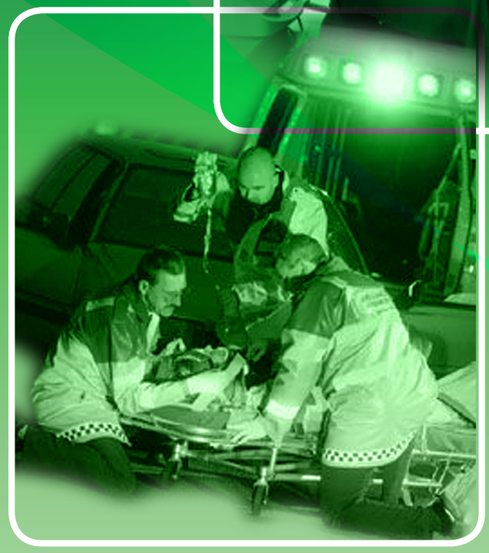
National Trauma Database

January 2009 to December 2009
Fourth Report



National Trauma Database
improving trauma care

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National Trauma Database

Ministry of Health Malaysia

NATIONAL TRAUMA DATABASE JANUARY 2009 TO DECEMBER 2009 FOURTH REPORT

Edited by

Sabariah Faizah Jamaluddin
Mahathar Abd Wahab
Mohd Yusof Abdul Wahab
Yeoh Tze Ming
Ismail Mohd Saiboon

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Hospital Sungai Buloh
Jalan Hospital
47000 Sungai Buloh
Selangor Darul Ehsan
Malaysia

Tel : 603-6145 4333 (ext:5231)
Fax : 603-6157 2727
Email : ntrd@acrm.org.my
Website : http://www.acrm.org.my/ntrd

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Electronic version
The electronic version of this report can be downloaded at http://www.acrm.org.my/ntrd

ACKNOWLEDGEMENTS

The National Trauma Database Committee would like to thank all those who have participated and contributed to our fourth report, from January 2009 to December 2009.

We would like to extend our special thanks to the following:

1. All centre coordinators, doctors, medical assistants and staff nurses from the Emergency Departments of the participating hospitals. Their commitment and timely data collection and submission helped smooth the progression of the project.

2. The Clinical Research Centre for its continuous support and guidance.

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

INTRODUCTION

The National Trauma Database 2009 – Fourth Report provides a descriptive analysis of patients with major trauma who were admitted and referred to eight participating hospitals in Malaysia. The data source for this report is derived from the National Trauma Database (NTrD). A major trauma patient is defined as patient with one of the following criteria:

i. Patient who died from injuries after admission.
ii. Patient with Injury Severity Score (ISS) of >(more than) 15
iii. Patient admitted to Intensive Care Units (ICUs) or High Dependency Wards (HDWs) for > (more than) 24 hours and who were mechanically ventilated.
iv. Urgent surgery within 24 hours for intracranial, intrathoracic, intraabdominal, or fixation for pelvic or spinal injuries
v. All severe head injury patient rated 3-8 on the Glasgow Coma Scale (GCS)

The report is presented in five Chapters:

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

Chapter 2 assesses the patient's details of injury, such as injury mechanism, injury intent, injury cause, injury place, 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).

Chapter 3 presents the procedures and operative management that were carried out on patients.

Chapter 4 provides information on the outcome of the patients, which is then categorized according to age group, injury mechanism, injury cause, injury places, cause and place of injury, admission types, systolic BP, GCS, RTS, AIS, ISS, and ICU admission.

The Trauma Injury Severity Score (TRISS) methodology is also used to determine the probability of survival based on the ISS, RTS, mechanism of injury and patient's age.

Chapter 5 shows the total length of stay in hospitals and ICUs.

The limitations of the study are:

i. Under reporting - The reported data were less than the actual number of cases.
ii. Missing data - Missing values excluded from the analysis may cause the sample size to be smaller than expected.

About NTrD

The National Trauma Database (NTrD) is a service initiated and supported by the Ministry of Health (MOH) to collect information on Malaysia's major trauma incidences and its risk factors, and management. Such information is of vital value for the MOH, non-governmental organizations, private healthcare providers and other interested parties to implement strategies to strengthen and improve trauma care in the country.

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

i. Emergency Medical and Trauma Services
ii. Surgical Services
iii. Clinical Research Centre

The objectives of the NTrD are to:

1. Determine the frequency, mechanisms of injury and distribution of major trauma in Malaysia. The statistic and data will be of importance in determining the resources utilization in the management of major trauma.

2. Determine the outcome and probability of survival of trauma patients.

3. Evaluate major trauma management practices in the participating hospitals and design better guidelines for improved trauma care.

4. Determine the effectiveness and impact after introduction of improved practices.

5. Stimulate and facilitate research on major trauma and its management.

Initially the key data sources identified for this database were all Emergency Physicians and surgeons working in the MOH hospitals. We later expanded to include those beyond MOH (private and university hospitals, private organization and the Armed Forces) for data on Major Trauma and Head Injury patients in the country.

METHOD OF DATA COLLECTION

Coverage

The NTrD is a multi-centre study with eight MOH hospitals as source data provider (SDP) in year 2009. The number of centres has from five centres in previous reports from May 2006 to December 2008.

Registration method

The participation of Source Data Providers (SDPs) was entirely voluntary.

A standardized Case Report Form (CRF) was used for 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 data were then uploaded onto the NTrD, a custom designed and secure web based application. The data transferred to NTrD was kept strictly confidential with access only to authorized individuals involved in the NTrD. Two level user authentications were practiced, that is in addition to the login ID and password, user were required to enter the authentication code sent as a text message to their personal mobile phone before they are able to access the web application. Access is controlled according to the role of the user. Data is then analyzed, interpreted and presented in reports and disseminated to the users.

Statistical analysis

Descriptive analysis was conducted on all the variables. All data were described in percentages except for continuous data such as length of stay (LOS). Missing data was excluded and the analysis was confined to complete data. The TRISS methodology was used to determine the probability of survival which incorporates ISS, RTS, mechanisms of injury and the patient's age.

MEMBERS OF THE STEERING COMMITTEE OF THE NTrD

1.	Dr Sabariah Faizah Jamaluddin (Chairman)	Head of Department Emergency and Trauma Department, Hospital Sungai Buloh
2.	Dr Goh Pik Pin	Director Clinical Research Centre, Ministry of Health
3.	Dr Fatahul Laham Bin Mohamed	Head of Department Emergency and Trauma Department, Hospital Sultanah Bahiyah
4.	Dr Jamaiyah Haniff	Head of Clinical Epidemiology Unit, Clinical Research Centre
5.	Dr Mahathar Bin Abdul Wahab	Emergency Physician Emergency Department, Kuala Lumpur Hospital

SUPPORTING STAFF OF THE NTrD

	Role	**Team member**
1.	Clinical Registry Manager	Mr Mohd Fadhleen Bin Dom (October 2007 - July 2009) Ms Lithnes Kalaivani Palniandy (July 2009 – November 2010) Ms Dan Siew Peng (December 2010- April 2011)
2.	Clinical Data Manager	Ms Teo Jau Shya
3.	Medical Reviewer	Ms Anne John Michael
4.	Clinical Epidemiologist	Dr Jamaiyah Bte Haniff
5.	Clinical Economist	Dr Shanti Varatharajan
6.	Biostatistician	Ms Lena Yeap Ms Yeong Lai Chee
7.	Web Application Developer	Mrs Sayani Bte Sabran
8.	Desktop Publisher	Mrs Azizah Bte Alimat
9.	Database Admin	Ms Lim Jie Ying
10.	Network Admin/ Engineer	Mr Adlan Bin Abdul Rahman

LIST OF PARTICIPATING CENTRES

1. **Selayang Hospital**

Department	: Emergency and Trauma
Head of Department	: Dr Mohamed Alwi Bin Haji Abdul Rahman
Coordinator	: Dr Ahmad Fadzil Bin Sujak
Members	: MA Hushaimi Bin Husin
	SN Aisah Bte Ibos

2. **Kuala Lumpur Hospital**

Department	: Emergency and Trauma
Head of Department	: Dato Dr Abu Hassan Asaari Bin Abdullah
Coordinator	: Dr Mahathar Bin Ab Wahab
Members	: MA Mohamad Aiyri Harizat Abdul Rahim
	MA Mudzaffar Shah Bin Abdul Ghaffar

3. **Sultanah Bahiyah Hospital**

Department	: Emergency and Trauma
Head of Department	: Dr Fatahul Laham Bin Mohamed
Members	: Dr Zaidah Bte M. Arif
	MA Mohd Yusof Mamat
	MA M.Sani Abdullah

4. **Pulau Pinang Hospital**

Department	: Emergency and Trauma
Head of Department	: Dr Teo Aik Howe
Members	: MA Raj Kumar a/l Paramasiven

5. **Sultanah Aminah Hospital**

Department	: Emergency and Trauma
Head of Department	: Dr Md Saed Bin Mian
Members	: MA Raschidi Bin Abdul Karim
	: MA Radzman Bin Che Rus
	: MA Ahmad Salimi Bin Mohd Noor
	: MA Norzamzuri Bin Zakaria

6. **Sungai Buloh Hospital**

Department	: Emergency and Trauma
Head of Department	: Dr Sabariah Faizah Jamaluddin
Members	: MA Mazlan Bin Zakariya
	: SN Asmalida Bte Md Emran

7. **Tengku Ampuan Rahimah Hospital**

Department	: Emergency and Trauma
Head of Department	: Dr Ahmad Tajuddin Bin Mohamad Noor
Coordinator	: Dr Ranjini Sivaganabalan
Members	: SN Marykutty Mathews
	: SN Megala a/p Soomoo

8. **Hospital Ampang**

Department	: Emergency and Trauma
Head of Department	: Dr. Ridzuan Bin Dato' Mohd Isa
Members	: MA Mohd Fadhillah
	: SN Nursyulizahana

ABBREVIATIONS

AIS	Abbreviated Injury Scale
ALOS	Average Length of Stay
BP	Blood Pressure
CRC	Clinical Research Centre
CRF	Case Report Form
ED	Emergency Department
GCS	Glasgow Coma Score
HDW	High Dependency Ward
ICU	Intensive Care Unit
ISS	Injury Severity Score
LOS	Length of Stay
MOH	Ministry of Health
NTrD	National Trauma Database
OP	Operation Procedure
OT	Operating Theatre
Ps	Probability of Survival
RTA	Road Traffic Accident
RTS	Revised Trauma Score
SDP	Source Data Provider
TRISS	Trauma Injury Severity Score

GLOSSARY

Disease Register	The on-going systemic collection, analysis and interpretation of specific disease data essential to the planning, implementation and evaluation of clinical and public health practices, 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 a SDP reporting data on registrable patients to the registry.
Source Data Providers	The individuals or institutions that report the required data to the registry.
Sponsors	The individuals or institutions that own the registry.
Expert Panel	Individuals who are subject matter experts i.e. Emergency Physicians and surgeons. 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 guide for future development. They ensure that the database has a sound technical and scientific basis.

EDITORIAL TEAM

CHIEF EDITOR: Dr Sabariah Faizah Jamaluddin	Head Emergency and Trauma Department, Sungai Buloh Hospital
Dr Mahathar Bin Abd Wahab	Emergency Physician Emergency and Trauma Department Kuala Lumpur Hospital
Dato Dr Mohd Yusof Bin Abdul Wahab	Consultant General Surgeon Department of Surgery Tengku Ampuan Rahimah Hospital
Assoc Prof Dr Ismail Bin Mohd Saiboon	Emergency and Orthopaedic Surgeon Emergency Medicine Department University Kebangsaan Malaysia Medical Centre
MEMBERS OF THE NTrD TEAM	
Ms Dan Siew Peng	NTrD Registry Manager
Dr Lee Kun Yun	CRC Hospital Sungai Buloh

EXPERT PANEL ON REPORT WRITING

Dr Sabariah Faizah Jamaluddin	Head Emergency and Trauma Department, Sungai Buloh Hospital
Dr Mahathar Bin Abd Wahab	Emergency Physician Emergency and Trauma Department Kuala Lumpur Hospital
Dato Dr Mohd Yusof Bin Abdul Wahab	Consultant General Surgeon Department of Surgery Tengku Ampuan Rahimah Hospital
Mr Yeoh Tze Ming	General Surgeon Department of Surgery Tengku Ampuan Rahimah Hospital
Assoc Prof Dr Ismail Bin Mohd Saiboon	Emergency and Orthopaedic Surgeon Emergency Medicine Department University Kebangsaan Malaysia Medical Centre

CONTENTS

CHAPTER 1: DEMOGRAPHICS

There were a total of 166,768 trauma patients admitted to the Emergency Department from eight participating centres in 2009. Major trauma patients constituted 1.2% (2061/166,768) of all trauma admissions. Centre E reported the highest number of major trauma cases; making up one third of total cases (30.9%).

Males were about 6.5 times more likely than the females to sustain major trauma. (male 86.6% versus female 13.4%). The younger age group (15-34 years: 56.6%) was at the highest risk of major trauma. From the 2061 cases of major trauma, 52.9% involved Malays and 12.9% involved foreigners.

Most of the major trauma patients attended the emergency department (ED) between 1801-2400 hours (31.3%). There were similar rates of admission on all days except for Sundays, which was slightly busier.

More than half (51.8%) of the cases were referred/transferred from other medical facilities with Centre F receiving the highest number of referred cases (72.1%). By contract, all cases from Centre A were direct admissions. Most of the referred cases were from hospitals with specialist (46.5%) and without specialist (45.4%), while only a handful of the cases were referred from private clinics (0.9%).

CHAPTER 2: INJURY DETAILS

The majority of the injuries were from blunt trauma (96.3%). A high percentage of the injuries were unintentional (91.2%) with most of the cases due to road traffic accidents (76.8%). Motorcyclists (66.0%) were at the highest risk of road traffic accidents. Injuries from home accounted for 6.8% of total cases while 5.0% of the injuries occured at industrial/construction areas.

Emergency physician and surgical field specialists reviewed 19.9% and 11.2% of the cases respectively at the Emergency Department. About 25.9% of the cases were sent directly to the general ward, another 23.0% of the cases were sent directly to the operating theatre (OT) from ED and 21.0% of the cases were admitted to ICU from ED.

During hospital admission, 56.8% of the patients received ICU care. Centre E (68.0%) reported the highest number of patients admitted to ICU while Centre H only sent 4 (16.7%) major trauma patients to ICU in 2009.

About 61.6% of the major trauma cases had systolic blood pressure higher than 120mmHg on admission to ED and 6.1% of the cases had systolic blood pressure of less than 90mmHg. About half (49.8%) of the major trauma cases had a Glasgow Coma Scale (GCS) score of 3-8. More than half of the major trauma cases had an Abbreviated Injury Score (AIS) of ≥3. One in every five major trauma patients had a low Revised Trauma Score (RTS) of less than 5.0. Majority of the cases had an Injury Severity Score (ISS) of between 16 and 25 (64.8%) and about 1.6% had an ISS > 40. Most of the major trauma patients had injuries to the head and neck (85.4%) followed by extremities/pelvic girdle (34.3%).

CHAPTER 3: OPERATIVE MANAGEMENT

In 2009, endotracheal intubation was performed on 64.8% of patients. CT Scan was done on 71% of patients. Majority of the CTs performed on major trauma patients was for CT Brain (92.5%), followed by cervical spine CTs (42.5%). Ultrasound/FAST was carried out in 29.5% of the cases. Chest tube was inserted in 7.1% of major trauma patients in the emergency department.

Half (51.33%) of the major trauma patients underwent surgery; the common reason was for intra-cranial injuries (63.6%). Surgery for intra-abdominal injuries was the second most common (16.92%), followed by pelvic fixation (1.61%).

CHAPTER 4: OUTCOME

The survival rate for major trauma cases was 72.1 % of the 2059 cases documented in 2009. This ranged from 60.9% to 83.5 % for individual centres; Centre B had the highest percentage of survival. Centre H had the highest mortality rate at 39.1%.

Of those who survived, majority (65.9%) were discharged home. Others were transferred back to the referring hospital (18.8%), transferred to other hospitals (11.2%) or discharged against medical advice (4.0%).

The survival rates among those younger than 55 years old were higher (ranging between 64.7 % and 93.6 %). The elderly, aged more than 65 years old, had lower survival rates ranging from 52.8 % to 22.2%.

For major trauma cases involving road traffic accidents, the highest number of survivors was those who were front seat passenger (83.3%), followed by back seat passengers (76.2%), motorcycle pillion riders (76.0 %), car drivers (72.6%), motorcycle riders (71.6%), and bicyclist (70.6%). Pedestrians had the highest percentage of deaths (33.6%).

There were more survivors among patients who were transferred (75.7%) compared with those who were admitted directly (68.2%).

Patients who had a systolic blood pressure (SBP) of more than 89mmHg on arrival had a higher survival rate (>74.0%) compared with those who presented with SBP of less than 76mmHg. The survival rate was higher in those with Glasgow Coma Scale (GCS) of 13-15 (88.0 %) and 9-12 (83.4 %). The survival rate for patients with GCS 3-8 was only 57.8 %.

Patients who had a Revised Trauma Score (RTS) of more than 5 had a much better outcome, with a survival rate of more than 65.0 %. Similarly, for those who had an Abbreviated Injury Scale (AIS) of more than or equal to 3, survival rate was 74.0 %. Patients' who had Injury Severity Score (ISS) of more than 40, 57.6% survived. Patients' who had ISS 25-40, 71.8% survived; ISS 16-25, 76.9% survived.

Most death occurred in patients with ISS > 40 (42.4%) and those with ISS <10 (43.7%). The mortality rate for those who admitted to Intensive Care Unit (ICU) was 27.1%.

Trauma Injury Severity Score (TRISS) determines the probability of survival (Ps) of a patient and is calculated based on RTS, ISS, age and type of injury (blunt or penetrating). Of the major trauma patients who were expected to survive ($Ps \geq 0.5$), 25.0% died. However, 30.5% of patients who were expected to succumb to injury (based on TRISS calculation) survived.

CHAPTER 5: LENGTH OF STAY

The average length-of-stay (ALOS) for major trauma patients from the eight participating hospitals in 2009 ranged from 3 to 18 days. Two centres recorded ALOS of 7 or less days while the other 6 centres recorded ALOS of between 8 to 18 days.

Out of the 2056 cases recorded, 72.0% of patients survived and the other 28.0 % succumbed to their injuries. Among those who survived, the ALOS was between 5 and 22 days while the ALOS for those who died were between 0 and 8 days. The ALOS for patients admitted in ICU and survived was between 5 and 11 days.

Burn injuries had the longest ALOS (9 days) followed by road traffic accidents and industrial accidents (each at 11 days). Those who presented directly to the hospitals had the same ALOS of 11 days as those who were transferred from other facilities.

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Chapter 1 Demographics

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Chapter 3 Operative Management

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Chapter 5 Length of Stay

Chapter 1: Demographic

Figure 1.1. Total Number of Trauma Admission at Emergency Department by Centre

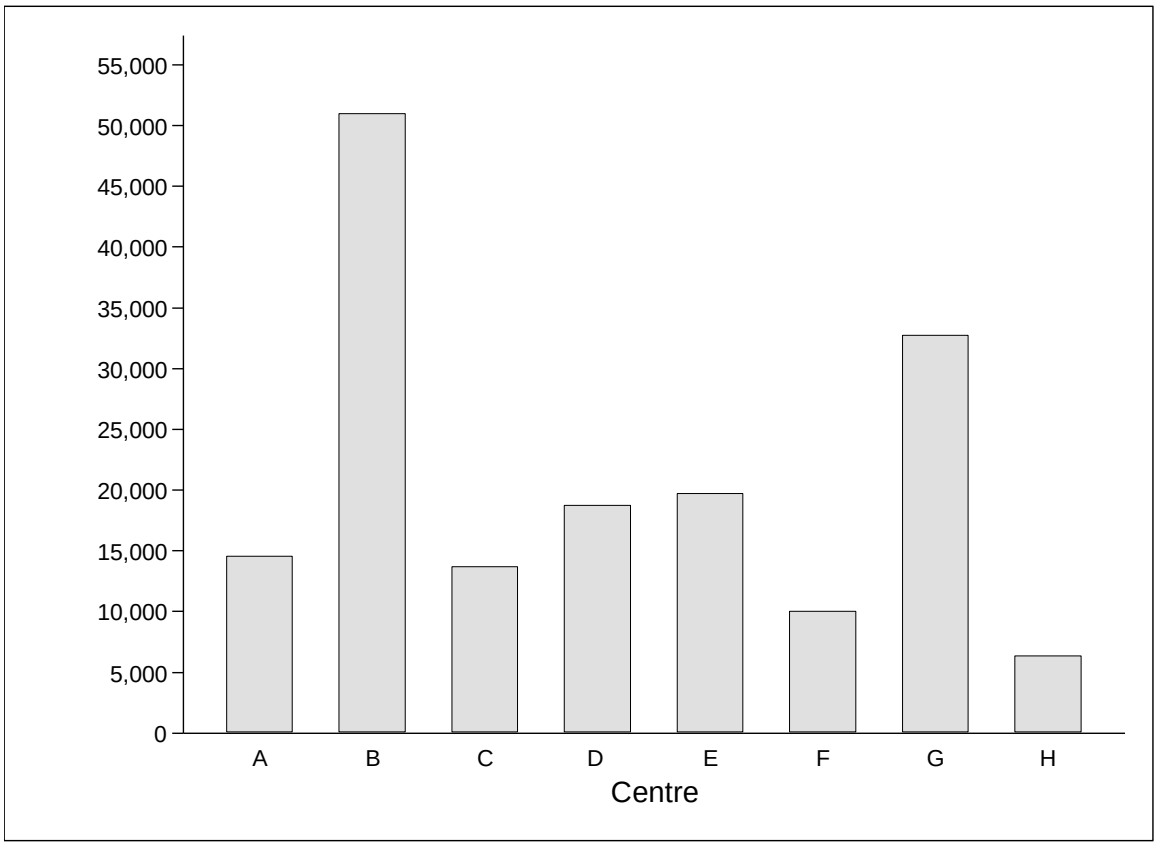

Figure 1.1a. Total Trauma Emergency Department Admissions by Centre

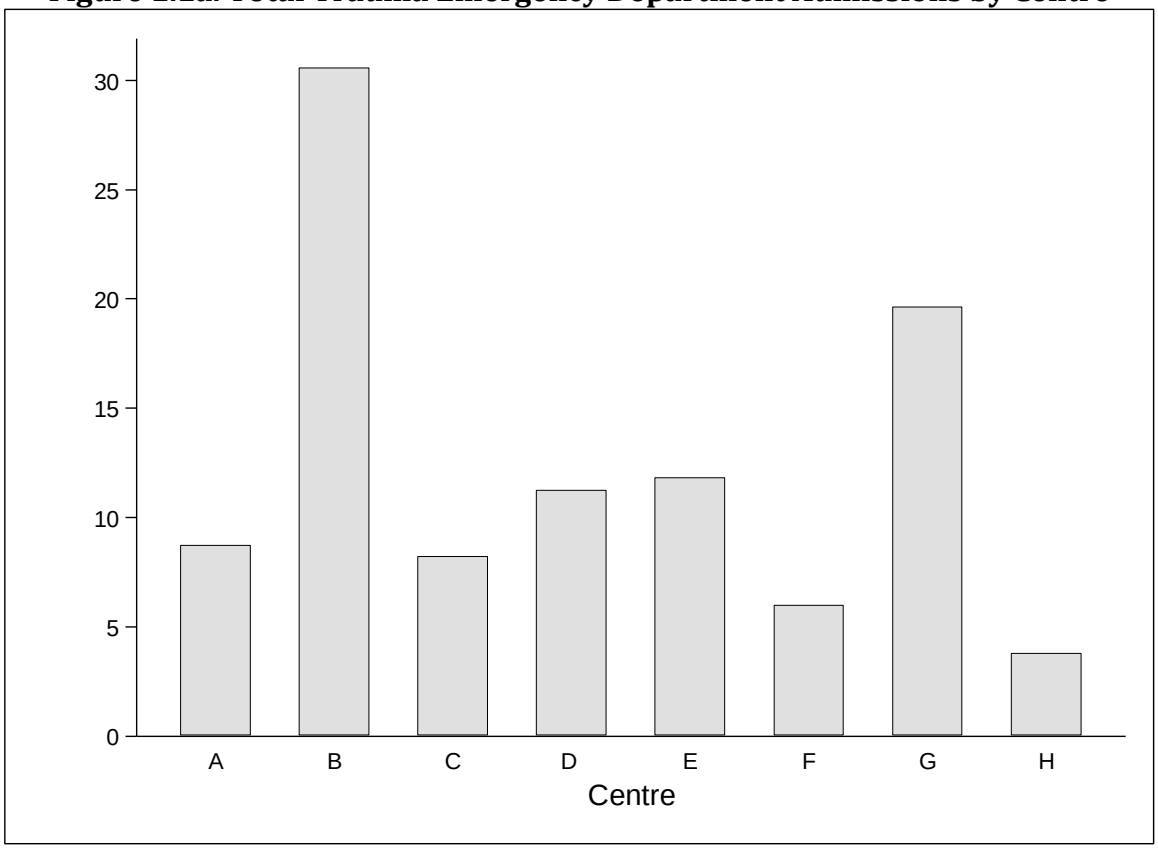

Table 1.1. Total Trauma Emergency Department Admissions by Centre

Centre	No	%
A	14,538	8.72
B	50,983	30.57
C	13,699	8.21
D	18,771	11.26
E	19,692	11.81
F	9,998	6.00
G	32,757	19.64
H	6,330	3.80
TOTAL	**166,768**	**100**

Figure 1.2. Major Trauma Cases by Centre

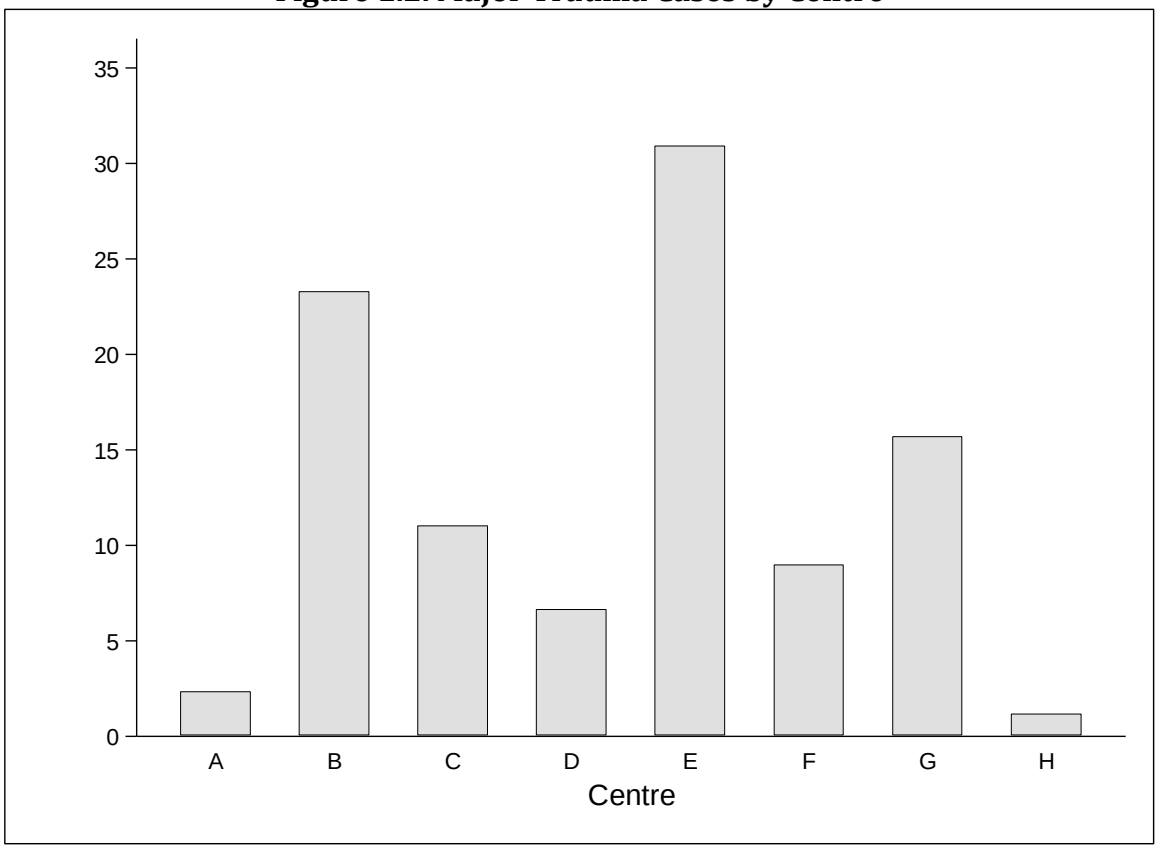

Table 1.2. Major Trauma Cases by Centre

Centre	No.	%
A	48	2.33
B	480	23.29
C	227	11.01
D	137	6.65
E	637	30.91
F	185	8.98
G	323	15.67
H	24	1.16
TOTAL	**2061**	**100**

Figure 1.3. Major Trauma Cases by Gender

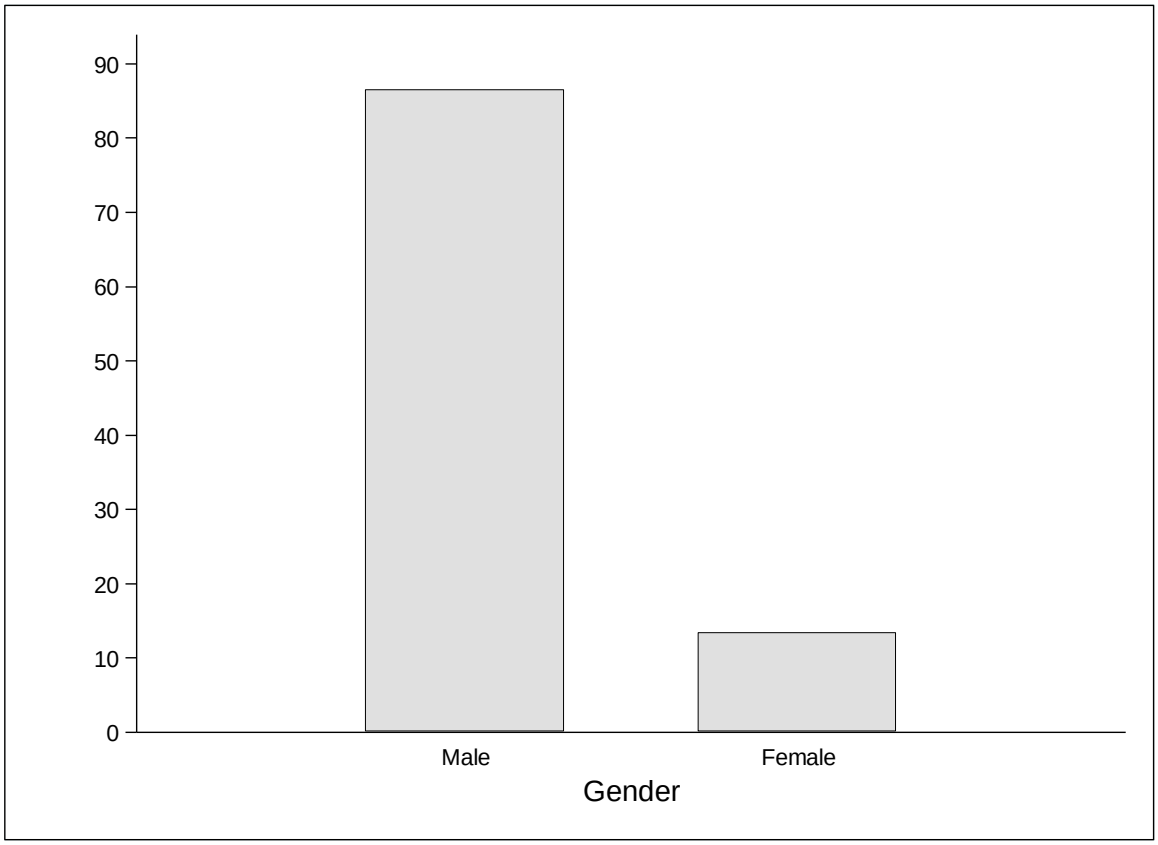

Table 1.3. Major Trauma Cases by Gender

Gender	No.	%
Male	1784	86.56
Female	277	13.44
TOTAL	**2061**	**100**

Figure 1.4. Major Trauma Cases by Age Group

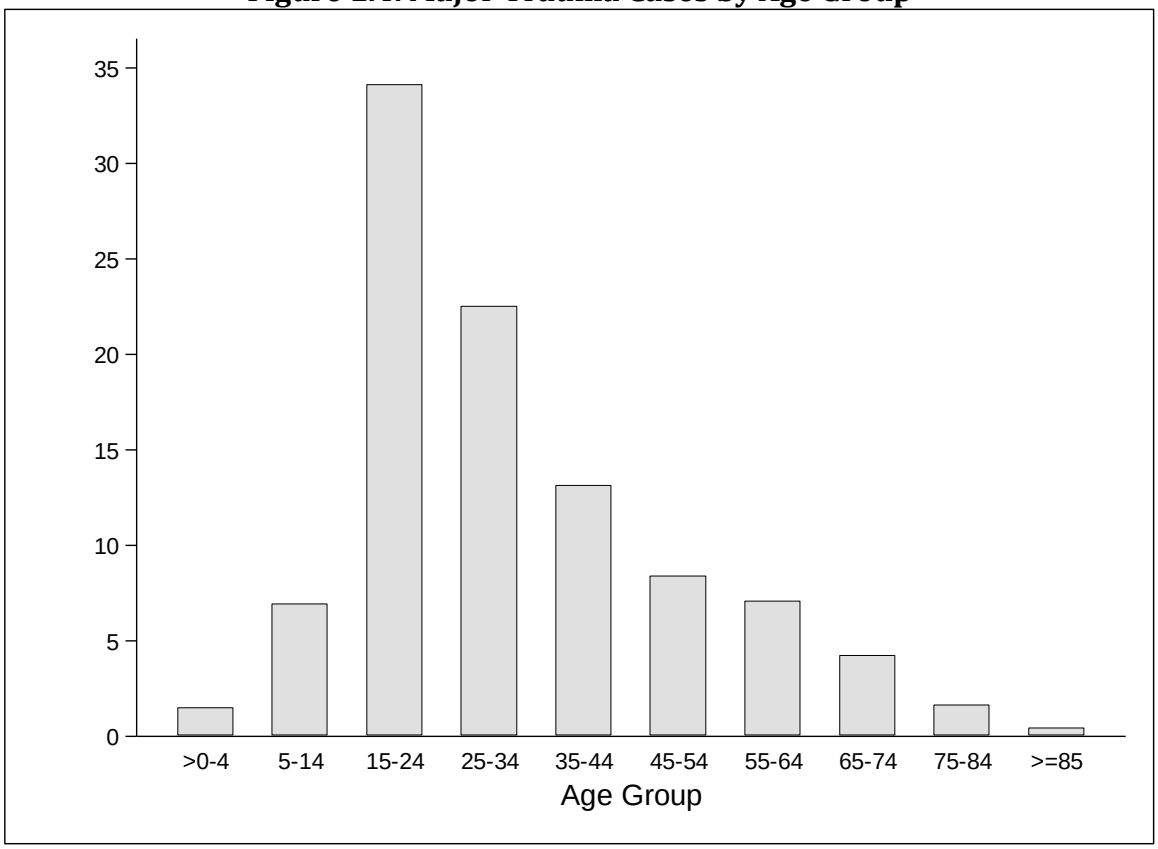

Table 1.4. Major Trauma Cases by Age Group

Age group	No.	%
>0-4	31	1.5
5-14	143	6.94
15-24	703	34.11
25-34	464	22.51
35-44	271	13.15
45-54	173	8.39
55-64	146	7.08
65-74	87	4.22
75-84	34	1.65
≥85	9	0.44
TOTAL	**2061**	**100**

Figure 1.5. Major Trauma Cases by Race

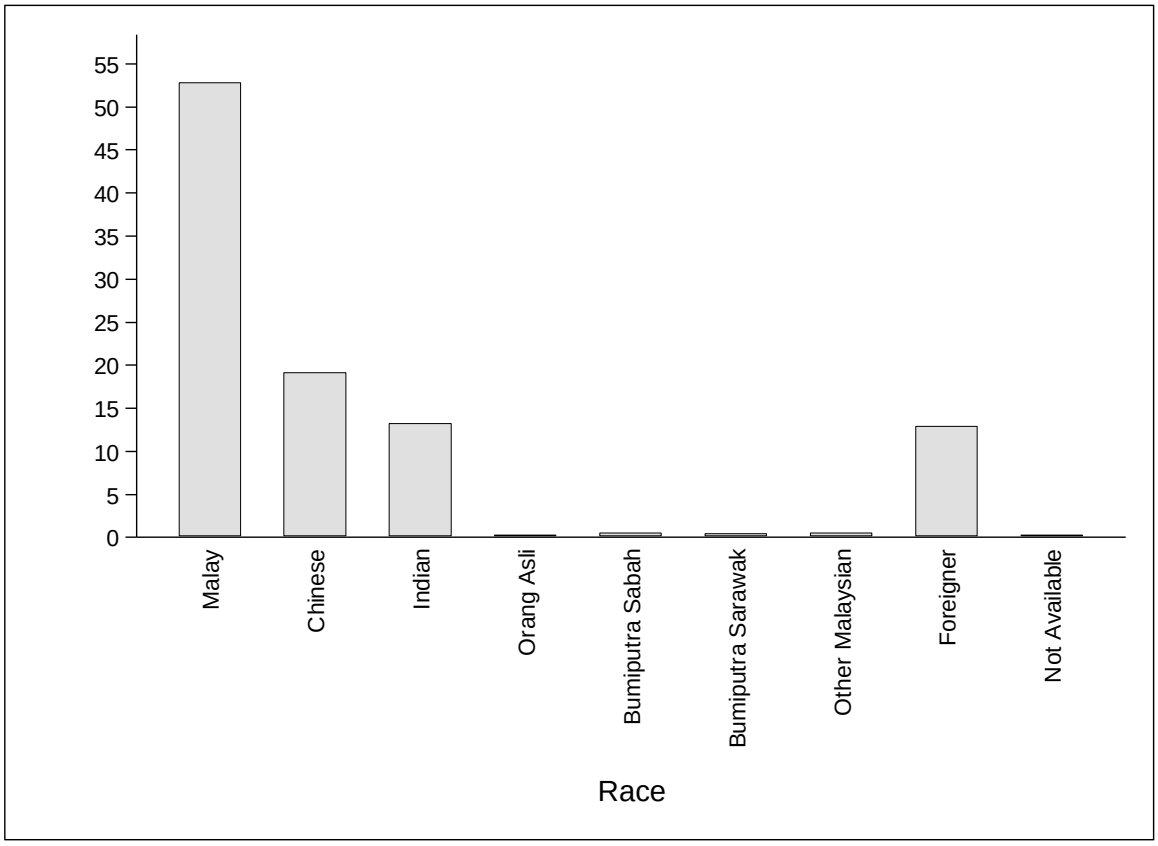

Table 1.5. Major Trauma Cases by Race

Race	**No.**	**%**
Malay	1088	52.79
Chinese	395	19.17
Indian	272	13.2
Orang Asli	5	0.24
Bumiputra Sabah	10	0.49
Bumiputra Sarawak	9	0.44
Other Malaysian	10	0.49
Foreigner	266	12.91
Not Available	6	0.29
TOTAL	**2061**	**100**

Figure 1.6. Time of Admission for Major Trauma Cases

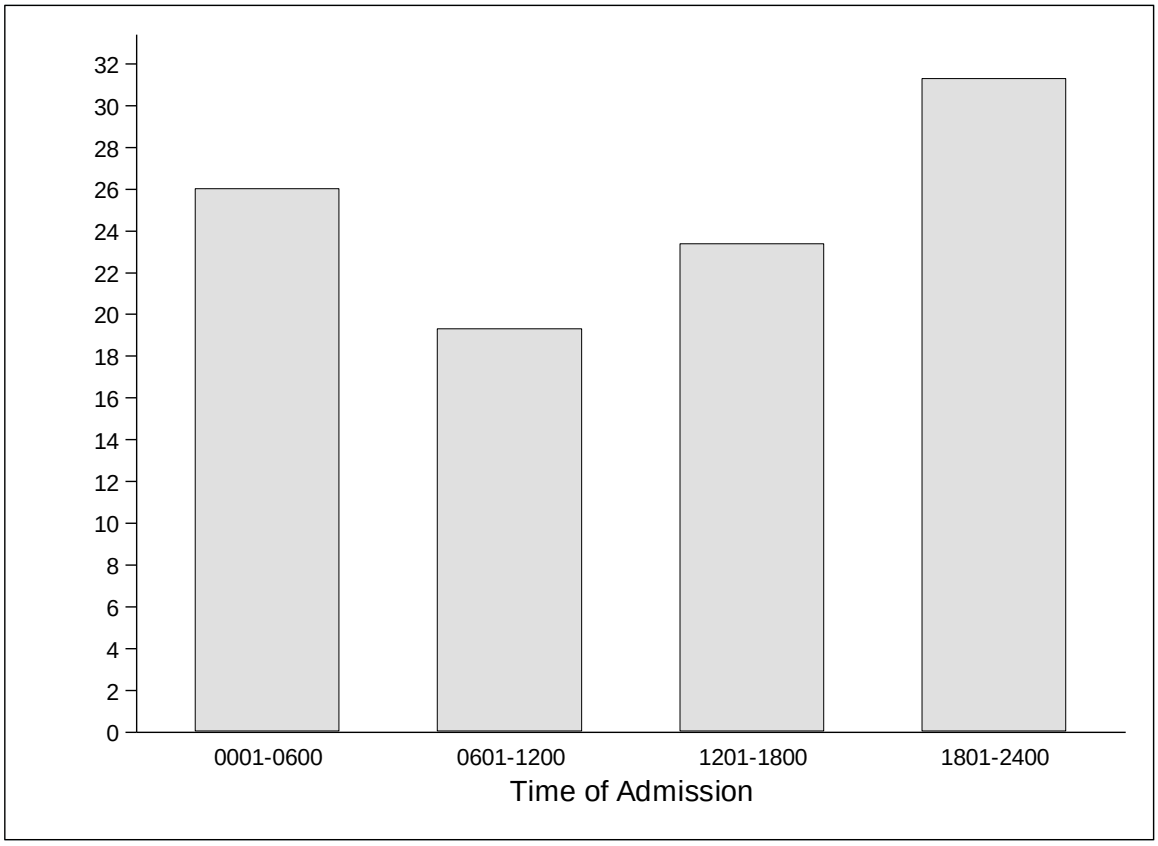

Table 1.6. Time of Admission for Major Trauma Cases

Time of Admission (Hours)	No.	%
0001-0600	536	26.01
0601-1200	398	19.31
1201-1800	482	23.39
1801-2400	645	31.3
TOTAL	**2061**	**100**

Figure 1.7. Day of Admission for Major Trauma Cases

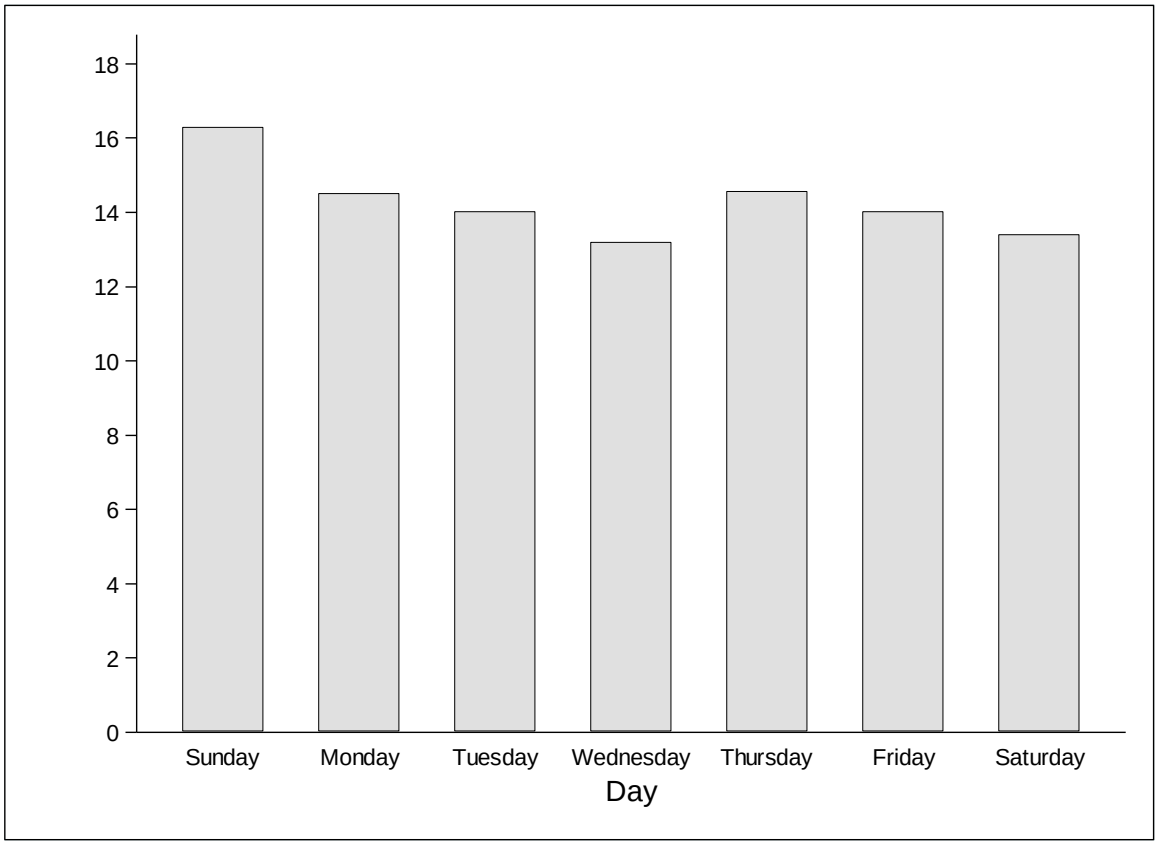

Table 1.7. Day of Admission for Major Trauma Cases

Admission (Days)	**No.**	**%**
Sunday	336	16.3
Monday	299	14.51
Tuesday	289	14.02
Wednesday	272	13.2
Thursday	300	14.56
Friday	289	14.02
Saturday	276	13.39
TOTAL	**2061**	**100**

Figure 1.8. Type of Admission for Major Trauma Cases

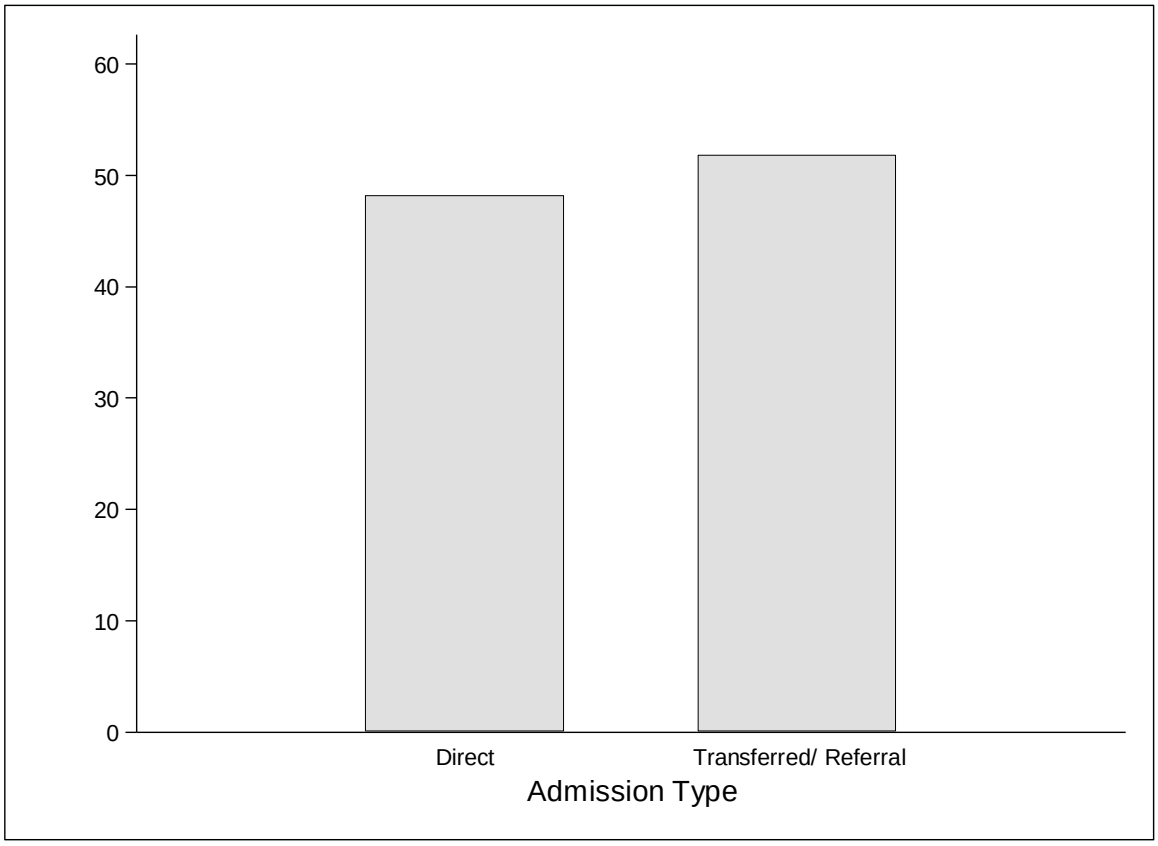

Table 1.8. Type of Admission for Major Trauma Cases

Admission Type	**No.**	**%**
Direct	993	48.18
Transferred / Referral	1068	51.82
TOTAL	**2061**	**100**

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

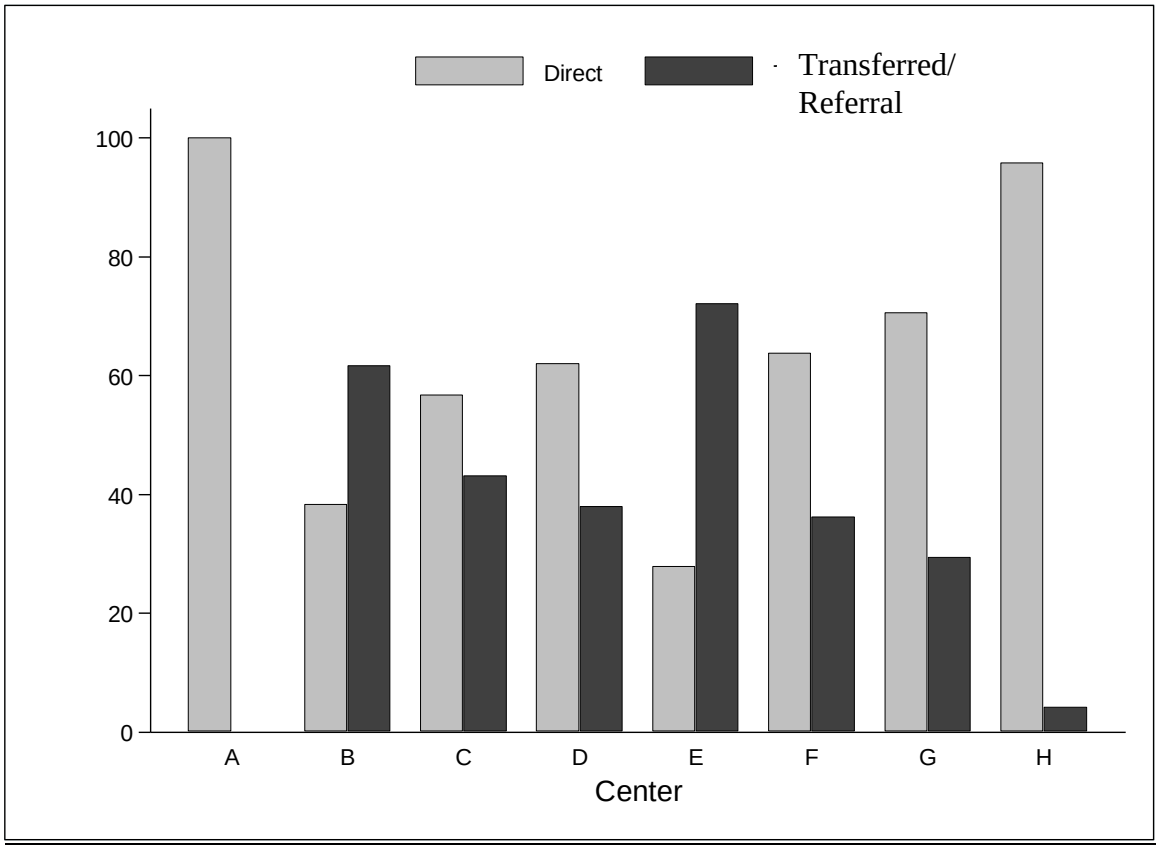

Table 1.8a. Type of Admission for Major Trauma Cases by Centre

Centre	Direct		Transferred / Referral		Total
	No.	%	No.	%	
A	48	100	0	0	48
B	184	38.3	296	61.7	480
C	129	56.8	98	43.2	227
D	85	62	52	38	137
E	178	27.9	459	72.1	637
F	118	63.8	67	36.2	185
G	228	70.6	95	29.4	323
H	23	95.8	1	4.2	24
TOTAL	**993**	**48.2**	**1068**	**51.8**	**2061**

Figure 1.9. Source of Referral for Major Trauma Cases

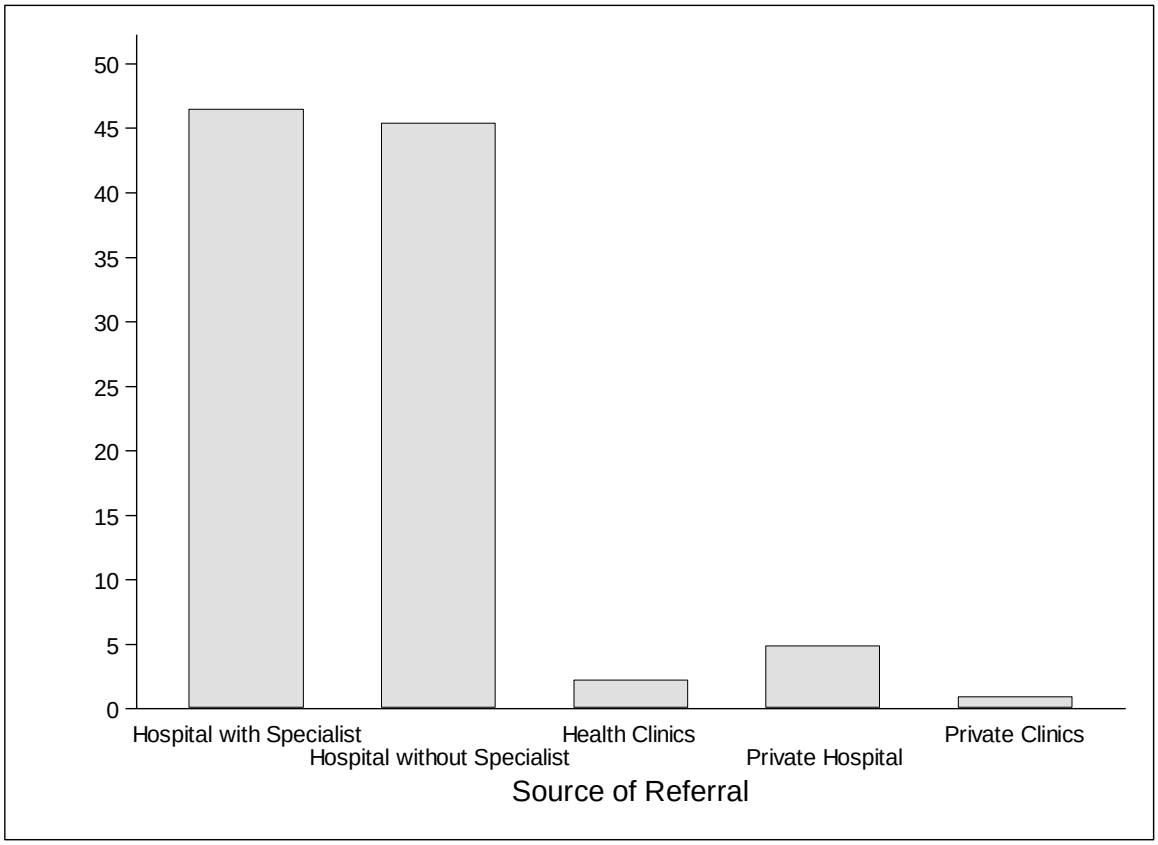

Table 1.9. Type of Admission Referred From for Major Trauma Cases

Source of Referral	**No.**	**%**
Government Hospital with Specialist	493	46.47
Goverment Hospital without Specialist	482	45.43
Health Clinics	24	2.26
Private Hospital	52	4.9
Private Clinics	10	0.94
TOTAL	**1061**	**100**

Note * 7 cases have no "Source of Referral" information

Chapter 2: INJURY DETAILS

Figure 2.1. Mechanism of Injury for Major Trauma Cases

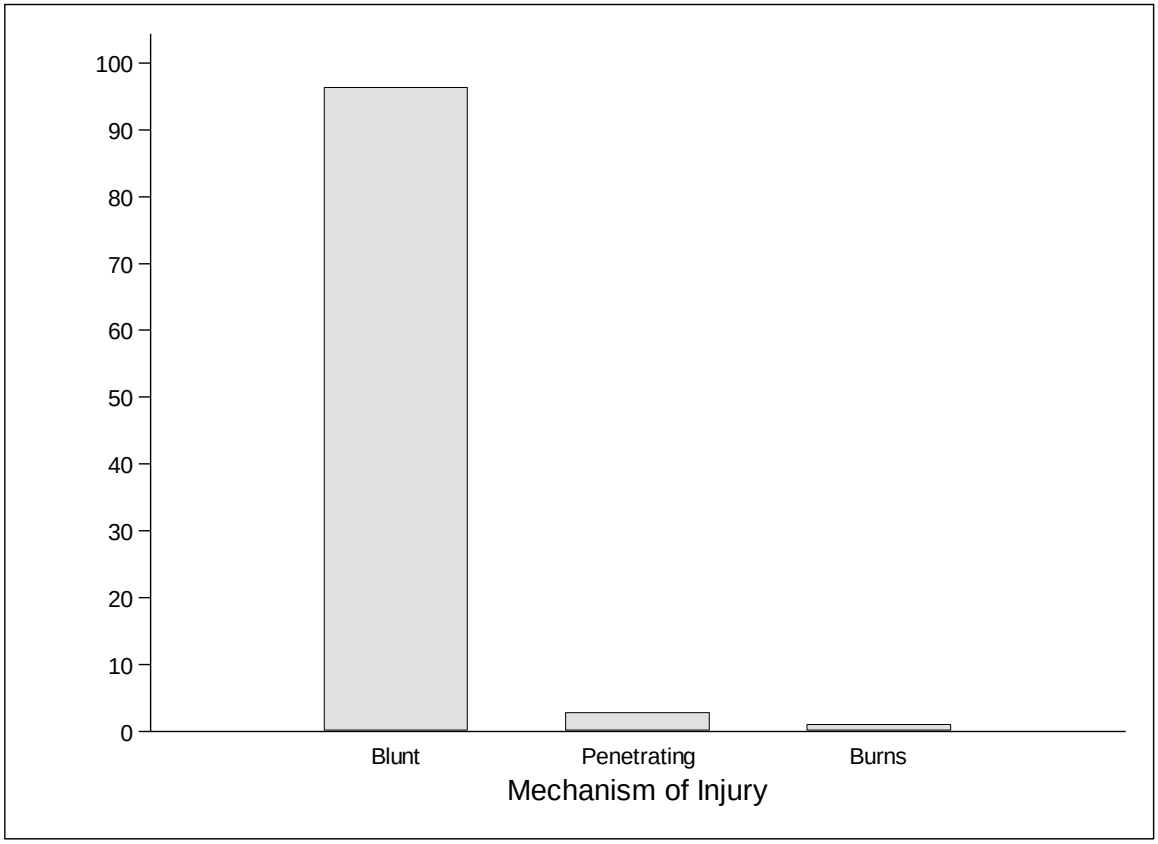

Table 2.1. Mechanism of Injury for Major Trauma Cases

Mechanism of Injury (Total Patients=2061)	No.	%
Blunt	1985	96.31
Penetrating	58	2.81
Burns	21	1.02

Note * Number or Percentage may be more than total patients or 100% as patients might have more than one mechanism of injury

Figure 2.2. Major Trauma Cases by Injury Intent

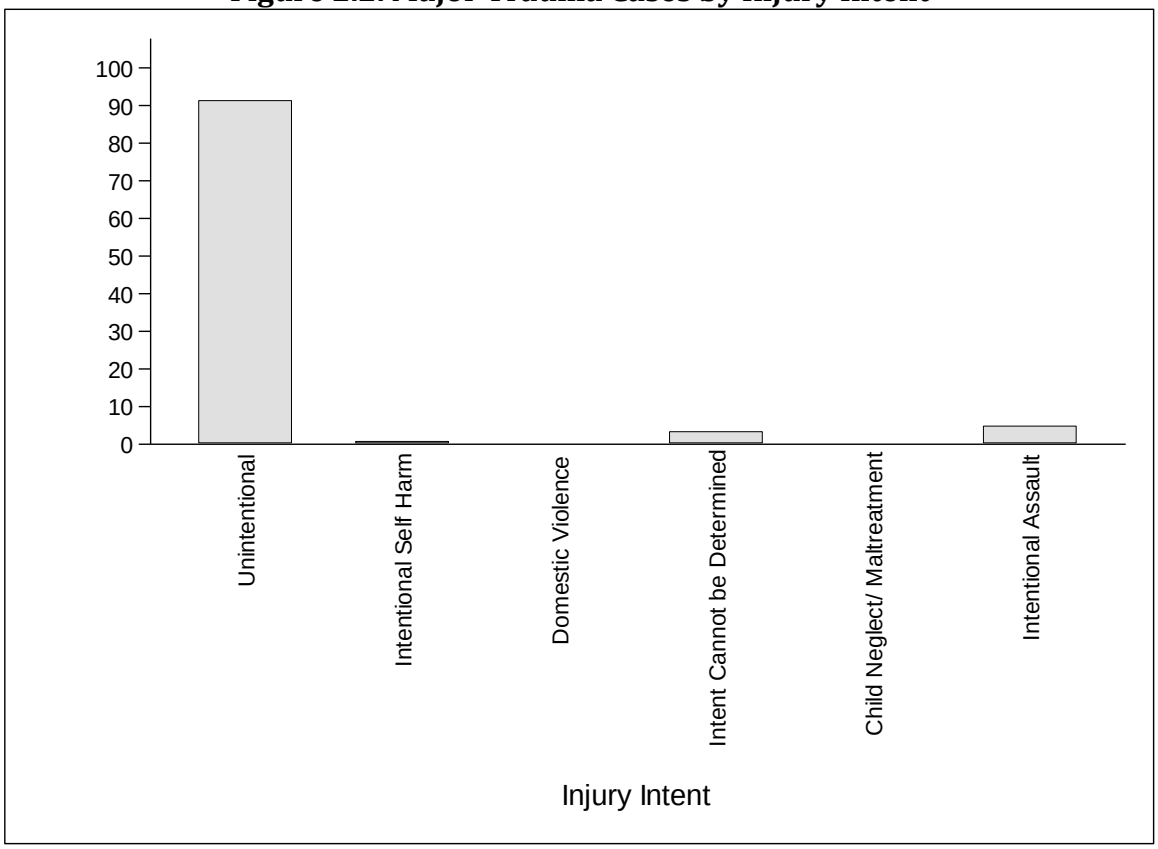

Table 2.2. Major Trauma Cases by Injury Intent

Injury Intent (Total Patients=2061)	**No.**	**%**
Unintentional	1880	91.22
Intentional Self Harm	15	0.73
Domestic Violence	0	0
Intent Cannot be Determined	67	3.25
Child Neglect / Maltreatment	1	0.05
Intentional Assault	96	4.66

Figure 2.3. Major Trauma Cases by Cause of Injury

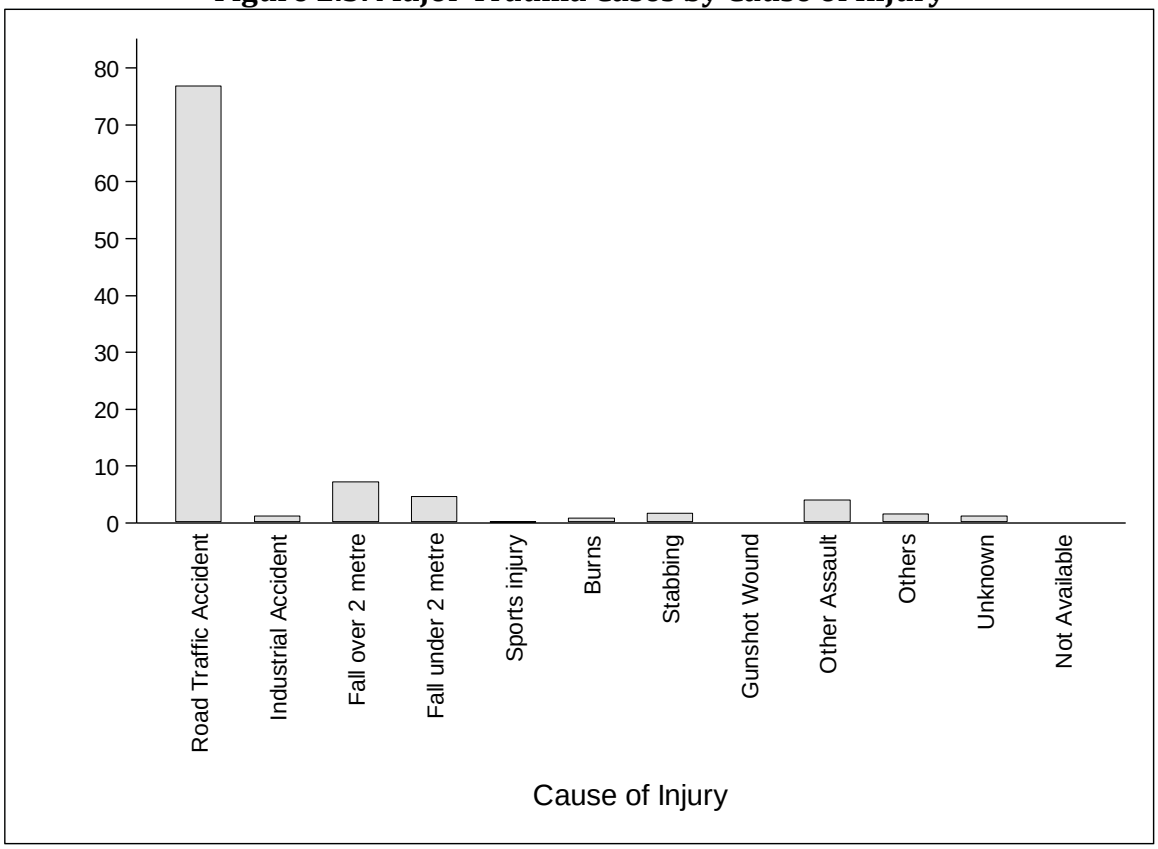

Table 2.3. Major Trauma Cases by Cause of Injury

Cause of Injury	**No.**	**%**
Road Traffic Accident	1582	76.76
Industrial Accident	26	1.26
Fall from over 2 meter	148	7.18
Fall from under 2 meter (about a door's height)	95	4.61
Sports Injury	6	0.29
Burns	19	0.92
Stab Wounds	36	1.75
Gunshot Wound	4	0.19
Other Assault	83	4.03
Others	32	1.55
Unknown	26	1.26
Not Available	4	0.19
TOTAL	**2061**	**100**

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

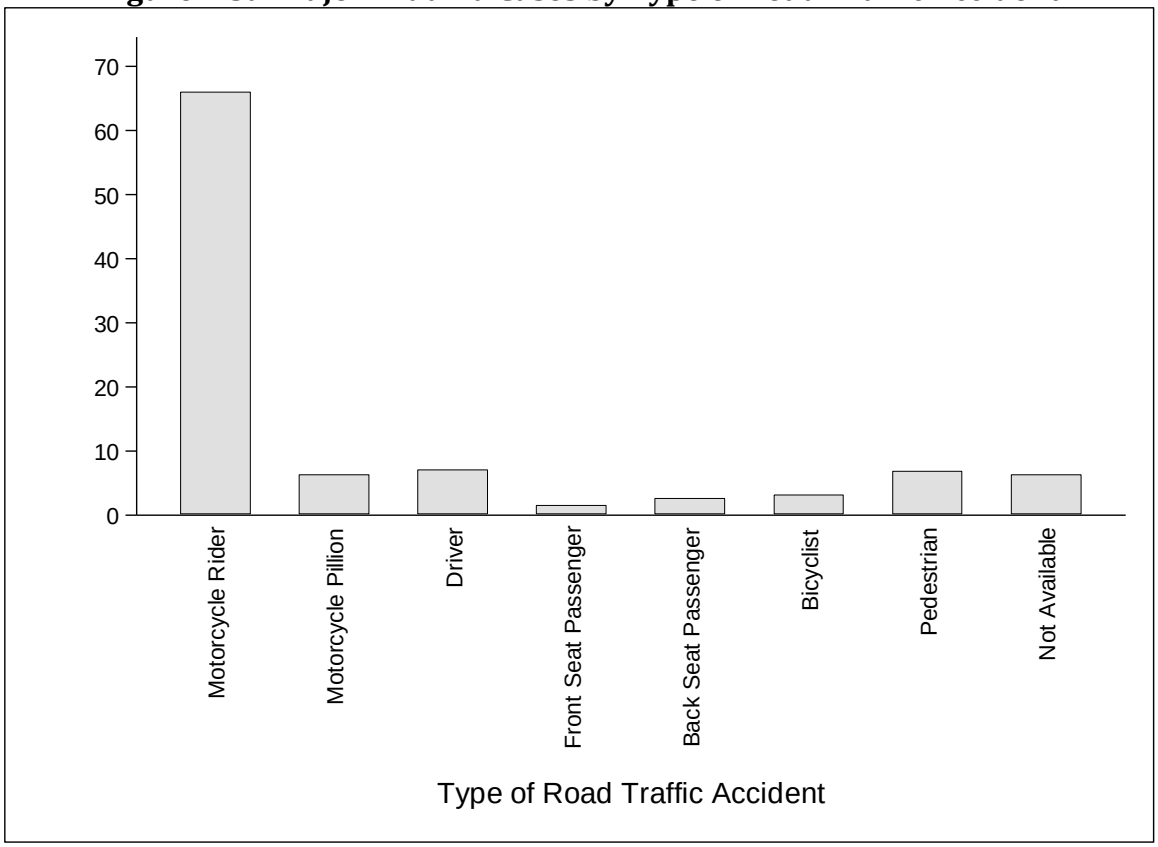

Table 2.3a. Major Trauma Cases by Type of Road Traffic Accident

Type of Road Traffic Accident	**No.**	**%**
Motorcycle Rider	1044	65.99
Motorcycle Pillion	100	6.32
Driver	113	7.14
Front Seat Passenger	24	1.52
Back Seat Passenger	42	2.65
Bicyclist	51	3.22
Pedestrian	108	6.83
Not Available	100	6.32
TOTAL	**1582**	**100**

Figure 2.4. Major Trauma Cases by Place of Injury

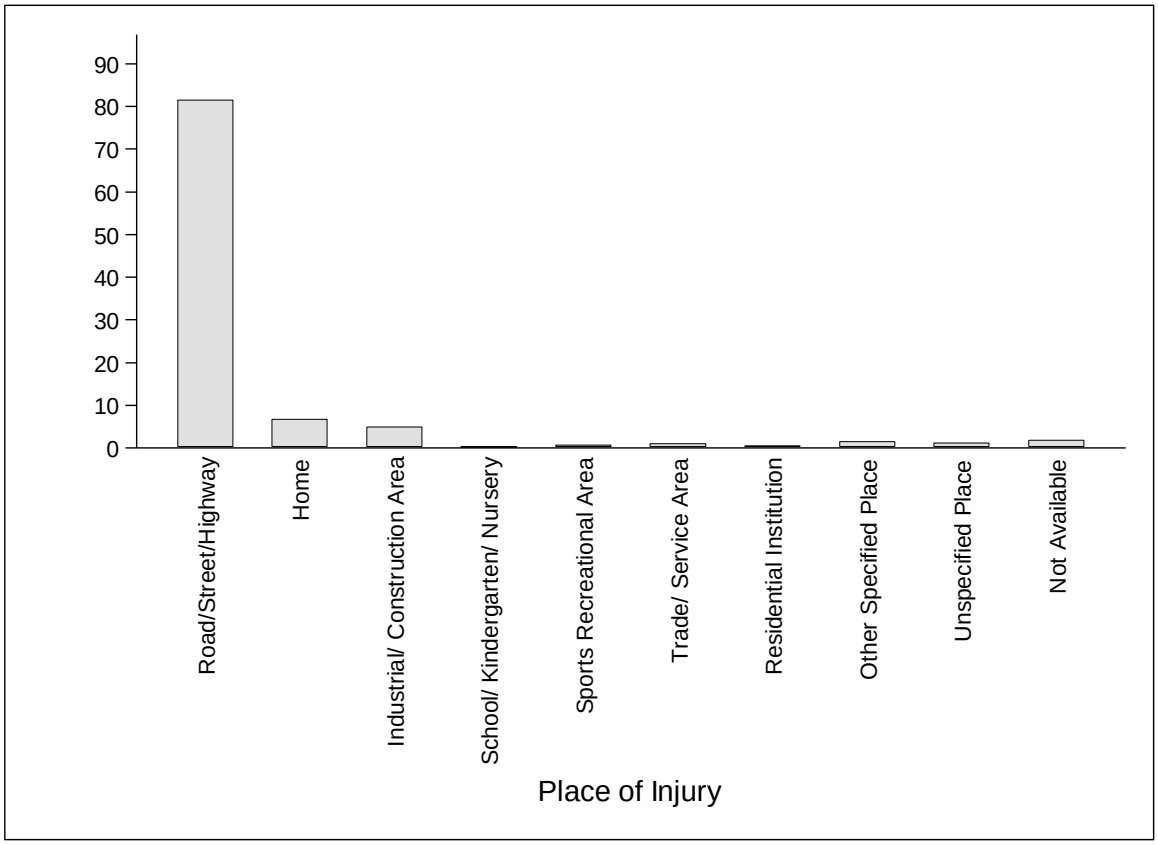

Table 2.4. Major Trauma Cases by Place of Injury

Place of Injury	**No.**	**%**
Road/Street/Highway	1678	81.42
Home	140	6.79
Industrial / Construction Area	102	4.95
School / Kindergarten / Nursery	6	0.29
Sports Recreational Area	13	0.63
Trade / Service Area	22	1.07
Residential	10	0.49
Other Specified Place	30	1.46
Unspecified Place	24	1.16
Not Available	36	1.75
TOTAL	**2061**	**100**

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

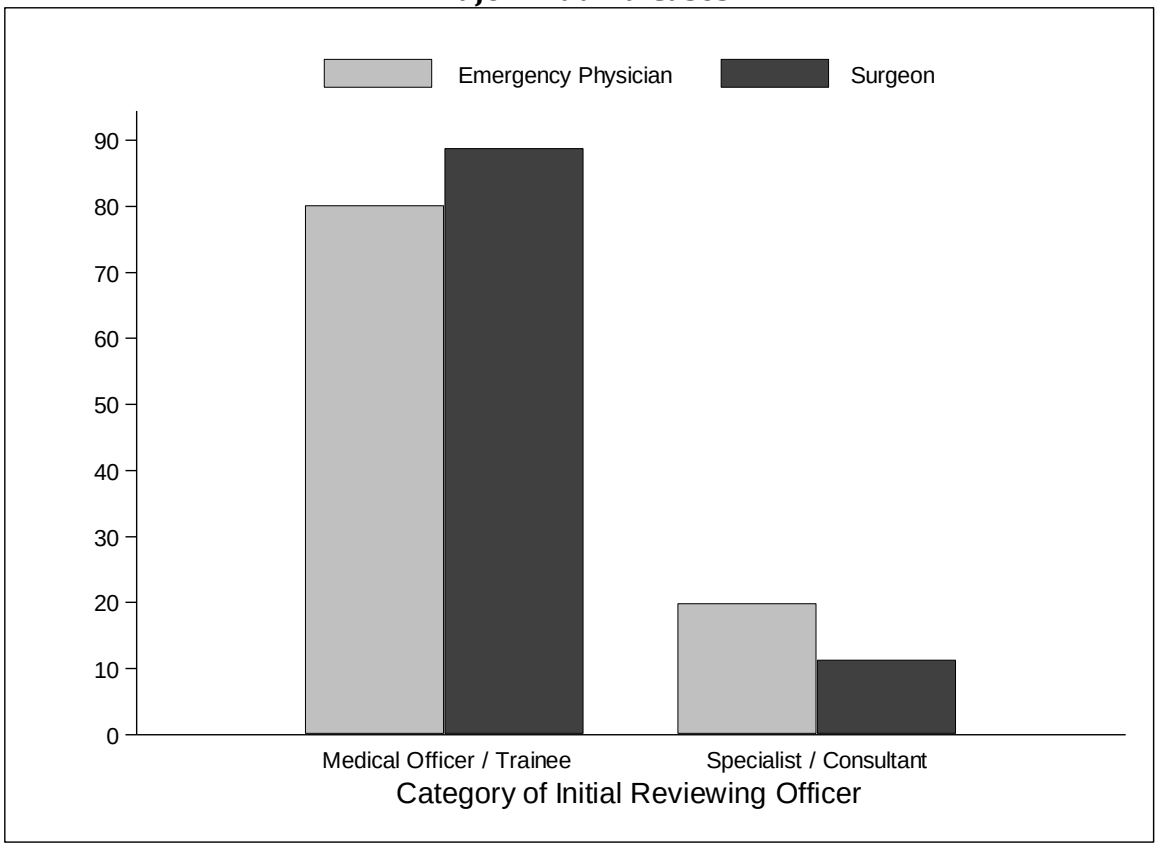

Table 2.5. Category of Initial Reviewing Officer in Emergency Department for Major Trauma Cases

Category of Initial Reviewing Officer	Emergency Physician		Surgeon	
	No.	%	No.	%
Medical Officer / Trainee	1643	80.15	1761	88.76
Specialist / Consultant	407	19.85	223	11.24
TOTAL	**2050**	**100**	**1984**	**100**

Note * Included cases with both categories of "Initial Reviewing Officer"

Figure 2.6. Disposition of Major Trauma Cases from ED

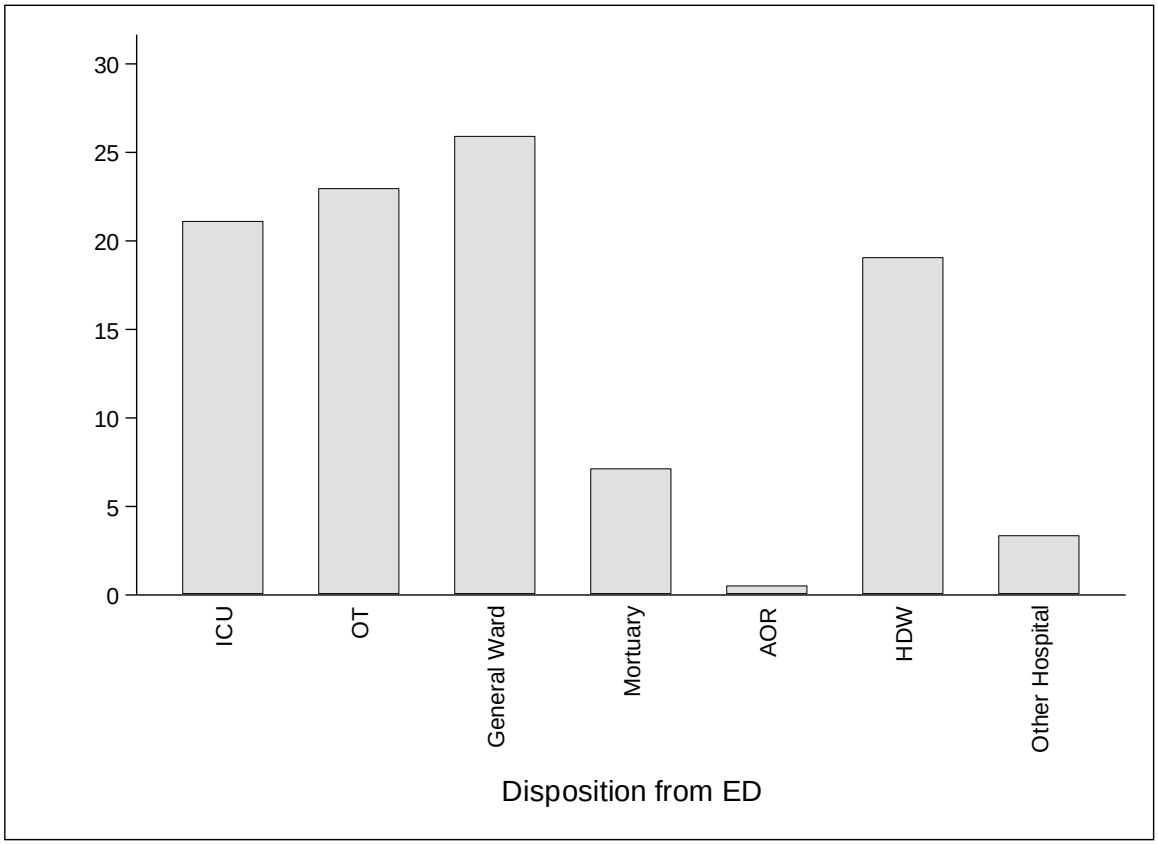

Table 2.6. Disposition of Major Trauma Cases from ED

Disposition From ED	**No.**	**%**
Intensive Care Unit (ICU)	435	21.11
Operating Theatre (OT)	473	22.95
General Ward	534	25.91
Mortuary	147	7.13
AOR	10	0.49
High Dependency Ward (HDW)	393	19.07
Other Hospital	69	3.35
Not Available	0	0
TOTAL	**2061**	**100**

Figure 2.7. ICU Admission for Major Trauma Cases

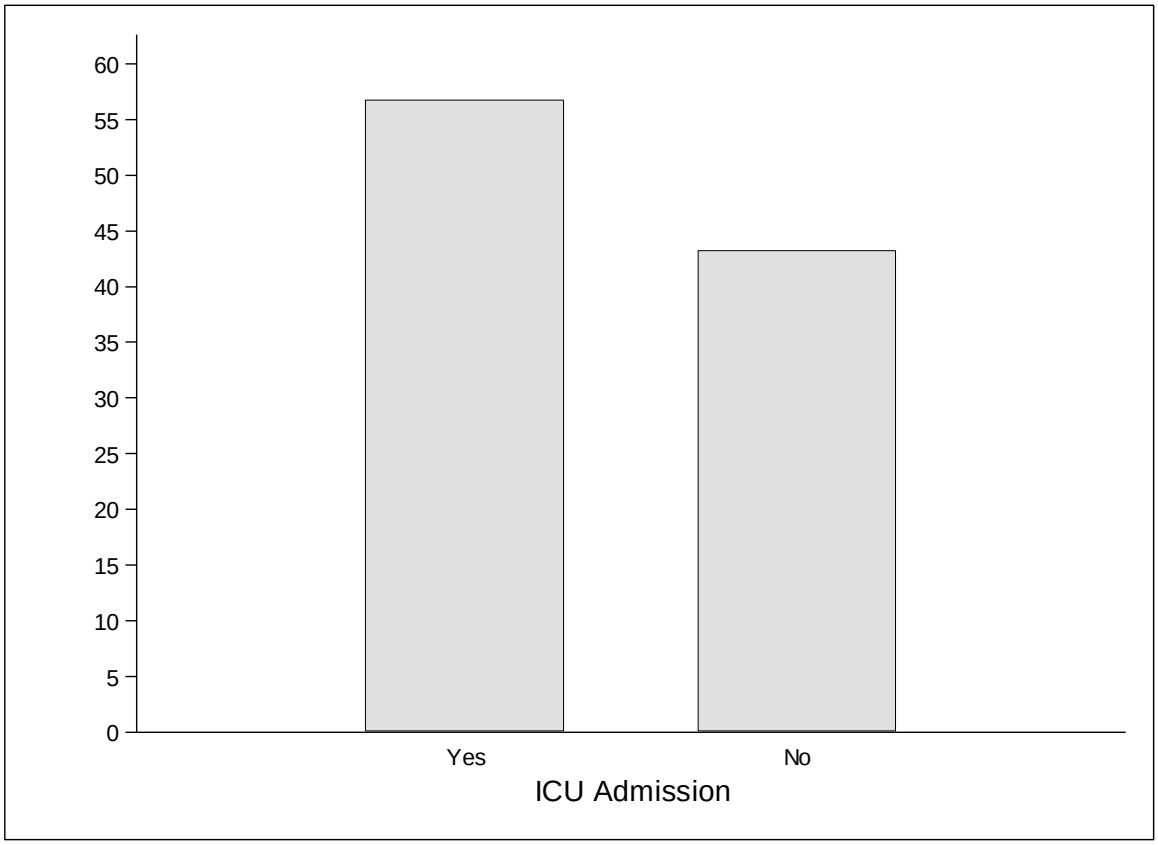

Table 2.7. ICU Admission for Major Trauma Cases

ICU Admission	No.	%
Yes	1170	56.77
No	891	43.23
TOTAL	**2061**	**100**

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

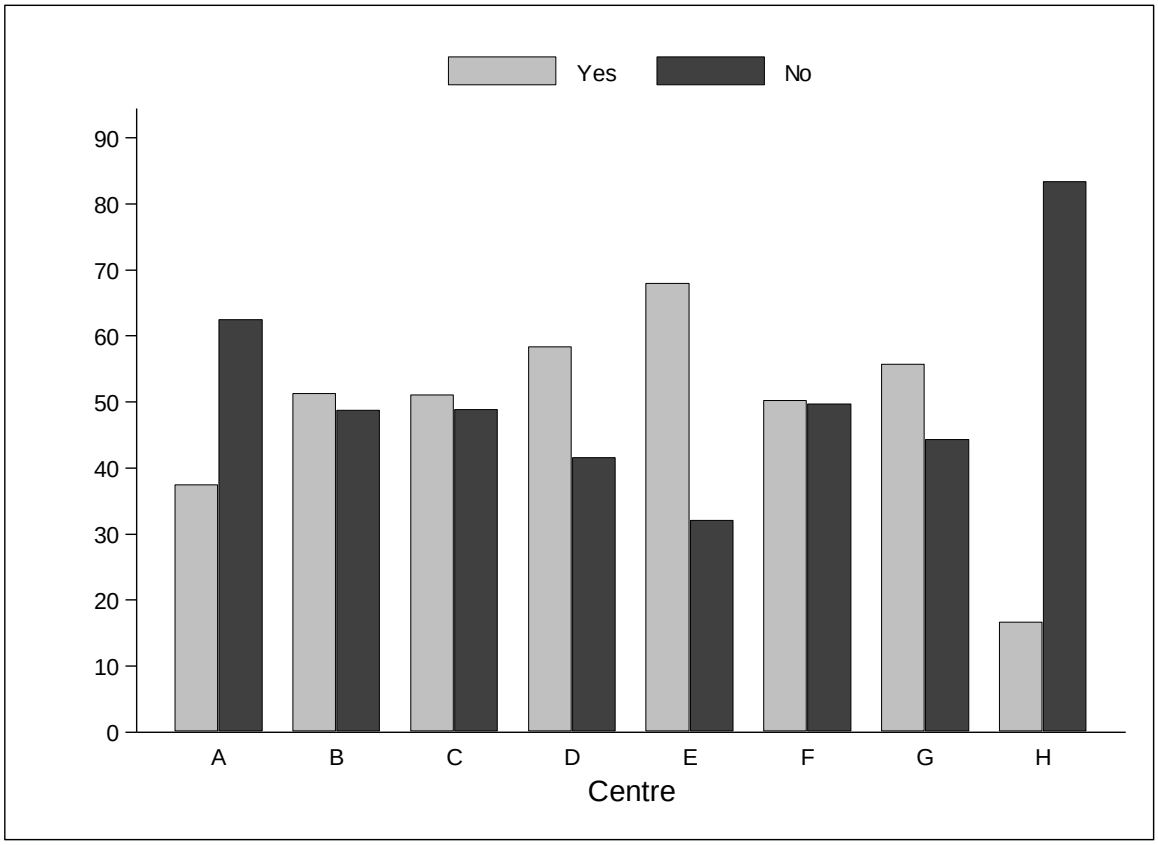

Table 2.7a. Total ICU Admissions for Major Trauma Cases by Centre

Centre	ICU admissions				Total
	Yes		No		
	No.	%	No.	%	
A	18	37.5	30	62.5	48
B	246	51.25	234	48.75	480
C	116	51.1	111	48.9	227
D	80	58.39	57	41.61	137
E	433	67.97	204	32.03	637
F	93	50.27	92	49.73	185
G	180	55.73	143	44.27	323
H	4	16.67	20	83.33	24
TOTAL	**1170**	**56.77**	**891**	**43.23**	**2061**

Figure 2.8. Major Trauma Cases by Systolic BP

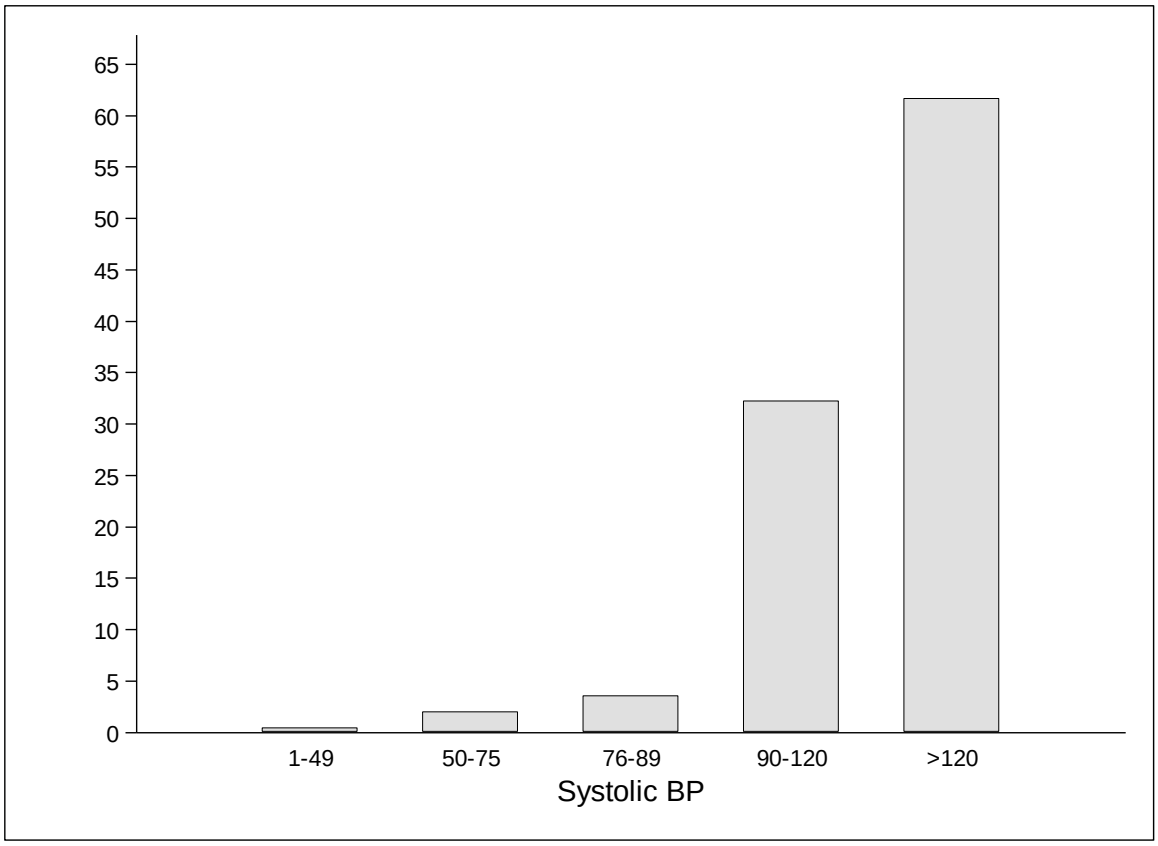

Table 2.8. Major Trauma Cases by Systolic BP

Systolic BP	No.	%
1-49	10	0.49
50-75	42	2.04
76-89	74	3.59
90-120	664	32.22
>120	1271	61.67
TOTAL	**2061**	**100**

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

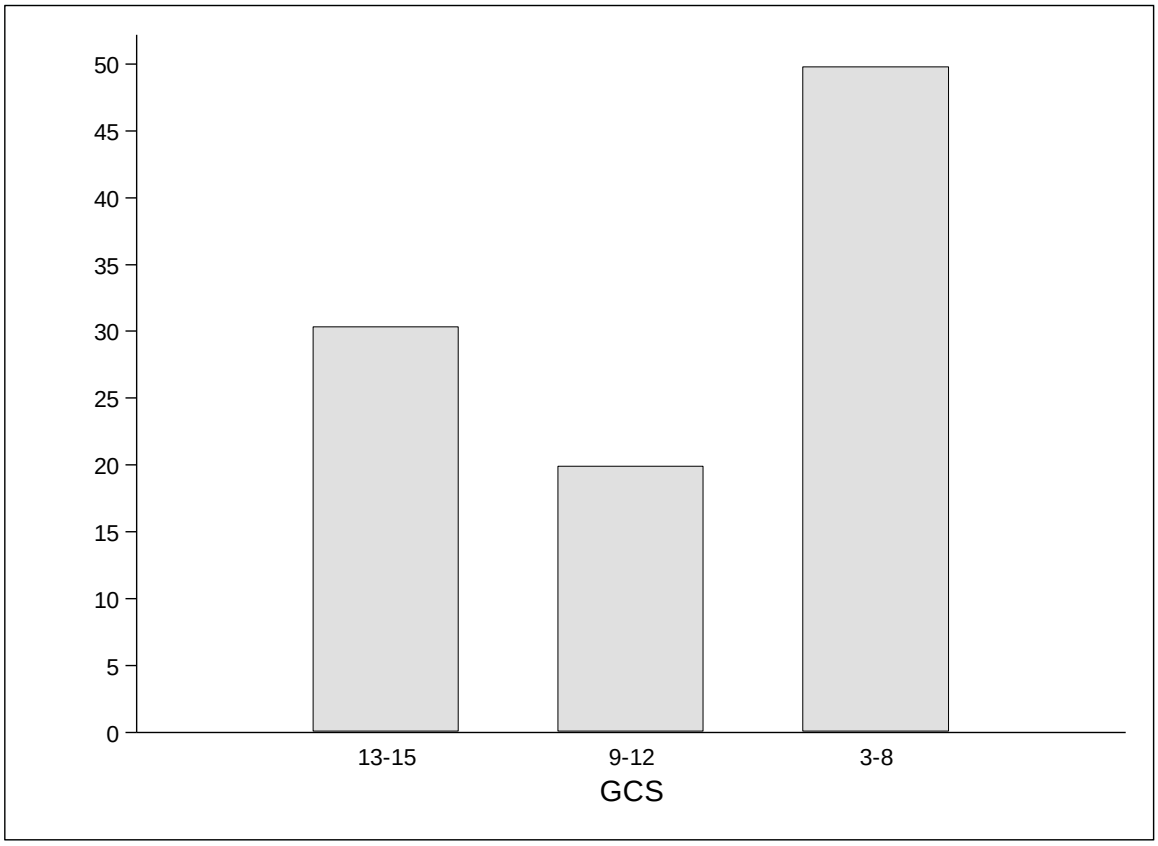

Table 2.9. Major Trauma Cases by Glasgow Coma Scale (GCS)

Glasgow Coma Scale (GCS)	No.	%
13-15	625	30.33
9-12	410	19.89
3-8	1026	49.78
TOTAL	**2061**	**100**

Figure 2.10. Major Trauma Cases by Revised Trauma Score (RTS)

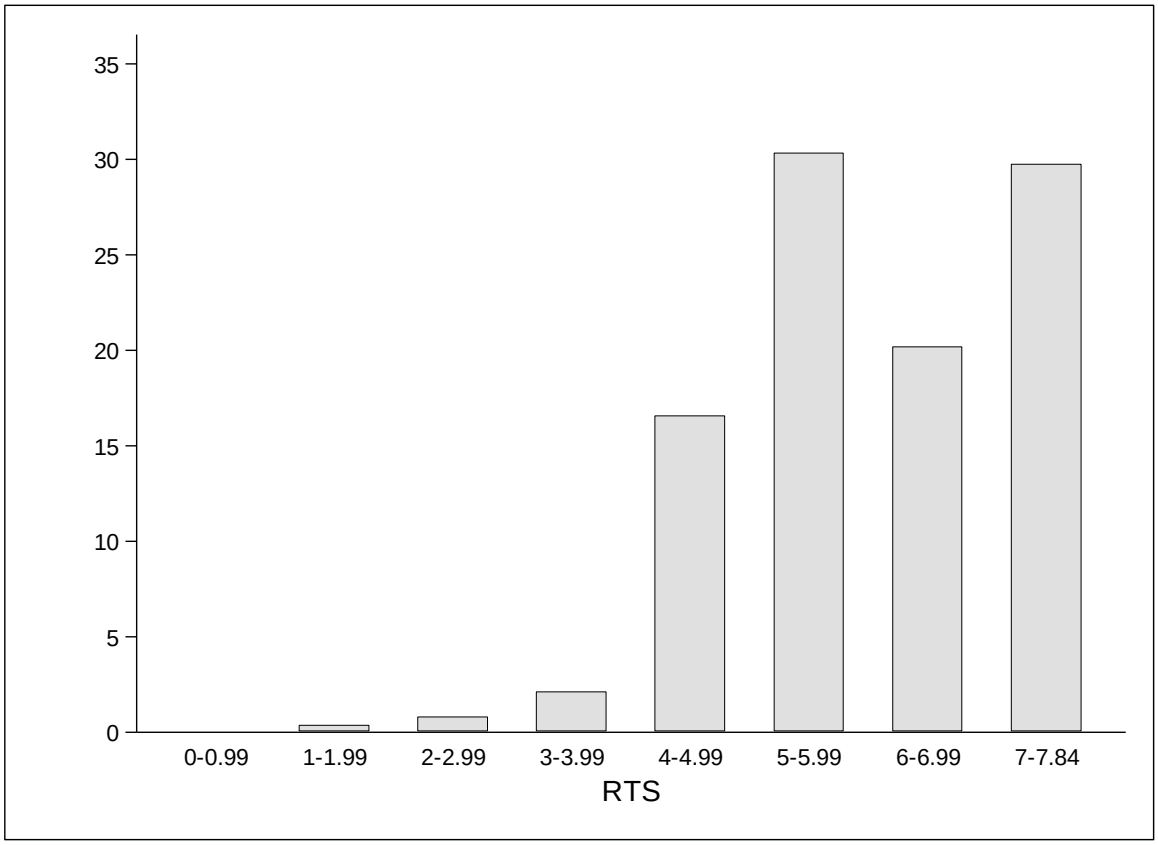

Table 2.10. Major Trauma Cases by Revised Trauma Score (RTS)

RTS	No.	%
0-0.99	0	0
1-1.99	7	0.34
2-2.99	16	0.78
3-3.99	43	2.09
4-4.99	341	16.55
5-5.99	625	30.33
6-6.99	416	20.18
7-7.84	613	29.74
TOTAL	**2061**	**100**

Figure 2.11. Injuries According to Body Region for Major Trauma Cases

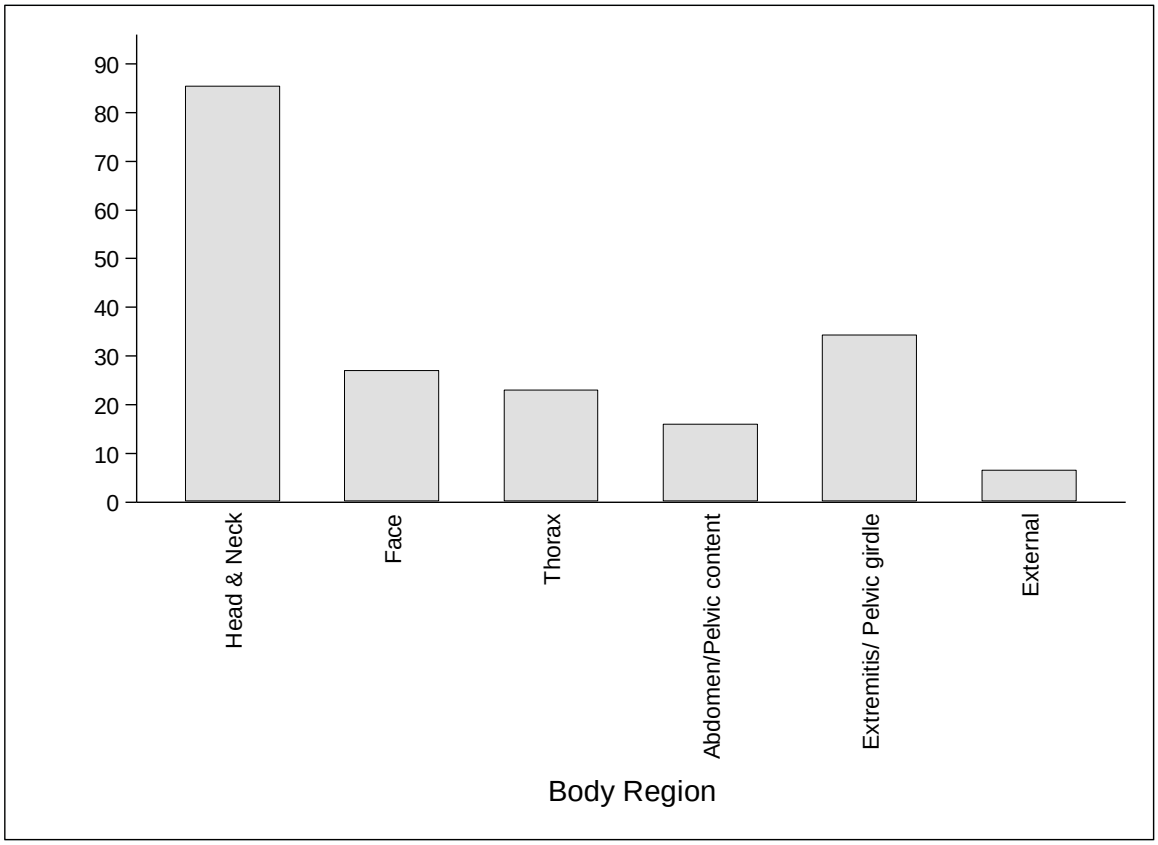

Table 2.11. Injuries According to Body Region for Major Trauma Cases

Body Region (Total Patients=2061)	No.	%
Head & Neck	1743	85.36
Face	551	26.98
Thorax	469	22.97
Abdomen/Pelvic content	326	15.96
Extremitis/ Pelvic girdle	701	34.33
External	133	6.51

Note * Number or Percentage may be more than total patients or 100% as patients might have more than one injuries according to body region

Figure 2.12. Abbreviated Injury Score (AIS) for All Major Trauma Cases

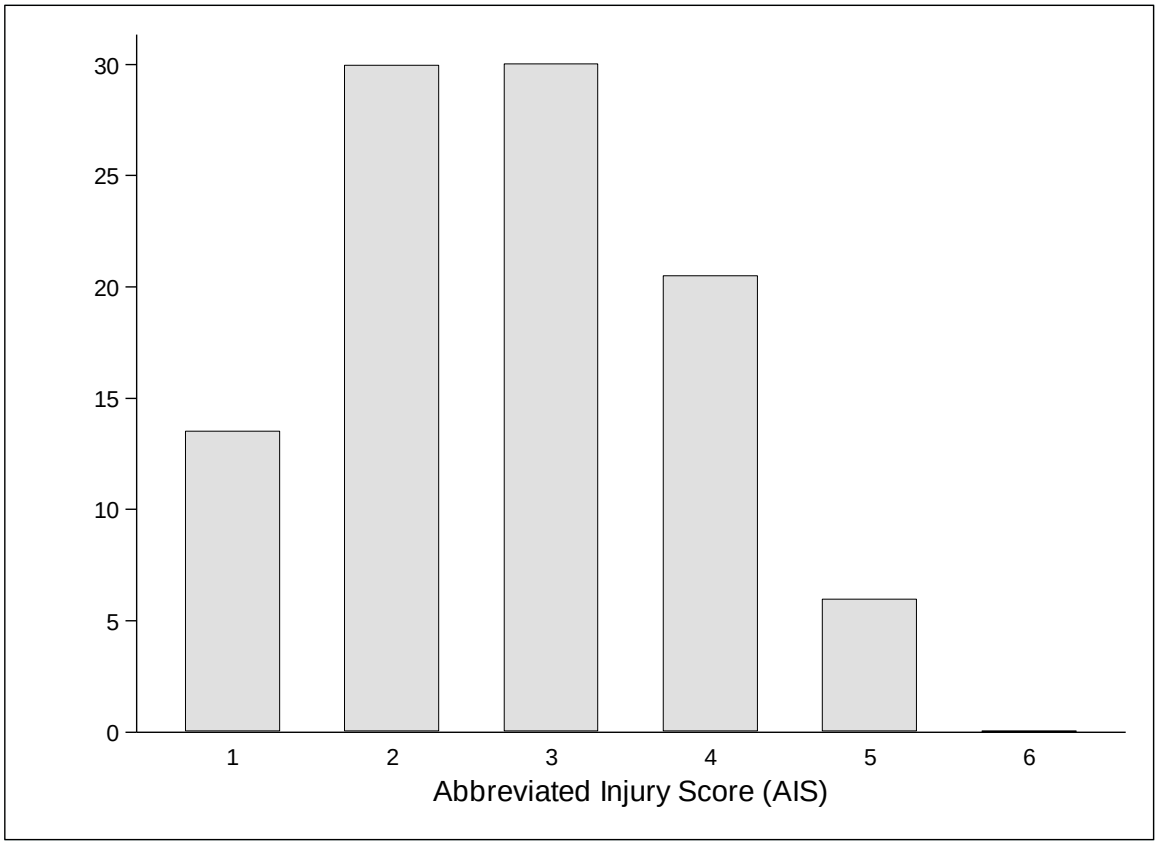

Table 2.12. Abbreviated Injury Score (AIS) for All Major Trauma Cases

AIS	No.	%
1	1065	13.52
2	2360	29.96
3	2365	30.02
4	1614	20.49
5	471	5.98
6	3	0.04
TOTAL	**7878**	**100**

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

Figure 2.12a. Abbreviated Injury Score (AIS) Distribution According to Body Region for Major Trauma Cases

Figure 2.12a(i). The Head and Neck Region

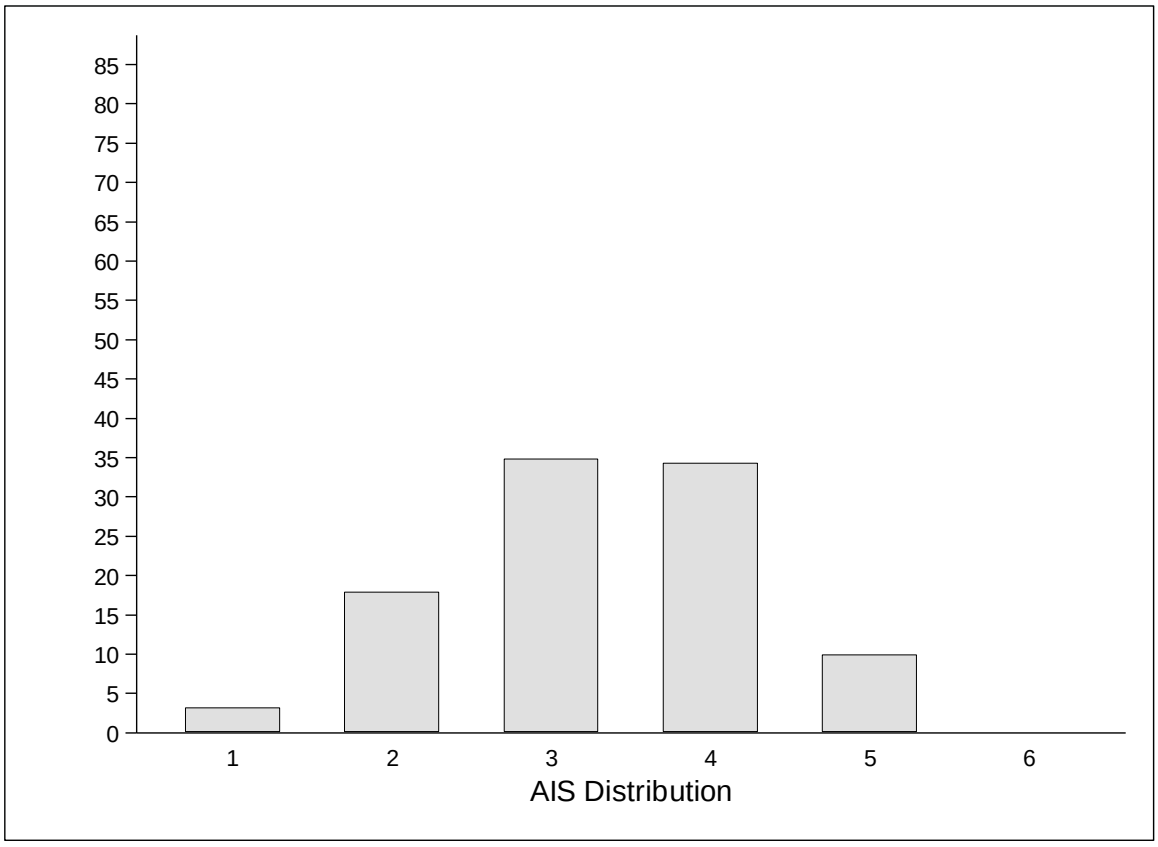

Figure 2.12a(ii). The Face Region

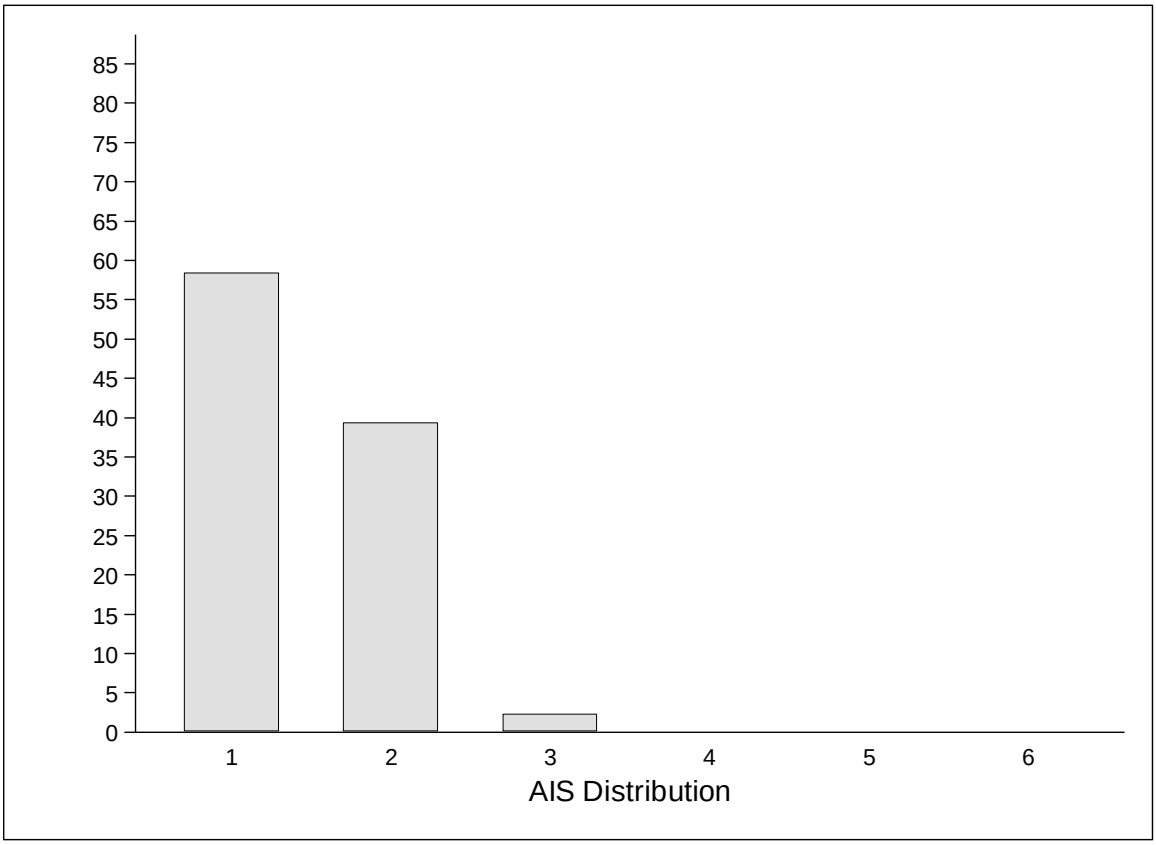

Figure 2.12a(iii). The Thorax Region

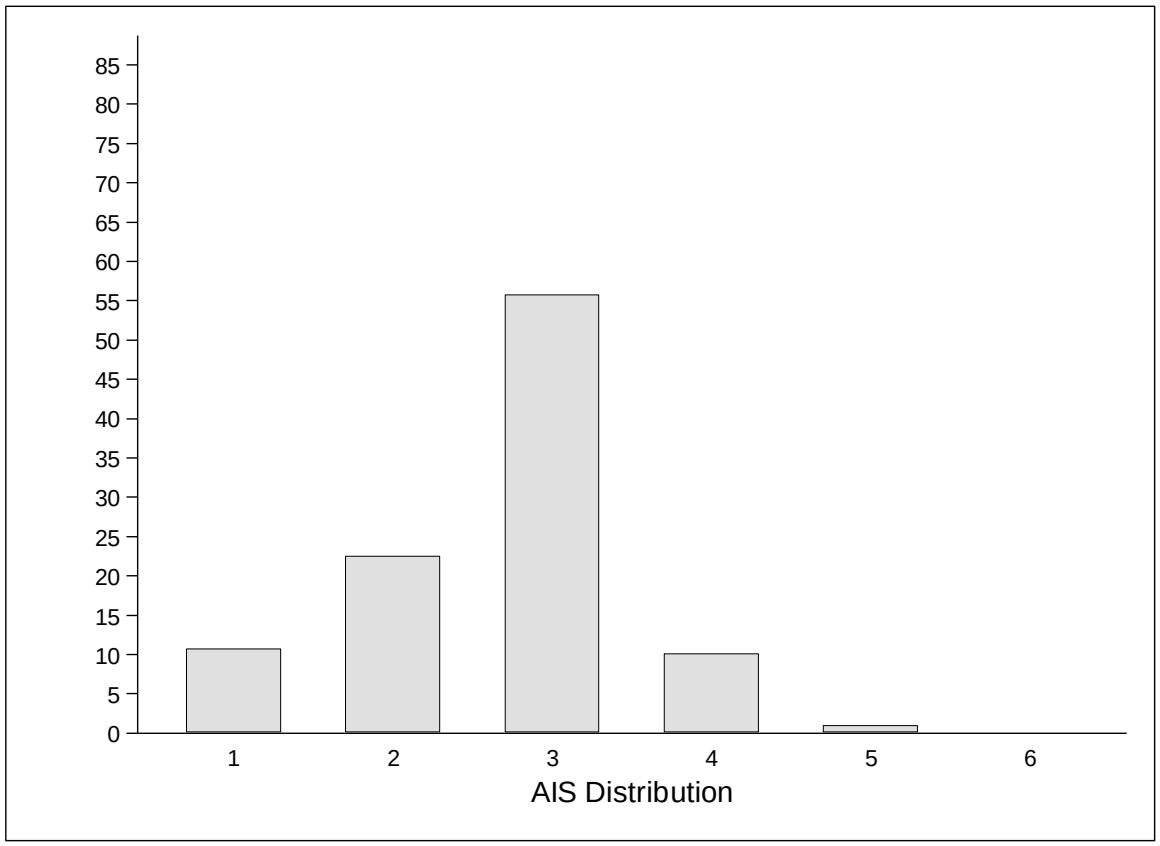

Figure 2.12a(iv). The Abdomen/Pelvic Content Region

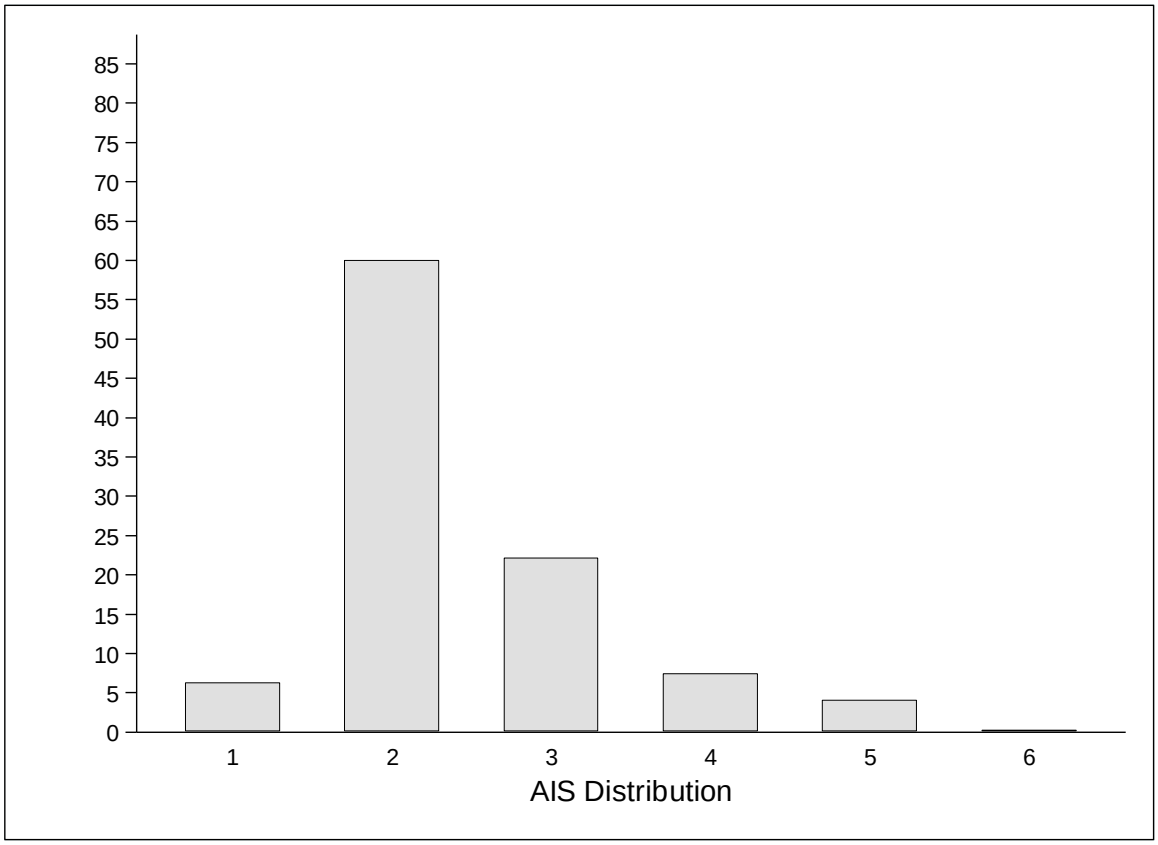

Figure 2.12a(v). The Extremities /Pelvic Girdle Region

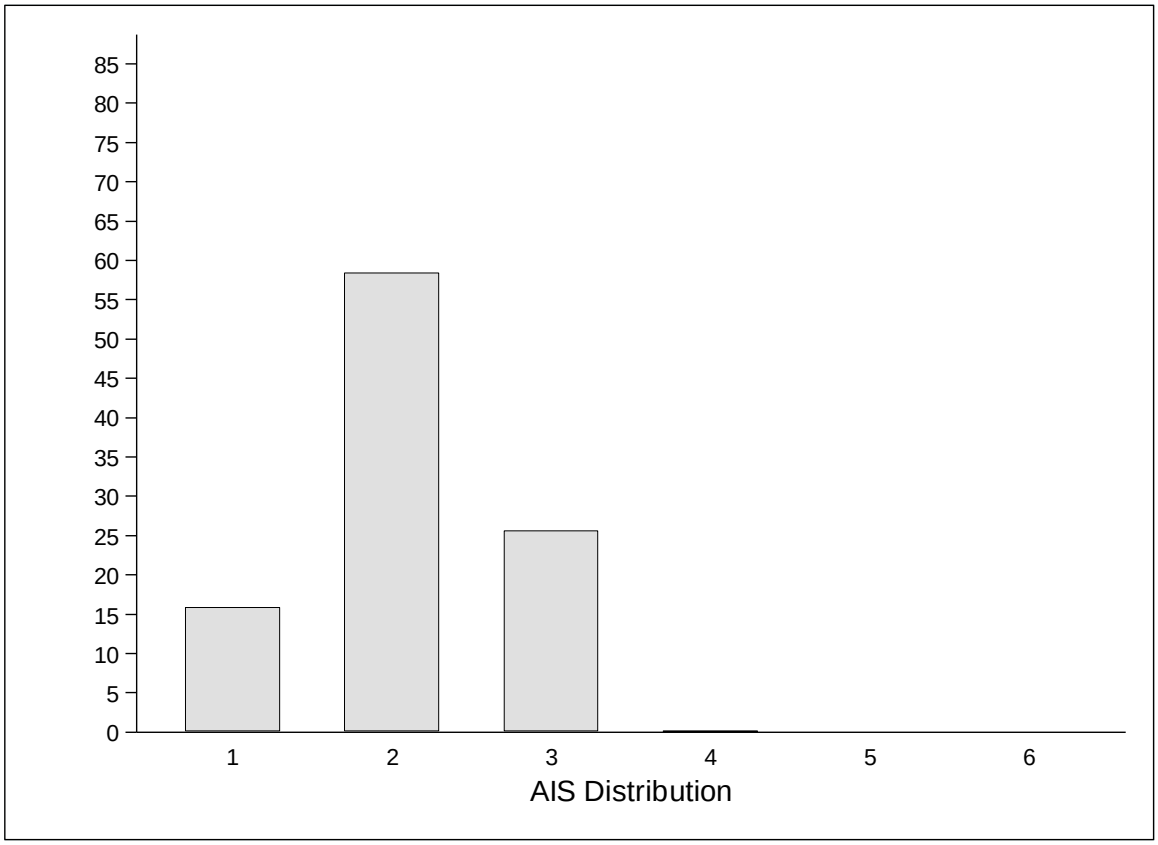

Figure 2.12a(vi). The External Region

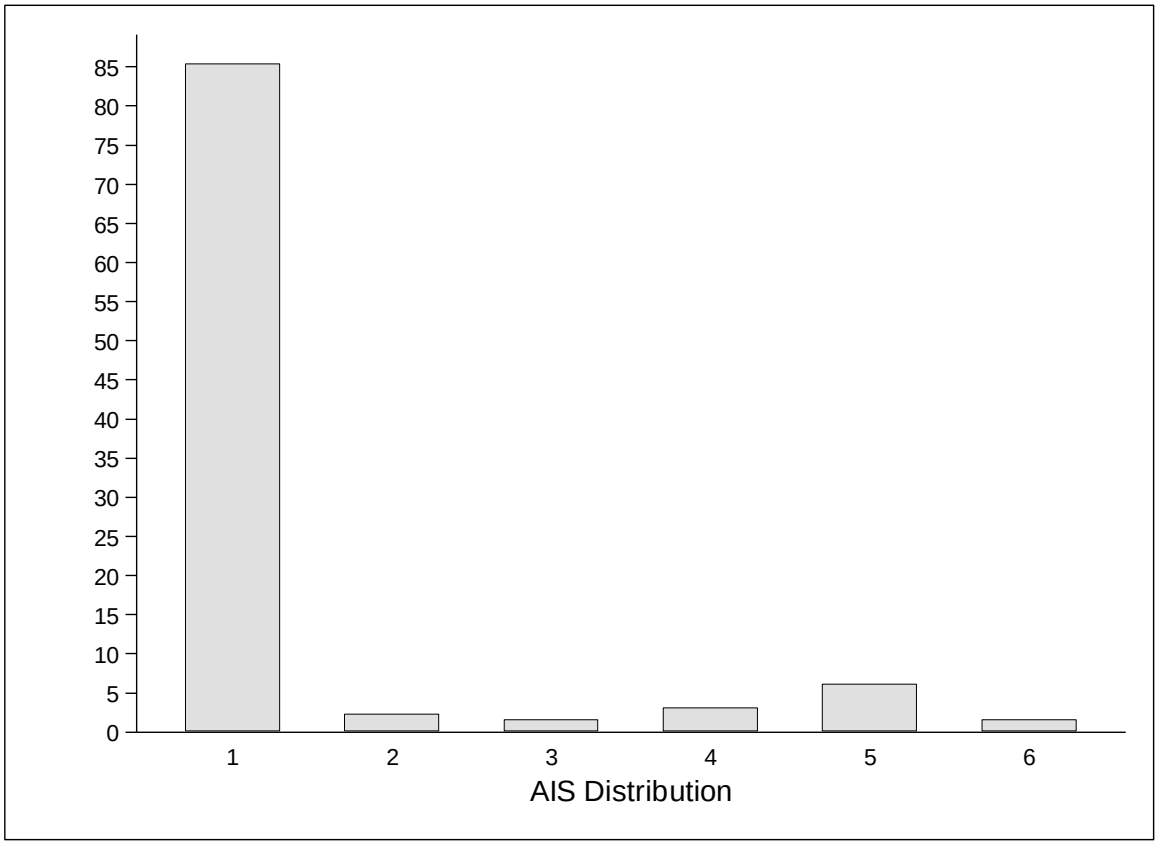

Table 2.12a. Distribution According to Body Region for Major Trauma Cases

AIS	Head and Neck		Face		Thorax		Abdomen/ Pelvic content		Extremities/ Pelvic girdle		External		Total	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
1	141	3.19	494	58.39	66	10.7	28	6.26	225	15.85	111	85.38	1065	13.52
2	788	17.84	333	39.36	139	22.53	268	59.96	829	58.38	3	2.31	2360	29.96
3	1537	34.79	19	2.25	344	55.75	99	22.15	364	25.63	2	1.54	2365	30.02
4	1513	34.25	0	0	62	10.05	33	7.38	2	0.14	4	3.08	1614	20.49
5	439	9.94	0	0	6	0.97	18	4.03	0	0	8	6.15	471	5.98
6	0	0	0	0	0	0	1	0.22	0	0	2	1.54	3	0.04
TOTAL	**4418**	**100**	**846**	**100**	**617**	**100**	**447**	**100**	**1420**	**100**	**130**	**100**	**7878**	**100**

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

Figure 2.13. Body Region with Abbreviated Injury Score (AIS) ≥ 3 for Major Trauma Cases

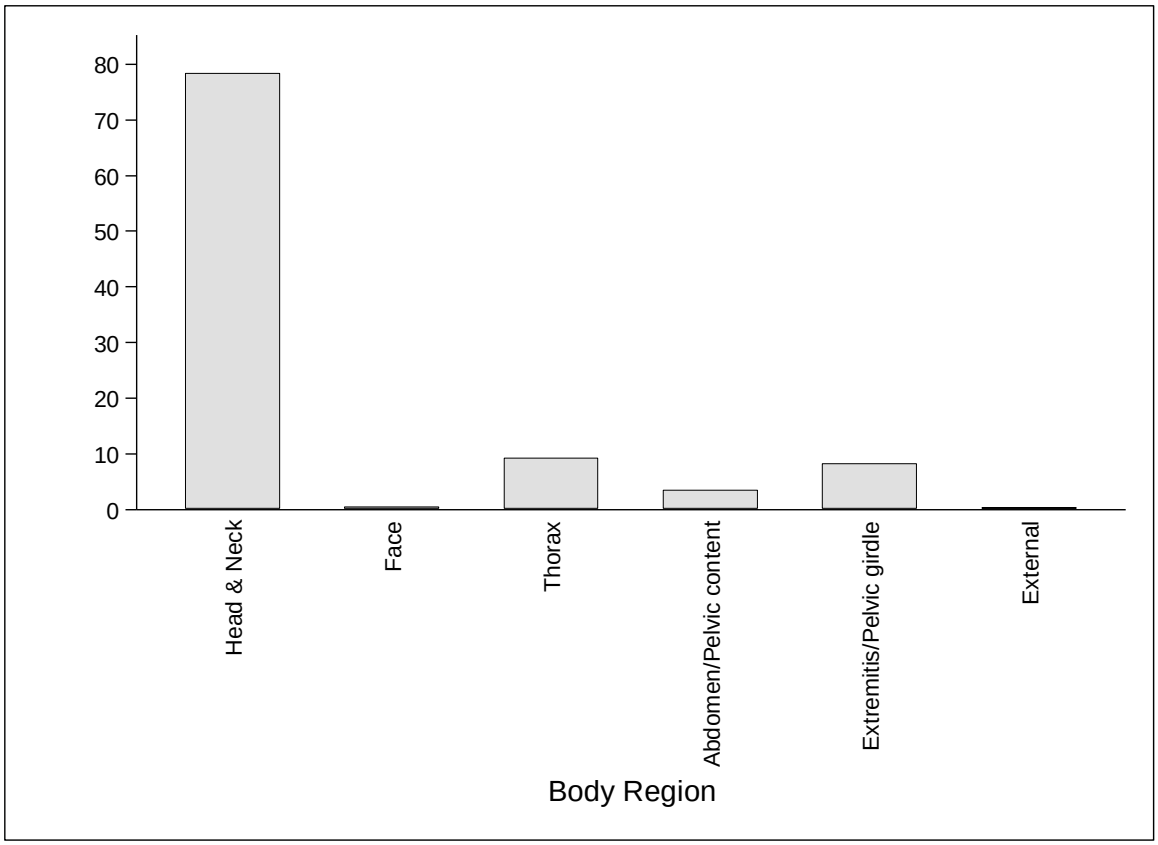

Table 2.13. Body Region with Abbreviated Injury Score (AIS) ≥ 3 for Major Trauma Cases

Body Region	**No.**	**%**
Head & Neck	3489	78.35
Face	19	0.43
Thorax	412	9.25
Abdomen/Pelvic content	151	3.39
Extremitis/Pelvic girdle	366	8.22
External	16	0.36
TOTAL	**4453**	**100**

Figure 2.14. Injury Severity Score (ISS) for Major Trauma Cases

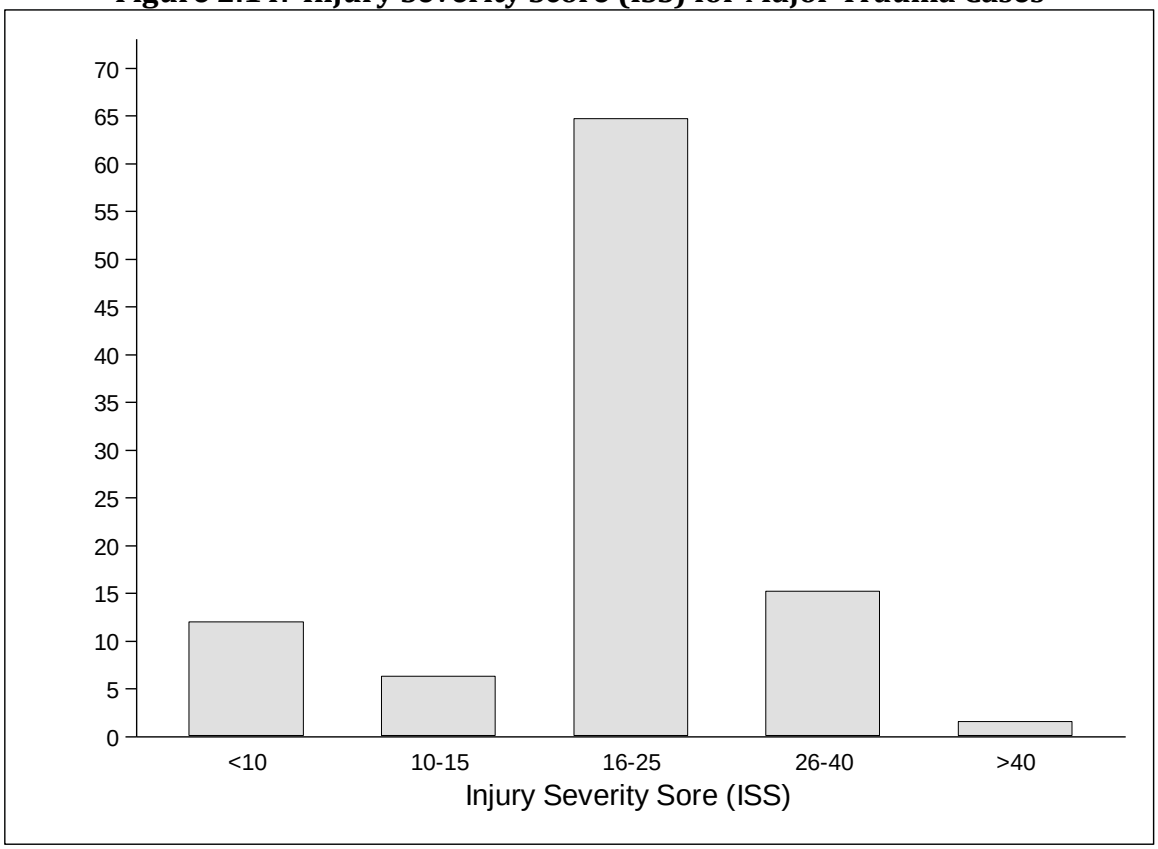

Table 2.14. Injury Severity Score (ISS) for Major Trauma Cases

ISS	No.	%
<10	245	12.06
10-15	129	6.35
16-25	1315	64.75
25-40	309	15.21
>40	33	1.62
TOTAL	**2031**	**100**

Note * 30 cases have no "IIS information"

Chapter 3: PROCEDURES AND OPERATIVE MANAGEMENT

Figure 3.1. Procedure Done in Emergency Department for Major Trauma Cases

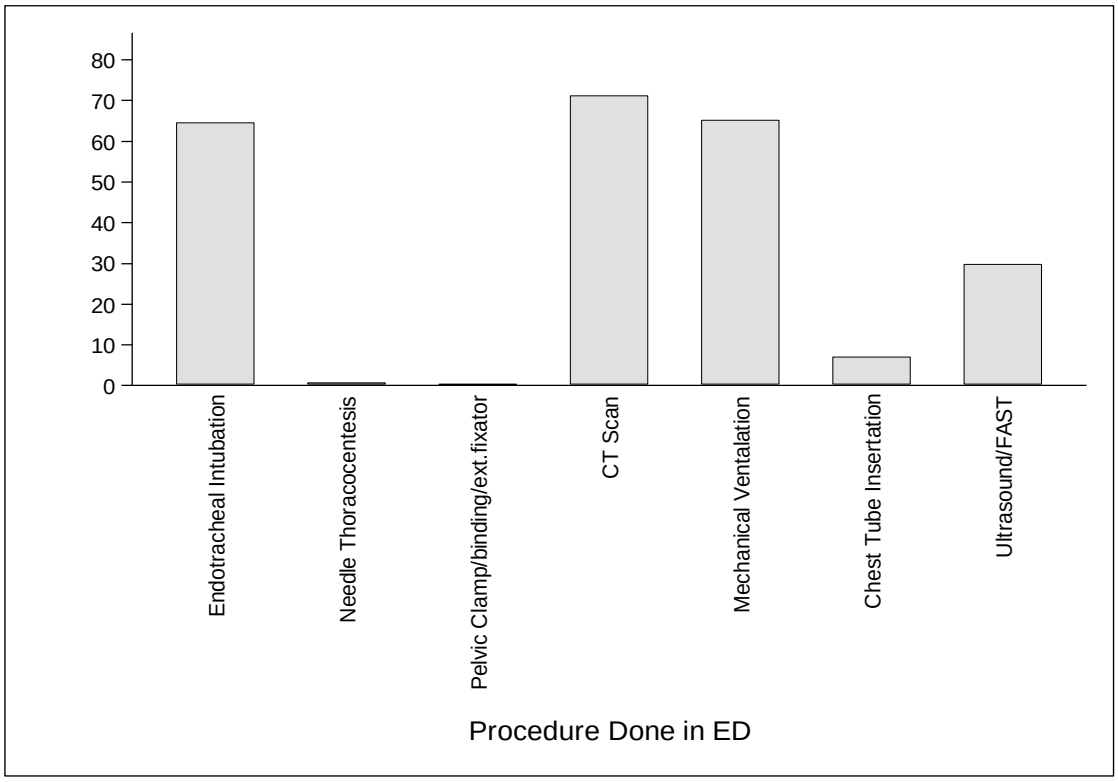

Table 3.1. Procedure Done in Emergency Department for Major Trauma Cases

Procedure Done in ED	No.	%
Endotracheal Intubation	**1336**	**64.8**
• Intubated at Referral Hospital	596	44.61
• Intubated at Current Hospital	740	55.39
• Not Available	0	0
Needles Thoracocentesis	14	0.7
Pelvic Clamp/Binding/ext. Fixator	8	0.4
CT Scan	**1463**	**71**
• Brain	1354	92.5
• Cervical Spine	622	42.5
• Abdomen	190	13
• Pelvis	50	3.4
• Thorax	55	3.8
• Others, specify	17	1.2
Mechanical Ventilation	1348	65.4
Chest Tube Insertion	147	7.1
Ultrasound/FAST	599	29.1

Figure 3.2. Operative Management for Major Trauma Cases

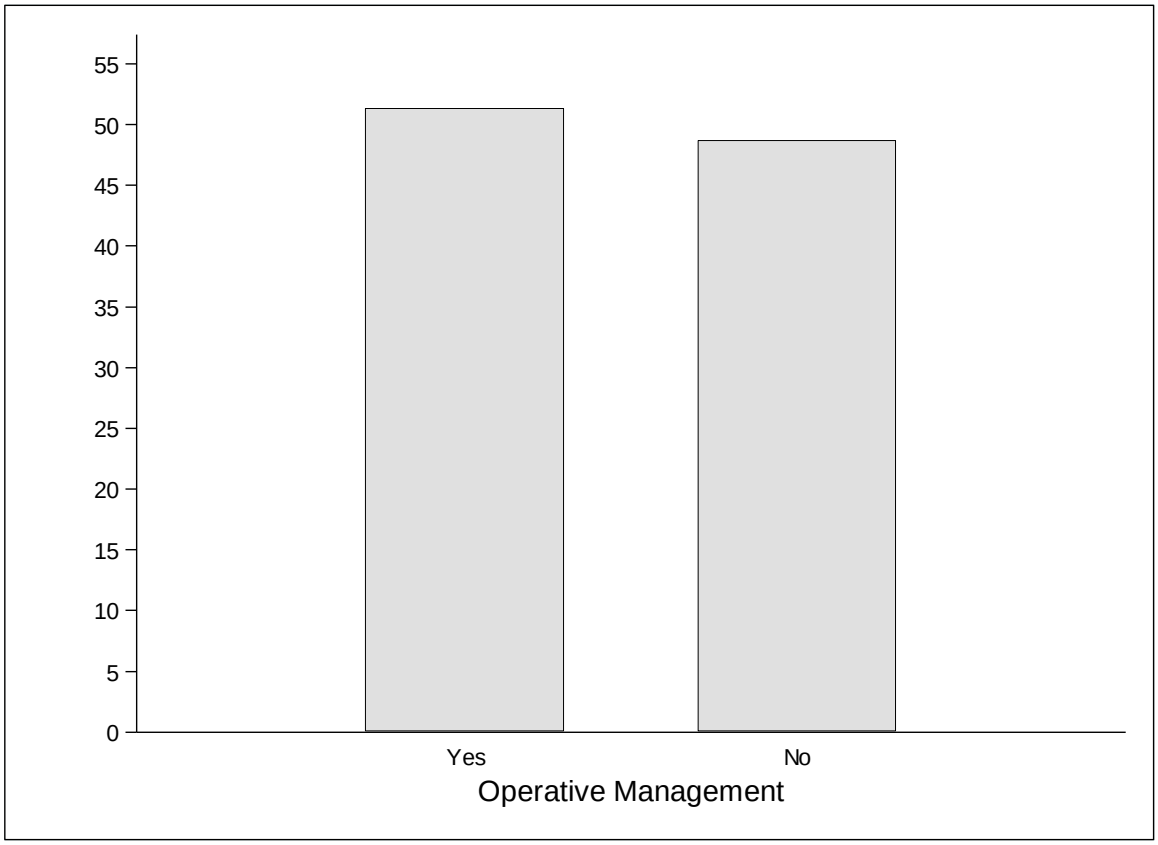

Table 3.2. Operative Management for Major Trauma Cases

Operative Management	Total	
	No.	%
Yes	1058	51.33
No	1003	48.67
TOTAL	**2061**	**100**

Figure 3.3. Operative Procedure for Major Trauma Cases

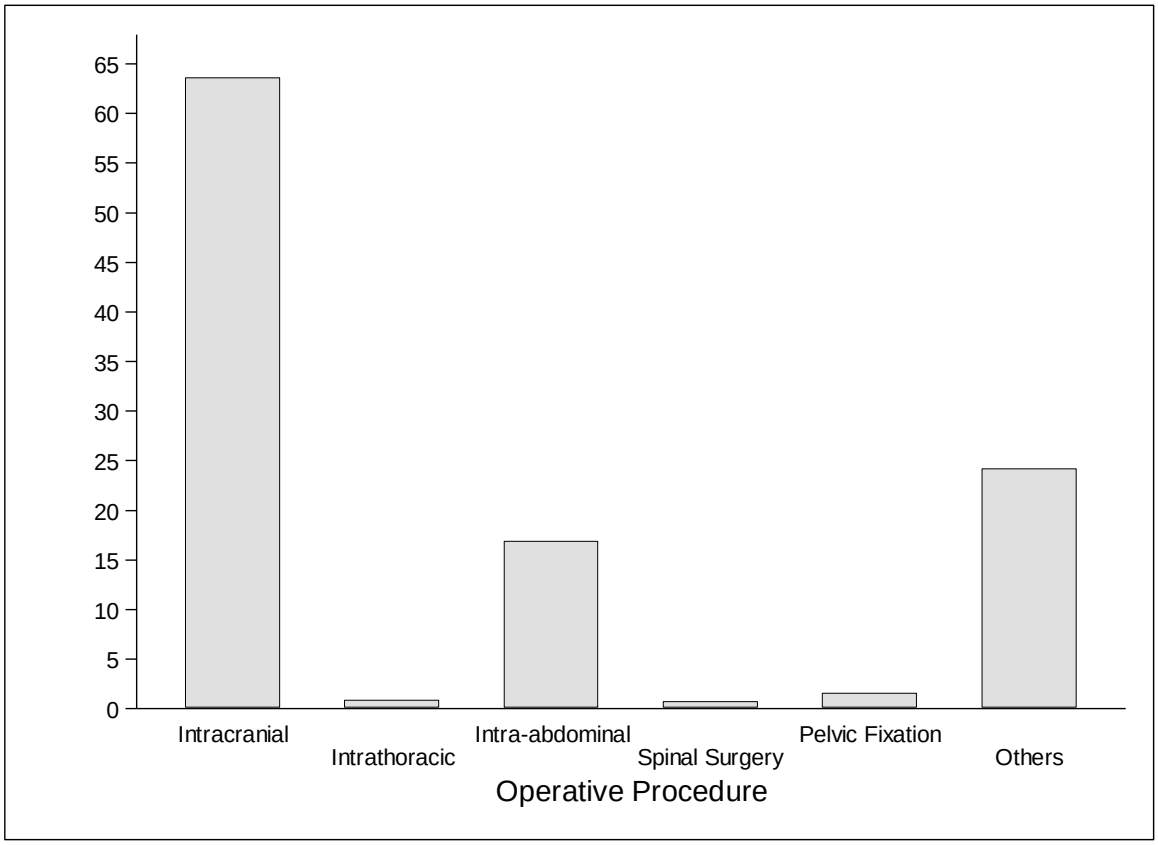

Table 3.3. Operative Procedure for Major Trauma Cases

Operative Procedure	**No.**	**%**
Intracranial	673	63.61
Intrathoracic	9	0.85
Intra-abdominal	179	16.92
Spinal Surgery	8	0.76
Pelvic Fixation	17	1.61
Others	256	24.2
TOTAL	**1058**	**100**

Chapter 4: Outcome

Figure 4.1. Total Outcome for Major Trauma Cases

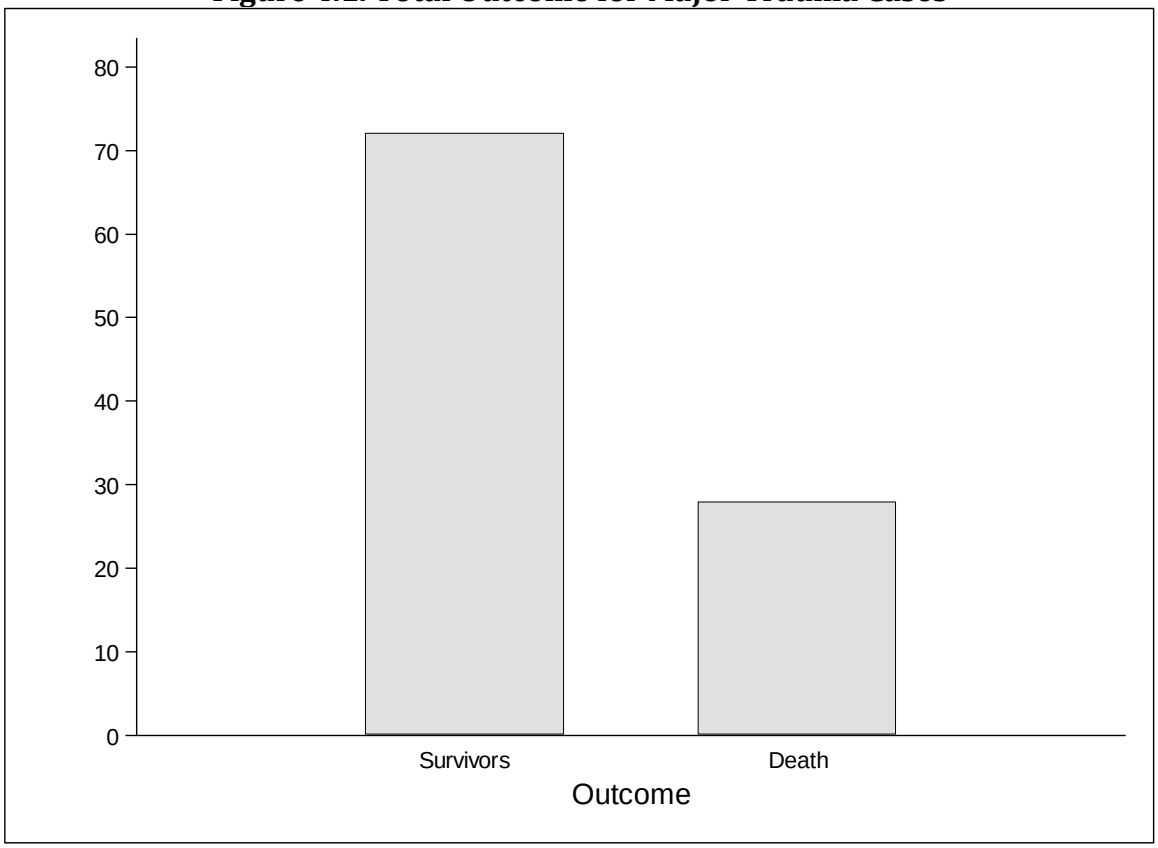

Table 4.1. Total Outcome for Major Trauma Cases

Outcome	**No.**	**%**
Survivors	1484	72.07
Deaths	575	27.93
TOTAL	**2059**	**100**

Note *2 cases have no "Outcome" information

Figure 4.1a. Outcome for Major Trauma Cases by Centre

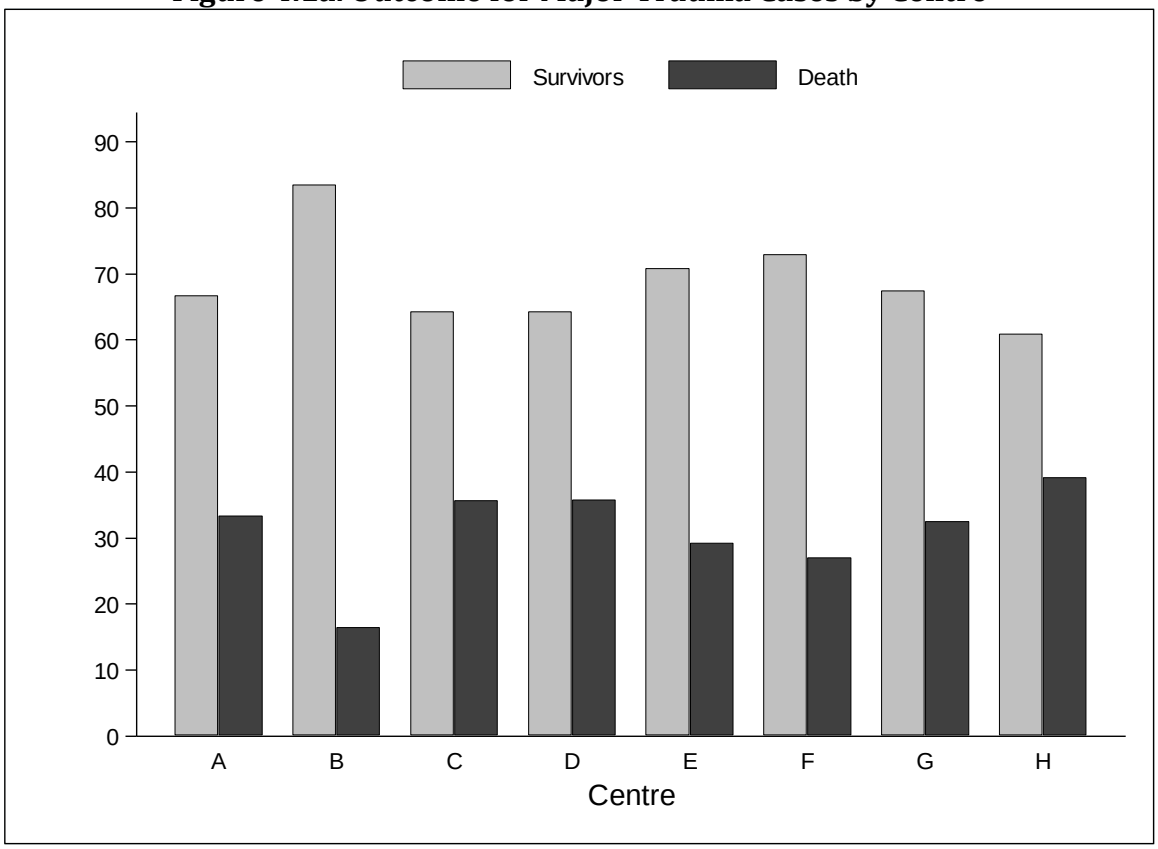

Table 4.1a. Outcome for Major Trauma Cases by Centre

Centre	Survivors		Deaths		Total
	No.	%	No.	%	
A	32	66.67	16	33.33	48
B	400	83.51	79	16.49	479
C	146	64.32	81	35.68	227
D	88	64.23	49	35.77	137
E	451	70.8	186	29.2	637
F	135	72.97	50	27.03	185
G	218	67.49	105	32.51	323
H	14	60.87	9	39.13	23
Total	**1484**	**72.07**	**575**	**27.93**	**2059**

Note *2 cases have no "Outcome" information

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

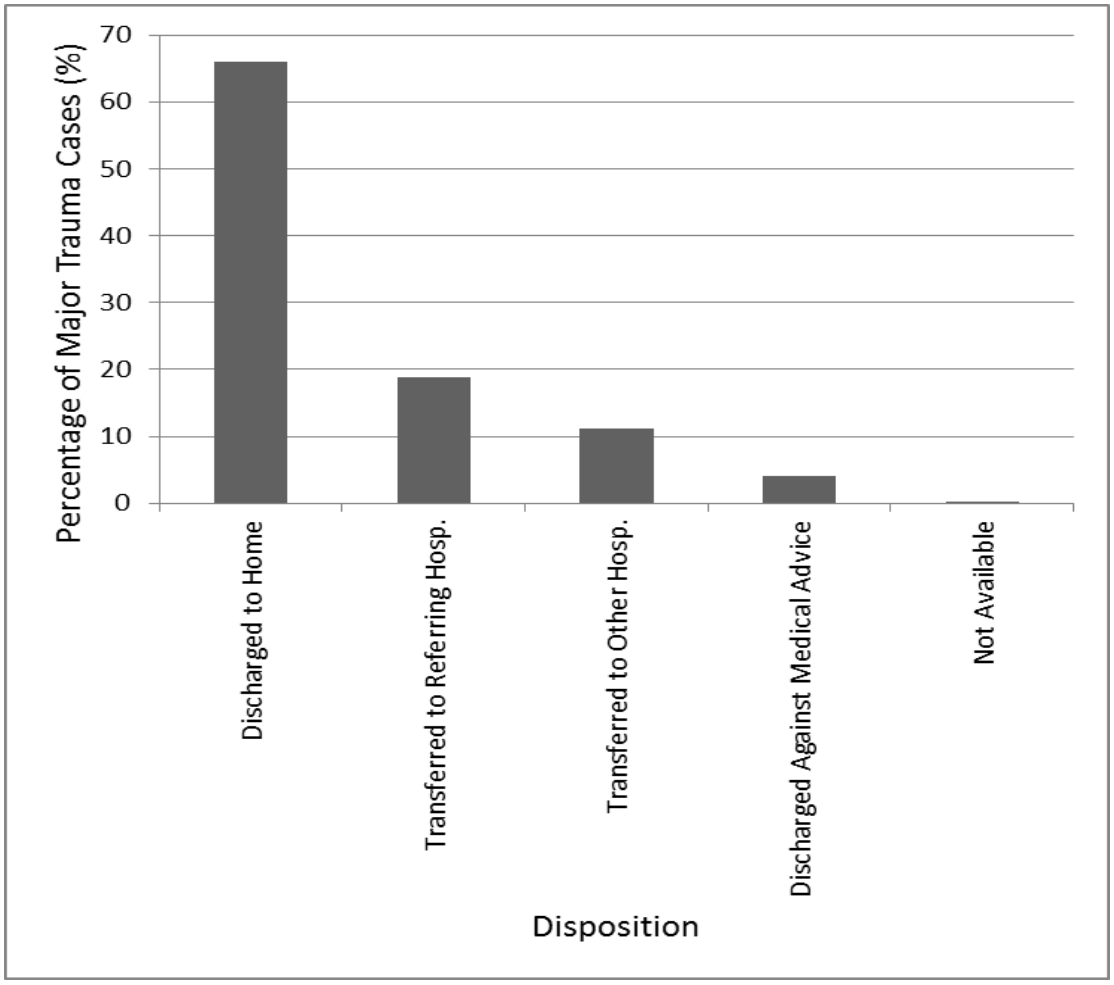

Table 4.2. Disposition of Survivors at Discharge for Major Trauma Cases

Disposition	**Survivors**	
	No.	**%**
Discharged to Home	975	65.92
Transferred to Referring Hosp.	278	18.8
Transferred to Other Hosp.	166	11.22
Discharged Against Medical Advice	59	3.99
Not Available	1	0.07
TOTAL	**1479**	**100**

*5 cases of "Survivors" had no Disposition information

Figure 4.3. Outcome for Major Trauma Cases by Age Group

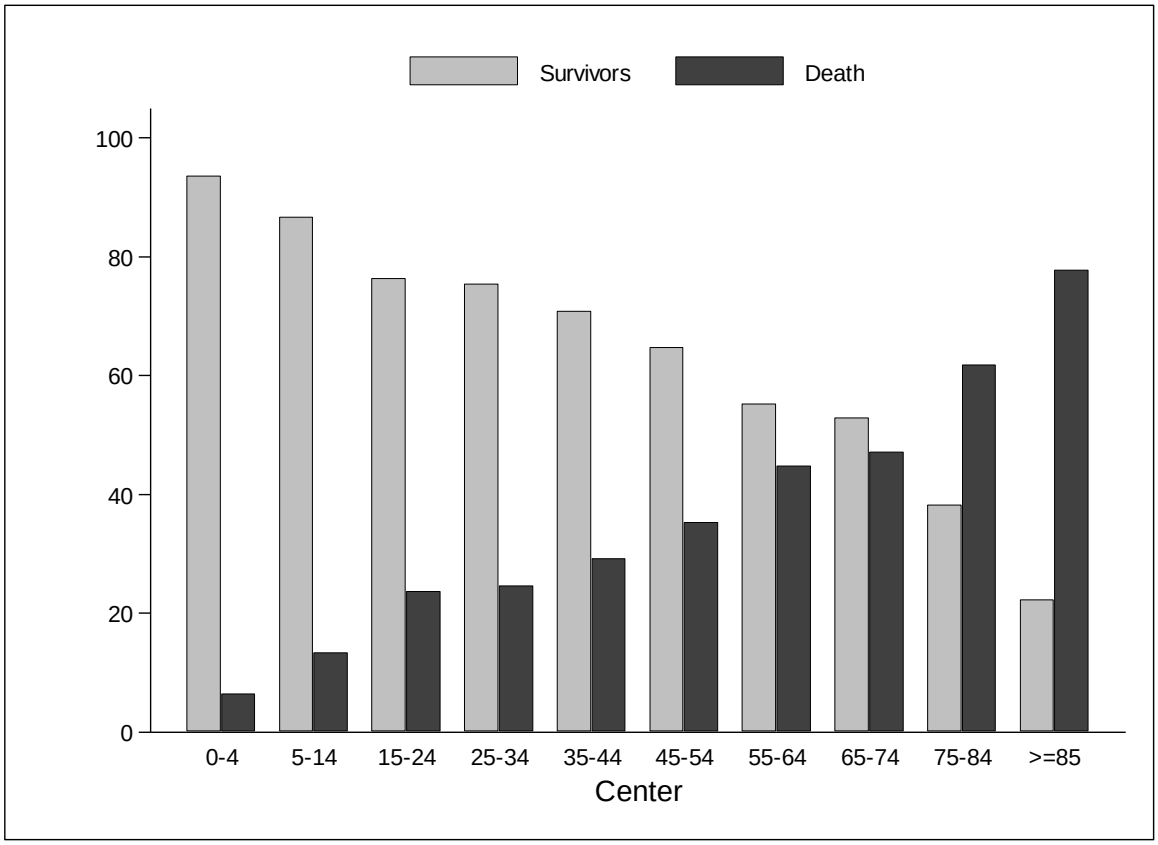

Table 4.3. Outcome for Major Trauma Cases by Age Group

Age Group (years)	Survivors		Deaths		Total	
	No.	%	No.	%	No.	%
0-4	29	93.55	2	6.45	31	1.51
5-14	124	86.71	19	13.29	143	6.95
15-24	537	76.39	166	23.61	703	34.14
25-34	349	75.38	114	24.62	463	22.49
35-44	192	70.85	79	29.15	271	13.16
45-54	112	64.74	61	35.26	173	8.4
55-64	80	55.17	65	44.83	145	7.04
65-74	46	52.87	41	47.13	87	4.23
75-84	13	38.24	21	61.76	34	1.65
≥85	2	22.22	7	77.78	9	0.44
TOTAL	**1484**	**72.07**	**575**	**27.93**	**2059**	**100**

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

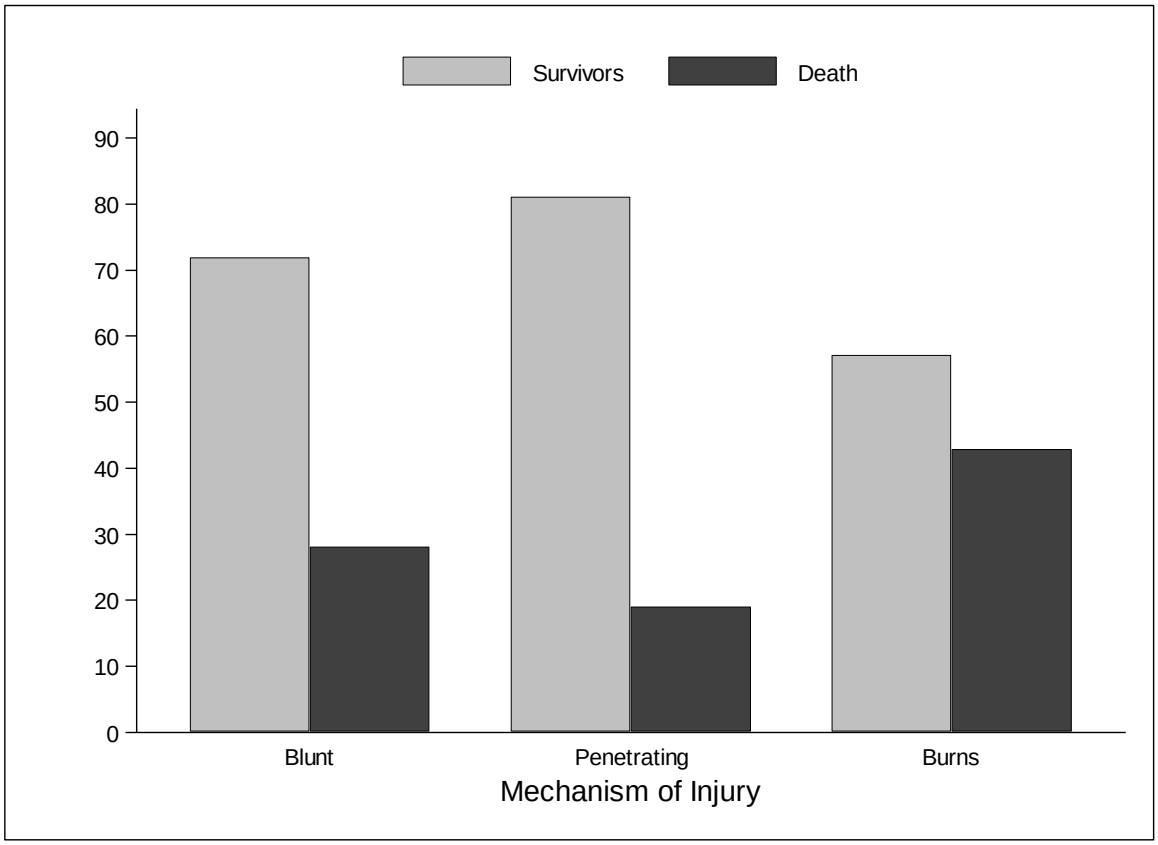

Table 4.4. Outcome for Major Trauma Cases by Mechanism of Injury

Mechanism of Injury	Survivors		Deaths		Total	
	No.	%	No.	%	No.	%
Blunt	1427	71.89	556	28.01	1985	96.31
Penetrating	47	81.03	11	18.97	58	2.81
Burns	12	57.14	9	42.86	21	1.02
TOTAL	**1484**	**72**	**575**	**27.9**	**2061**	**100**

Figure 4.5. Injury Cause for Major Trauma Cases by Outcome

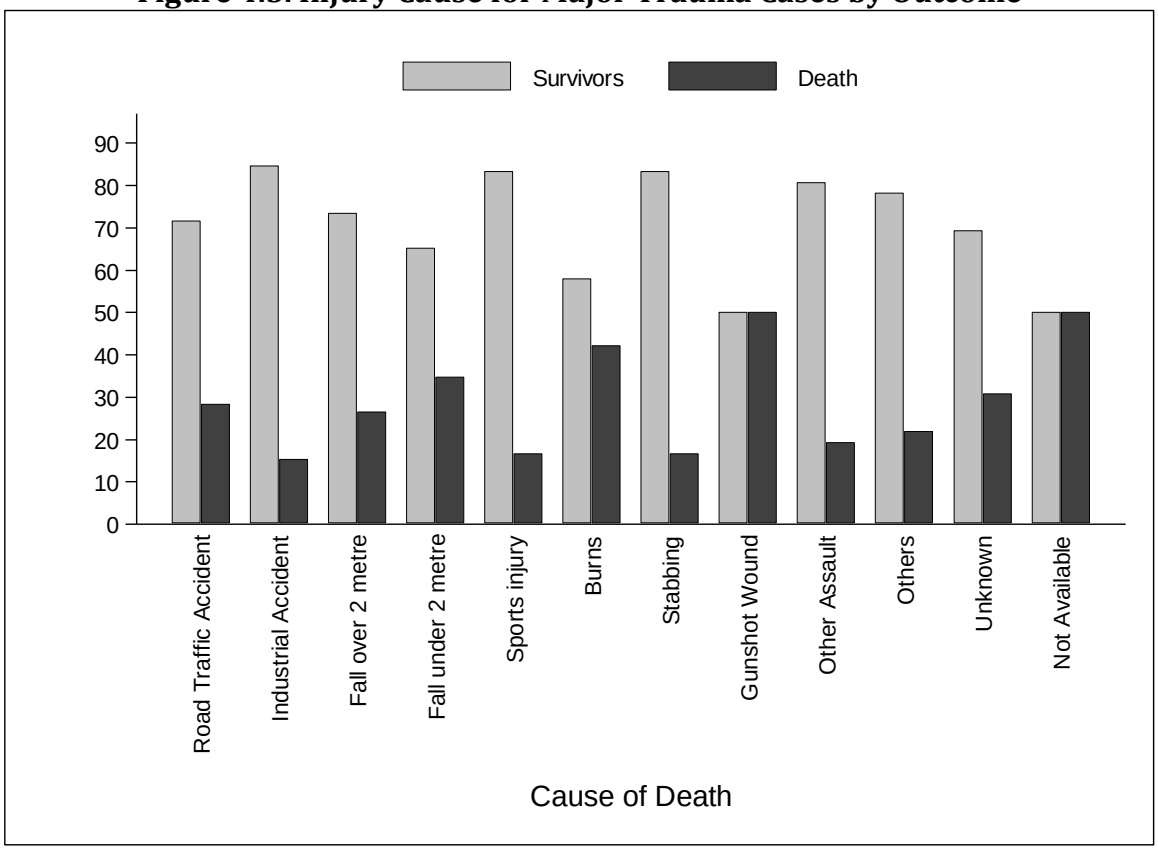

Table 4.5. Cause of Injury for Major Trauma Cases by Outcome

Cause of Injury	Survivors		Deaths		Total	
	No.	%	No.	%	No.	%
Road Traffic Accident	1132	71.6	449	28.4	1581	76.78
Industrial Accident	22	84.62	4	15.38	26	1.26
Fall from over 2 metres	108	73.47	39	26.53	147	7.14
Fall under 2 metres (about a door's height)	62	65.26	33	34.74	95	4.61
Sports injury	5	83.33	1	16.67	6	0.29
Burns	11	57.89	8	42.11	19	0.92
Stab wound	30	83.33	6	16.67	36	1.75
Gunshot Wound	2	50	2	50	4	0.19
Other Assault	67	80.72	16	19.28	83	4.03
Others	25	78.13	7	21.88	32	1.55
Unknown	18	69.23	8	30.77	26	1.26
Not Available	2	50	2	50	4	0.19
TOTAL	**1484**	**72.07**	**575**	**27.93**	**2059**	**100**

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

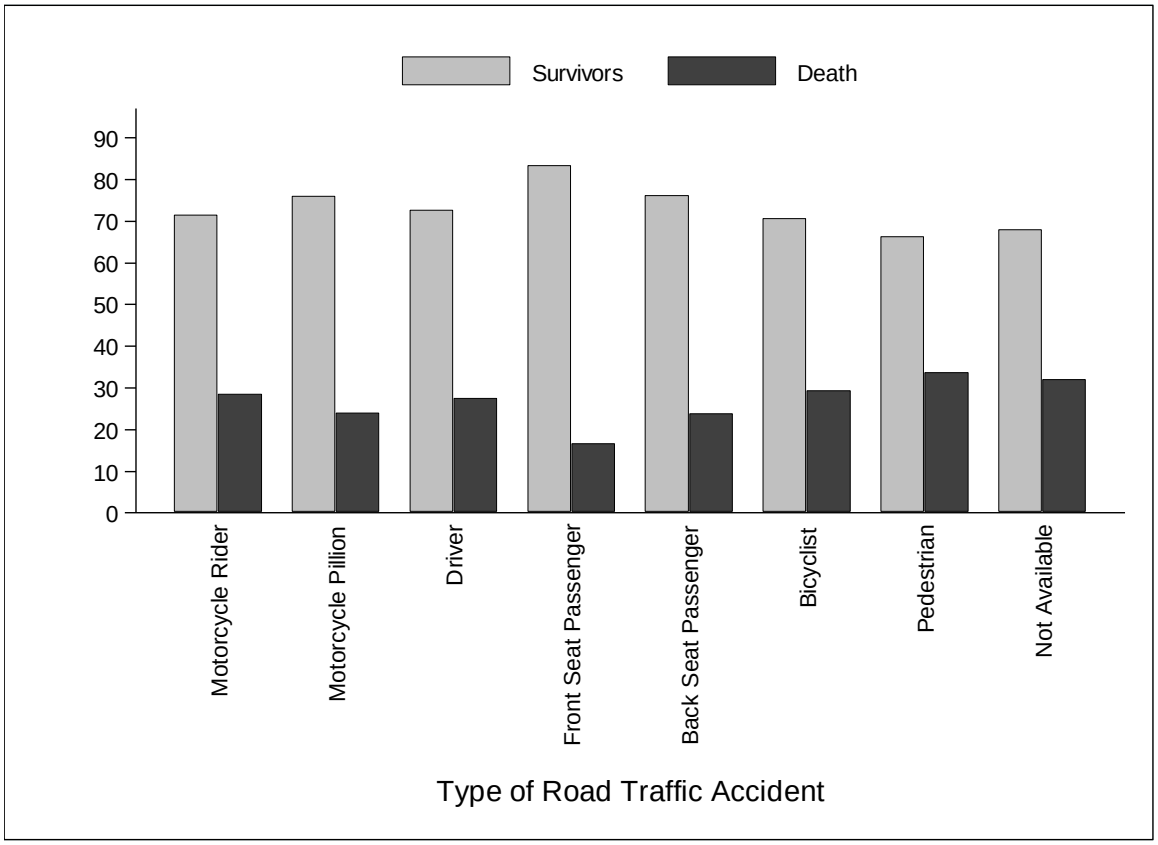

Table 4.6. Outcome by Type of Road Traffic Accident for Major Trauma Cases

Type of Road Traffic Accident	Survivors		Deaths		Total	
	No.	%	No.	%	No.	%
Motorcycle Rider	747	71.55	297	28.45	1044	66.03
Motorcycle Pillion	76	76	24	24	100	6.33
Driver	82	72.57	31	27.43	113	7.15
Front Seat Passenger	20	83.33	4	16.67	24	1.52
Back Seat Passenger	32	76.19	10	23.81	42	2.66
Bicyclist	36	70.59	15	29.41	51	3.23
Pedestrian	71	66.36	36	33.64	107	6.77
Not Available	68	68	32	32	100	6.33
TOTAL	**1132**	**71.6**	**449**	**28.4**	**1581**	**100**

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

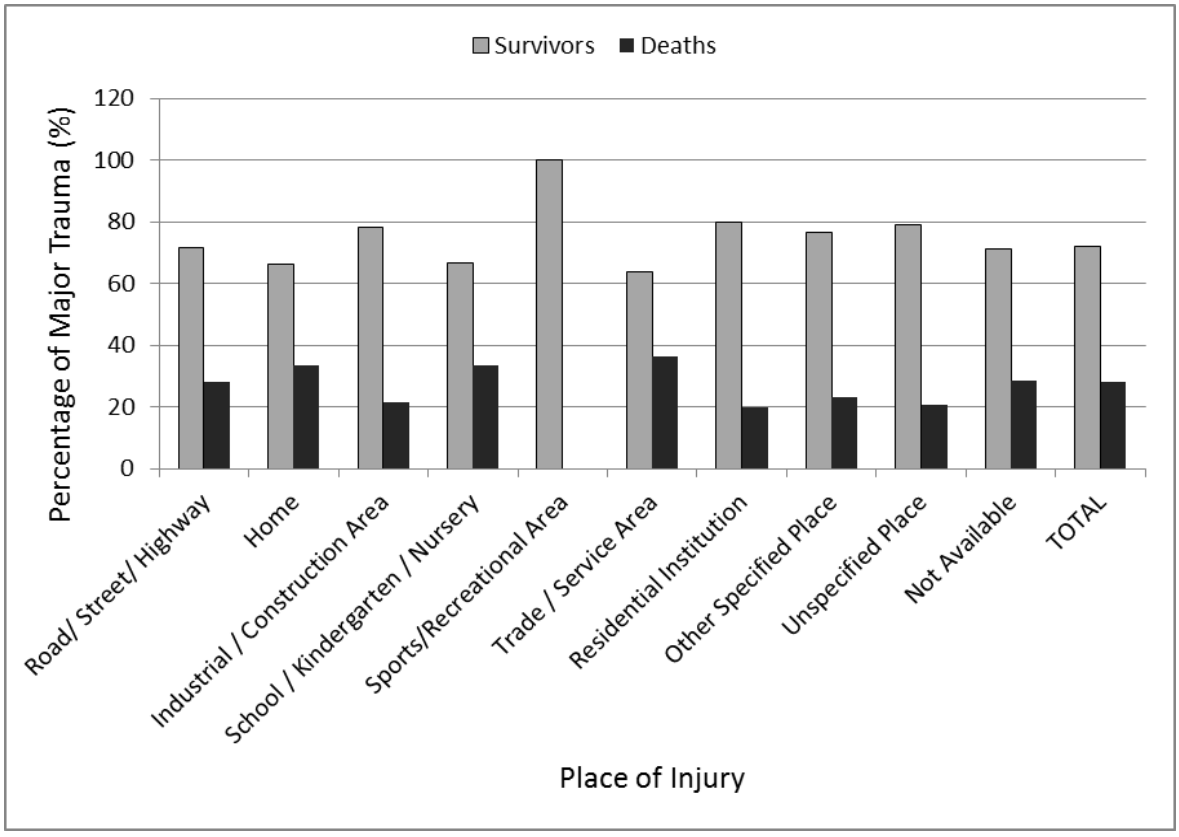

Table 4.7. Place of Injury for Major Trauma Cases by Outcome

Place of Injury	Survivors		Deaths		Total	
	No.	%	No.	%	No.	%
Road/ Street/ Highway	1205	71.85	472	28.15	1677	81.45
Home	93	66.43	47	33.57	140	6.8
Industrial / Construction Area	80	78.43	22	21.57	102	4.95
School / Kindergarten / Nursery	4	66.67	2	33.33	6	0.29
Sports/Recreational Area	13	100	0	0	13	0.63
Trade / Service Area	14	63.64	8	36.36	22	1.07
Residential Institution	8	80	2	20	10	0.49
Other Specified Place	23	76.67	7	23.33	30	1.46
Unspecified Place	19	79.17	5	20.83	24	1.17
Not Available	25	71.43	10	28.57	35	1.7
TOTAL	**1484**	**72.07**	**575**	**27.93**	**2059**	**100**

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

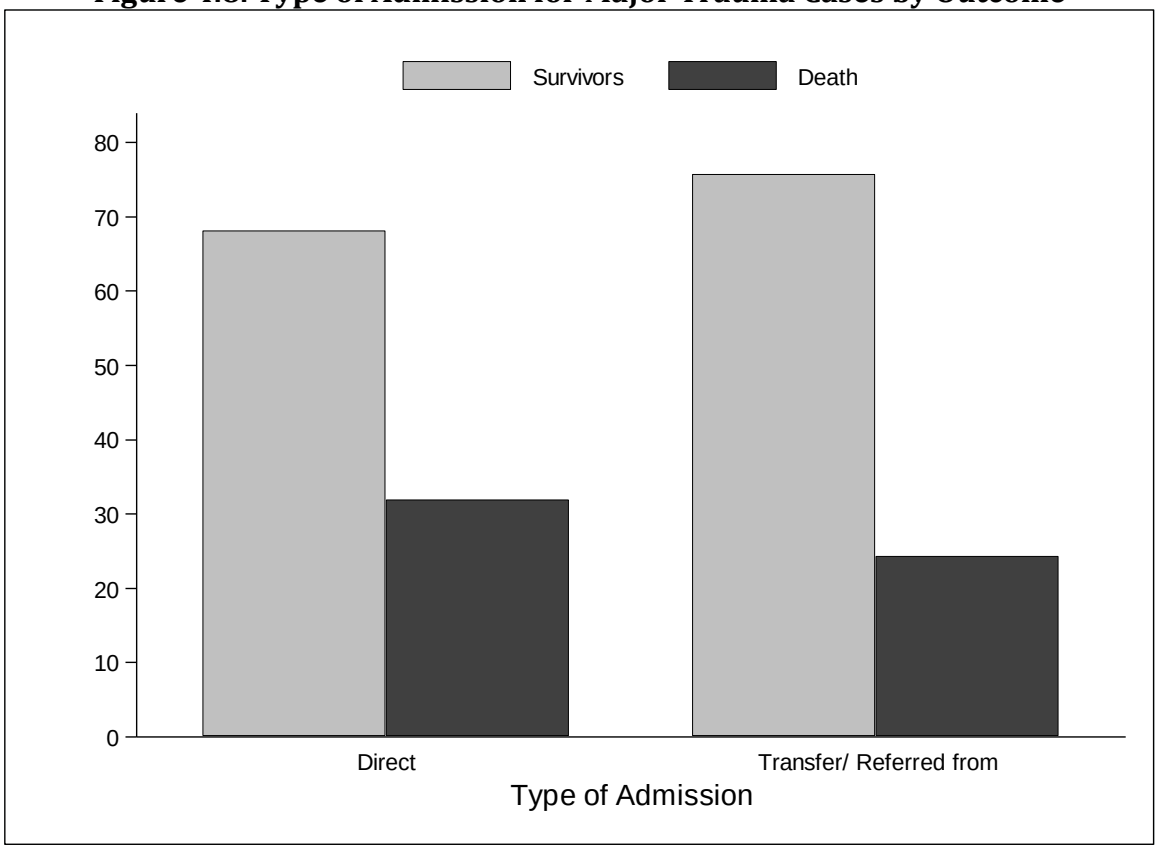

Table 4.8. Type of Admission for Major Trauma Cases by Outcome

Type of Admission	Survivors		Death		Total	
	No.	%	No.	%	No.	%
Direct	676	68.15	316	31.85	992	48.2
Transferred / Referral	808	75.73	259	24.27	1067	51.8
TOTAL	**1484**	**72.07**	**575**	**27.93**	**2059**	**100**

Figure 4.9. Systolic BP for Major Trauma Cases by Outcome

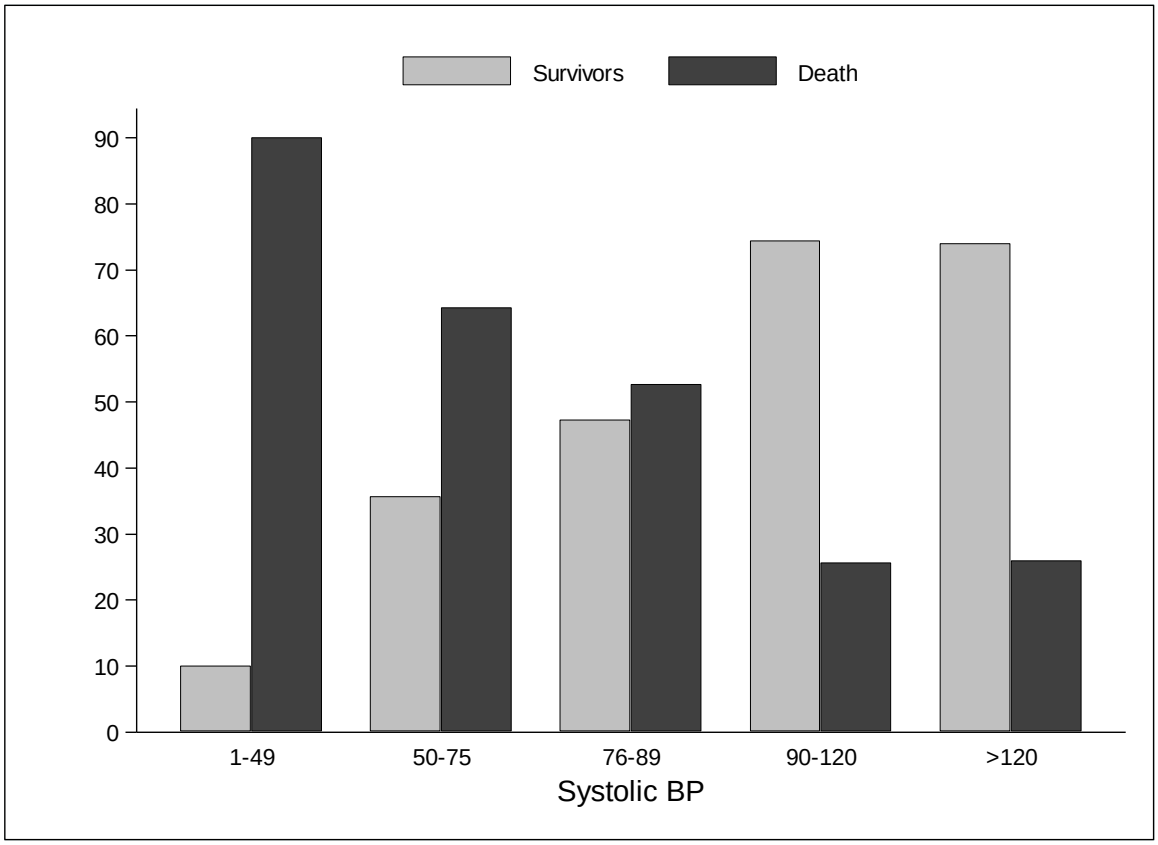

Table 4.9. Systolic BP for Major Trauma Cases by Outcome

Systolic BP	Survivors		Deaths		Total	
	No.	%	No.	%	No.	%
1-49	1	10	9	90	10	0.49
50-75	15	35.71	27	64.29	42	2.04
76-89	35	47.3	39	52.7	74	3.59
90-120	493	74.36	170	25.64	663	32.2
>120	940	74.02	330	25.98	1270	61.68
TOTAL	**1484**	**72.07**	**575**	**27.93**	**2059**	**100**

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

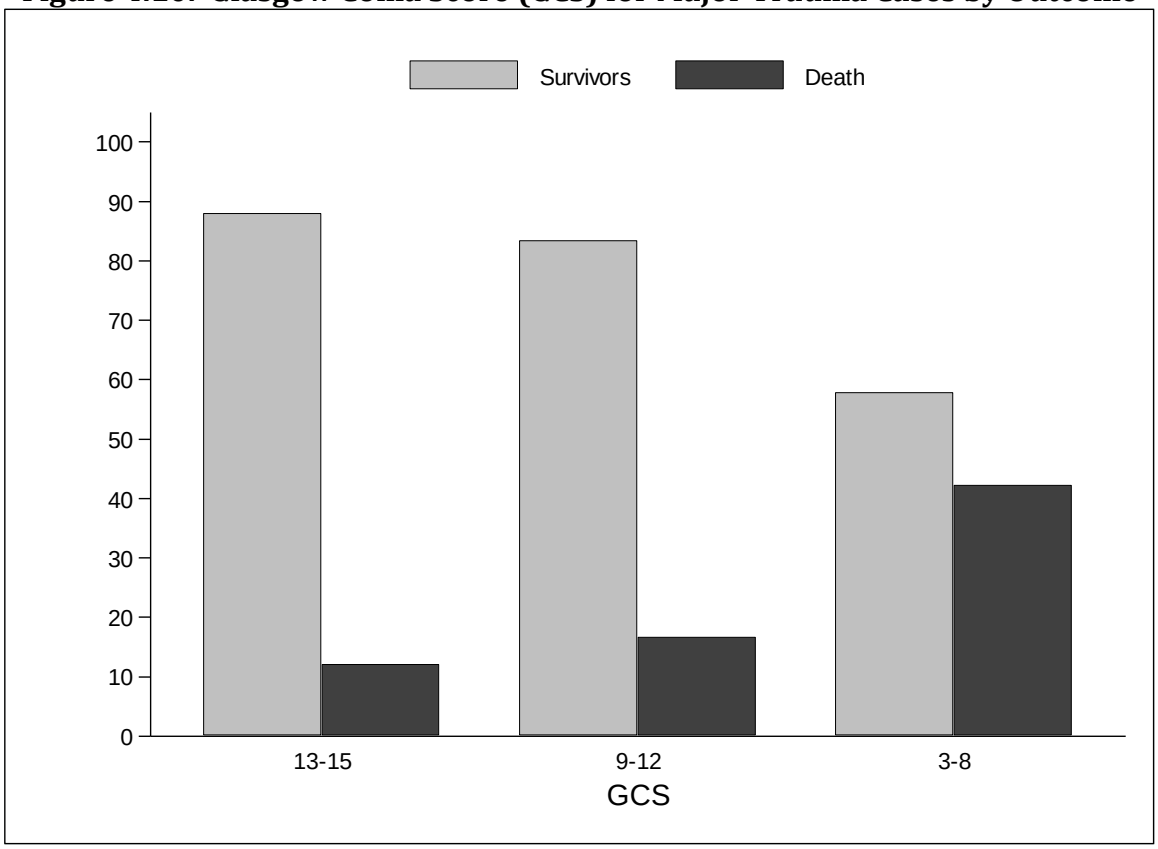

Table 4.10. Glasgow Coma Score (GCS) for Major Trauma Cases by Outcome

Glasgow Coma Score (GCS)	Survivors		Deaths		Total	
	No.	%	No.	%	No.	%
13-15	550	88	75	12	625	30.35
9-12	342	83.41	68	16.59	410	19.91
3-8	592	57.81	432	42.19	1024	49.73
TOTAL	**1484**	**72.07**	**575**	**27.93**	**2059**	**100**

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

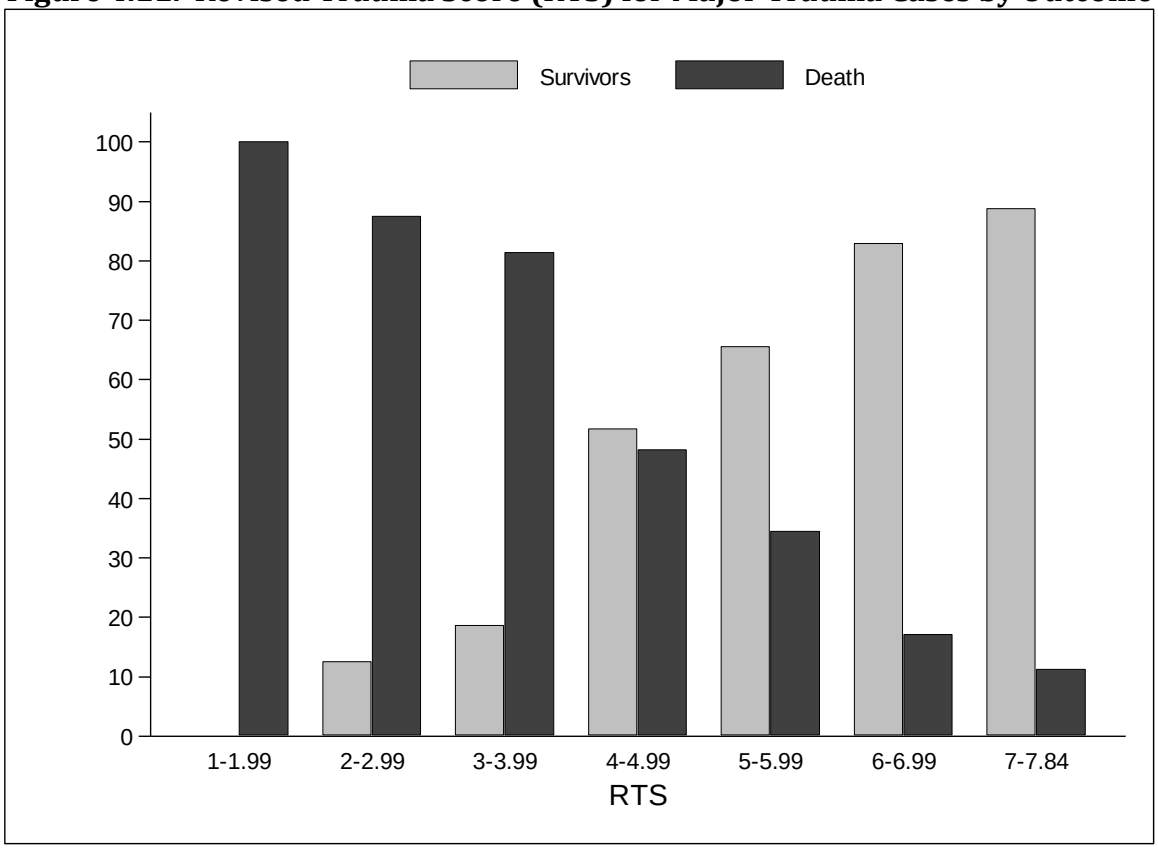

Table 4.11. Revised Trauma Score (RTS) for Major Trauma Cases by Outcome

RTS	Survivors		Deaths		Total	
	No.	%	No.	%	No.	%
1-1.99	0	0	7	100	7	0.34
2-2.99	2	12.5	14	87.5	16	0.78
3-3.99	8	18.6	35	81.4	43	2.09
4-4.99	176	51.76	164	48.24	340	16.51
5-5.99	409	65.54	215	34.46	624	30.31
6-6.99	345	82.93	71	17.07	416	20.2
7-7.84	544	88.74	69	11.26	613	29.77
TOTAL	**1484**	**72.07**	**575**	**27.93**	**2059**	**100**

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

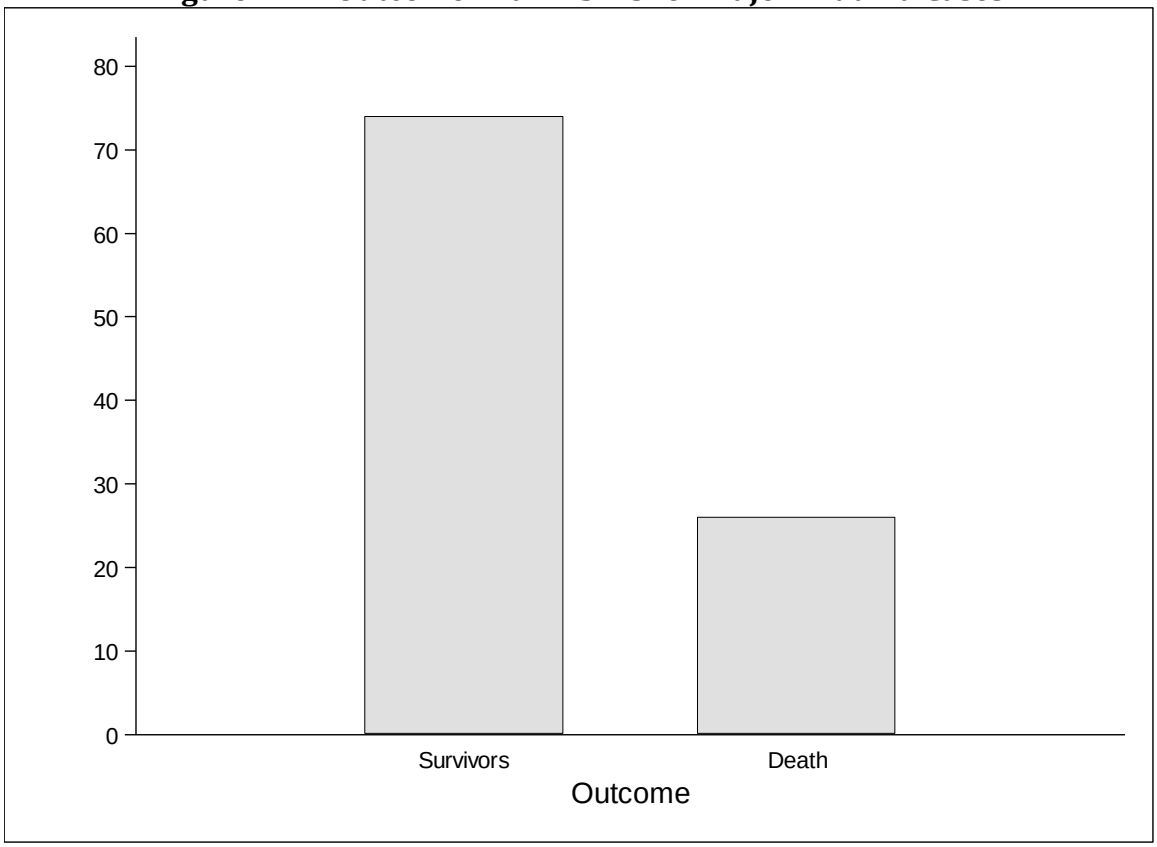

Table 4.12. Outcome with AIS ≥3 for Major Trauma Cases

Outcome	**No.**	**%**
Survivors	1401	74.01
Death	492	25.99
TOTAL	**1893**	**100**

Figure 4.13. ISS for Major Trauma Cases by Outcome

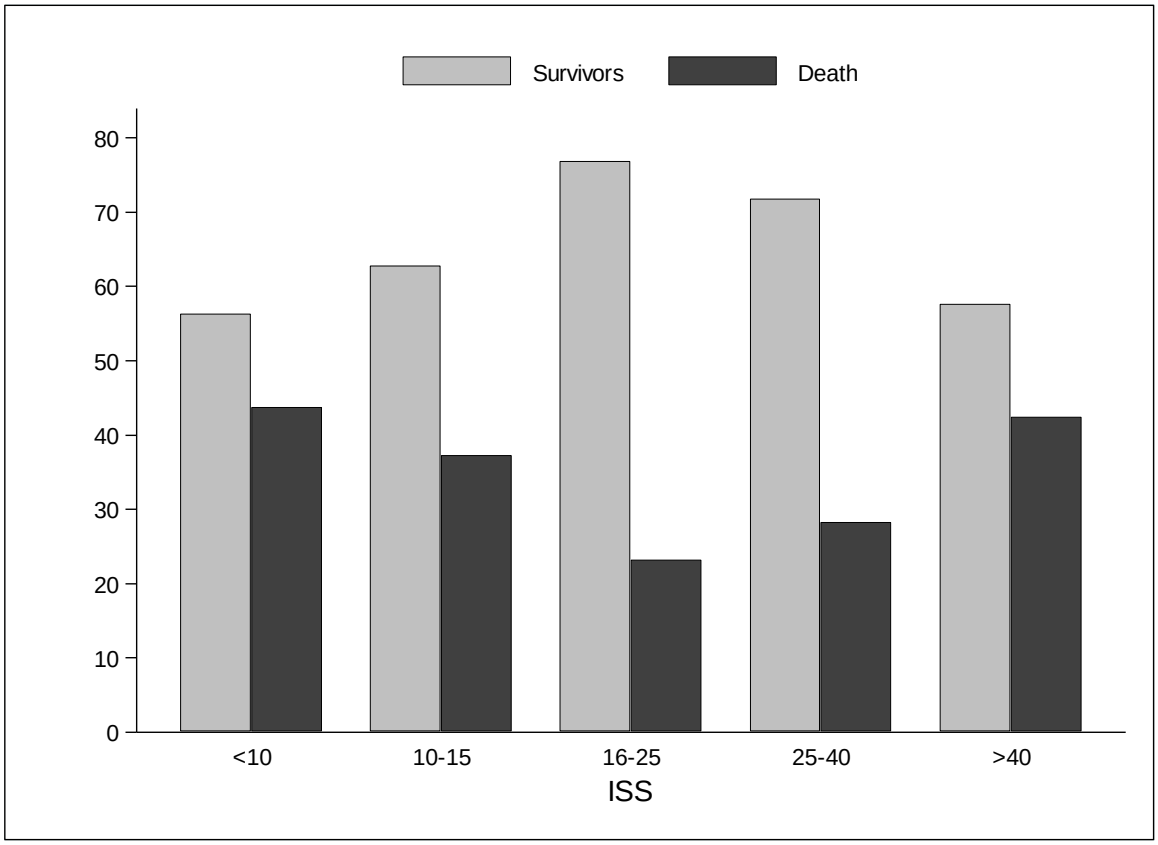

Table 4.13. ISS for Major Trauma Cases by Outcome

ISS	Survivors		Deaths		Total	
	No.	%	No.	%	No.	%
<10	138	56.33	107	43.67	245	12.07
10-15	81	62.79	48	37.21	129	6.36
16-25	1010	76.86	304	23.14	1314	64.76
25-40	221	71.75	87	28.25	308	15.18
>40	19	57.58	14	42.42	33	1.63
TOTAL	**1469**	**72.4**	**560**	**27.6**	**2029**	**100**

Note* 30 cases had no 'ISS" information
Note* 2 cases had "Outcome" information

Figure 4.14. ICU Admissions for Major Trauma Cases by Outcome

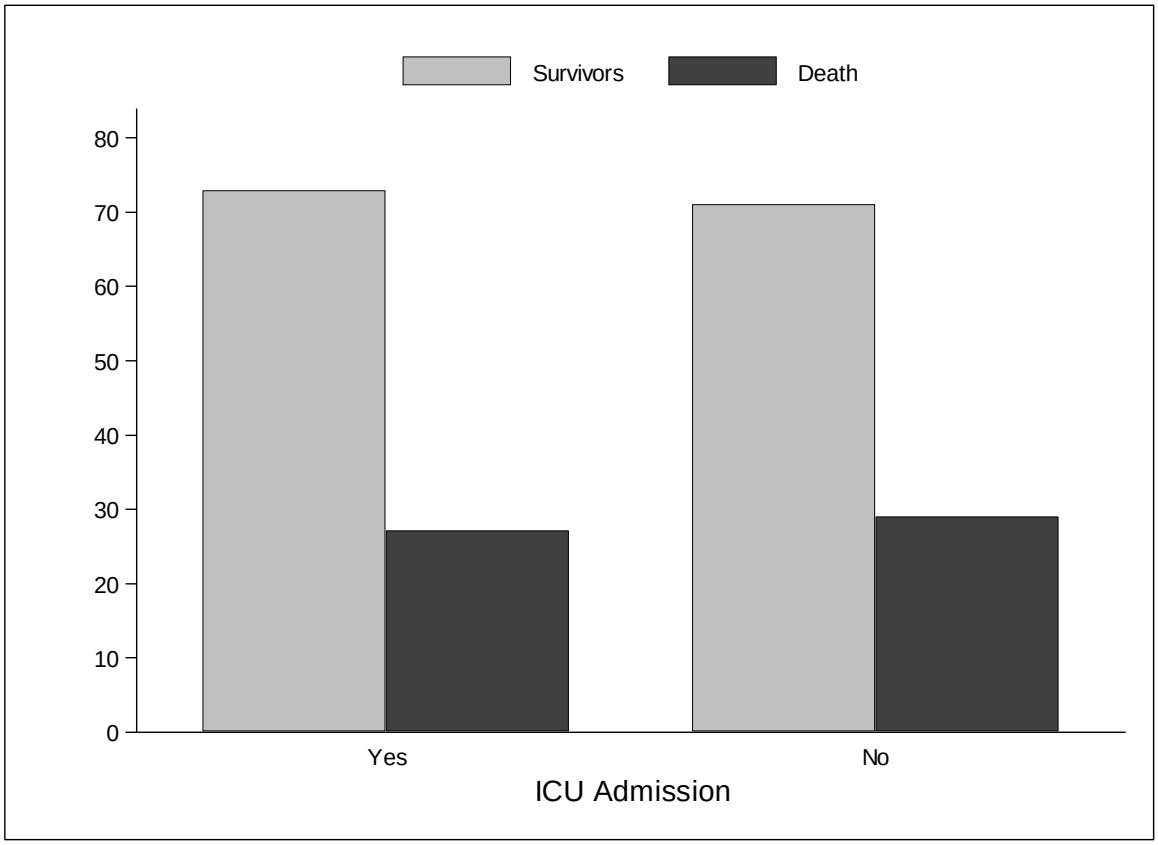

Table 4.14. ICU Admissions for Major Trauma Cases by Outcome

ICU Admissions	Survivors		Deaths		Total	
	No.	%	No.	%	No.	%
Yes	852	72.88	317	27.12	1169	56.78
No	632	71.01	258	28.99	890	43.22
TOTAL	**1484**	**72.07**	**575**	**27.93**	**2059**	**100**

Figure 4.15. TRISS for Major Trauma Cases

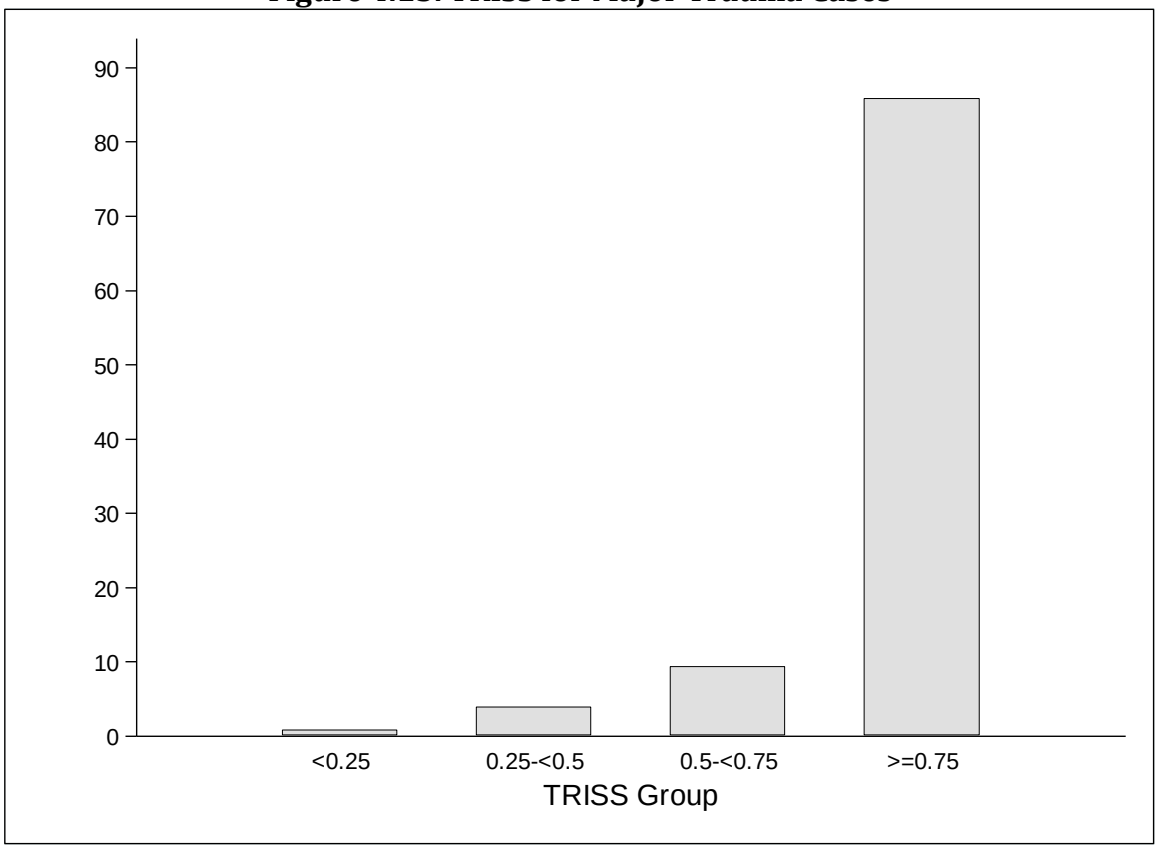

Table 4.15. TRISS Distribution for Major Trauma Cases

TRISS (Ps)	Total	
	No.	**%**
<0.25	17	0.84
0.25≤Ps<0.5	79	3.92
0.5≤Ps<0.75	188	9.34
Ps≥0.75	1729	85.89
TOTAL	**2013**	**100**

Note* 48 cases had no "TRISS" information

Figure 4.16. Observed and Expected Outcome for Major Trauma Cases

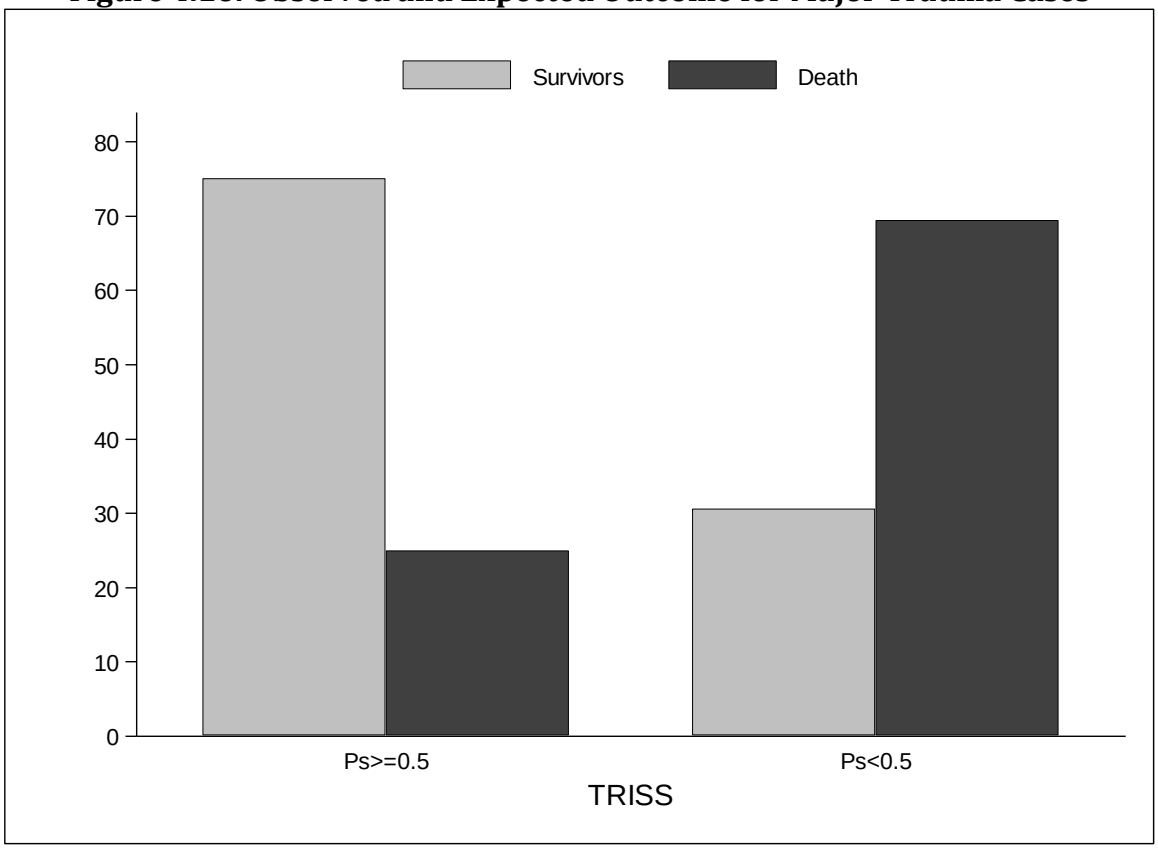

Table 4.16. Observed and Expected Outcome for Major Trauma Cases

TRISS	Survivors		Deaths		Total	
	No.	%	No.	%	No.	%
Ps≥0.5	1438	75.05	478	24.95	1916	95.28
Ps<0.5	29	30.53	66	69.47	95	4.72
TOTAL	**1467**	**72.95**	**544**	**27.05**	**2011**	**100**

* 48 cases had no ''TRISS'' information
* 2 cases had no ''Outcome'' information

Chapter 5: Length of Stay

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

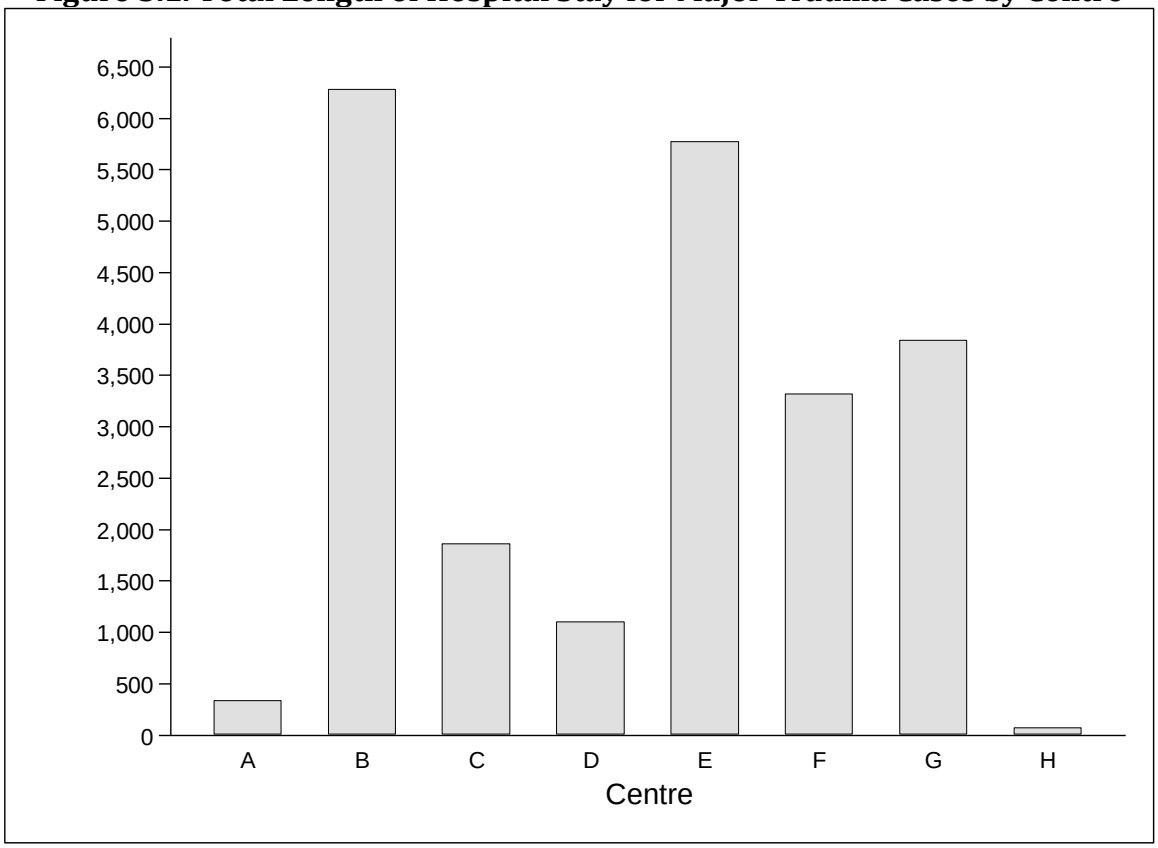

Table 5.1. Total and Average Length of Hospital Stay for Major Trauma Cases by Centre

Centre	Total		
	No.	Total LOS	Average LOS
A	48	334	7
B	479	6282	13
C	227	1860	8
D	137	1105	8
E	634	5776	9
F	185	3320	18
G	323	3845	12
H	23	73	3

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

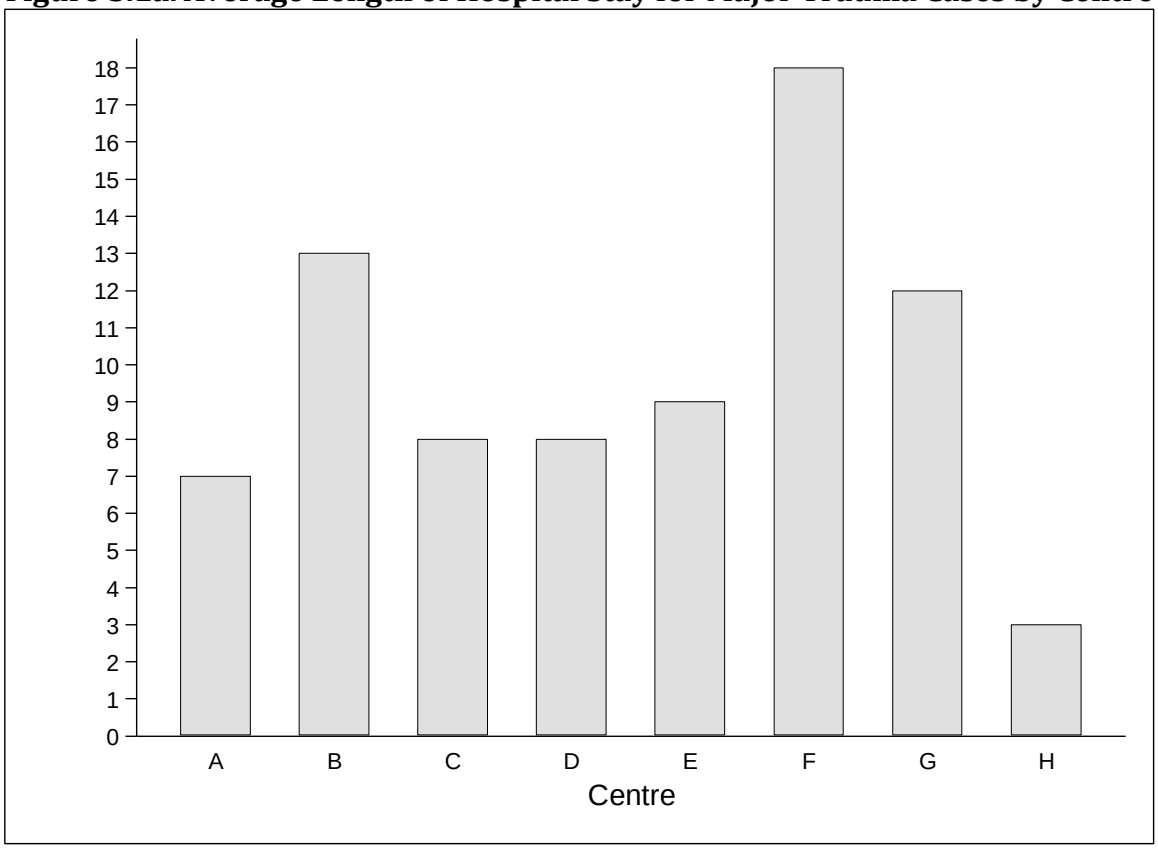

Table 5.1a. Total and Average Length of Hospital Stay for Major Trauma Cases by Outcome and Centre

Centre	Survivors			Death		
	No.	Total LOS	Average LOS	No.	Total LOS	Average LOS
A	32	227	7	16	107	7
B	400	5712	14	79	570	7
C	146	1595	11	81	265	3
D	88	1022	12	49	83	2
E	448	4746	11	186	1030	6
F	135	2937	22	50	383	8
G	218	3102	14	105	743	7
H	14	70	5	9	3	0

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

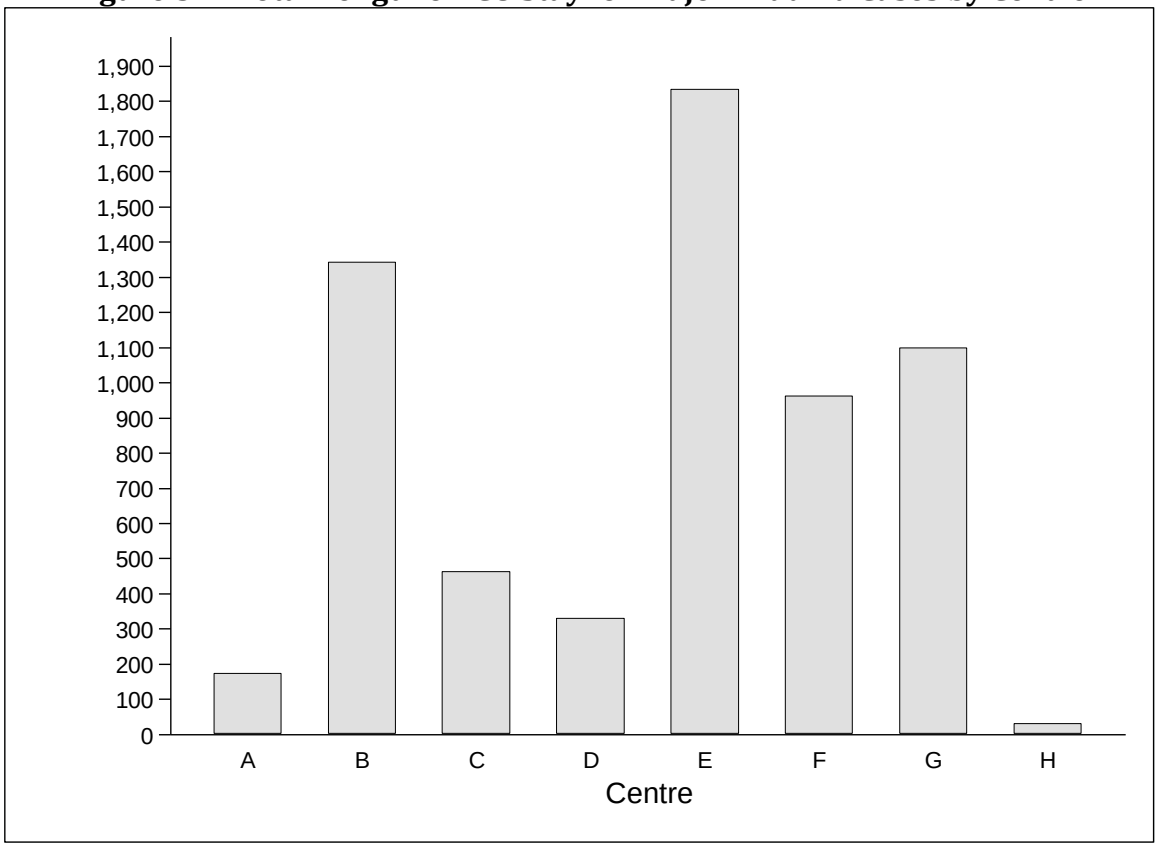

Table 5.2. Total and Average Length of ICU Stay for Major Trauma Cases by Centre

Centre	Total		
	No.	Total LOS	Average LOS
A	18	174	10
B	218	1343	6
C	102	463	5
D	70	331	5
E	276	1834	7
F	92	963	10
G	179	1100	6
H	3	32	11

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

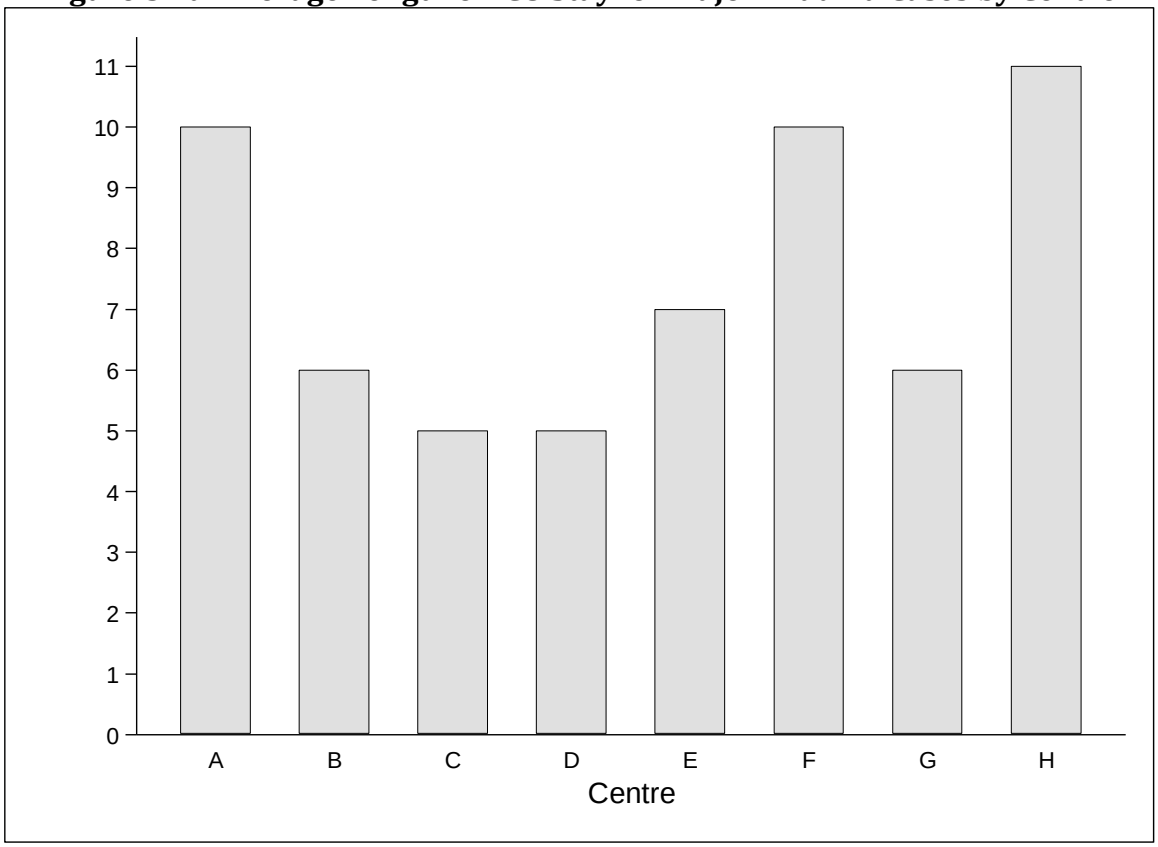

Table 5.2a. Total and Average Length of ICU Stay for Major Trauma Cases by Outcome and Centre

Centre	Survivors			Deaths		
	No.	Total LOS	Average LOS	No.	Total LOS	Average LOS
A	12	73	6	6	101	17
B	185	1125	6	33	218	7
C	67	308	5	35	155	4
D	50	267	5	20	64	3
E	182	1407	8	94	427	5
F	69	760	11	23	203	9
G	128	771	6	51	329	6
H	3	32	11	0	0	0

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

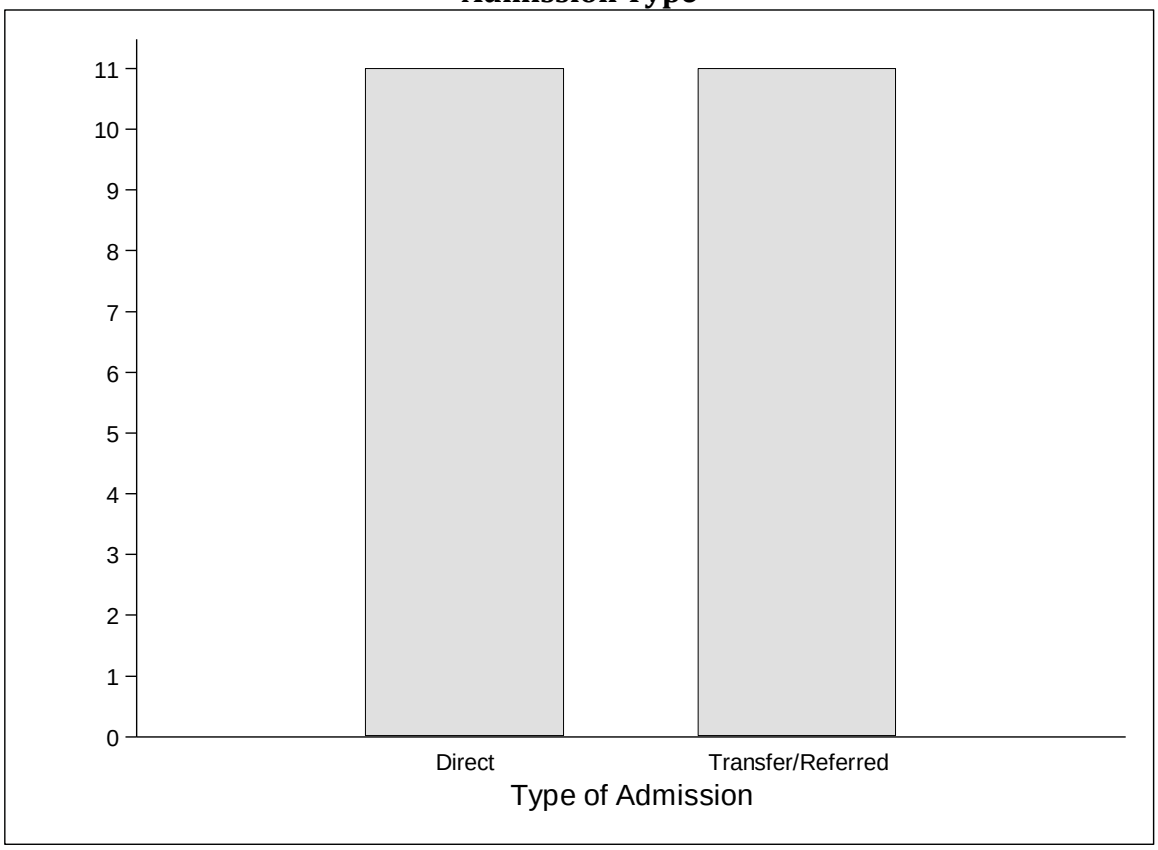

Table 5.3. Total and Average Length of Hospital Stay for Major Trauma Cases by Admission Type

Admission Type	No.	LOS	
		Total	Average
Direct	990	11346	11
Transferred/Referral	1068	11252	11

Note * 3 cases had no ''LOS'' information

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

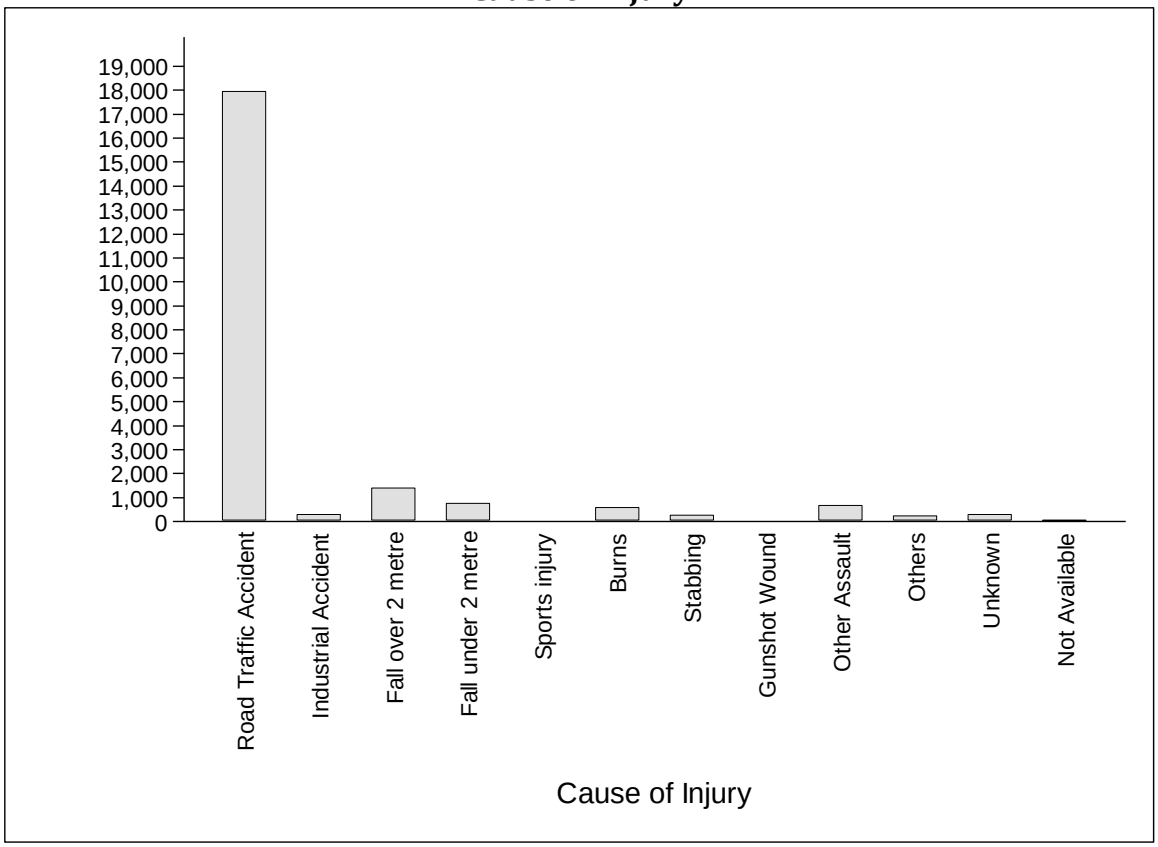

Figure 5.4a. Average Length of Hospital Stay in Days for Major Trauma Cases by Cause of Injury

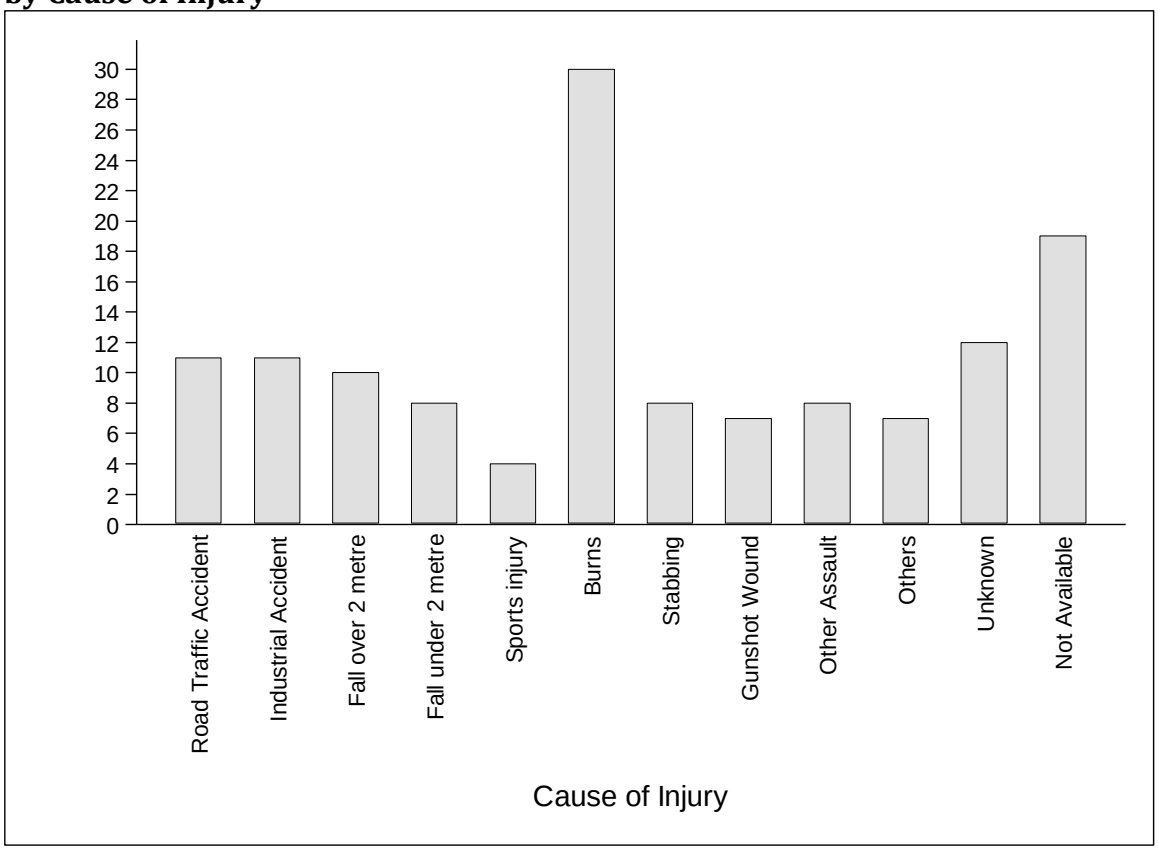

Table 5.4. Total and Average Length of Hospital Stay in Days for Major Trauma Cases by Cause of Injury

Cause of Injury	No.	Total LOS	Average LOS
Road Traffic Accident	1581	17961	11
Industrial Accident	26	291	11
Fall from over 2 metres	147	1400	10
Fall under 2 metres	95	763	8
Sports injury	6	21	4
Burns	19	576	30
Stab WOUND	35	274	8
Gunshot Wound	4	27	7
Other Assault	83	670	8
Others	32	236	7
Unknown	26	304	12
Not Available	4	75	19
TOTAL	**2058**	**22598**	**11**

* 3 cases had no ''LOS'' information

National Trauma Database (NTrD) Notification Form 2009

Office use:

Instruction: Where check boxes ☐ are provided, check (√) one or more boxes. Where radio buttons ◉ are provided, check (√) one box only.

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 : Admission: ED: Neurosurgery Dept (if different from ED):

4. Date of Birth : *(dd/mm/yy)*

***5. Gender :** ◉ Male ◉ Female

***6. Nationality and Ethnic Group :**

◉ Malaysian → ◉ Malay ◉ Indian ◉ Bumiputra Sarawak ◉ Other M'sian, specify : ◉ Chinese ◉ Orang Asli ◉ Bumiputra Sabah

◉ Non Malaysian → **Specify nationality:**

SECTION 2 : ADMISSION

***7. a. Date of Admission :** *(dd/mm/yy)* **b. Age at Admission:** *(Auto Calculated)*

8. Time of ED Admission / Registration : : AM / PM

9. Type of Admission :

◉ Direct

◉ Transfer / Referred → **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. Mechanism of Injury : ☐ Blunt (e.g. MVA) ☐ Penetrating (e.g. Stab, Gunshot wound) ☐ Burns

12. Injury Intent :

◉ Unintentional ◉ Domestic violence ◉ Child neglect / Maltreatment

◉ Intentional self harm ◉ Intent cannot be determined ◉ Intentional assault

13. Cause of Injury :

◉ Road Traffic Accident → ◉ Motorcycle Rider ◉ Driver ◉ Back Seat Passenger ◉ Pedestrian ◉ Motorcycle Pillion ◉ Front Seat Passenger ◉ Bicyclist ◉ Not Available

◉ Industrial Accident ◉ Sports Injury ◉ Gunshot Wound ◉ Not Known

◉ Fall over 2 metre ◉ Burns ◉ Other Assault

◉ Fall under 2 metre (about 1 door's height) ◉ Stabbing ◉ Others

14. Place of Injury :

◉ Road, Street, Highway ◉ School / Kindergarten / nursery ◉ Residential institution

◉ Home ◉ Sports / Recreational Area ◉ Other specified place

◉ Industrial / Construction Area ◉ Trade / Service area ◉ Not Available

SECTION 4 : CLINICAL DETAILS (EMERGENCY DEPARTMENT)

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

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

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

18. Temperature : *(C)*

19. Pulse Oximetry : *(%)*

20. Glasgow Coma Scale : * *(Please score as Verbal 1 if patient is intubated)*

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)			

21. Procedures done in ED : *(Check one or more boxes)*

☐ Endotracheal intubation → ◉ Intubated at referral hospital ◉ Intubated at current hospital

☐ CT scan → ☐ Brain ☐ Cervical spine ☐ Abdomen ☐ Pelvis ☐ Thorax ☐ Others, specify:

☐ Needle thoracocentesis ☐ Mechanical ventilation ☐ Ultrasound/FAST

☐ Pelvic clamp/binding/ext. fixator ☐ Chest tube insertion

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 ◉ HDW

National Trauma Database (NTrD) Notification Form 2009

Office use:

Instruction: Where check boxes ☐ are provided, check (√) one or more boxes. Where radio buttons ◉ are provided, check (√) one box only.

A. Reporting Centre Name:		**B. Date of Notification**	*(dd/mm/yy)*

SECTION 5 : DIAGNOSIS AND OPERATIVE PROCEDURE

24. Operative Management:	◉ Yes (if Yes, please fill up below) ◉ No (If No, please proceed to Section 6 directly)
25. Date of Operation : *	*(dd/mm/yy)*
26. Time of Operation : *	**Start** : AM / PM
27. Duration Time to Operation : (Time of Admission to Start of Surgery) *	*(Auto Calc)*
28. Operative Procedure : * *(Check one or more boxes)*	☐ Intracranial (Excluding operation for ICP monitoring only) ☐ Intrathoracic ☐ Intra-abdominal ☐ Spinal surgery ☐ Pelvic fixation ☐ Others, specify: ----------

SECTION 6 : IN-HOSPITAL OUTCOME

29. Discharge Date :	*(dd/mm/yy)*
30. Length of Stay in	**Hospital :** ---------- *day(s)* *(Auto calc. From date of admission to date of discharge)*
31. Admission to ICU	◉ Yes → **Number of days:** * *day(s)* ◉ No
32. Patient's Outcome at Discharge:	◉ Alive **Disposition** ◉ Discharge Home ◉ Transfer to Referring Hospital → **Name of Hospital:** ◉ Transfer to Other Hospital → **Name of Hospital:** ◉ Discharge Against Medical Advice ◉ Death

Name :	

SECTION 7 : INJURY SEVERITY SCORE

33. Injuries and Injury Severity Score

BODY REGION	INJURY NO.	INJURY DESCRIPTION	AIS CODE	AIS	Best AIS	AIS^2
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.					

34. Total ISS :	*(Auto Calc)*
35. Revised Trauma Score :	*(Auto Calc)*
36. 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.

National Trauma Database (NTrD) Follow Up Form

Office use: / Centre:

Complete this form at 3rd month, 6th month, 12th month and annually after the trauma event. Check (√) one box unless specified otherwise.

A. Reporting Centre Name	
B. Date of Follow Up:	*(dd/mm/yy)*
C. Name :	Mr/Mrs/Ms/Dr
D. Identification Card Number :	*MyKad / MyKid:* - - *Old IC:* *Other document No:* *Specify type (eg.passport, armed force ID):*
E. Patient RN :	**ED:** **Neurosurgery Dept (if different from ED):**

PATIENT OUTCOME

1. Follow Up at:

- ◉ **3 months**
- ◉ **6 months**
- ◉ **1 year**

2. Outcome

a. Alive	◉	
b. Death	◉ →	**i) Date of death: (dd/mm/yy)**
c. Transferred to another centre	◉ →	**i) Date of last follow up: (dd/mm/yy)** **ii) Name of centre transferred to:**
d. Lost to Follow Up	◉ →	**i) Date of last follow up: (dd/mm/yy)**

3. Glasgow Outcome Score

1 - Dead	◉
2 - Persistent Vegetative	◉
3 - Severe Disability	◉
4 - Moderate Disability	◉
5 - Well	◉