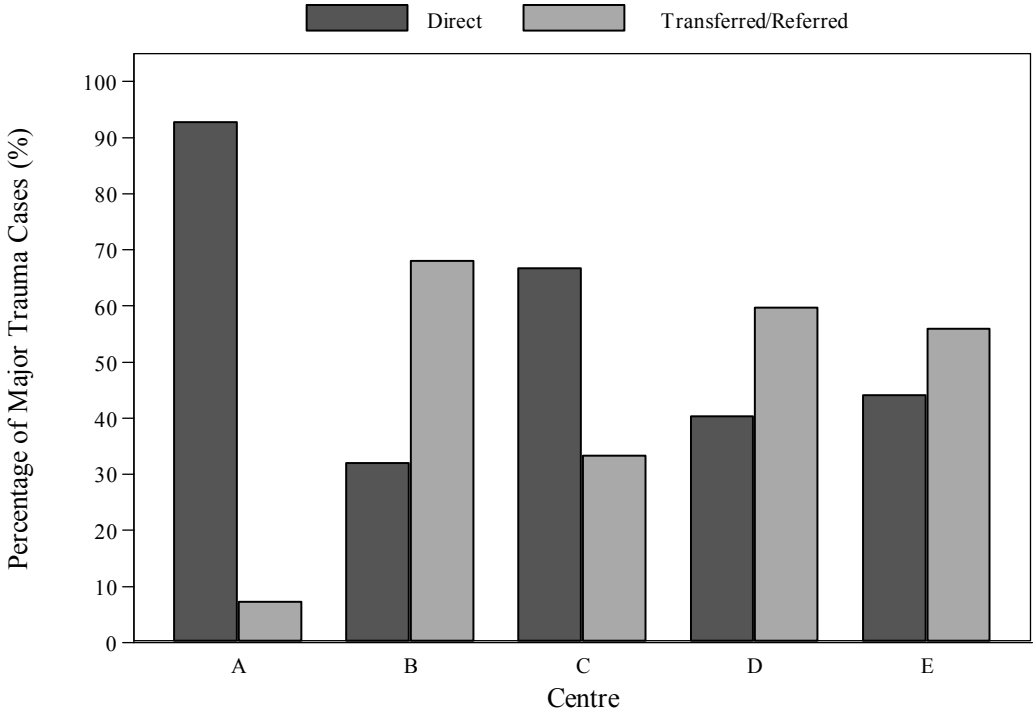


Table 1.8a. Type of Admission for Major Trauma Cases by Centre

Centre	Direct		Transferred / Referred From		Total
	No	%	No	%	
A	77	92.77	6	7.23	83
B	92	31.94	196	68.06	288
C	26	66.67	13	33.33	39
D	46	40.35	68	59.65	114
E	26	44.07	33	55.93	59
TOTAL	267	45.8	316	54.2	583

*1 case has no information on "Admission Type"

Figure 1.9. Type of Admission Referred From for Major Trauma Cases

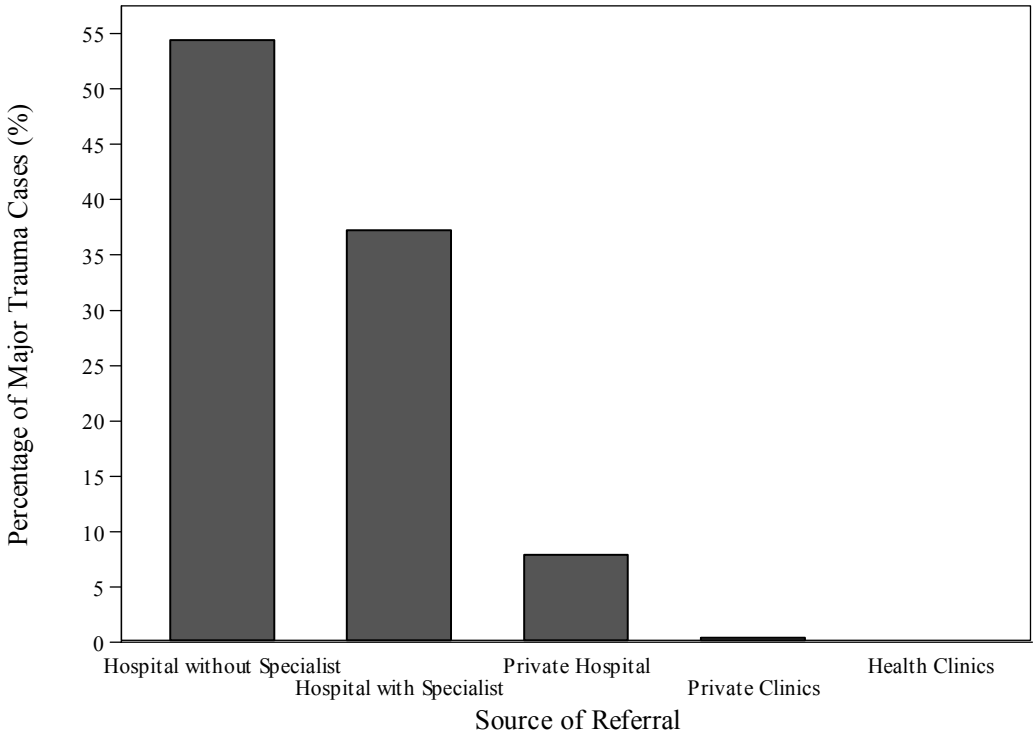


Table 1.9. Type of Admission Referred From for Major Trauma Cases

Source of Referral	**No.**	**%**
Hospital with Specialist	80	37.21
Hospital without Specialist	117	54.42
Health Clinics	0	0
Private Hospital	17	7.91
Private Clinics	1	0.47
TOTAL	215	100

*101 cases have no information on "Source of Referral"

Table 1.10. Source of Referral for Major Trauma Cases by Centre

Source of Referral	Centre										Total	
	A		B		C		D		E			
	No	%	No	%	No	%	No	%	No	%	No	%
Hospital with Specialist	1	1.25	66	82.5	4	5	3	3.75	6	7.5	80	37.21
Hospital without Specialist	3	2.56	32	27.35	8	6.84	52	44.44	22	18.8	117	54.42
Health Clinics	0	0	0	0	0	0	0	0	0	0	0	0
Private Hospital	1	5.88	4	23.53	1	5.88	11	64.71	0	0	17	7.91
Private Clinics	1	100	0	0	0	0	0	0	0	0	1	0.47
TOTAL	6	2.79	102	47.44	13	6.05	66	30.7	28	13.02	215	100

*101 cases have no information on "Source of Referral"

Chapter 2: INJURY DETAILS

Figure 2.1. Mechanism of Injury for Major Trauma Cases

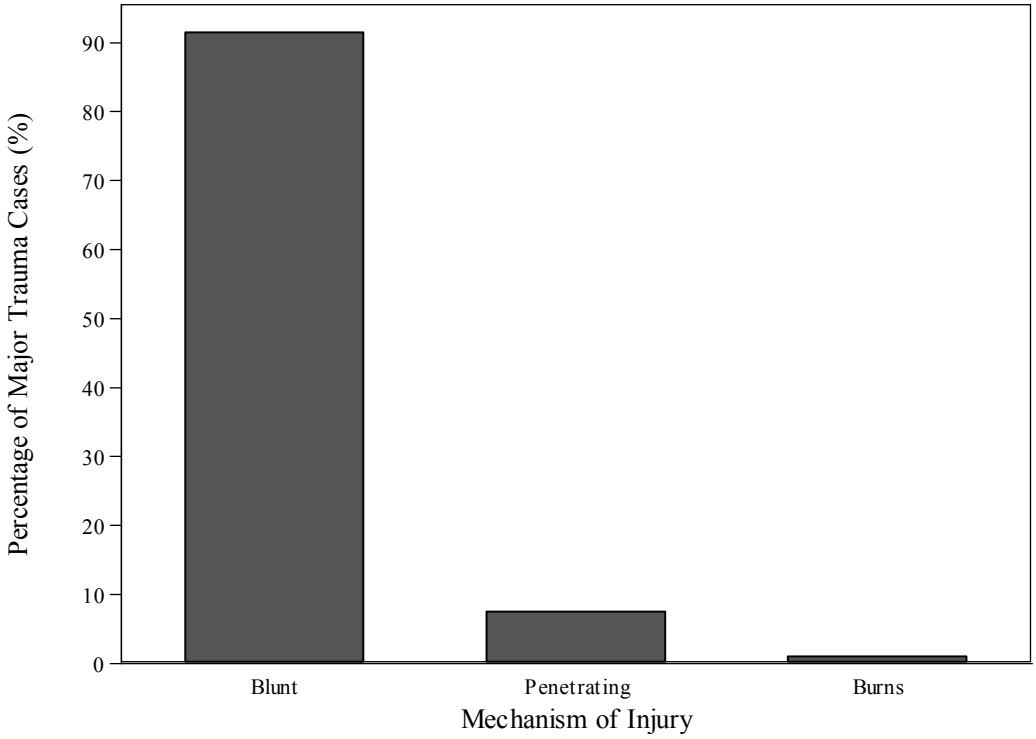


Table 2.1. Mechanism of Injury for Major Trauma Cases

Mechanism of Injury	**No**	**%**
Blunt	527	91.49
Penetrating	43	7.47
Burns	6	1.04
TOTAL	576	100

* 8 cases have no information on "Mechanism of Injury"

Figure 2.2. Major Trauma Cases by Injury Intent

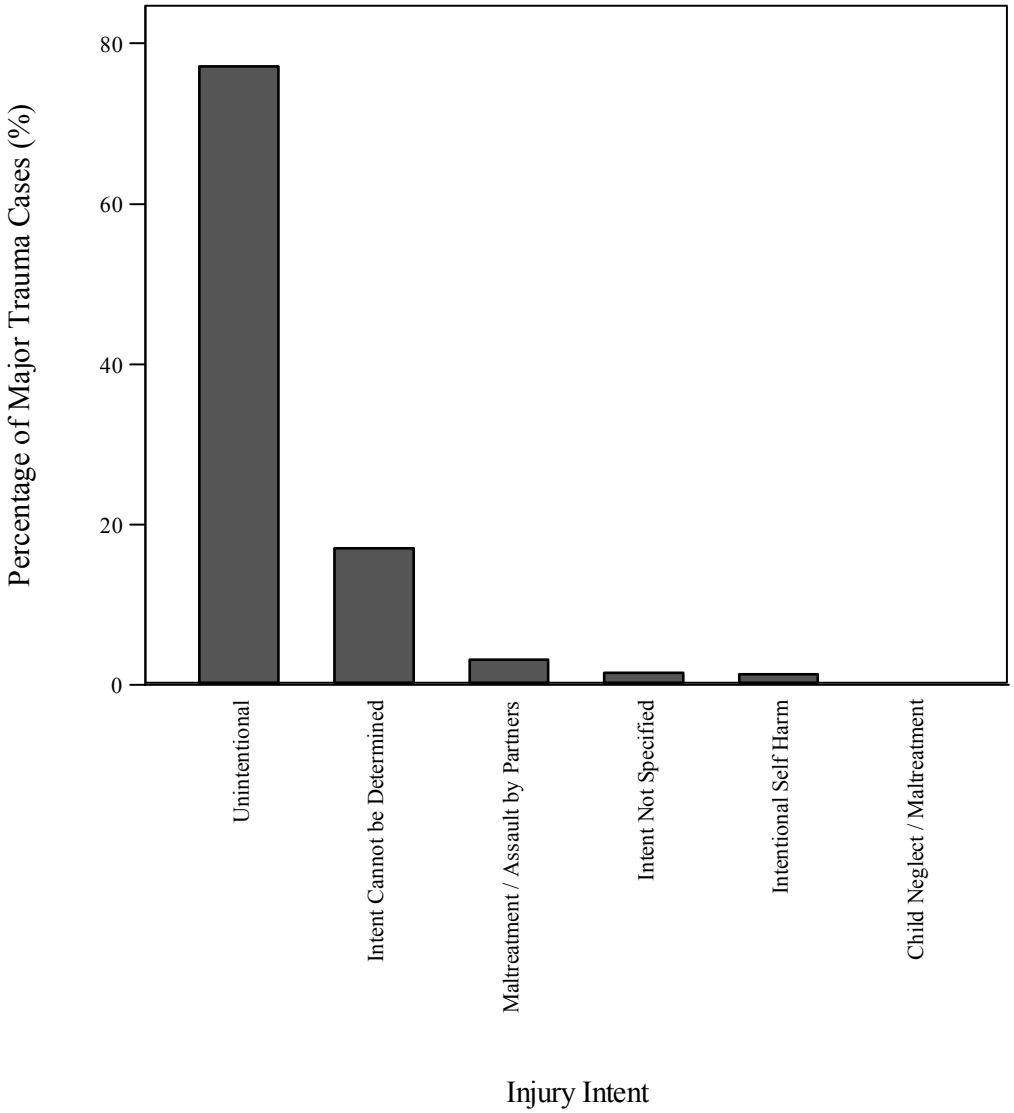


Table 2.2. Major Trauma Cases by Injury Intent

Injury Intent	**No**	**%**
Child Neglect / Maltreatment	0	0
Intent Cannot be Determined	93	17
Intent Not Specified	8	1.46
Intentional Self Harm	7	1.28
Maltreatment / Assault by Partners	17	3.11
Unintentional	422	77.15
TOTAL	547	100

* 60 cases have no information on "Injury Intent" and cases included patients with more than one category of "Injury Intent"

Figure 2.3. Major Trauma Cases by Cause of Injury

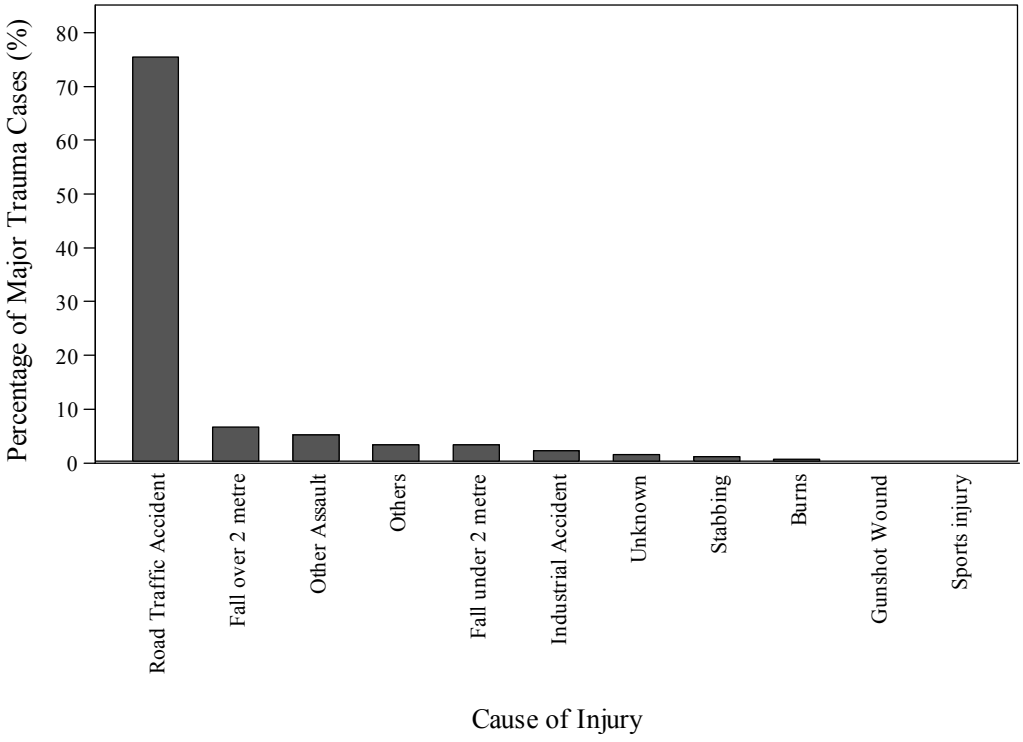


Table 2.3. Major Trauma Cases by Cause of Injury

Cause of Injury	No	%
Road Traffic Accident	432	75.52
Industrial Accident	13	2.27
Fall over 2 metre	38	6.64
Fall under 2 metre (about one door's height)	19	3.32
Sports injury	0	0
Burns	4	0.7
Stabbing	7	1.22
Gunshot Wound	1	0.17
Other Assault	30	5.24
Others	19	3.32
Unknown	9	1.57
TOTAL	572	100

* 12 cases have no information on "Cause of Injury"

Figure 2.3a. Major Trauma Cases by Type of Road Traffic Accident

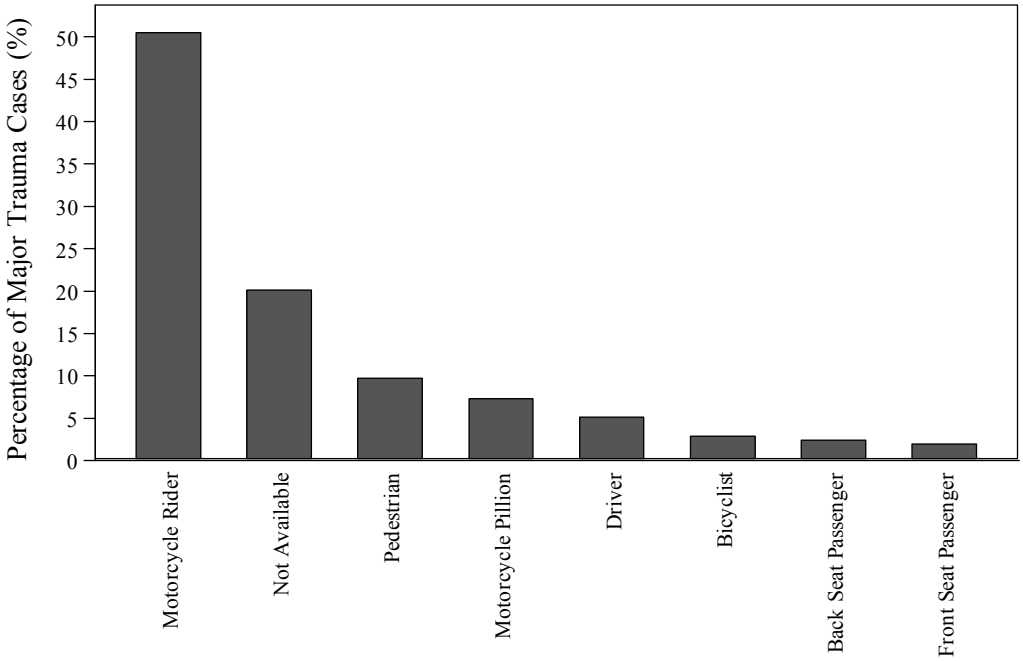


Table 2.3a. Major Trauma Cases by Type of Road Traffic Accident

Type of Road Traffic Accident	No	%
Motorcycle Rider	208	50.49
Motorcycle Pillion	30	7.28
Driver	21	5.1
Front Seat Passenger	8	1.94
Back Seat Passenger	10	2.43
Bicyclist	12	2.91
Pedestrian	40	9.71
Not Available	83	20.15
TOTAL	412	100

*20 cases have no information on "Type of Road Traffic Accident"

Figure 2.4. Major Trauma Cases by Place of Injury

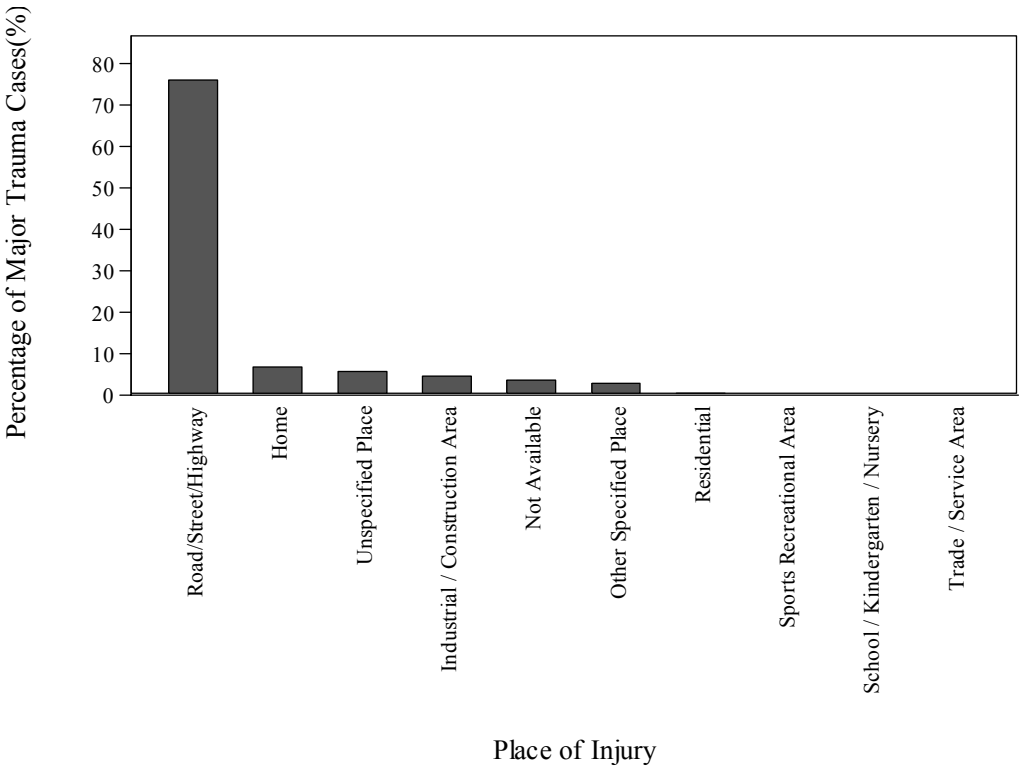


Table 2.4. Major Trauma Cases by Place of Injury

Place of Injury	No	%
Road/Street/ Highway	441	76.03
Home	39	6.72
Industrial / Construction Area	26	4.48
School / Kindergarten / Nursery	1	0.17
Sports Recreational Area	1	0.17
Trade / Service Area	0	0
Residential Institution	2	0.34
Other Specified Place	16	2.76
Unspecified Place	33	5.69
Not Available	21	3.62
TOTAL	580	100

* 4 cases have no information on "Place of Injury"

Figure 2.5. Category of Initial Reviewing Officer in ED for Major Trauma Cases

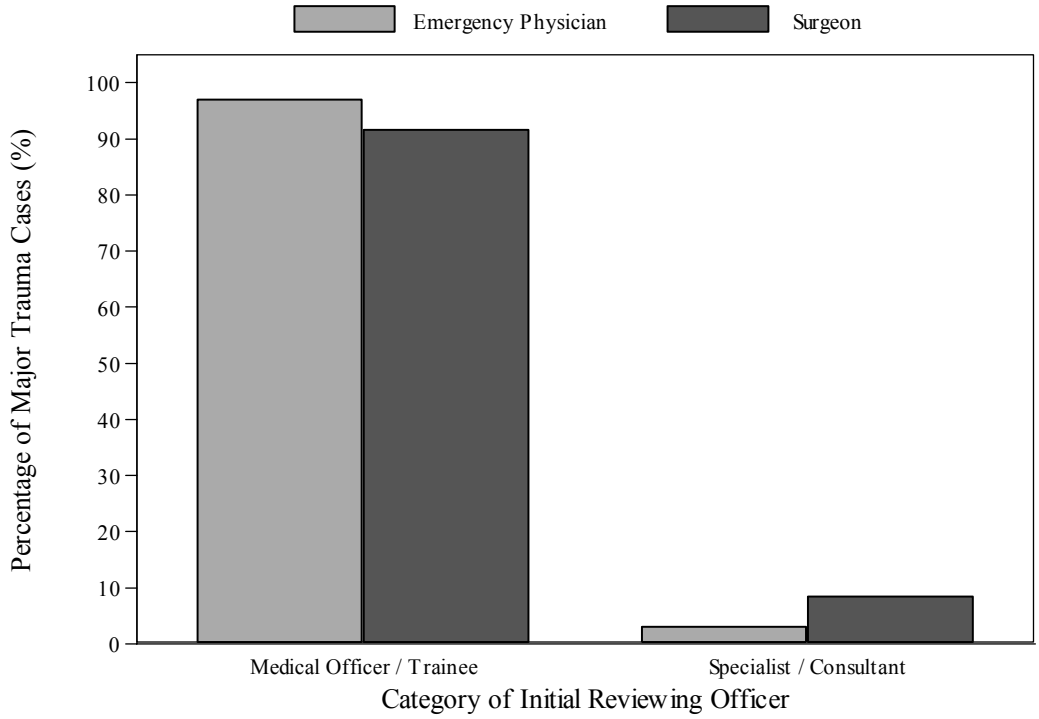


Table 2.5. Category of Initial Reviewing Officer in ED for Major Trauma Cases

Category of Initial Reviewing Officer	Emergency Physician		Surgeon	
	No	%	No	%
Medical Officer/Trainee	513	96.98	306	91.62
Specialist/Consultant	16	3.02	28	8.38
TOTAL	529	100	334	100

* Included cases with both category of "Initial Reviewing Officer"

Figure 2.6. Disposition of Major Trauma Cases from ED

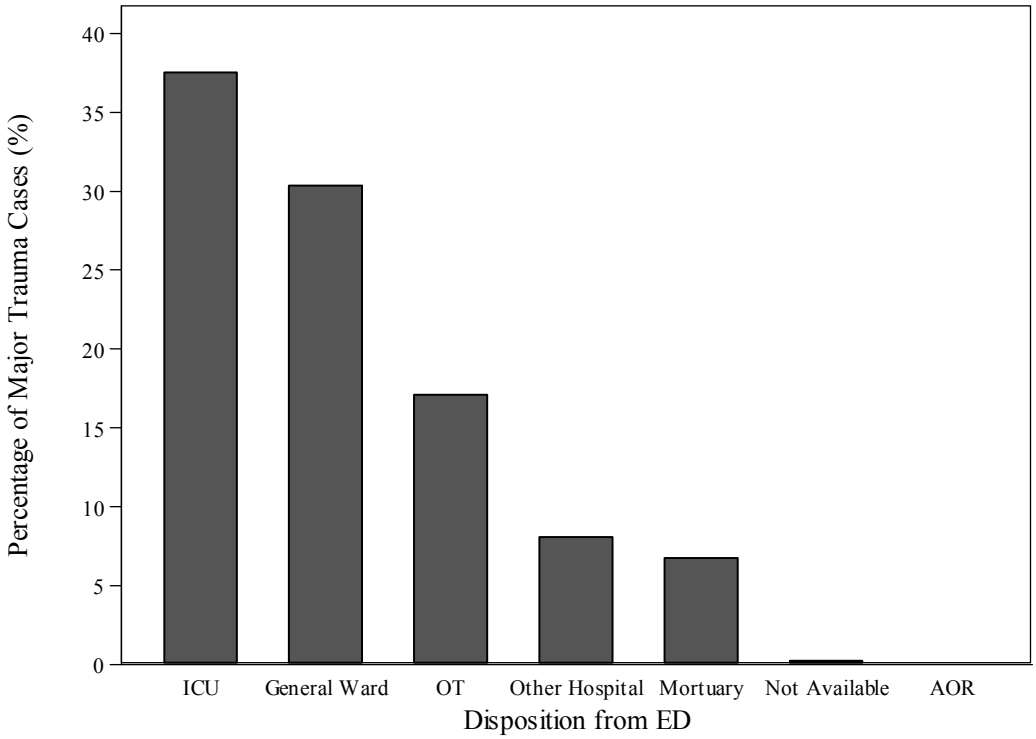


Table 2.6. Disposition of Major Trauma Cases from ED

Disposition From ED	No	%
ICU	167	37.53
OT	76	17.08
General Ward	135	30.34
Mortuary	30	6.74
AOR	0	0
Other Hospital	36	8.09
Not Available	1	0.22
TOTAL	445	100

* 139 cases have no information on "Disposition from ED"

Figure 2.7. ICU Admission for Major Trauma Cases

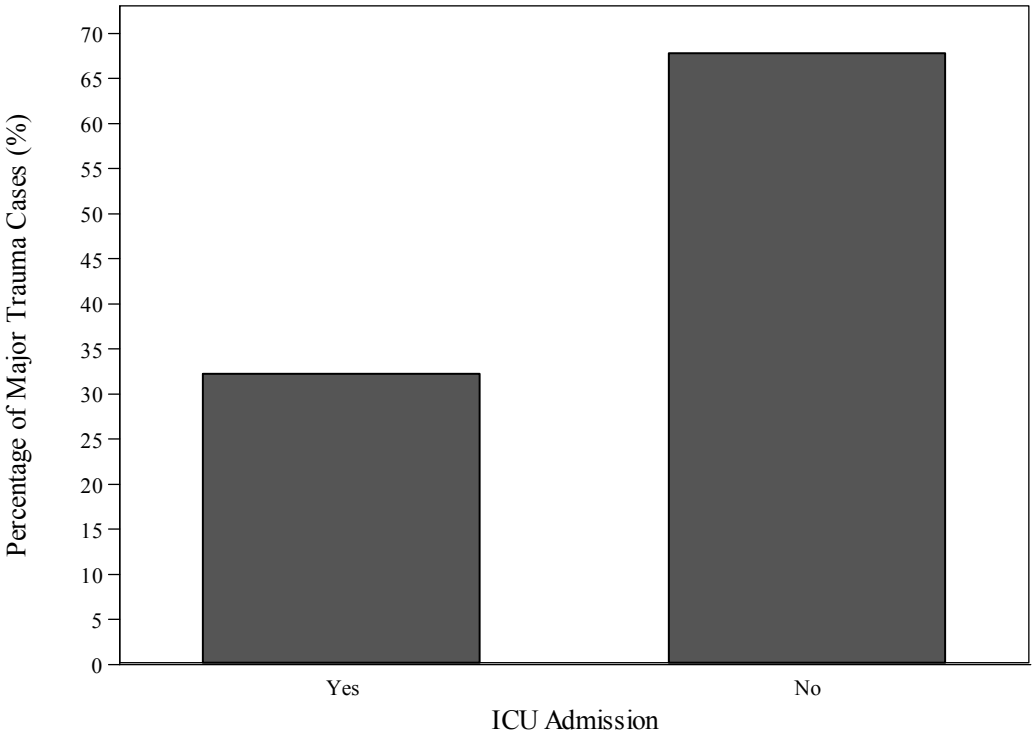


Table 2.7. ICU Admission for Major Trauma Cases

ICU Admission	No	%
Yes	183	32.22
No	385	67.78
TOTAL	568	100

*16 cases have no information on "ICU Admission".

Figure 2.7a. ICU Admissions for Major Trauma Cases by Centre

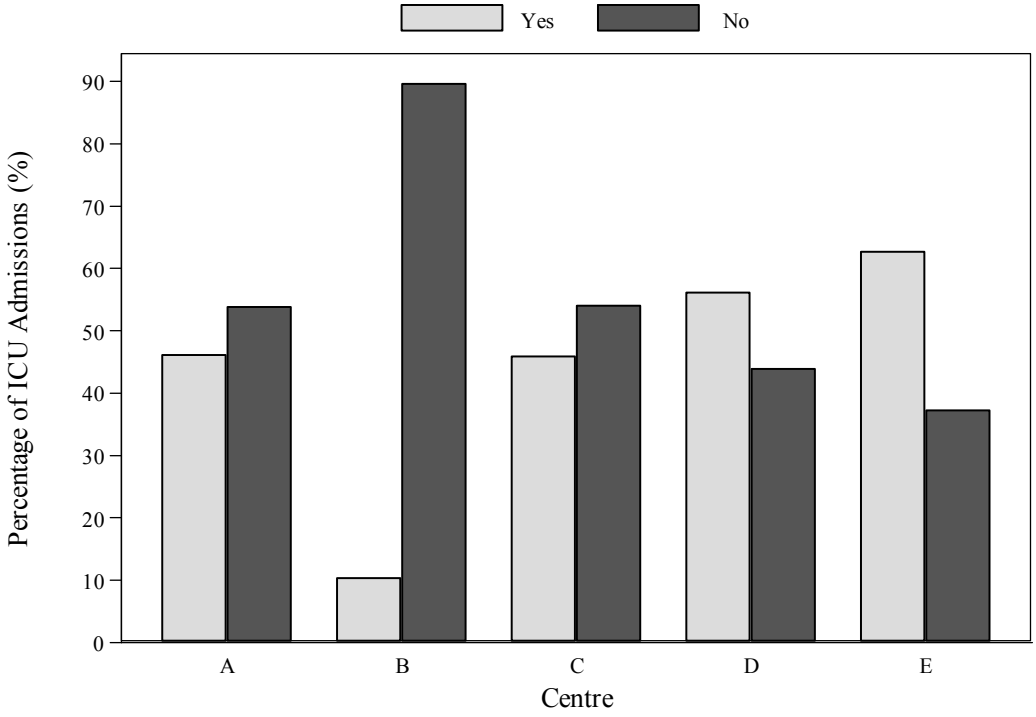


Table 2.7a. Total ICU Admissions for Major Trauma Cases by Centre

Centre	ICU admissions				Total
	Yes		No		
	No	%	No	%	
A	36	46.15	42	53.85	78
B	29	10.36	251	89.64	280
C	17	45.95	20	54.05	37
D	64	56.14	50	43.86	114
E	37	62.71	22	37.29	59
TOTAL	183	32.22	385	67.78	568

Figure 2.8. Major Trauma Cases by Systolic BP

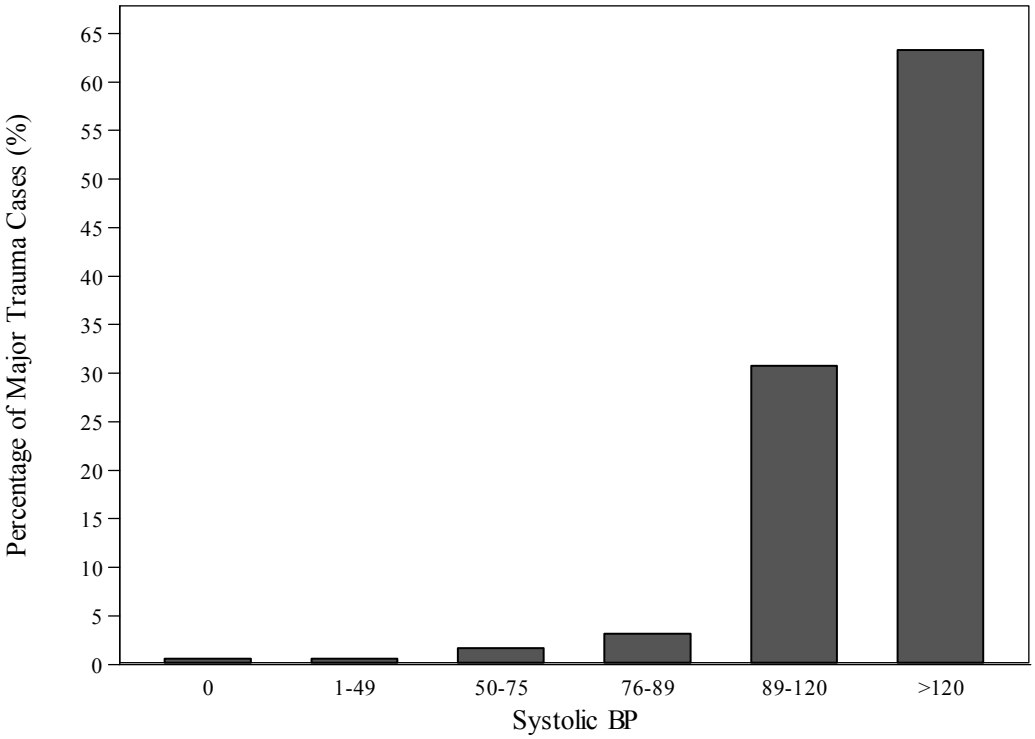


Table 2.8. Major Trauma Cases by Systolic BP

Systolic BP	No	%
0	3	0.56
1-49	3	0.56
50-75	9	1.68
76-89	17	3.17
89-120	165	30.73
>120	340	63.31
TOTAL	537	100

*47 cases have no information on "Systolic BP".

Figure 2.9. Major Trauma Cases by Glasgow Coma Scale (GCS)

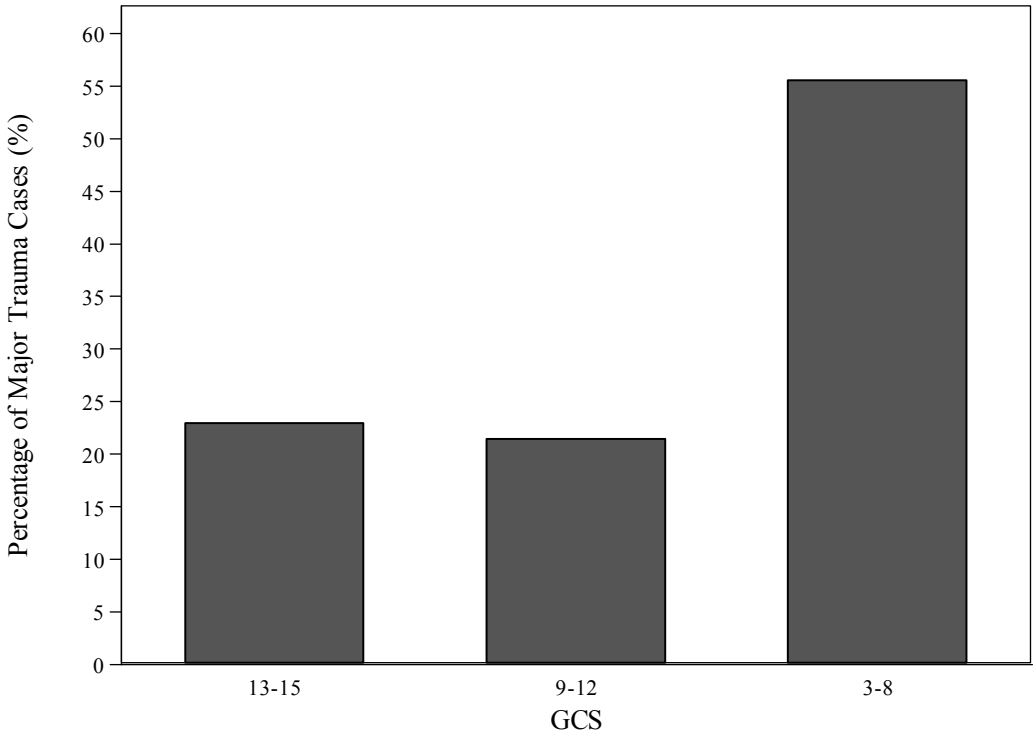


Table 2.9. Major Trauma Cases by Glasgow Coma Scale (GCS)

Glasgow Coma Scale (GCS)	No	%
13-15	124	22.96
9-12	116	21.48
3-8	300	55.56
TOTAL	540	100

**44 cases have no information on "GCS".

Figure 2.9a. Glasgow Coma Scale (GCS) for Major Trauma Cases by Centre.

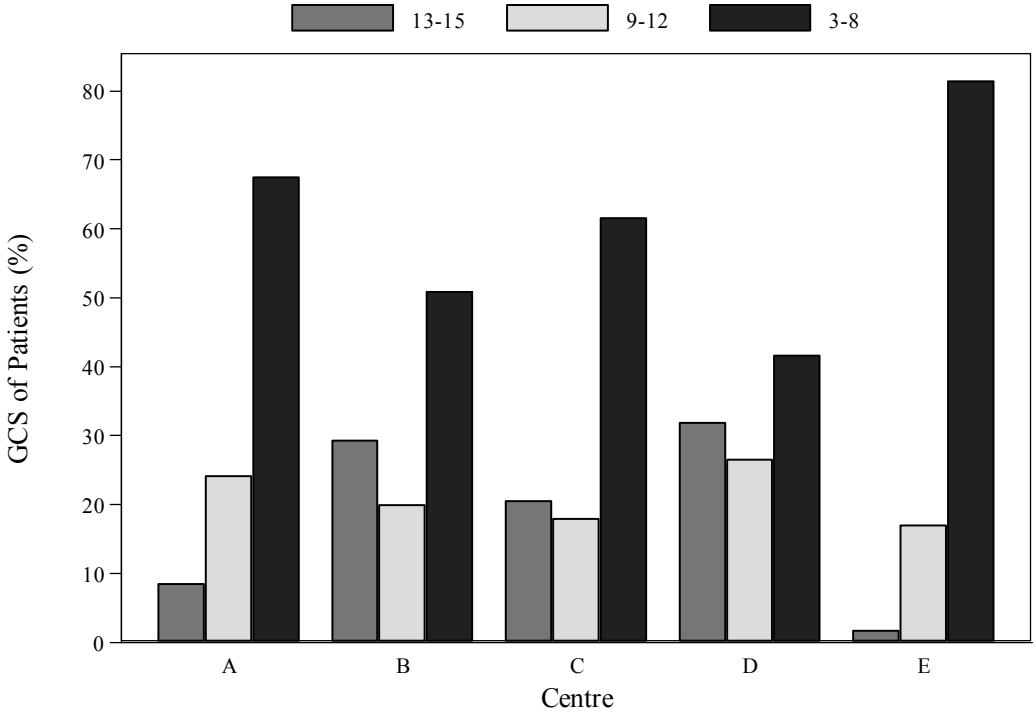


Table 2.9a. Glasgow Coma Scale (GCS) for Major Trauma Cases by Centre.

Centre	GCS						Total
	13-15		9-12		3-8		
	No	%	No	%	No	%	
A	7	8.43	20	24.1	56	67.47	83
B	72	29.27	49	19.92	125	50.81	246
C	8	20.51	7	17.95	24	61.54	39
D	36	31.86	30	26.55	47	41.59	113
E	1	1.69	10	16.95	48	81.36	59
TOTAL	124	22.96	116	21.48	300	55.56	540

*44 cases have no information on "GCS".

Figure 2.10. Trauma Cases with Moderate Head Injury (GCS 9 – 12) by Centre.

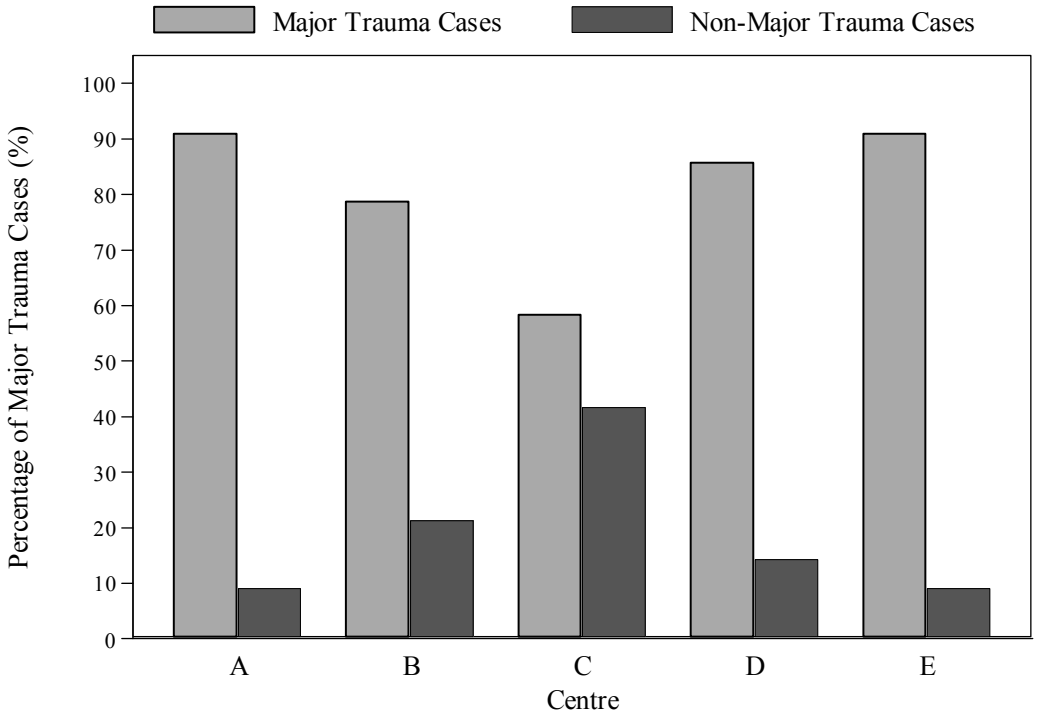


Table 2.10. Non-Major Trauma Cases with Moderate Head Injury (GCS 9 – 12) by Centre.

Centre	Moderate Head Injury + Major Trauma		Moderate Head Injury + Non-Major Trauma		Total
	No	%	No	%	
A	20	90.91	2	9.09	22
B	48	78.69	13	21.31	61
C	7	58.33	5	41.67	12
D	30	85.71	5	14.29	35
E	10	90.91	1	9.09	11
TOTAL	115	81.56	26	18.44	141

Figure 2.11. Traumatic Brain Injuries for Major Trauma Cases

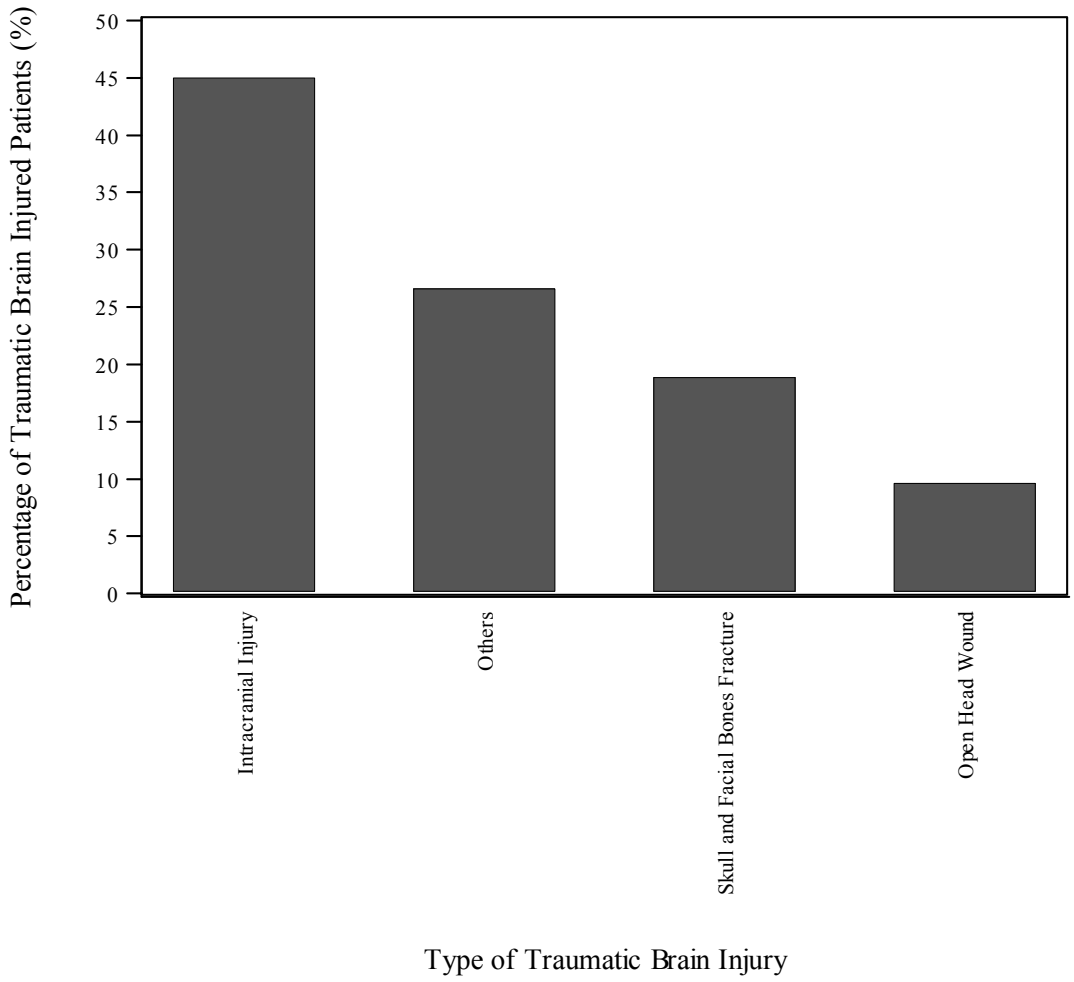


Table 2.11. Traumatic Brain Injuries for Major Trauma Cases

Traumatic Brain Injury	No	%
Open Head Wound	81	9.61
Skull and Facial Bones Fracture	159	18.86
Intracracnial Injury	379	44.96
Others	224	26.57
TOTAL	843	100

* Included cases with more than one "Traumatic Brain Injury".

Figure 2.11a. Traumatic Brain Injuries for Major Trauma Cases by Centre

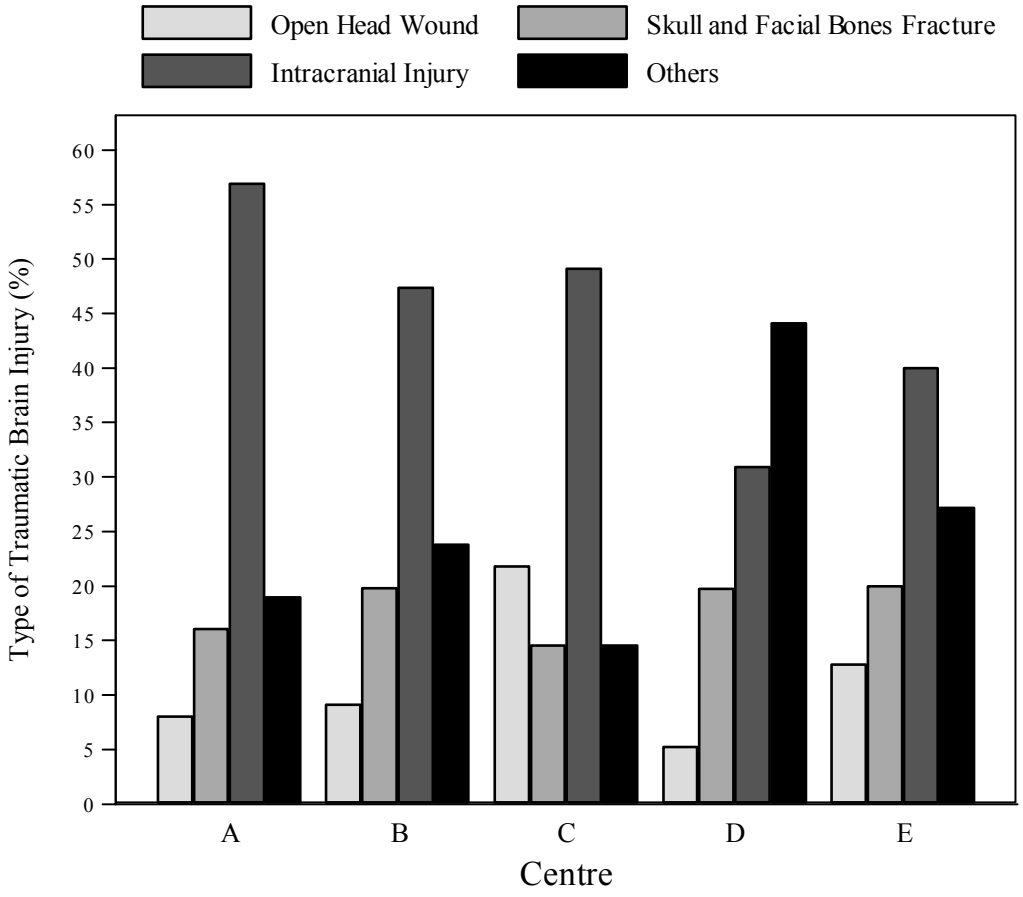


Table 2.11a. Traumatic Brain Injuries for Major Trauma Cases by Centre

Centre	Traumatic Brain Injuries								Total
	Open Head Wound		Fracture of Skull and Facial Bones		Intracranial Injury		Others		
	No	%	No	%	No	%	No	%	
A	11	8.03	22	16.06	78	56.93	26	18.98	137
B	34	9.09	74	19.79	177	47.33	89	23.8	374
C	12	21.82	8	14.55	27	49.09	8	14.55	55
D	8	5.26	30	19.74	47	30.92	67	44.08	152
E	16	12.8	25	20	50	40	34	27.2	125
TOTAL	81	9.61	159	18.86	379	44.96	224	26.57	843

* Included cases with more than one "Traumatic Brain Injury".

Figure 2.12. Intracranial Injury for Major Trauma Cases

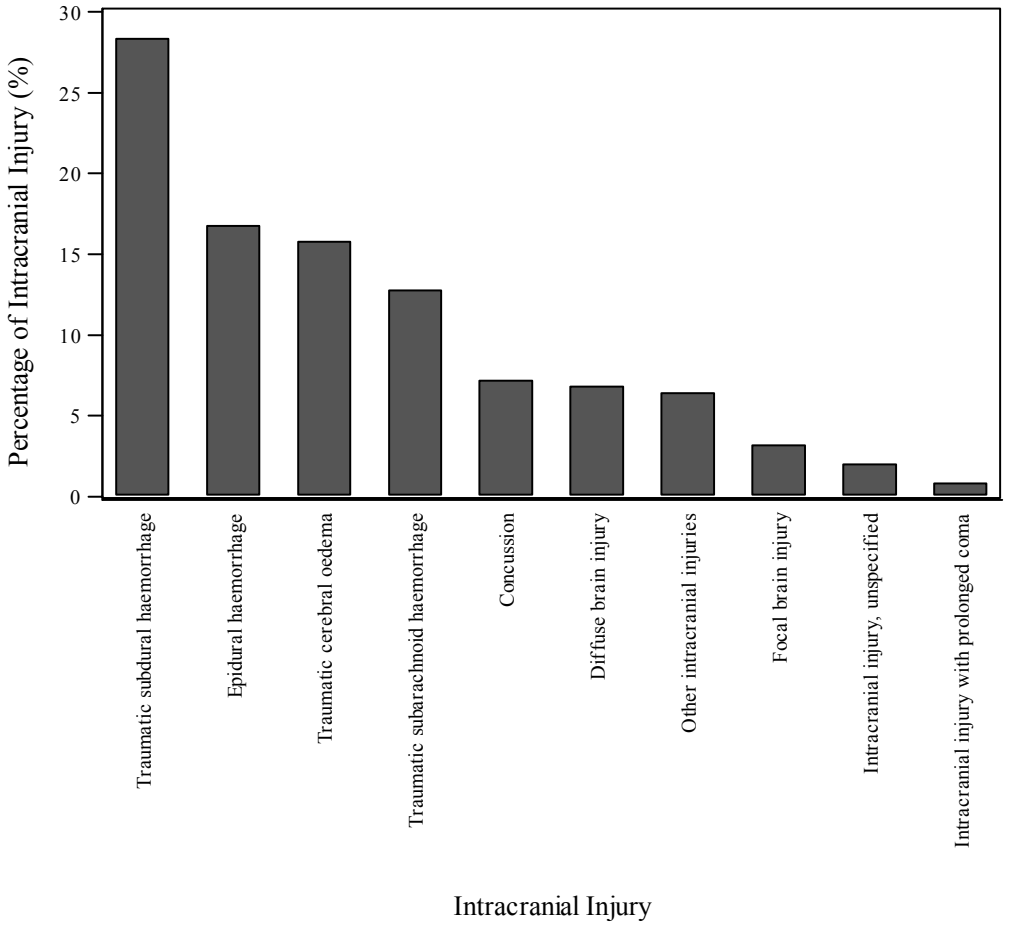


Table 2.12. Intracranial Injury for Major Trauma Cases

Intracranial Injury	**No**	**%**
Concussion	36	7.19
Traumatic cerebral oedema	79	15.77
Diffuse brain injury	34	6.79
Focal brain injury	16	3.19
Epidural haemorrhage	84	16.77
Traumatic subdural haemorrhage	142	28.34
Traumatic subarachnoid haemorrhage	64	12.77
Intracranial injury with prolonged coma	4	0.8
Others	32	6.39
Intracranial injury, unspecified	10	2
TOTAL	501	100

* Included cases with more than one "Intracracnial Injury".

Table 2.12a. Intracranial Injury for Major Trauma Cases by Centre

Centre	Intracranial Injury																				Total
	Concussion		Traumatic cerebral oedema		Diffuse brain injury		Focal brain injury		Epidural heamorrhage		Traumatic subdural haemorrhage		Traumatic subarachnoid haemorrhage		With prolonged coma		Others		Unspecified		
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	
A	8	7.21	25	22.5	9	8.11	0	0	0	0	25	22.5	21	18.9	0	0	19	17.1	4	3.6	111
B	5	2.36	25	11.8	4	1.89	15	7.1	63	29.7	73	34.4	22	10.4	0	0	3	1.42	2	0.9	212
C	6	14.6	10	24.4	2	4.88	0	0	0	0	10	24.4	7	17.1	2	4.9	4	9.76	0	0	41
D	12	16.2	16	21.6	0	0	1	1.4	10	13.5	17	23	9	12.2	0	0	5	6.76	4	5.4	74
E	5	7.94	3	4.76	19	30.2	0	0	11	17.5	17	27	5	7.94	2	3.2	1	1.59	0	0	63
TOTAL	36	7.19	79	15.8	34	6.79	16	3.2	84	16.8	142	28.3	64	12.8	4	0.8	32	6.39	10	2	501

Figure 2.13. Major Trauma Cases by RTS

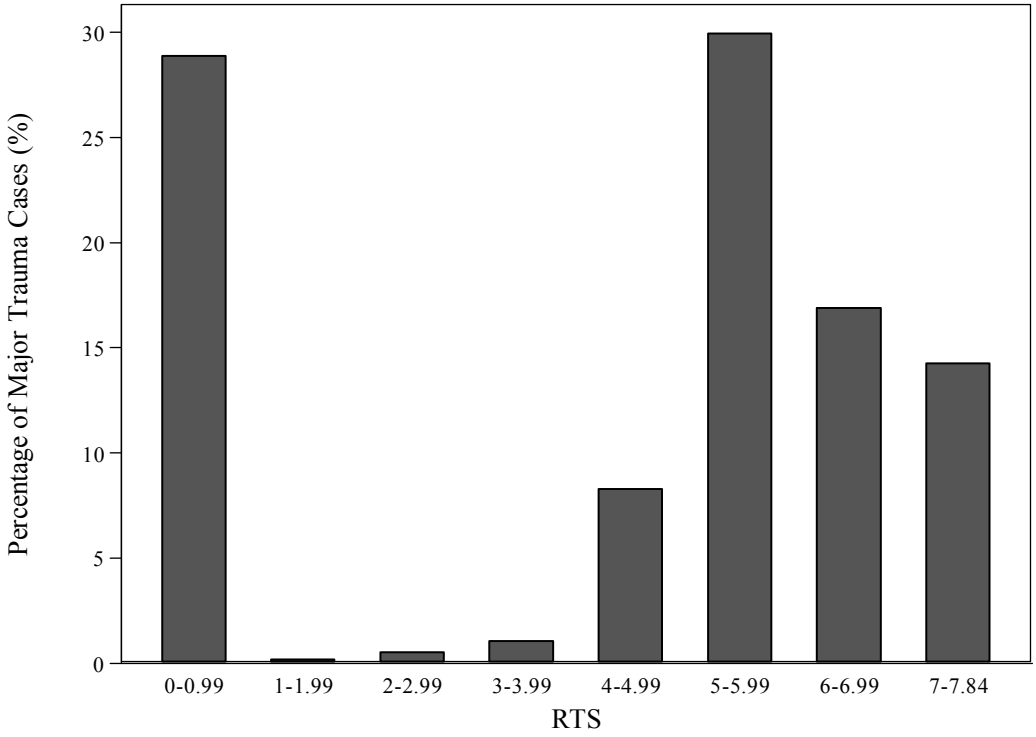


Table 2.13. Major Trauma Cases by RTS

RTS	No	%
0-0.99	164	28.87
1-1.99	1	0.18
2-2.99	3	0.53
3-3.99	6	1.06
4-4.99	47	8.27
5-5.99	170	29.93
6-6.99	96	16.9
7-7.84	81	14.26
TOTAL	568	100

*16 cases have no information on "RTS".

Table 2.13a. RTS for Major Trauma Cases by Centre

RTS	Centre										Total
	A		B		C		D		E		
	No	%	No	%	No	%	No	%	No	%	
0-0.99	4	2.44	153	93.29	0	0	3	1.83	4	2.44	164
1-1.99	0	0	1	100	0	0	0	0	0	0	1
2-2.99	0	0	1	33.33	0	0	1	33.33	1	33.33	3
3-3.99	1	16.67	1	16.67	1	16.67	0	0	3	50	6
4-4.99	9	19.15	18	38.3	8	17.02	6	12.77	6	12.77	47
5-5.99	42	24.71	40	23.53	15	8.82	41	24.12	32	18.82	170
6-6.99	20	20.83	31	32.29	7	7.29	28	29.17	10	10.42	96
7-7.84	7	8.64	31	38.27	8	9.88	34	41.98	1	1.23	81
TOTAL	83	14.61	276	48.59	39	6.87	113	19.89	57	10.04	568

*16 cases have no information on "RTS".

Figure 2.14. Injuries According to Body Region for Major Trauma Cases

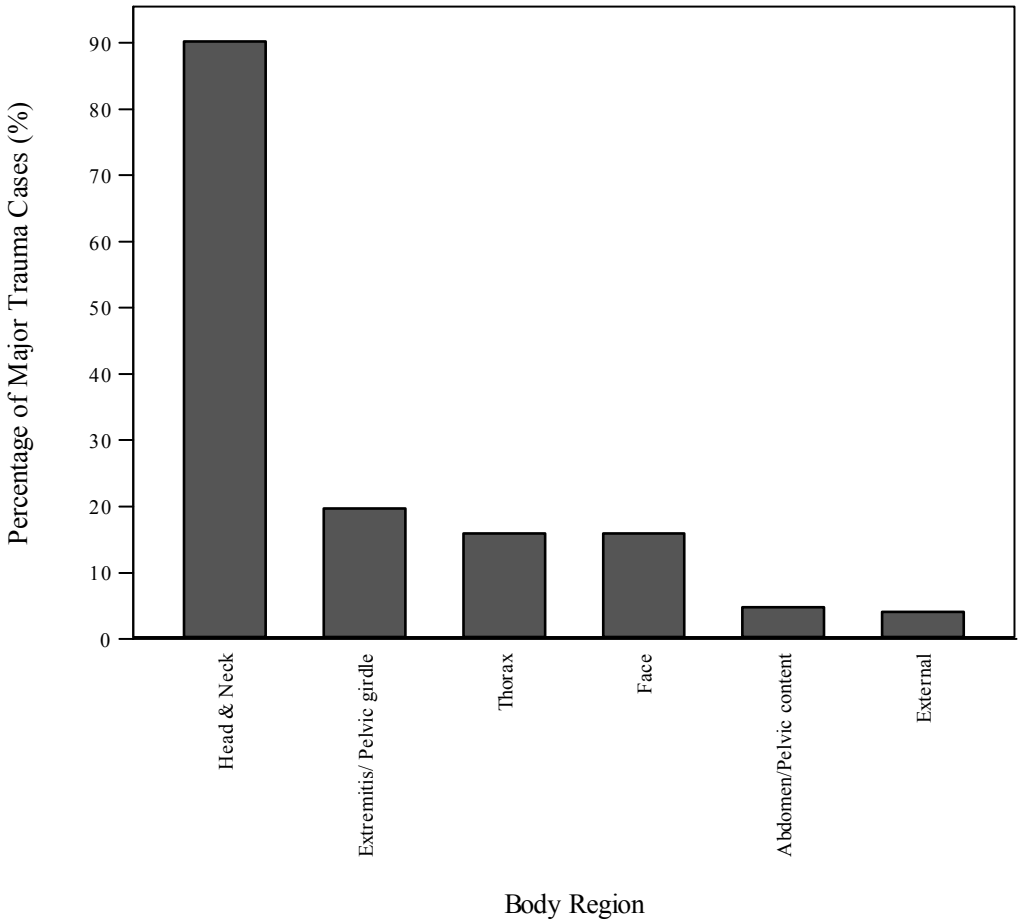


Table 2.14. Injuries According to Body Region for Major Trauma Cases

Body Region	**No**	**%**
Head & Neck	527	90.24
Face	93	15.92
Thorax	93	15.92
Abdomen/Pelvic content	28	4.79
Extremitis/ Pelvic girdle	115	19.69
External	24	4.11

Figure 2.15. Abbreviated Injury Score (AIS) for All Injuries for Major Trauma Patients

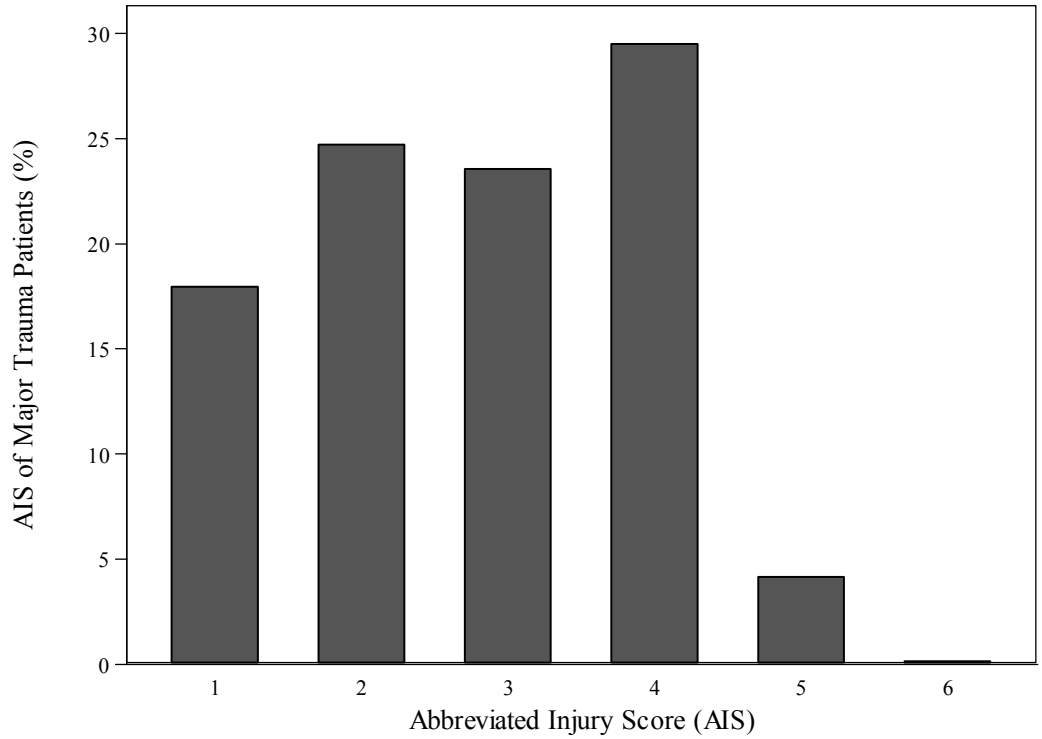


Table 2.15. Abbreviated Injury Score (AIS) for All Injuries for Major Trauma Patients

AIS	No.	%
1	263	17.95
2	362	24.71
3	345	23.55
4	432	29.49
5	61	4.16
6	2	0.14
TOTAL	1465	100

* Included cases with more than one record on "AIS"

Table 2.15a. Abbreviated Injury Score (AIS) for All Injuries in Major Trauma Patients by Centre

AIS	Centre										Total	
	A		B		C		D		E			
	No	%	No	%	No	%	No	%	No	%	No	%
1	66	25.1	127	48.29	23	8.75	38	14.45	9	3.42	263	17.95
2	73	20.17	145	40.06	43	11.88	78	21.55	23	6.35	362	24.71
3	71	20.58	139	40.29	28	8.12	90	26.09	17	4.93	345	23.55
4	72	16.67	228	52.78	21	4.86	80	18.52	31	7.18	432	29.49
5	10	16.39	16	26.23	4	6.56	5	8.2	26	42.62	61	4.16
6	1	50	0	0	1	50	0	0	0	0	2	0.14
TOTAL	293	20	655	44.71	120	8.19	291	19.86	106	7.24	1465	100

Figure 2.15b. Abbreviated Injury Score (AIS) Distribution According to Body Region for Major Trauma Cases

Figure 2.15b(i). Head and Neck Region

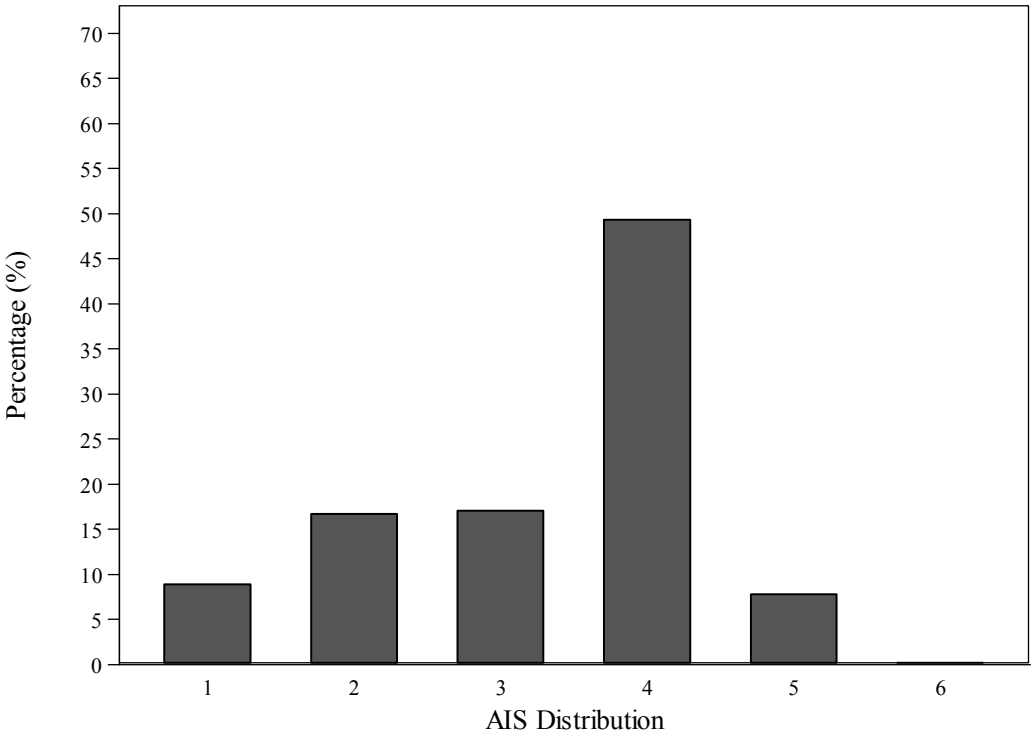


Figure 2.15b(ii). Face Region

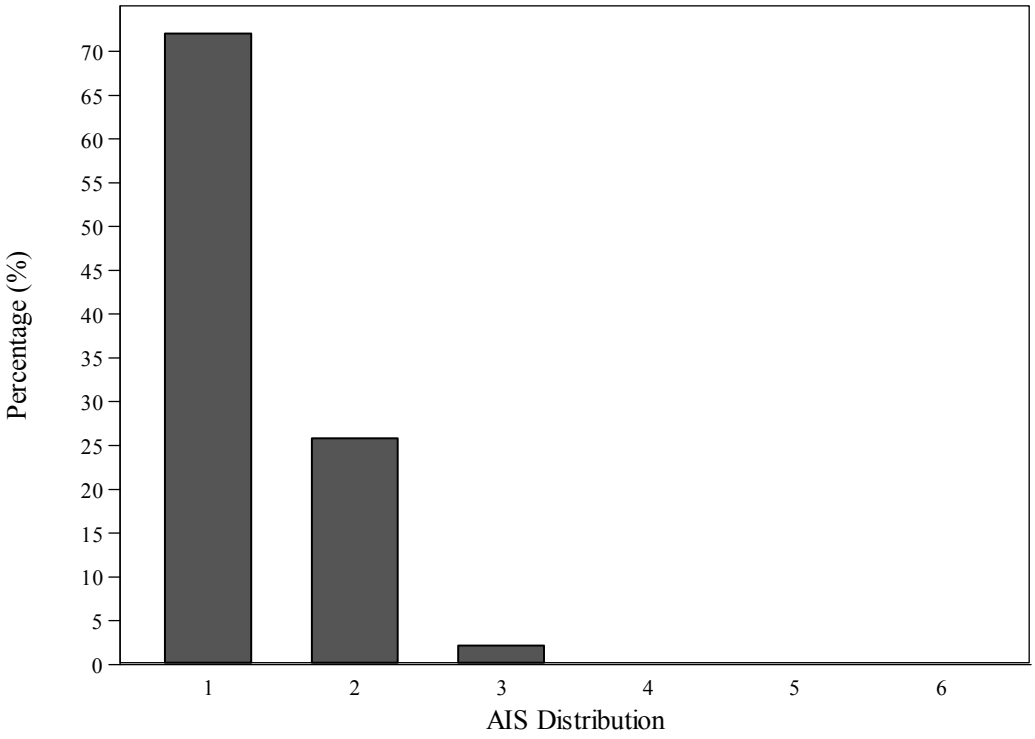


Figure 2.15b(iii). Thorax Region

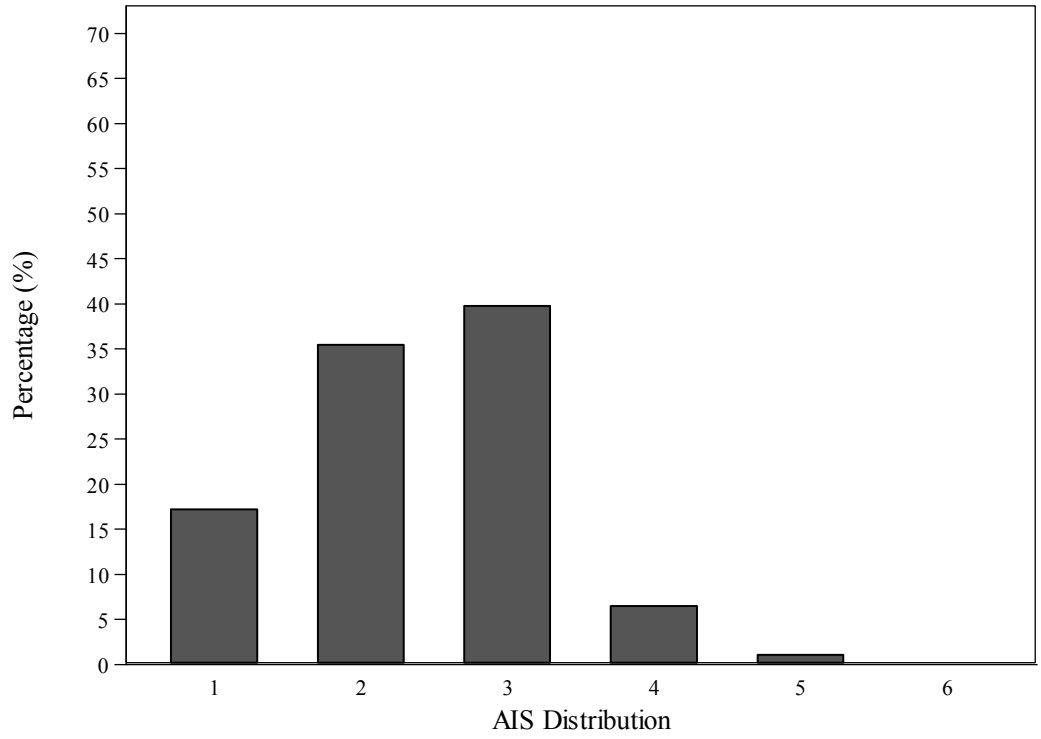


Figure 2.15b(iv). Abdomen/Pelvic Content Region

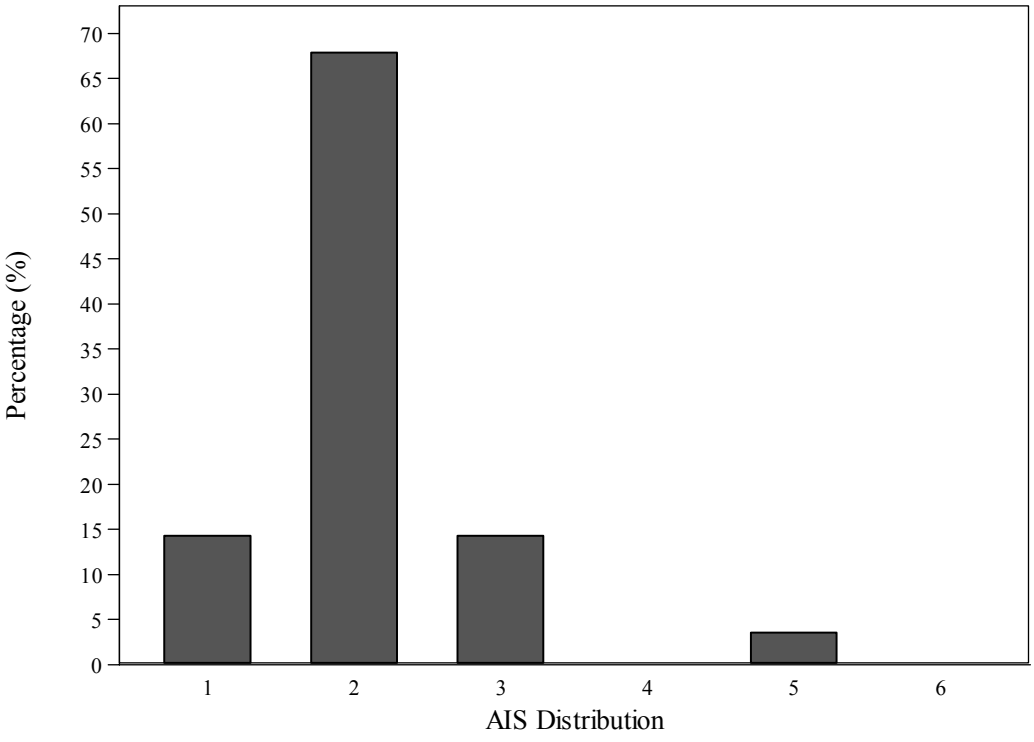


Figure 2.15b(v). Extremitis/Pelvic Girdle Region

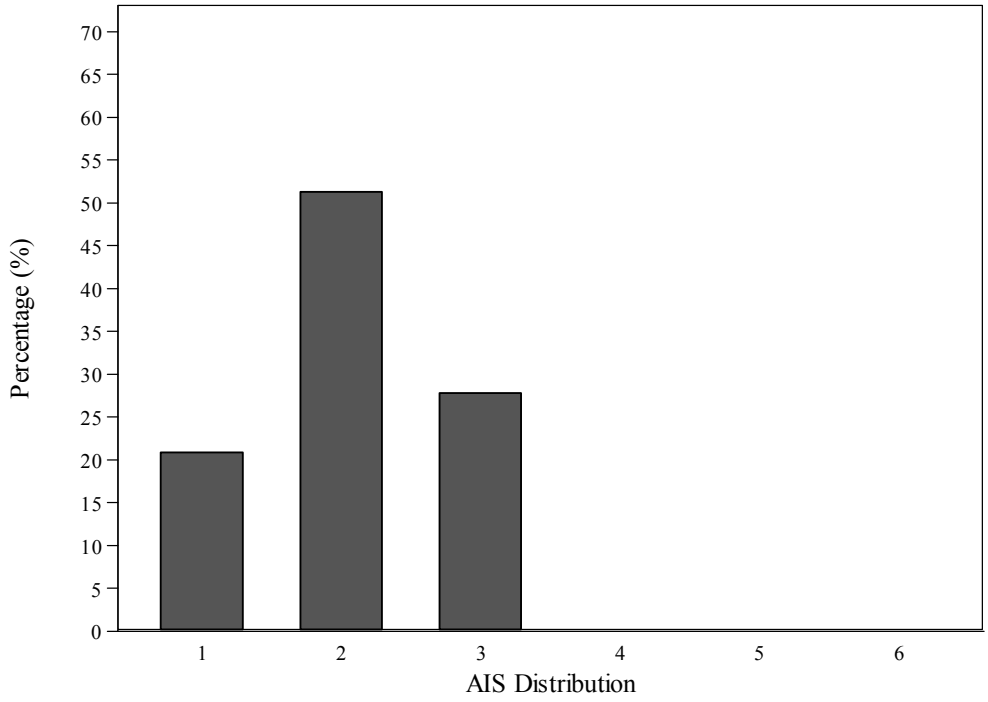


Figure 2.15b(vi). External Region

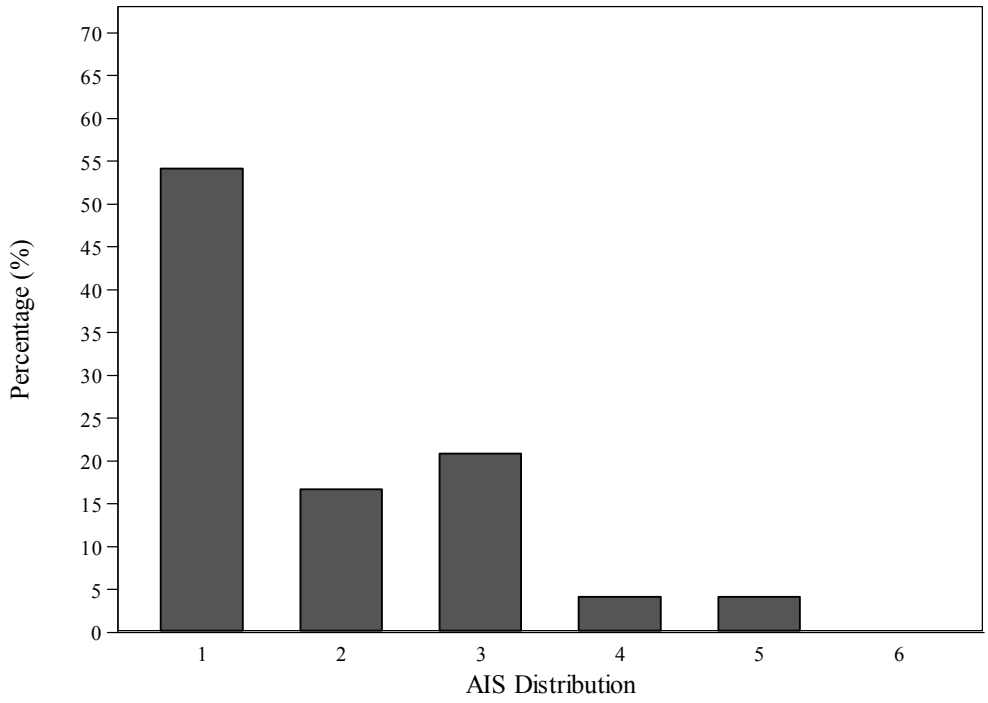


Table 2.15b. Distribution According to Body Region for Major Trauma Cases for Major Trauma Cases

AIS	Head and Neck		Face		Thorax		Abdomen/ Pelvic content		Extremitis/ Pelvic girdle		External		Total	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
1	47	8.92	67	72.04	16	17.2	4	14.29	23	20	13	54.17	170	19.32
2	88	16.7	24	25.81	33	35.48	19	67.86	60	52.17	4	16.67	228	25.91
3	90	17.08	2	2.15	37	39.78	4	14.29	31	26.96	5	20.83	169	19.2
4	260	49.34	0	0	6	6.45	0	0	1	0.87	1	4.17	268	30.45
5	41	7.78	0	0	1	1.08	1	3.57	0	0	1	4.17	44	5
6	1	0.19	0	0	0	0	0	0	0	0	0	0	1	0.11
TOTAL	527	100	93	100	93	100	28	100	115	100	24	100	880	100

Figure 2.16. Body Region with Abbreviated Injury Score (AIS) ≥ 3 for Major Trauma Cases

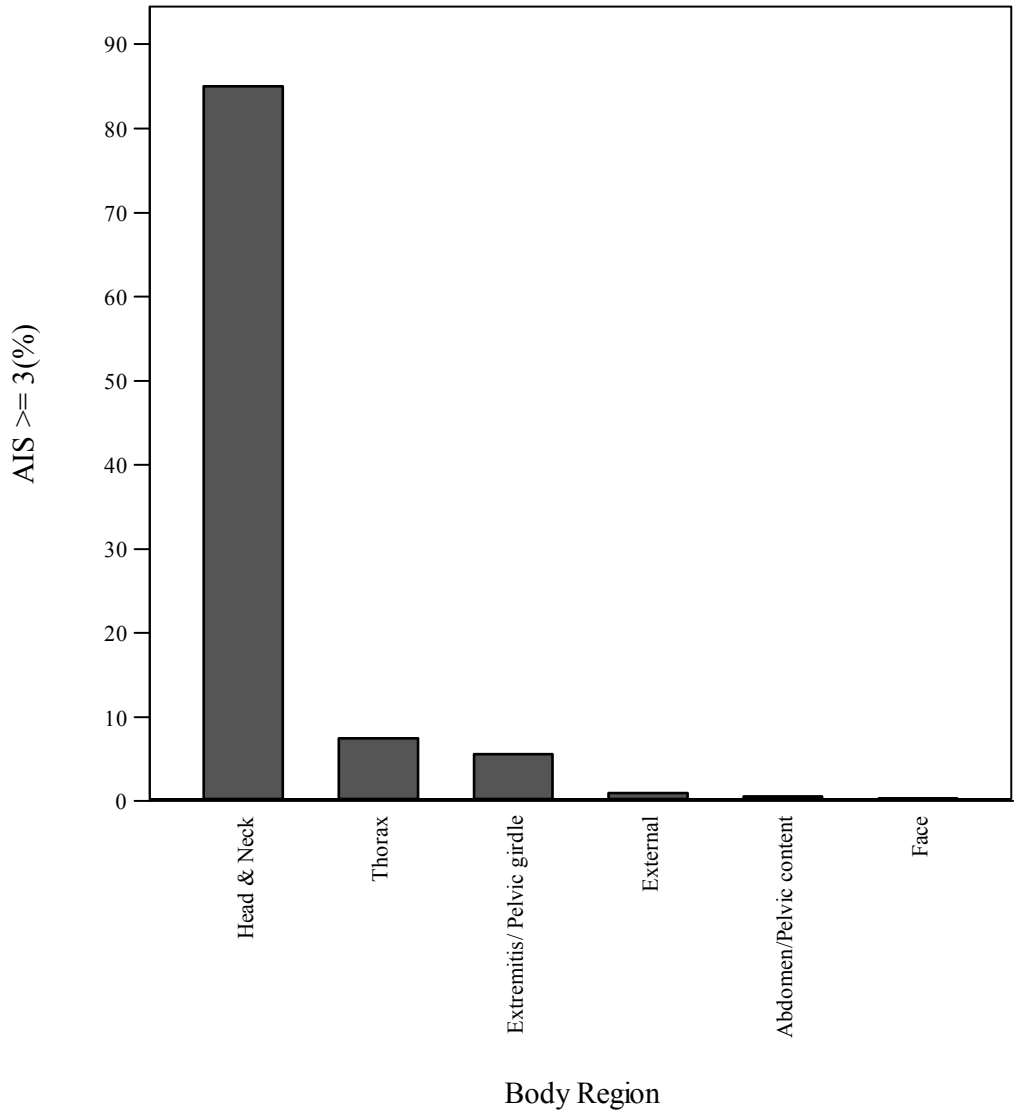


Table 2.16. Body Region with Abbreviated Injury Score (AIS) ≥ 3 for Major Trauma Cases

Body Region	No.	%
Head & Neck	714	85
Face	3	0.36
Thorax	63	7.5
Abdomen/Pelvic content	5	0.6
Extremitis/ Pelvic girdle	47	5.6
External	8	0.95
TOTAL	840	100

Figure 2.17. Injury Severity Score (ISS) for Major Trauma Cases

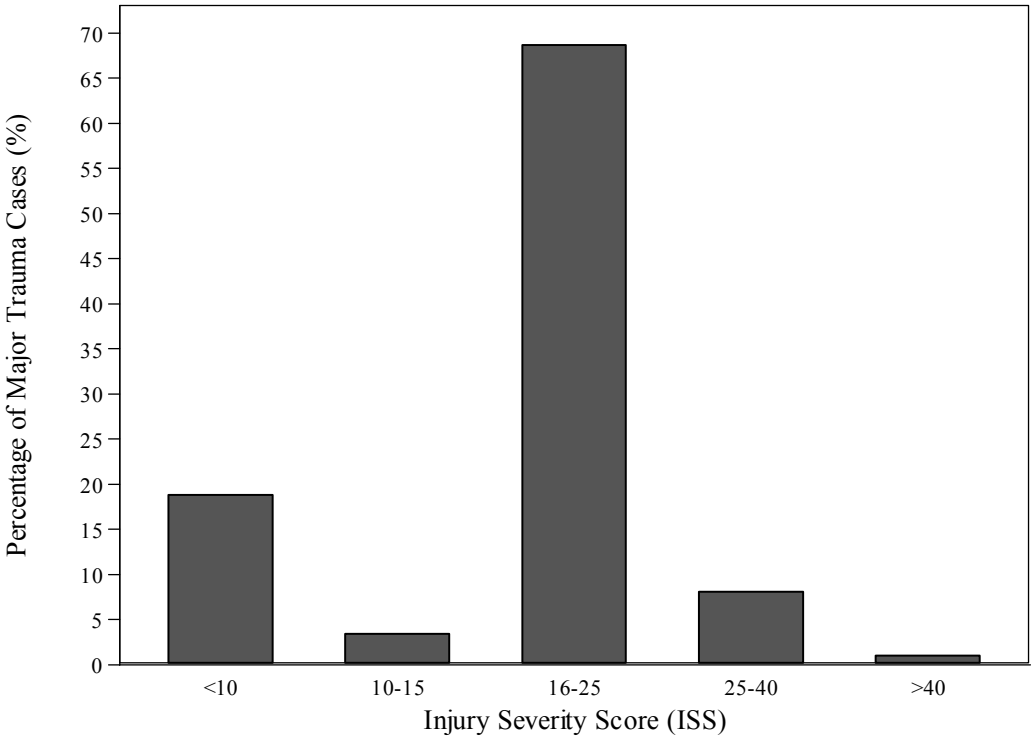


Table 2.17. Injury Severity Score (ISS) for Major Trauma Cases

ISS	No	%
<10	110	18.84
10-15	20	3.42
16-25	401	68.66
25-40	47	8.05
>40	6	1.03

Table 2.17a. Injury Severity Score (ISS) for Major Trauma Cases by Centre

ISS	Centre										Total	
	A		B		C		D		E			
	No	%	No	%	No	%	No	%	No	%	No	%
<10	12	10.91	59	53.64	11	10	21	19.09	7	6.36	110	18.84
10-15	3	15	9	45	1	5	6	30	1	5	20	3.42
16-25	50	12.47	209	52.12	22	5.49	77	19.2	43	10.72	401	68.66
25-40	17	36.17	11	23.4	3	6.38	9	19.15	7	14.89	47	8.05
>40	1	16.67	1	16.67	2	33.33	1	16.67	1	16.67	6	1.03
TOTAL	83	14.21	289	49.49	39	6.68	114	19.52	59	10.1	584	100

Chapter 3: Operation Management

Table 3.1. Operative Management for Major Trauma Cases

Operative Management	Total	
	No	%
Yes	184	48.29
No	197	51.71
TOTAL	381	100

*203 cases have no information on "Operative Management"

Table 3.1a. Operative Management for Major Trauma Cases by Centre

Centre	Yes		No		Total	
	No	%	No	%	No	%
A	2	2.44	80	97.56	82	21.52
B	68	58.62	48	41.38	116	30.45
C	18	52.94	16	47.06	34	8.92
D	63	62.38	38	37.62	101	26.51
E	33	68.75	15	31.25	48	12.6
TOTAL	184	48.29	197	51.71	381	100

Figure 3.2. Operative Procedure for Major Trauma Cases

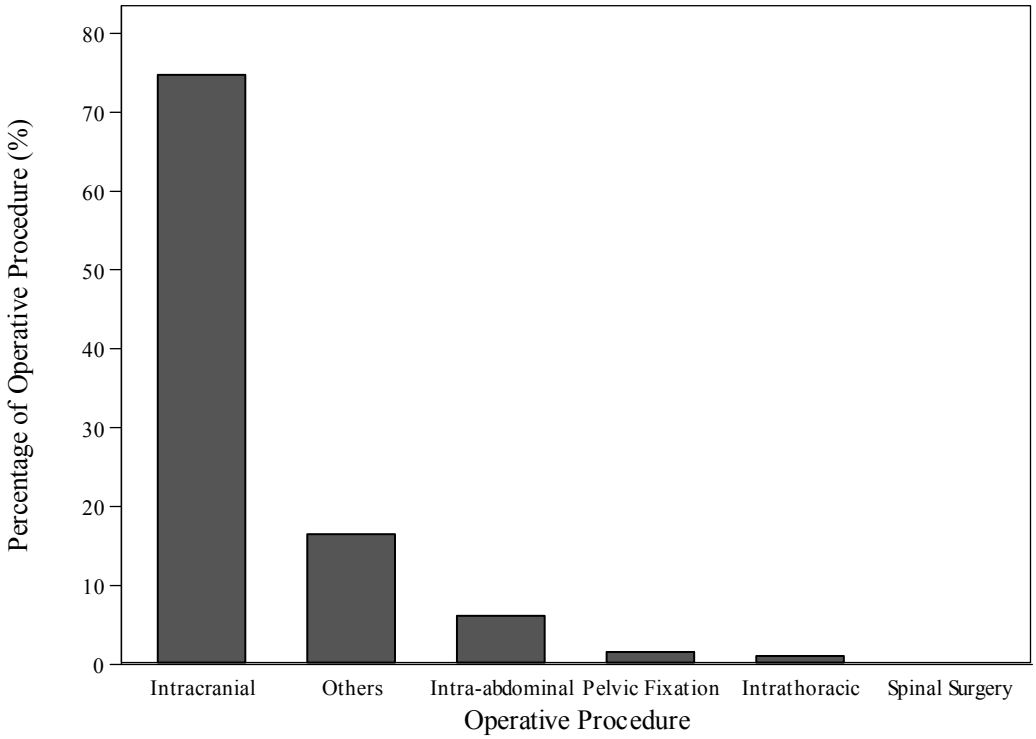


Table 3.2. Operative Procedure for Major Trauma Cases

Operative Procedure	**No**	**%**
Intracranial	145	74.74
Intrathoracic	2	1.03
Intra-abdominal	12	6.19
Spinal Surgery	0	0
Pelvic Fixation	3	1.55
Others	32	16.49
TOTAL	194	100

Table 3.2a. Operative Procedure for Major Trauma Cases by Centre

Centre	Intracranial		Intra-thoracic		Intra-abdominal		Spinal Surgery		Pelvic Fixation		Others		Total	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
A	0	0	0	0	0	0	0	0	0	0	2	6.25	2	1.03
B	57	39.31	0	0	0	0	0	0	0	0	9	28.13	66	34.02
C	8	5.52	0	0	6	50	0	0	0	0	6	18.75	20	10.31
D	54	37.24	2	100	5	41.67	0	0	3	100	8	25	72	37.11
E	26	17.93	0	0	1	8.33	0	0	0	0	7	21.88	34	17.53
TOTAL	145	100	2	100	12	100	0	0	3	100	32	100	194	100

Figure 3.3. Types of Intracranial Procedure for Major Trauma Cases

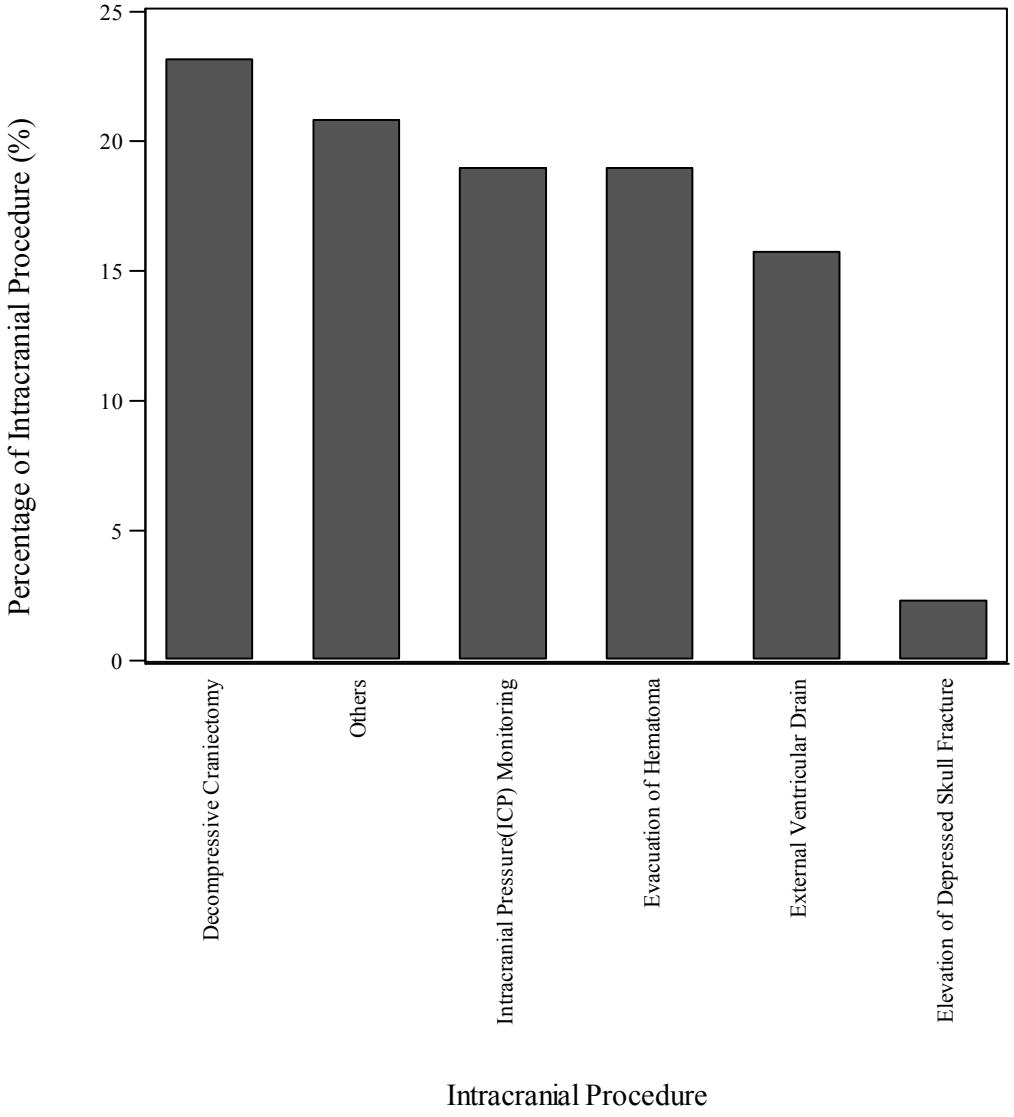


Table 3.3. Types of Intracranial Procedure for Major Trauma Cases

Intracranial Procedure	**No**	**%**
Evacuation of Hematoma	41	18.98
Decompressive Craniectomy	50	23.15
External Ventricular Drain	34	15.74
Intracranial Pressure(ICP) Monitoring	41	18.98
Elevation of Depressed Skull Fracture	5	2.31
Others	45	20.83
TOTAL	216	100

Chapter 4: Outcome

Figure 4.1. Total Outcome for Major Trauma Cases

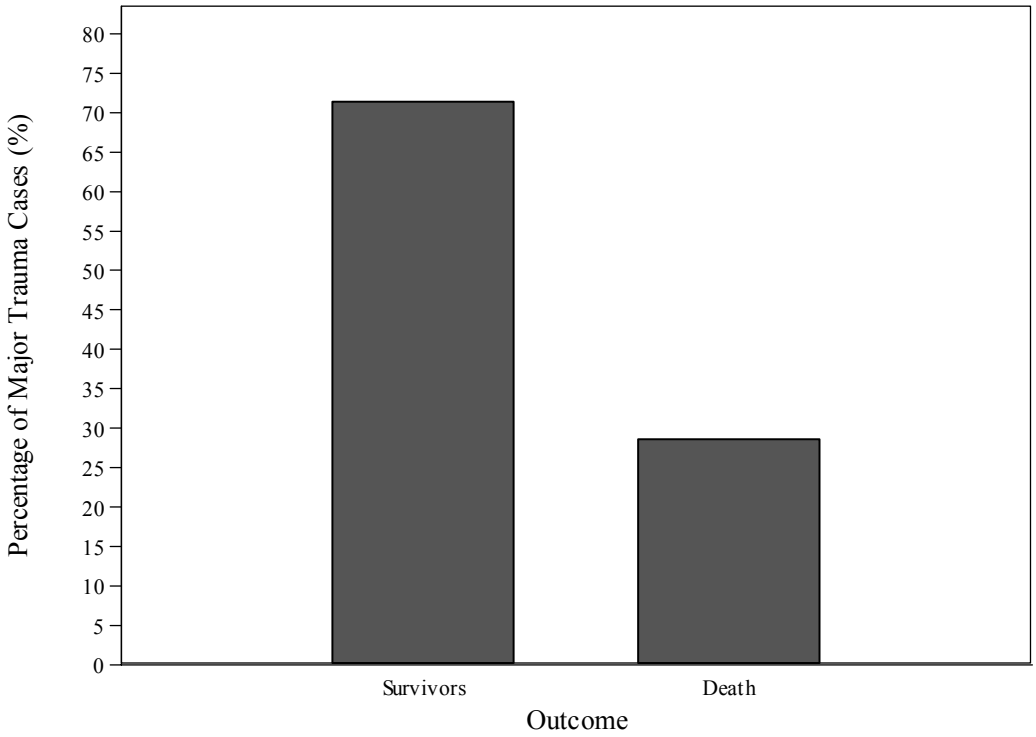


Table 4.1. Total Outcome for Major Trauma Cases

Outcome	**No**	**%**
Survivors	280	71.43
Deaths	112	28.57
TOTAL	392	100

*192 cases have no information in "Outcome".

Figure 4.1a. Outcome for Major Trauma Cases by Centre

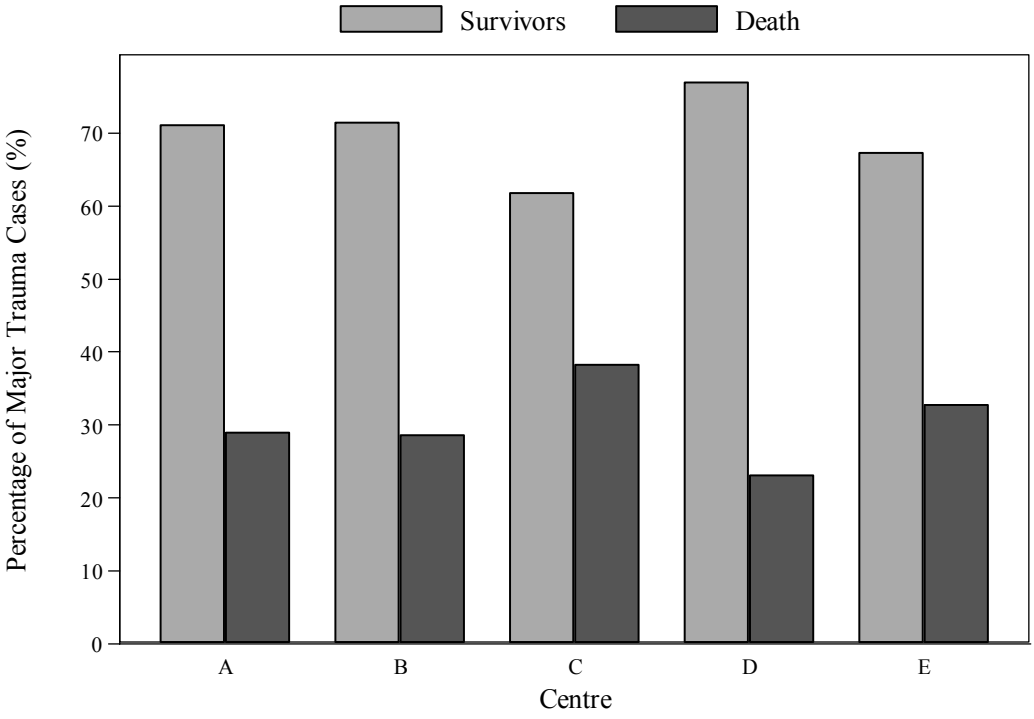


Table 4.1a. Outcome for Major Trauma Cases by Centre

Centre	Survivors		Death		Total
	No	%	No	%	
A	59	71.08	24	28.92	83
B	85	71.43	34	28.57	119
C	21	61.76	13	38.24	34
D	80	76.92	24	23.08	104
E	35	67.31	17	32.69	52
TOTAL	280	71.43	112	28.57	392

*192 cases have no information in "Outcome".

Figure 4.2. Disposition of Survivors at Discharge for Major Trauma Cases

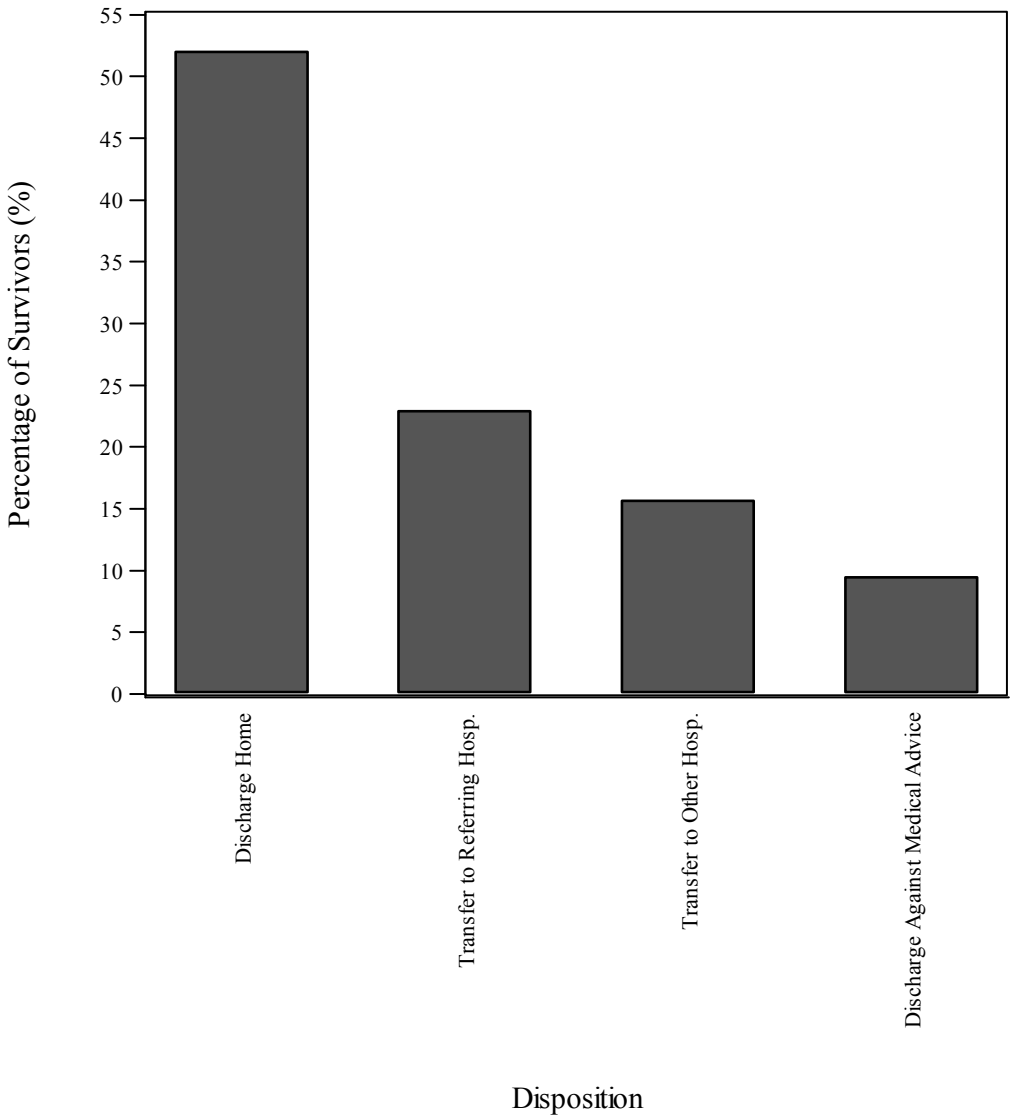


Table 4.2. Disposition of Survivors at Discharge for Major Trauma Cases

Disposition of Survivors	**Survivors**	
	No	**%**
Discharge Home	143	52
Transfer to Referring Hospital	63	22.91
Transfer to Other Hospital	43	15.64
Discharge Against Medical Advice	26	9.45
TOTAL	275	100

*5 cases from total number of "Survivors" have no information on discharge.

Figure 4.3. Outcome for Major Trauma Cases by Age Group

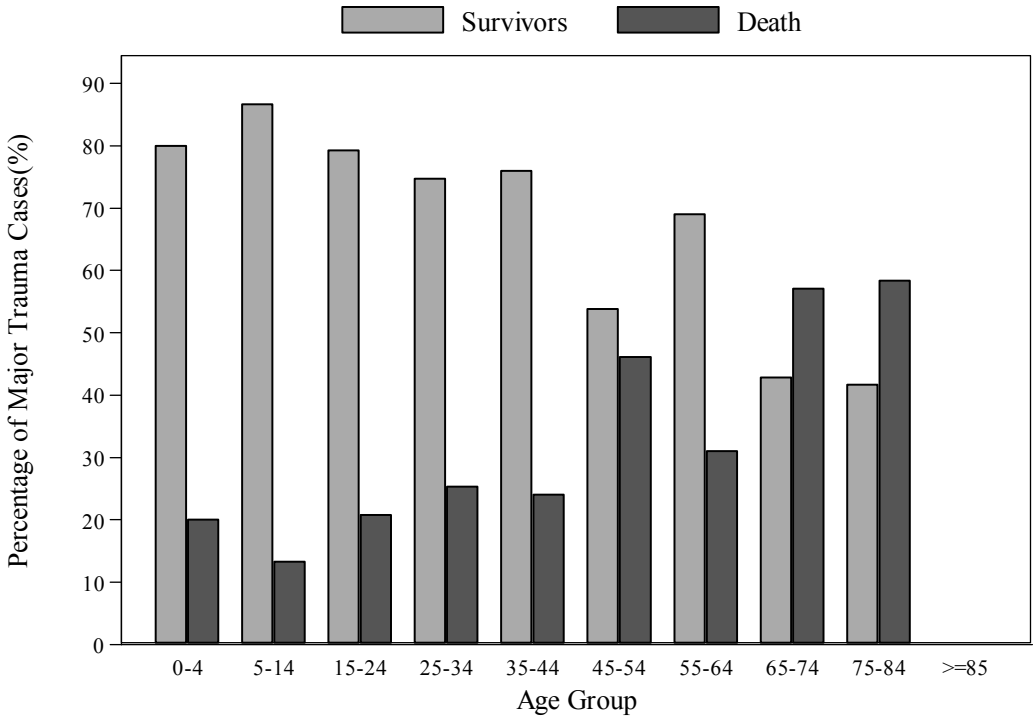


Table 4.3. Outcome for Major Trauma Cases by Age Group

Age Group	Survivors		Death		Total	
	No	%	No	%	No	%
0-4	4	80	1	20	5	1.3
5-14	13	86.67	2	13.33	15	3.9
15-24	107	79.26	28	20.74	135	35.06
25-34	59	74.68	20	25.32	79	20.52
35-44	38	76	12	24	50	12.99
45-54	21	53.85	18	46.15	39	10.13
55-64	20	68.97	9	31.03	29	7.53
65-74	9	42.86	12	57.14	21	5.45
75-84	5	41.67	7	58.33	12	3.12
≥85	0	0	0	0	0	0
TOTAL	276	71.69	109	28.31	385	100

* 3 cases have no information on both "Age Group" and "Outcome"

**10 cases have no information on "Age Group"

Figure 4.4. Mechanism of Injury by Outcome for Total Major Trauma Cases

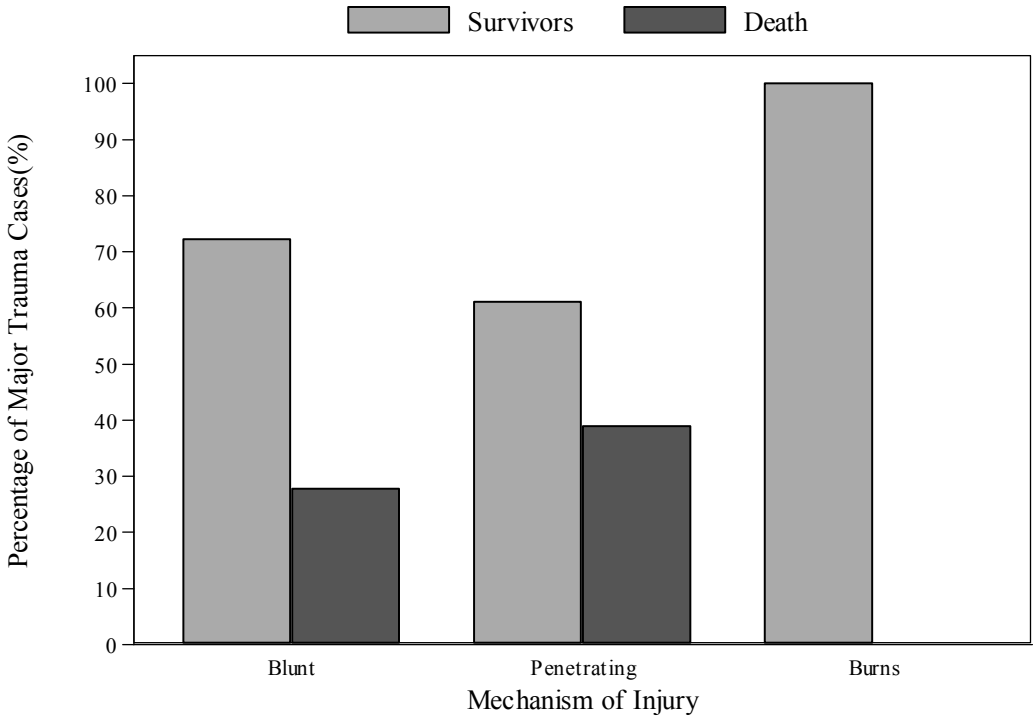


Table 4.4. Outcome for Major Trauma Cases by Mechanism of Injury

Mechanism of Injury	Survivors		Death		Total	
	No	%	No	%	No	%
Blunt	265	72.21	102	27.79	367	94.83
Penetrating	11	61.11	7	38.89	18	4.65
Burns	2	100	0	0	2	0.52
TOTAL	278	71.83	109	28.17	387	100

* 3 cases have no information on both "Mechanism of Injury" and "Outcome"

** 8 cases have no information on "Mechanism of Injury"

Figure 4.5. Injury Cause for Major Trauma Cases by Outcome

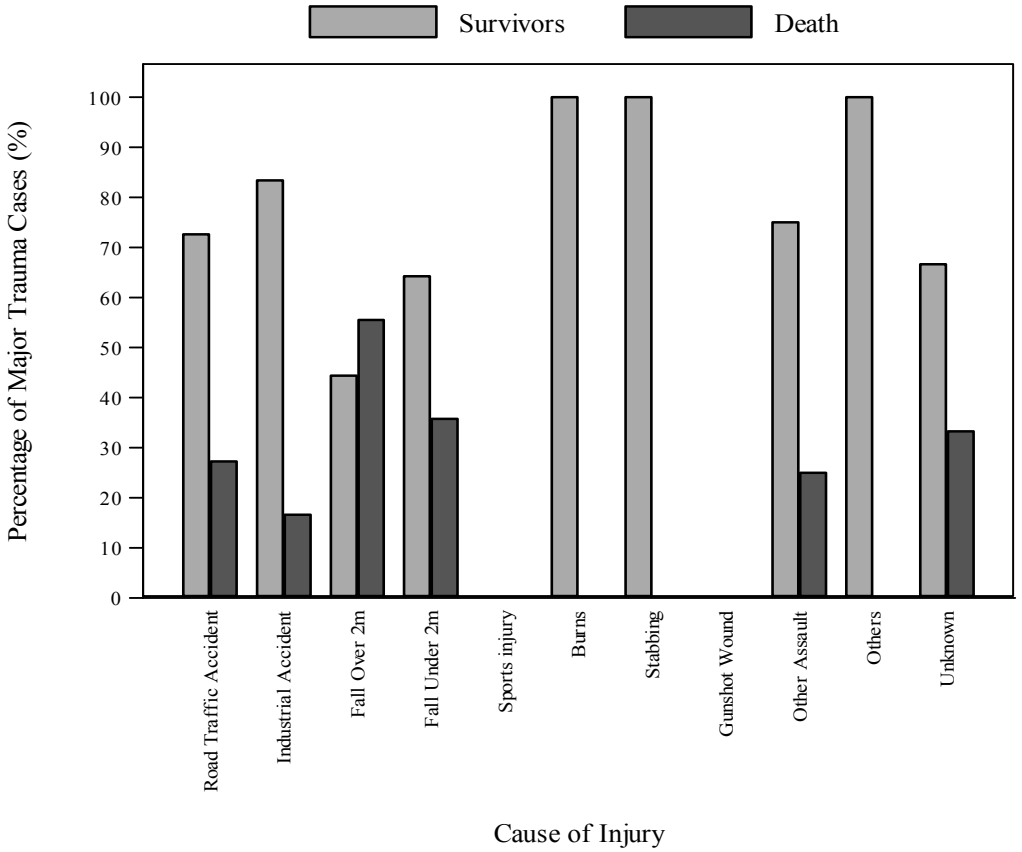


Table 4.5. Cause of Injury for Major Trauma Cases by Outcome

Cause of Injury	Survivors		Death		Total	
	No	%	No	%	No	%
Road Traffic Accident	226	72.67	85	27.33	311	80.99
Industrial Accident	5	83.33	1	16.67	6	1.56
Fall over 2 meter	8	44.44	10	55.56	18	4.69
Fall under 2 meter(about 1 door's height)	9	64.29	5	35.71	14	3.65
Sports injury	0	0	0	0	0	0
Burns	1	100	0	0	1	0.26
Stabbing	4	100	0	0	4	1.04
Gunshot Wound	0	0	0	0	0	0
Others Assault	15	75	5	25	20	5.21
Other	4	100	0	0	4	1.04
Unknown	4	66.67	2	33.33	6	1.56
TOTAL	276	71.88	108	28.13	384	100

*4 cases have no information on both "Cause of Injury" and "Outcome"

** 12 cases have no information on "Cause of Injury"

Figure 4.6. Outcome by Type of Road Traffic Accident for Major Trauma Cases

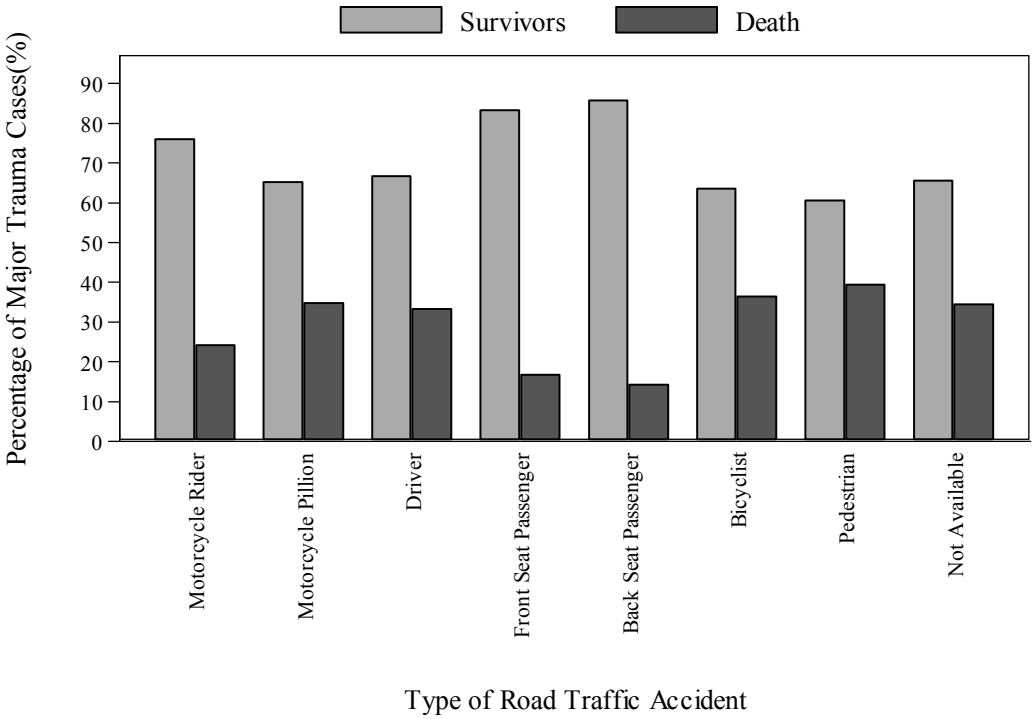


Table 4.6. Outcome by Type of Road Traffic Accident for Major Trauma Cases

Type of Road Traffic Accident	Survivors		Death		Total	
	No	%	No	%	No	%
Motorcycle Rider	126	75.9	40	24.1	166	56.66
Motorcycle Pillion	15	65.22	8	34.78	23	7.85
Driver	12	66.67	6	33.33	18	6.14
Front Seat Passenger	5	83.33	1	16.67	6	2.05
Back Seat Passenger	6	85.71	1	14.29	7	2.39
Bicyclist	7	63.64	4	36.36	11	3.75
Pedestrian	20	60.61	13	39.39	33	11.26
Not Available	19	65.52	10	34.48	29	9.9
TOTAL	210	71.67	83	28.33	293	100

* 2 cases have no information on both "Type of Road Traffic Accident" and "Outcome"

** 20 cases have no information on "Type of Road Traffic Accident"

Table 4.7. Place of Injury for Major Trauma Cases by Outcome

Place of Injury	Survivors		Death		Total	
	No	%	No	%	No	%
Road/ Street/ Highway	231	72.41	88	27.59	319	81.59
Home	17	60.71	11	39.29	28	7.16
Industrial / Construction Area	10	62.5	6	37.5	16	4.09
School / Kindergarten / Nursery	1	100	0	0	1	0.26
Sports Recreational Area	0	0	0	0	0	0
Trade / Service Area	0	0	0	0	0	0
Residential Institution	1	50	1	50	2	0.51
Other Specified Place	6	66.67	3	33.33	9	2.3
Unspecified Place	5	71.43	2	28.57	7	1.79
Not Available	9	100	0	0	9	2.3
TOTAL	280	71.61	111	28.39	391	100

* 3 cases have no information on both "Place of Injury" and "Outcome"

** 4 cases have no information on "Place of Injury"

Figure 4.8. Type of Admission for Major Trauma Cases by Outcome

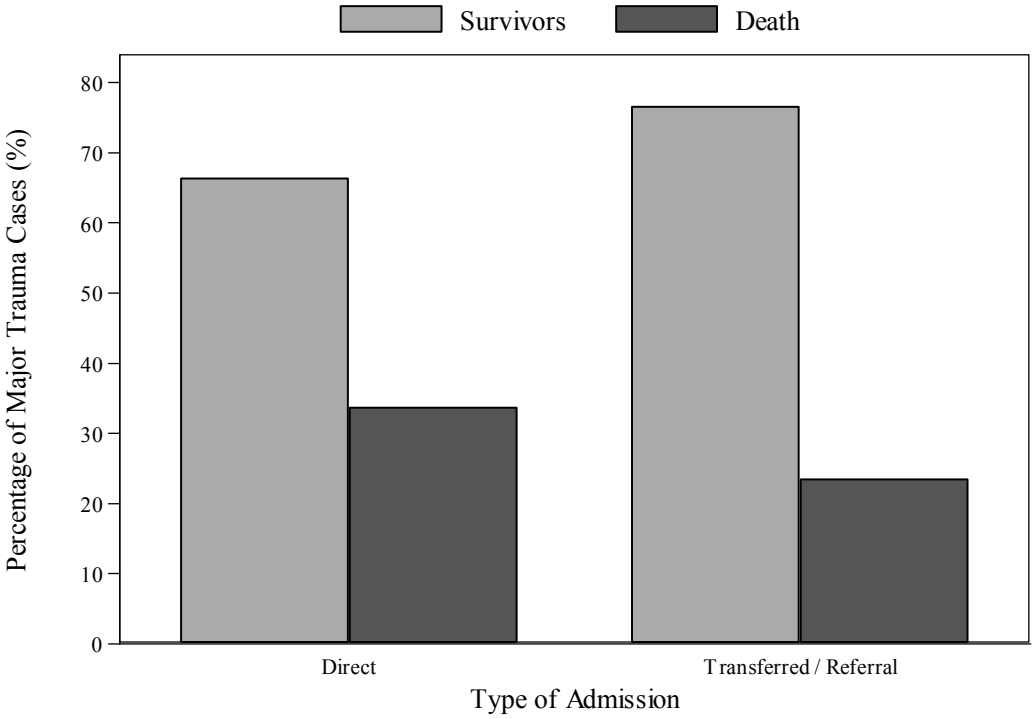


Table 4.8. Type of Admission for Major Trauma Cases by Outcome

Type of Admission	Survivors		Death		Total	
	No	%	No	%	No	%
Direct	130	66.33	66	33.67	196	50
Transfer / Referred from	150	76.53	46	23.47	196	50
TOTAL	280	71.43	112	28.57	392	100

*1 case has no information on both "Type of Admission" and "Outcome"

**1 case has no information on "Type of Admission"

Figure 4.9. Systolic BP for Major Trauma Cases by Outcome

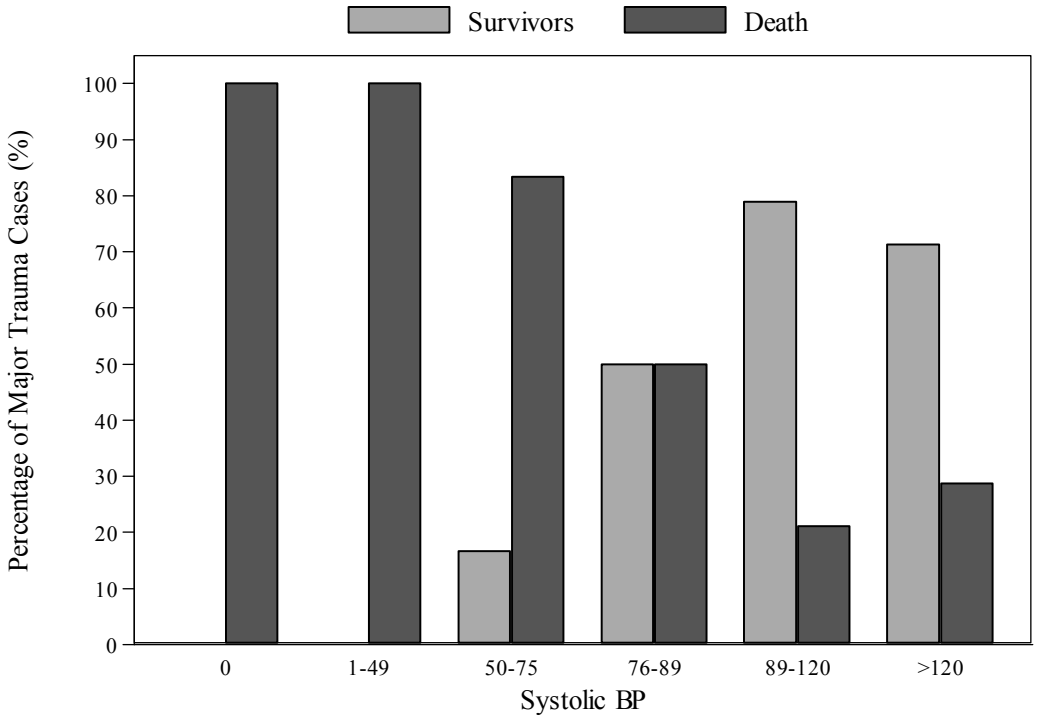


Table 4.9. Systolic BP for Major Trauma Cases by Outcome

Systolic BP	Survivors		Death		Total	
	No	%	No	%	No	%
0	0	0	3	100	3	0.77
1-49	0	0	1	100	1	0.26
50-75	1	16.67	5	83.33	6	1.53
76-89	5	50	5	50	10	2.55
89-120	90	78.95	24	21.05	114	29.08
>120	184	71.32	74	28.68	258	65.82
TOTAL	280	71.43	112	28.57	392	100

* 192 cases have no information on "Outcome"

Figure 4.10. Glasgow Coma Score (GCS) for Major Trauma Cases by Outcome

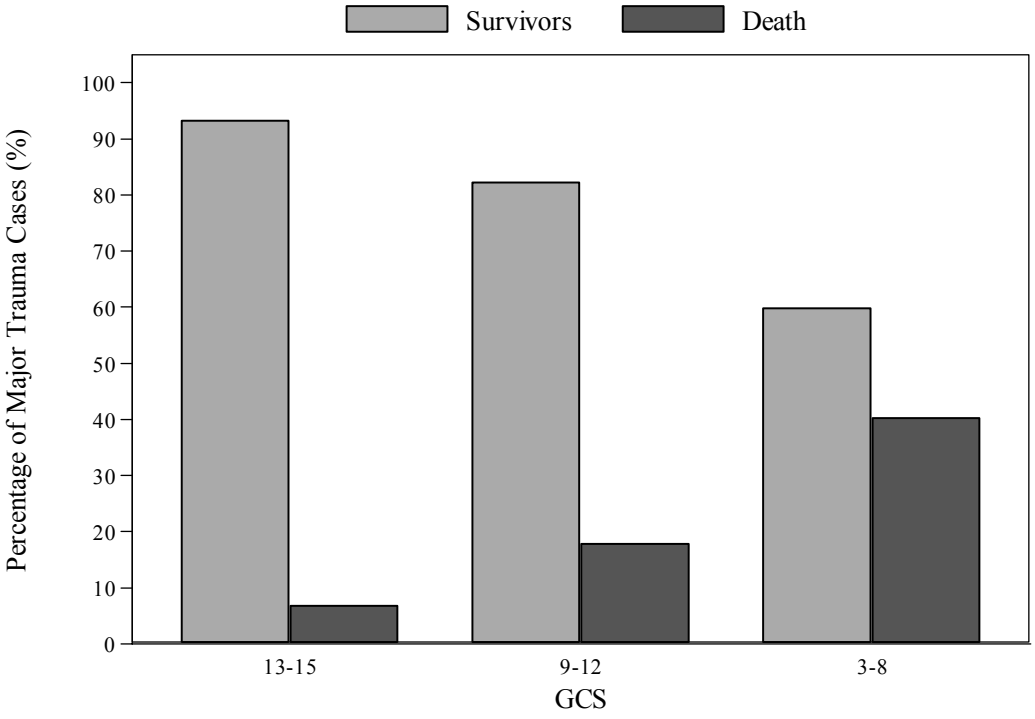


Table 4.10. Glasgow Coma Score (GCS) for Major Trauma Cases by Outcome

Glasgow Coma Score (GCS)	Survivors		Death		Total	
	No	%	No	%	No	%
13-15	69	93.24	5	6.76	74	19.07
9-12	74	82.22	16	17.78	90	23.2
3-8	134	59.82	90	40.18	224	57.73
TOTAL	277	71.39	111	28.61	388	100

*40 cases have no information on both "GCS" and "Outcome"

**44 cases have no information only on "GCS"

Figure 4.11. Revised Trauma Score (RTS) for Major Trauma Cases by Outcome

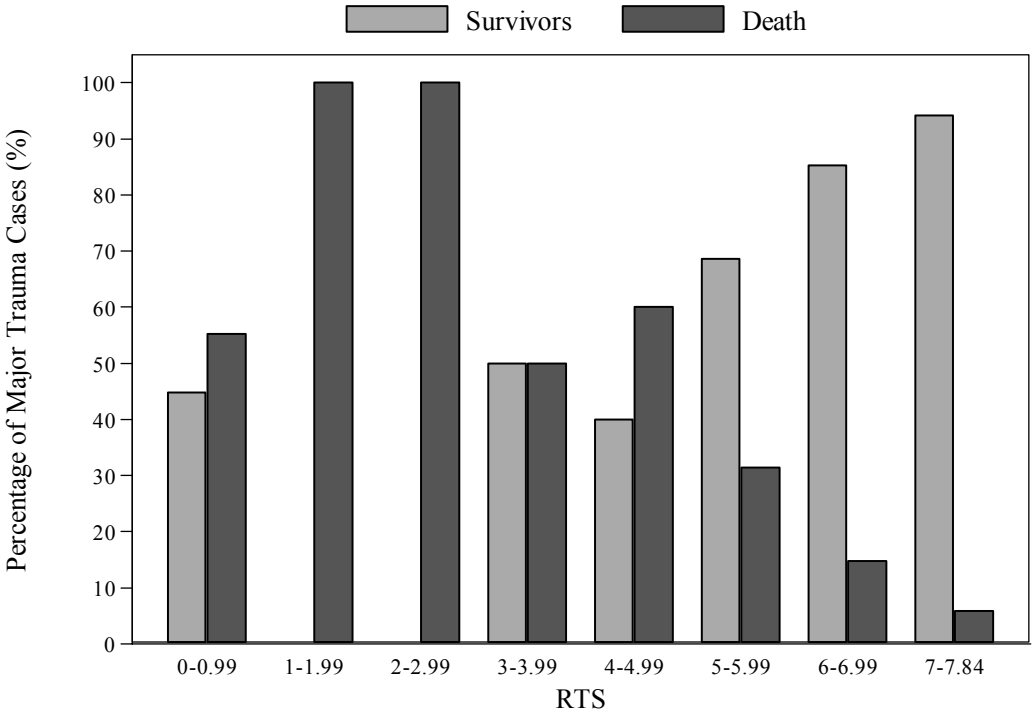


Table 4.11. Revised Trauma Score (RTS) for Major Trauma Cases by Outcome

RTS	Survivors		Death		Total	
	No	%	No	%	No	%
0-0.99	13	44.83	16	55.17	29	7.55
1-1.99	0	0	1	100	1	0.26
2-2.99	0	0	1	100	1	0.26
3-3.99	2	50	2	50	4	1.04
4-4.99	16	40	24	60	40	10.42
5-5.99	105	68.63	48	31.37	153	39.84
6-6.99	75	85.23	13	14.77	88	22.92
7-7.84	64	94.12	4	5.88	68	17.71
TOTAL	275	71.61	109	28.39	384	100

*8 cases have no information on both "RTS" and "Outcome"

**16 cases have no information only on "RTS"

Figure 4.12. Outcome with AIS ≥ 3 for Major Trauma Cases

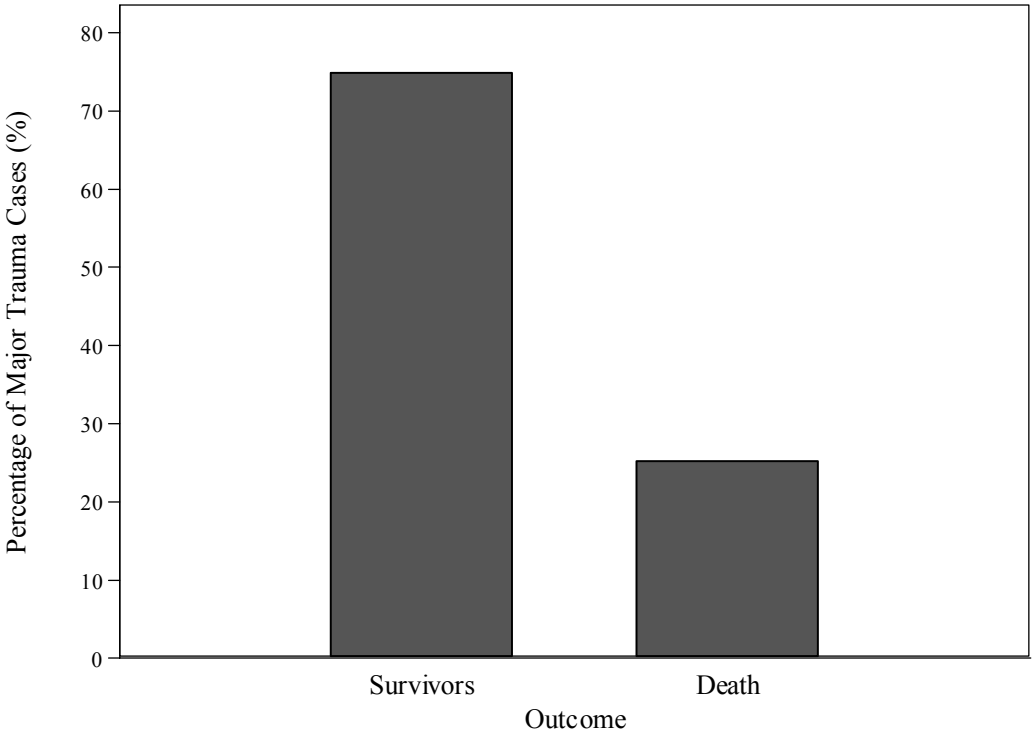


Table 4.12. Outcome with AIS ≥3 for Major Trauma Cases

Outcome	**No**	**%**
Survivors	104	74.82
Death	35	25.18
TOTAL	139	100

Figure 4.13. ISS for Major Trauma Cases by Outcome

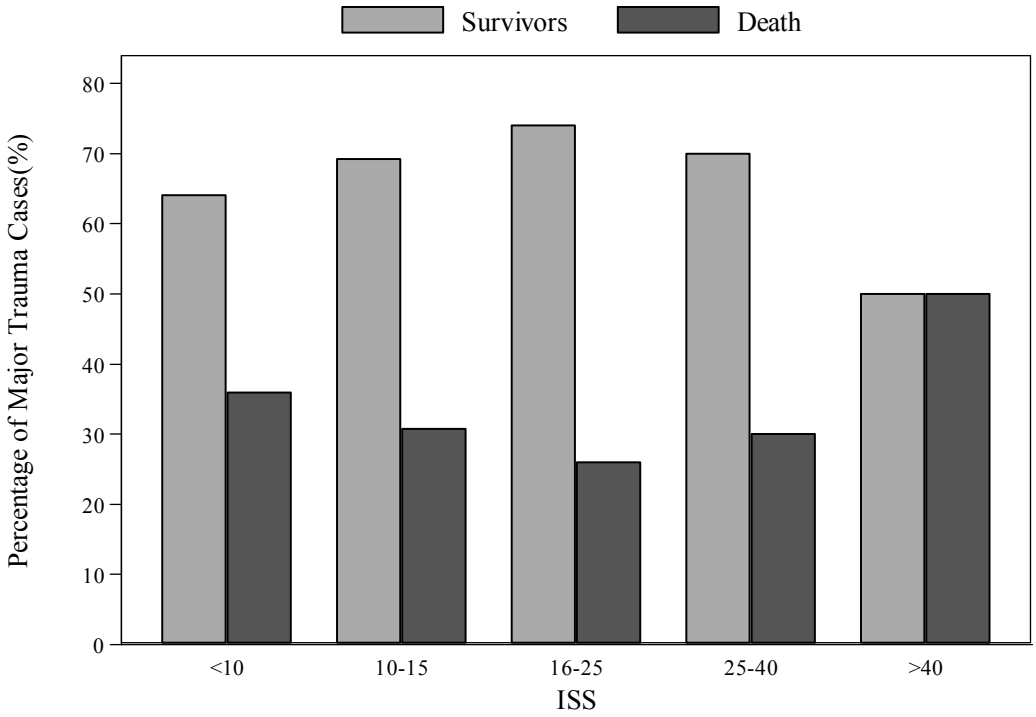


Table 4.13. ISS for Major Trauma Cases by Outcome

ISS	Survivors		Death		Total	
	No	%	No	%	No	%
<10	41	64.06	23	35.94	64	16.33
10-15	9	69.23	4	30.77	13	3.32
16-25	199	73.98	70	26.02	269	68.62
25-40	28	70	12	30	40	10.2
>40	3	50	3	50	6	1.53
TOTAL	280	71.43	112	28.57	392	100

* 192 cases have no information on "Outcome"

Figure 4.14. ICU Admissions for Major Trauma Cases by Outcome

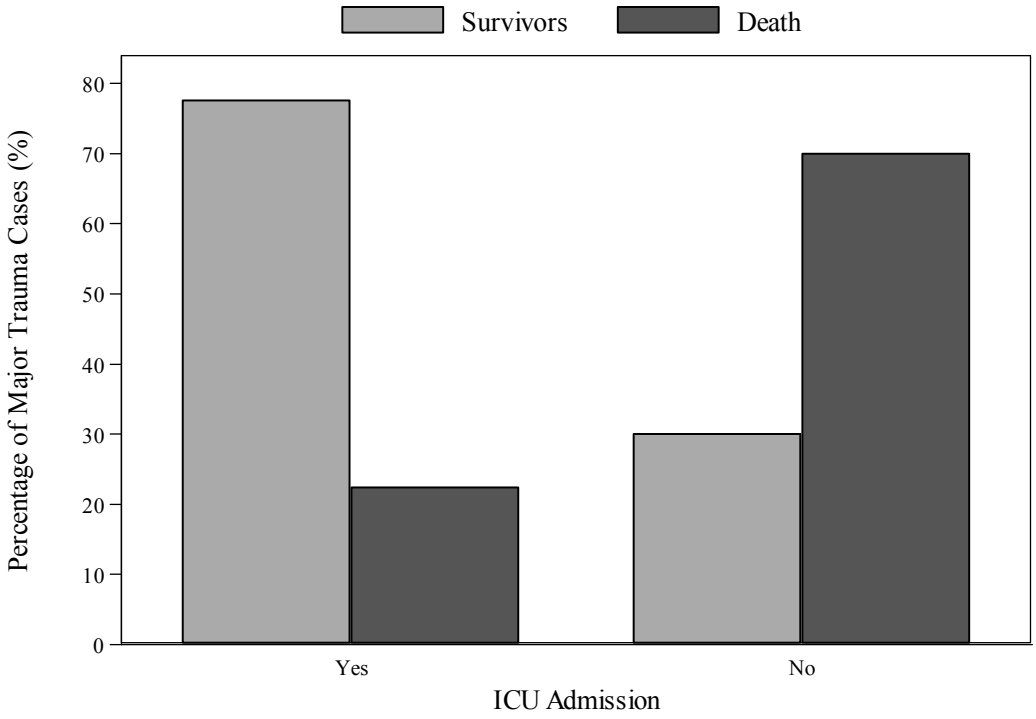


Table 4.14. ICU Admissions for Major Trauma Cases by Outcome

ICU Admissions	Survivors		Death		Total	
	No	%	No	%	No	%
Yes	114	77.55	33	22.45	147	93.63
No	3	30	7	70	10	6.37
TOTAL	117	74.52	40	25.48	157	100

Figure 4.15. TRISS for Major Trauma Cases

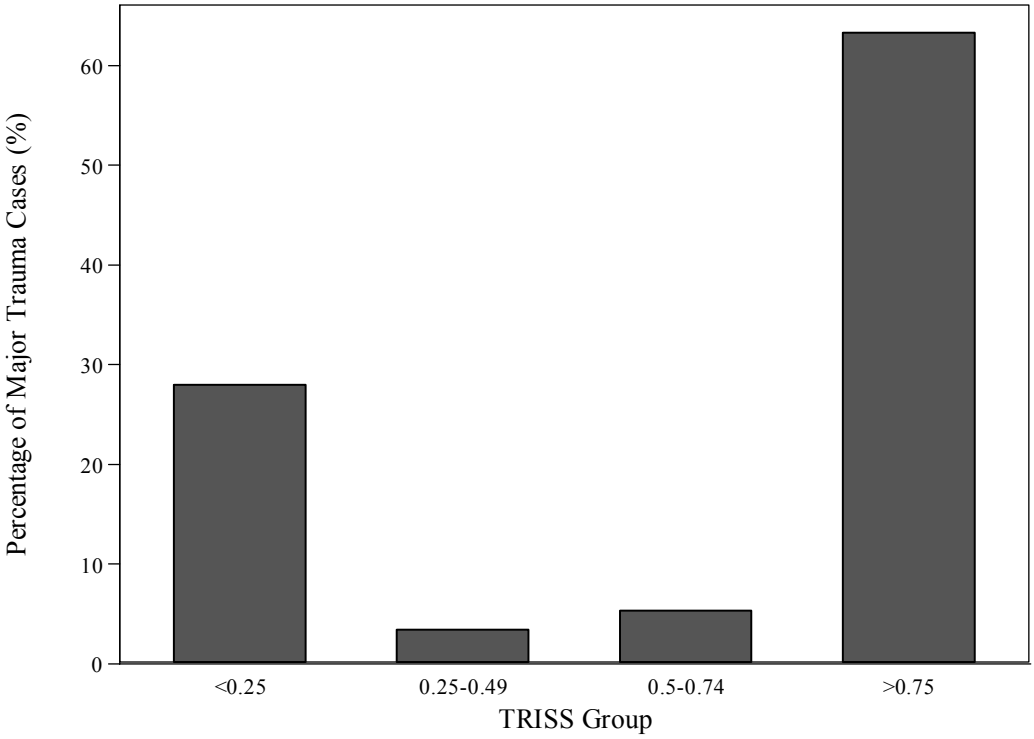


Table 4.15. TRISS Distribution for Major Trauma Cases

TRISS (Ps)	Total	
	No	%
<0.25	157	27.99
0.25-0.49	19	3.39
0.5-0.75	30	5.35
>0.75	355	63.28
TOTAL	561	100

* 23 cases have incomplete information for counting the "TRISS" probability of survival

Figure 4.16. Observed and Expected Outcome for Major Trauma Cases

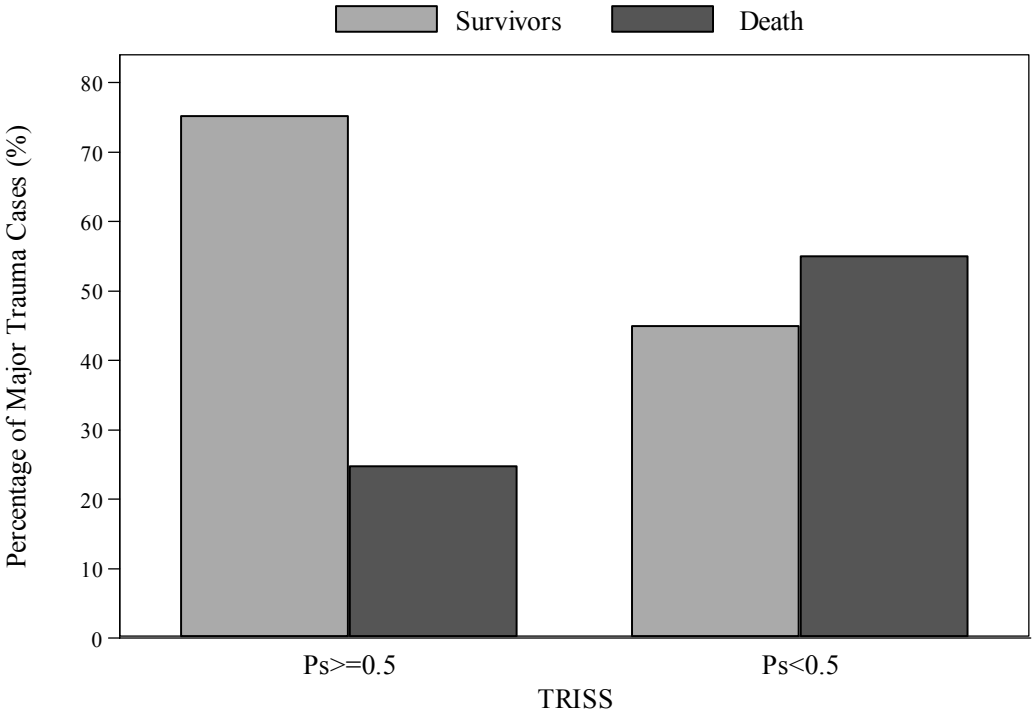


Table 4.16. Observed and Expected Outcome for Major Trauma Cases

TRISS	Survivors		Death		Total	
	No	%	No	%	No	%
Ps>=0.5	255	75.22	84	24.78	339	89.44
Ps<0.5	18	45	22	55	40	10.56
TOTAL	273	72.04	106	27.96	379	100

* 23 cases have incomplete information for counting "TRISS" probability of survival, 192 cases have no information on "Outcome" and 10 cases have no information on both "TRISS" and "Outcome"

Figure 5.1. Total Length of Hospital Stay for Major Trauma Cases by Centre

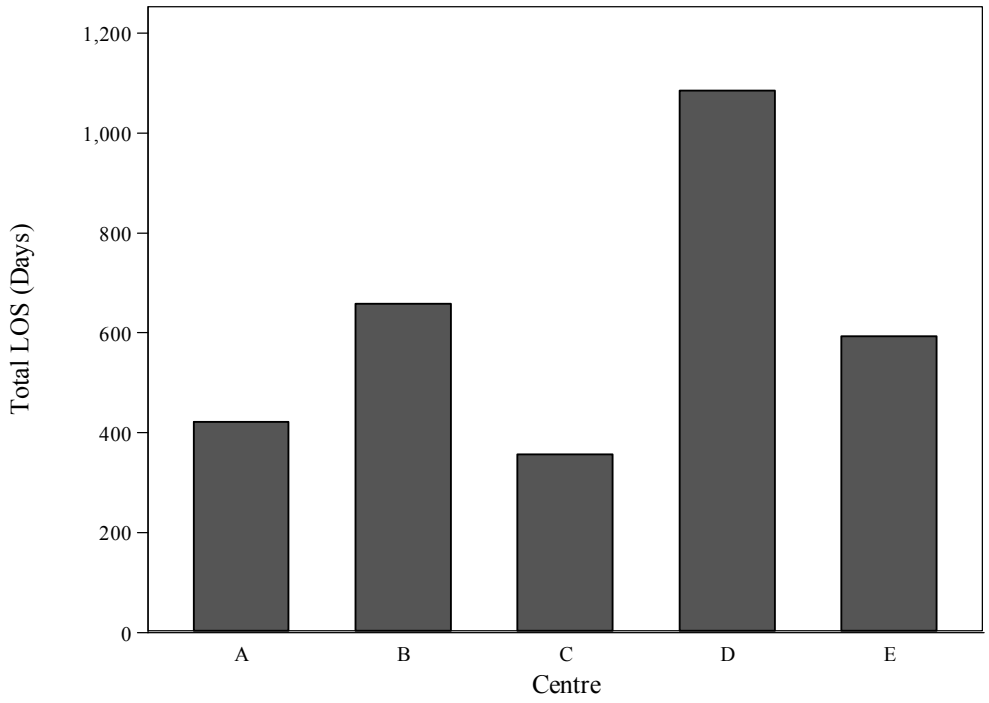


Figure 5.1a. Average Length of Hospital Stay for Major Trauma Cases by Centre

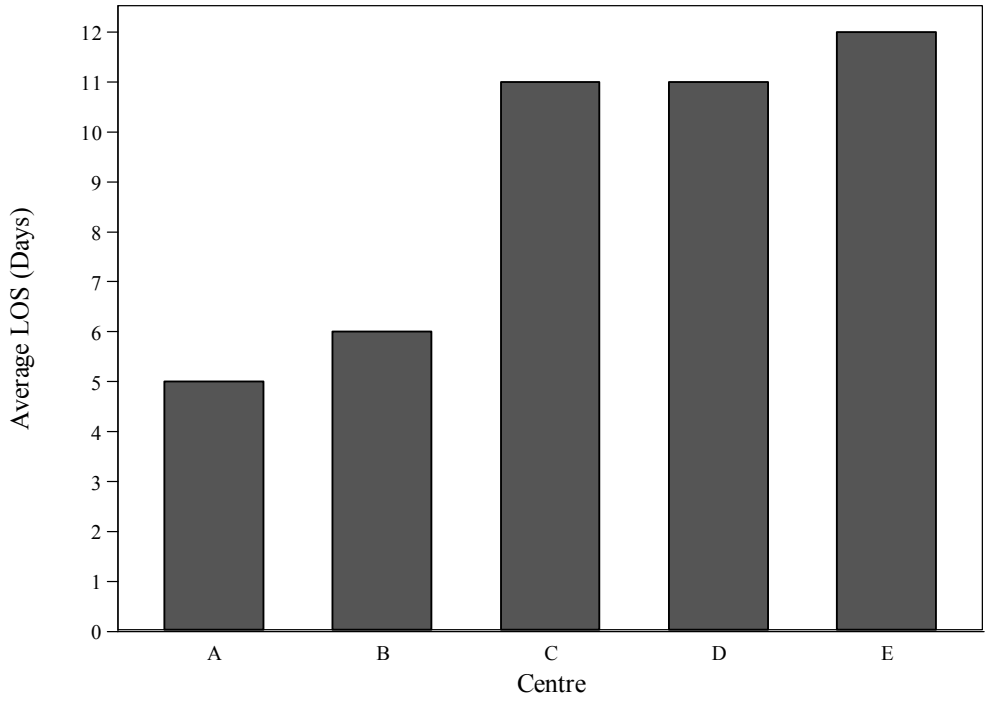


Table 5.1. Total and Average Length of Hospital Stay for Major Trauma Cases by Outcome and Centre

Centre	Total		
	No.	Total LOS	Average LOS
A	80	422	5
B	102	658	6
C	34	357	11
D	98	1085	11
E	48	593	12

Table 5.1a. Total and Average Length of Hospital Stay for Major Trauma Cases by Outcome and Centre

Centre	Survivors			Death		
	No.	Total LOS	Average LOS	No.	Total LOS	Average LOS
A	56	347	6	24	75	3
B	75	599	8	27	59	2
C	21	287	14	13	70	5
D	78	947	12	20	138	7
E	34	517	15	14	76	5

Figure 5.2. Total Length of ICU Stay for Major Trauma Cases by Centre

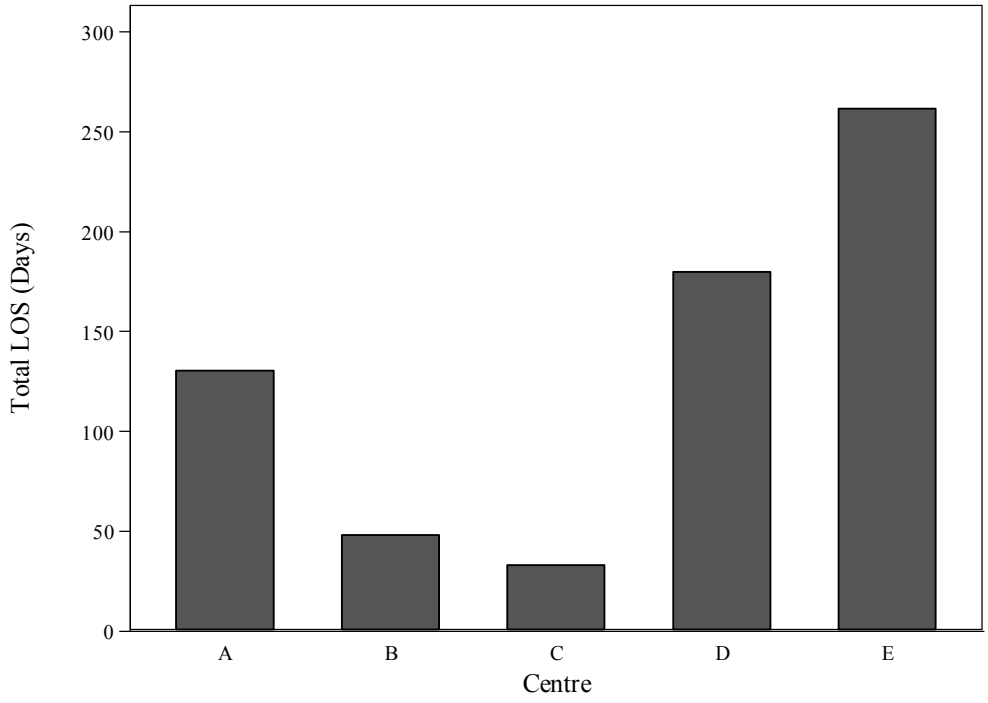


Figure 5.2a. Average Length of ICU Stay for Major Trauma Cases by Centre

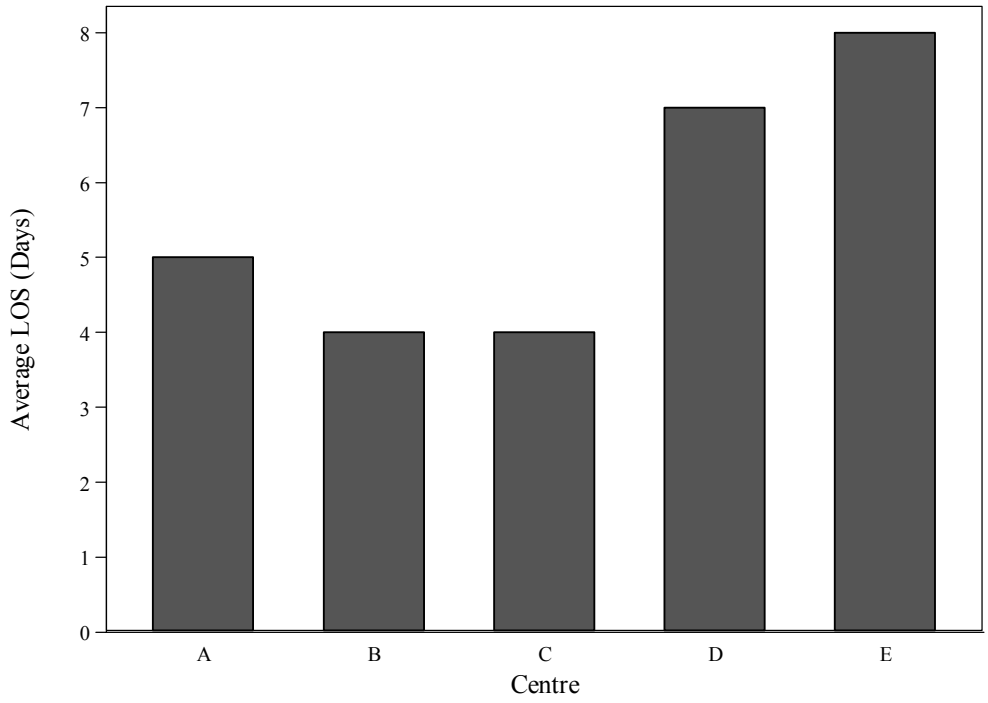


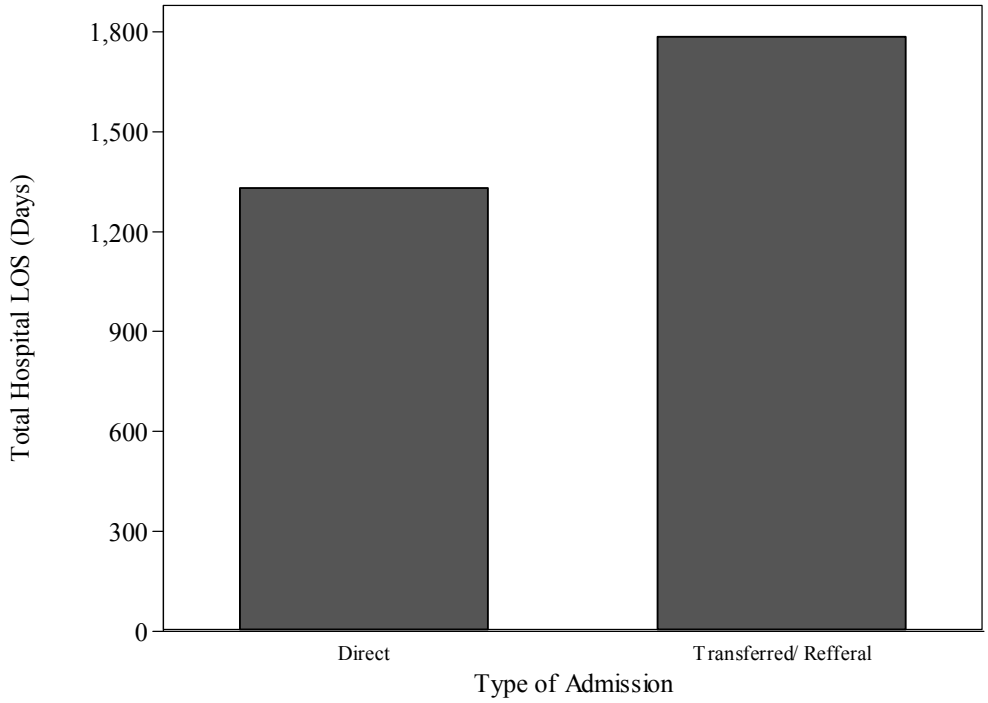
Table 5.2. Total and Average Length of ICU Stay for Major Trauma Cases by Centre

Centre	Total		
	No.	Total LOS	Average LOS
A	26	130	5
B	13	48	4
C	8	33	4
D	25	180	7
E	34	262	8

Table 5.2a. Total and Average Length of ICU Stay for Major Trauma Cases by Outcome and Centre

Centre	Survivors			Death		
	No.	Total LOS	Average LOS	No.	Total LOS	Average LOS
A	21	115	5	5	15	3
B	9	39	4	4	9	2
C	7	33	5	1	0	0
D	18	150	8	7	30	4
E	27	225	8	7	37	5

Figure 5.3. Total and Average Length of Hospital Stay for Major Trauma Cases by Admission Type



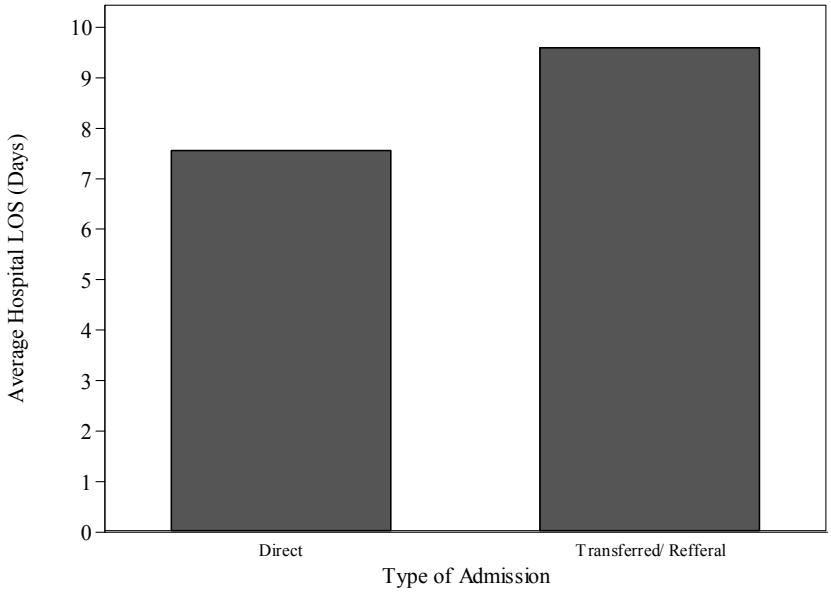


Table 5.3. Total and Average Length of Hospital Stay for Major Trauma Cases by Admission Type

Admission Type	No	LOS	
		Total	Average
Direct	176	1331	8
Transferred/Referrals	186	1784	10
TOTAL	362	3115	9

Figure 5.4. Total Length of Hospital Stay in Days for Major Trauma Cases by Cause of Injury

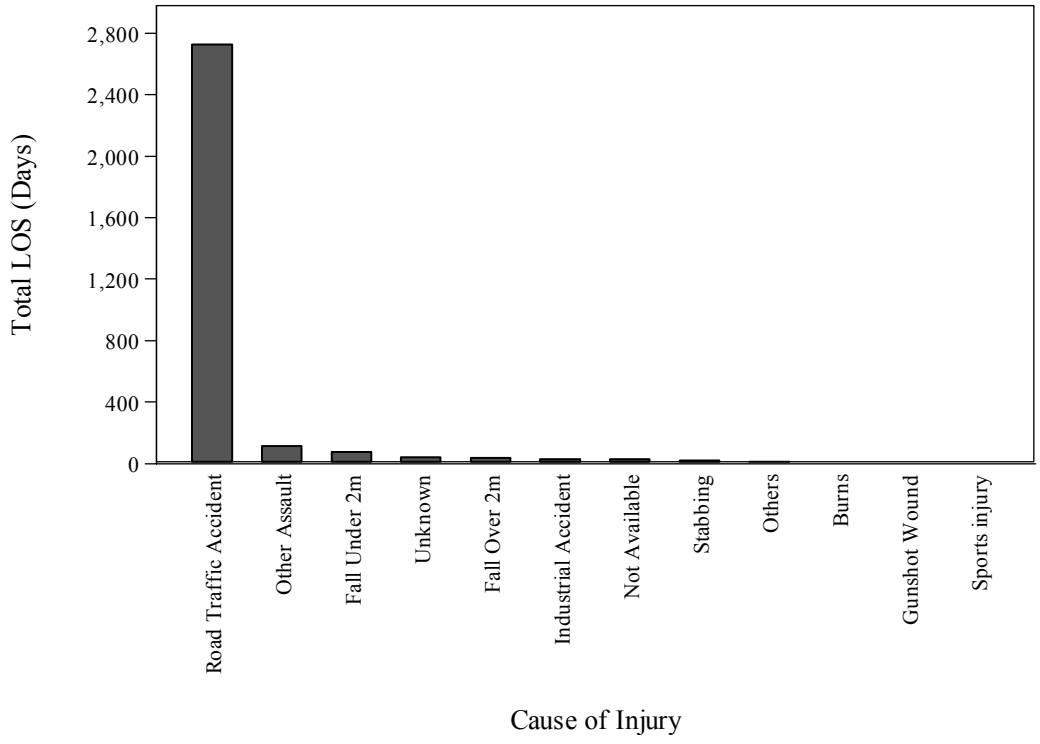


Figure 5.4a. Average Length of Hospital Stay for Major Trauma Cases by Cause of Injury

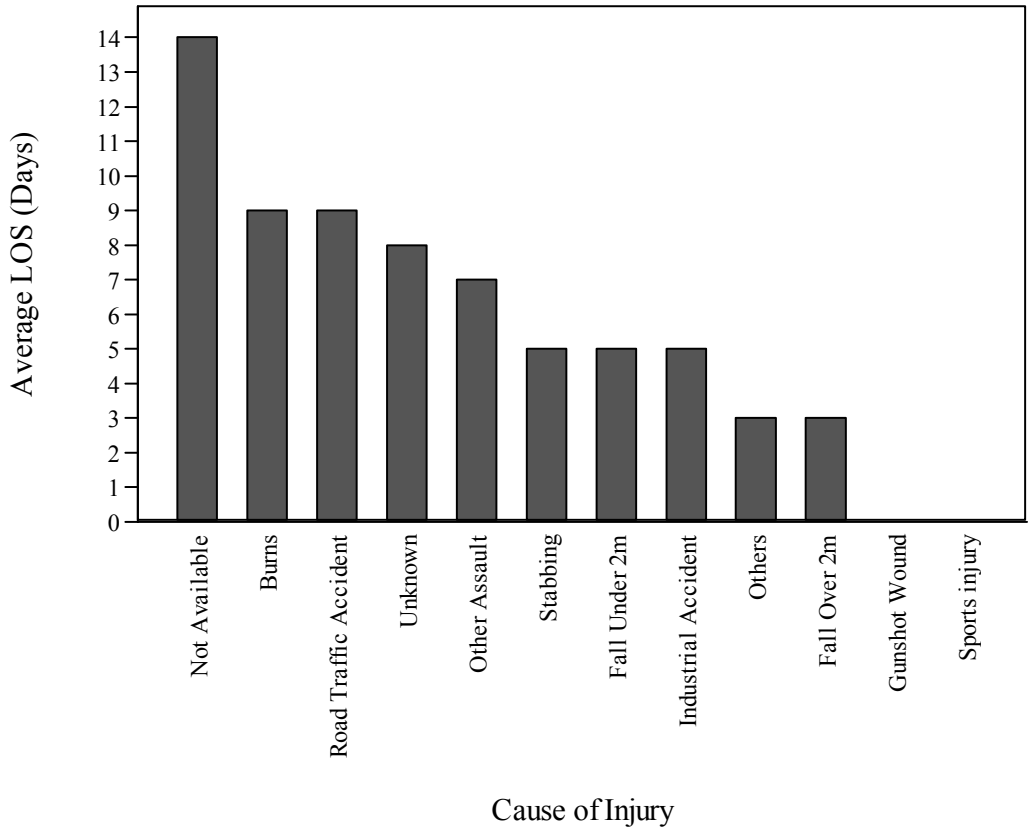


Table 5.4. Total and Average Length of Hospital Stay in Days for Major Trauma Cases by Cause of Injury

Cause of Injury	No.	Total LOS	Average LOS
Road Traffic Accident	292	2727	9
Industrial Accident	6	29	5
Fall over 2 metre	14	39	3
Fall under 2 metre (about 1 door's height)	14	75	5
Sports injury	0	0	0
Burns	1	9	9
Stabbing	4	19	5
Gunshot Wound	0	0	0
Other Assault	16	114	7
Others	4	11	3
Unknown	5	40	8
Not Available	2	28	14
TOTAL	358	3091	9

National Trauma Database (NTrD) Notification Form

Office use:

A. Reporting Centre Name:

B. Date of Notification: *(dd/mm/yy)*

SECTION 1 : PATIENT'S PARTICULARS

1. Name :

2. Identification Card Number :

MyKad / MyKid: - -

Old IC:

Other document No: (eg Birth Cert, Mother's IC)

Specify type (eg.passport, armed force ID):

3. Patient RN : ED: Neurosurgery Dept (if different from ED):

4. Age : *(Auto Calculated)* **b. Date of Birth :** *(dd/mm/yy)*

5. Gender : Male Female

6. Nationality and Ethnic Group :

- Malaysian →
  - Malay
  - Orang Asli
  - Other M'sian, specify :
  - Chinese
  - Bumiputra Sarawak
  - Indian
  - Bumiputra Sabah
- Non Malaysian → **Specify nationality:**

SECTION 2 : ADMISSION

7. Date of Admission : *(dd/mm/yy)*

8. Time of Admission : : AM / PM

9. Type of Admission :

- Direct
- Transfer / Referred from →
  - **a) Hospital Name:**
  - **b) Time of Arrival:** : AM / PM
  - **c) Hospital Type:**
    - Hospital with Specialist
    - Hospital without Specialist
    - Health clinics
    - Private Hospital
    - Private Clinic
    - Not Available

SECTION 3 : INJURY

10. Date of Injury : *(dd/mm/yy)*

11. Time of Injury : : AM / PM

12. Mechanism of Injury : Blunt (e.g. MVA) Penetrating (e.g. Stab, Gunshot wound) Burns

13. Injury Intent : *(Check one or more boxes)*

- Unintentional
- Maltreatment / Assault by partners
- Child neglect / Maltreatment
- Intentional self harm
- Intent cannot be determined
- Intent not specified

14. Cause of Injury :

- Road Traffic Accident
  - Motorcycle Rider
  - Motorcycle Pillion
  - Driver
  - Front Seat Passenger
  - Back Seat Passenger
  - Bicyclist
  - Pedestrian
  - Not Available
- Industrial Accident
- Fall over 2 metre
- Fall under 2 metre (about 1 door's height)
- Sports Injury
- Burns
- Stabbing
- Gunshot Wound
- Other Assault
- Others
- Not Known

15. Place of Injury :

- Road, Street, Highway
- Home
- Industrial / Construction Area
- School / Kindergarten / nursery
- Sports / Recreational Area
- Trade / Service area
- Residential institution
- Other specified place
- Not Available

SECTION 4 : CLINICAL DETAILS (EMERGENCY DEPARTMENT)

16. Pulse rate : *(Beats / Min)*

17. Respiratory rate : *(Breath / Min)*

18. Blood pressure : **a. Systolic :** *(mmHg)* **b. Diastolic :** *(mmHg)*

19. Temperature : *(C)*

20. Pulse Oximetry : *(%)*

21. Glasgow Coma Scale :

a. Best Eyes opening :	1	2	3	4		
b. Best Verbal Response :	1	2	3	4	5	
c. Best Motor Response :	1	2	3	4	5	6
d. Total GCS : *(Auto Calc)*						
e. Head Injury Category: *(Auto Calc)*	Mild (13-15)	Moderate (9-12)	Severe (3-8)			

22. Reviewed by : *(Check one or more boxes)*

- Emergency Physician → Medical Officer / Trainee, Specialist / Consultant
- Surgeon → Medical Officer / Trainee, Specialist / Consultant

23. Disposition from ED to : ICU OT General Ward Mortuary Other Hospital AOR

SECTION 5 : DIAGNOSIS AND OPERATIVE PROCEDURE

24. Traumatic Brain Injuries (based on ICD10):

(Check one or more boxes)

- ☐ Open wound of head →
  - ☐ Open wound of scalp
  - ☐ Multiple open wounds of head
- ☐ Fracture of skull and facial bones →
  - ☐ Fracture of vault of skull
  - ☐ Fracture of base of skull
- ☐ Intracranial Injury →
  - ☐ Concussion
  - ☐ Traumatic cerebral oedema
  - ☐ Diffuse brain injury
  - ☐ Focal brain injury
  - ☐ Epidural haemorrhage
  - ☐ Traumatic subdural haemorrhage
  - ☐ Traumatic subarachnoid haemorrhage
  - ☐ Intracranial injury with prolonged coma
  - ☐ Other intracranial injuries
  - ☐ Intracranial injury, unspecified
- ☐ Others, specify: _____

25. Operative Management: ◯ Yes (if Yes, please fill up below) ◯ No (If No, please proceed to Section 6 directly)

26. Date of Operation : _____ *(dd/mm/yy)*

27. Time of Operation : **Start** _____ : _____ AM / PM

28. Duration Time to Operation : (Time of Admission to Start of Surgery) *(Auto Calc)*

29. Operative Procedure :

(Check one or more boxes)

- ☐ Intracranial →
  - ☐ Evacuation of hematoma
  - ☐ Decompressive craniectomy
  - ☐ External ventricular drain
  - ☐ ICP (Intra cranial pressure) monitoring
  - ☐ Elevation of depressed skull fracture
  - ☐ Others, specify: _____
- ☐ Intrathoracic
- ☐ Intra-abdominal
- ☐ Spinal surgery
- ☐ Pelvic fixation
- ☐ Others, specify: _____

SECTION 6 : IN-HOSPITAL OUTCOME

30. Length of Stay in ICU: ◯ < 24 hrs: _____ *hrs* ◯ ≥ 24 hrs: _____ *day*

31. Length of Stay in Hospital: _____ *day*

32. Discharge Date : _____ *(dd/mm/yy)*

33. Patient's Outcome at Discharge:

a. Alive ◯

Glasgow Outcome Score at Discharge:	*(Auto Calc)*
1 - Dead	◯
2 - Persistent Vegetative	◯
3 - Severe Disability	◯
4 - Moderate Disability	◯
5 - Well	◯

Disposition

- ◯ **Discharge Home**
- ◯ **Discharge to Referring Hospital**
  - **Name of Hospital:** _____
- ◯ **Discharge to Other Hospital**
  - **Name of Hospital:** _____
- ◯ **Discharge Against Medical Advice**

b. Death ◯

Name :	

SECTION 7 : INJURY SEVERITY SCORE

34. Injuries and Injury Severity Score	
BODY REGION	**INJURIES**
Head & Neck	**1.**
	2.
	3.
	4.
	5.
	6.
	7.
Face	**1.**
	2.
	3.
	4.
	5.
	6.
	7.
Thorax	**1.**
	2.
	3.
	4.
	5.
	6.
	7.
Abdomen / Pelvic content	**1.**
	2.
	3.
	4.
	5.
	6.
	7.
Extremitis / Pelvic girdle	**1.**
	2.
	3.
	4.
	5.
	6.
	7.
External	**1.**
	2.
	3.
	4.
	5.
	6.
	7.

35. Total ISS :	*(Auto Calc)*
36. Revised Trauma Score :	*(Auto Calc)*
37. Please check (√) if patient has one or more criteria:	☐ Patient who died from their injuries after admission ☐ Patients with injury severity score (ISS) of >15 ☐ Patients admitted to ICU or high dependency area for >24 hours and mechanically ventilated ☐ Urgent surgery (within 24hours) for intracranial, intrathoracic, intraabdominal or fixation for pelvic or spinal injuries.

Sponsors:

EMERGENCY MEDICAL AND TRAUMA SERVICES,
MINISTRY OF HEALTH

SURGERY SERVICES,
MINISTRY OF HEALTH

NEUROSURGERY SERVICES,
MINISTRY OF HEALTH

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