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Major Trauma in NSW: 2017-18

A report from the NSW Trauma Registry

REPORT

NOVEMBER 2019

NSW Institute of Trauma and Injury Management

NSW GOVERNMENT

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AGENCY FOR CLINICAL INNOVATION

Level 4, 67 Albert Avenue
Chatswood NSW 2067

PO Box 699 Chatswood NSW 2057
T +61 2 9464 4666 | F +61 2 9464 4728
E aci-info@nsw.gov.au | **www.aci.health.nsw.gov.au**

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ACI team

- Hardeep Singh, Data Officer, NSW ITIM
- Emma Curtin, TORQUE Support Nurse, NSW ITIM
- Glenn Sisson, Manager, NSW ITM
- Michael Dinh, Clinical Director, NSW ITIM
- Kelly Dee, Clinical Review Officer, NSW ITIM
- Jon Newman, Project Officer, NSW ITIM
- Pooria Sarrami, Research Officer, NSW ITIM
- Chelsea McBride, Project Officer, NSW ITIM

Executive summary

Each year there are over 30,000 admissions for traumatic injuries, of which over 4000 were considered major trauma and admitted to a NSW trauma service. How the NSW trauma system responds to these patients is critical for their long-term outcome and quality of life and for reducing the overall financial and social cost of trauma to individuals and the community as a whole.

A key priority for the NSW Institute of Trauma and Injury Management (ITIM), within the Agency for Clinical Innovation, is to monitor the effectiveness of the NSW trauma system response for these major trauma patients. This group of patients places the greatest demand on the trauma system and on other agencies and services, not simply for healthcare, but for a wide range of needs.

This report describes how the NSW trauma system responded to major trauma patients, from the time of injury and provision of pre-hospital services, through to in-hospital services provided at a NSW trauma service. The finding from the report assists ITIM in determining whether the NSW trauma system is functioning effectively, to ensure that the right patient arrived at the right hospital in a timely matter.

The report helps us understand the nature of the injuries sustained and how they occurred. The findings are used by various agencies concerned with minimising the likelihood and effects of traumatic injury and contributing to safety and injury prevention efforts. Data from the NSW Trauma Registry is used by ITIM to provide advice and feedback to clinicians and other stakeholders and enables research into patterns of service demand and staffing.[1] This data also supports benchmarking and performance improvement activities.

It is important to note that this report does not represent all injuries in NSW, nor does it represent the full work or caseload of trauma services in hospitals or the full set of data recorded in hospital trauma registries.

2017-18 report highlights for major trauma in NSW

- 3964 major trauma patients resulted in 4097 major trauma admissions.
- Average age was 52 years old.
- Males were 2.5 times more likely to be injured than females.
- Case fatality rate for ISS >12 was 9.9%.
- Females had a higher case fatality rate (12.4%) compared to males (9.0%).
- Falls accounted for 43.6% of all major traumas, exceeding transport incidents (38.5%).
- ‘Three or more fractured ribs without flail’ was the most common serious injury (23.0%).
- 26.8% of major traumas were sustained in a rural area.
- The greatest proportion of traumatic injuries was falls in the metro setting (50.0%), and transport incidents in the rural setting (31.6%).
- Pedestrian traumas had a significantly higher case fatality rate (19.1%) than all other forms of road trauma.
- 60.8% of major trauma patients sustained injuries to the head or neck body region, and 49.3% the chest region.

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NSW trauma system

The primary function of the NSW trauma system is to facilitate and coordinate an organised multidisciplinary system response with the aim of reducing the burden of injury on patients, their families and the broader health system. The trauma system encompasses a continuum of care that provides traumatically injured patients with the greatest likelihood of returning to their pre-injury level of function within the community.

This continuum of care includes injury prevention, pre-hospital coordination and care, appropriate triage and transport, emergency department trauma care, trauma service team activation, surgical intervention, intensive, critical and general in-hospital care, rehabilitation services, allied health and medical care follow up.

The overall goal of the NSW trauma system is to decrease the incidence and severity of injury and to ensure optimal, accessible and equitable care to improve health outcomes for those who are injured. The main objective of the trauma system is to get the 'right patient to the right hospital in the right time, receiving the right care'. To meet this objective, designated trauma services need to have appropriate resources to meet the complex needs of the injured patient.

Mandate for trauma data

The *NSW Trauma Services Plan* outlines the role of the ITIM, including monitoring and reporting on the performance of individual trauma services to ensure that performance is consistent with the standard of care and to manage a statewide clinical injury data collection process.[2]

The plan also positions ITIM to develop partnerships with injury stakeholders, such as the local health districts, NSW Ambulance, State Insurance Regulatory Authority, State Coroner, Clinical Excellence Commission and universities. These partnerships aim to build an improved critical mass for research and education across the spectrum of trauma prevention care and rehabilitation. The collection of trauma data is an important aspect of these activities.

To enable ITIM to achieve its monitoring and reporting role, NSW trauma services are required to contribute data as outlined in *Improving the quality of trauma care in NSW: trauma services model of care*.[3]

NSW Trauma Registry

ITIM is responsible for managing the collection of data about moderate to critically injured people admitted to trauma services in NSW. Data collected is held securely in the NSW Trauma Registry.[1] Data in the registry is submitted from each of the designated NSW trauma services.

The NSW Trauma Registry contains de-identified patient records but does not hold data for every injured person admitted to hospital in NSW. Data is only included for patients with the greatest needs, the most seriously injured, who are treated at a designated NSW trauma service. This data is known as the NSW Trauma Minimum Data Set and forms the basis of data analysis and reporting activities at ITIM. As the scope of the current data collection is restricted to these designated hospitals, there may be some data for trauma admissions to other hospitals that are not included in the NSW Trauma Registry.

NSW trauma services

The NSW trauma system consists of seven adult major trauma services, three paediatric major trauma services and ten regional trauma services. All of the services contributed data to the NSW Trauma Registry used in this report.

Adult major trauma services

- John Hunter Hospital, Hunter New England Local Health District
- Liverpool Hospital, South Western Sydney Local Health District
- Royal North Shore Hospital, Northern Sydney Local Health District
- Royal Prince Alfred Hospital, Sydney Local Health District
- St George Hospital, South Eastern Sydney Local Health District
- St Vincent's Hospital, St Vincent’s Health Network
- Westmead Hospital, Western Sydney Local Health District

Paediatric major trauma services

- John Hunter Children's Hospital, Hunter New England Local Health District
- Sydney Children's Hospital, Sydney Children’s Hospital Network
- The Children's Hospital at Westmead, Sydney Children’s Hospital Network

Regional trauma services

- Coffs Harbour Health Campus, Mid North Coast Local Health District
- Gosford Hospital, Central Coast Local Health District
- Lismore Base Hospital, Northern NSW Local Health District
- Nepean Hospital, Nepean Blue Mountains Local Health District
- Orange Health Service, Western NSW Local Health District
- Port Macquarie Base Hospital, Mid North Coast Local Health District
- Tamworth Hospital, Hunter New England Local Health District
- The Tweed Hospital, Northern NSW Local Health District
- Wagga Wagga Rural Referral Hospital, Murrumbidgee Local Health District
- Wollongong Hospital, Illawarra Shoalhaven Local Health District

Methodology

This report is compiled from data submitted by the reporting facilities to the NSW Trauma Registry in accordance with the inclusion and exclusion criteria detailed below. Data for this report was extracted from the NSW Trauma Registry on 15 May 2019.

Inclusion criteria

All major trauma patient records from the NSW Trauma Registry, where the date of injury occurred between 1 July 2017 and 30 June 2018, are included in this report.

Major trauma is defined as all patients of any age, who were admitted to a NSW trauma service within seven days of sustaining an injury, and who:

- had an Injury Severity Score (ISS)>12 (moderate to critically injured), or
- were admitted to an intensive care unit (irrespective of ISS) following injury, or
- died in hospital (irrespective of ISS) following injury.

As a result of these criteria, patient records submitted for inclusion in this report do not represent all injuries in NSW, nor do they represent the full work or caseload of trauma services in hospitals, nor the full set of data recorded in hospital trauma registries.

Exclusion criteria

The criteria for excluding a patient record from this report are as follows.

- Patients not admitted to a designated NSW trauma service.
- Patients admitted to a designated NSW trauma service greater than seven days after sustaining an injury.
- Patients who die with an isolated fractured neck of femur injury sustained from a fall from a standing height (<1 metre).*
- Patients aged 65 years or older who die with minor soft tissue injury only.†

Records have also been excluded from this report if the *Outcome (survived or died)* data element is missing or invalid data recorded in the registry.

Based on the criteria outlined above, a total of 63 records were excluded as outlined in Table 1.

Table 1: Record of data exclusions

Data criteria	Excluded	Remaining records
Data extracted (15 May 2019)	N/A	4160
Date of admission >7 days from injury	55	4105
Isolated neck of femur injuries (with outcome = died)	5	4100
Over 65yrs old and died with minor soft tissue injury only	2	4098
Missing outcome	1	4097
Total remaining records		**4097**

* See Glossary for definition of an isolated fractured neck of femur injury.

† See Glossary for definition of a minor soft tissue injury.

Data quality

Data submitted to the NSW Trauma Registry is subject to rigorous checking and validation by ITIM and the reporting facilities while missing or invalid data is flagged and returned to individual trauma services for completion and validation.

The average data completeness by the trauma facilities was 90.1%, an increase of 2.7% from last year. A detailed breakdown of data completeness by trauma facility is available in Appendix 1.

Data privacy – reporting of small numbers

The Australian Statistical Information Management Committee guidelines suggest that statistical results involving small numbers (<5) can be presented if the population from which they are drawn is more than 1000 people, as the likelihood of identifying an individual would be very small.[4] This guideline is used for data reporting of small numbers by Health Stats NSW and the Agency for Clinical Innovation.[5]

For the purpose of this report, the demographic population is identified as either:

- those potentially injured within NSW (millions) when reporting on trauma patients as a whole; or
- those potentially injured within a facility's catchment area (thousands) when reporting on admissions to a trauma facility, such as in the facility summaries at Appendix 2-4.

The risk of a breach of data privacy is further mitigated by not aligning demographic information where the numbers are small (such as age groups in a regional area) with other potentially identifiable data fields such as mechanism of injury or outcome.

Metropolitan and rural categorisation

Various data elements within the report are categorised as either 'metropolitan' or 'rural'. These categories are derived using the postcode of injury and the Australian Statistical Geography Standard (ASGS) Remoteness Areas (RA).[6] The ASGS-RA is based on the *Accessibility and Remoteness Index of Australia* which defines locations in terms of remoteness, i.e. the physical distance of a location from the nearest urban centre (access to goods and services) based on population size.[7]

The ASGS-RA consists of five categories:

- major cities
- inner regional
- outer regional
- remote
- very remote.

For the purpose of this report, all locations with the ASGS-RA classification of 'major cities' are listed as 'metropolitan'. All other ASGS-RA classified locations are combined and listed as 'rural'. See Appendix 6 for further information on the ASGS-RA categorisation of NSW.

The Injury Severity Score and Abbreviated Injury Score

One of the key criteria for inclusion in this report is an Injury Severity Score (ISS) >12. The ISS is an internationally recognised scoring system which correlates with mortality, morbidity and other measures of severity. The ISS is calculated based on an anatomical injury severity classification, the Abbreviated Injury Scale (AIS). The AIS classifies individual injuries by body region on a six-point severity scale from minor (1) to maximum (6 - currently untreatable injury). The NSW Trauma Registry uses the AIS 2005 (Update 2008) dictionary.[8]

The AIS is used by accredited staff at each hospital to score individual patient injuries and their severity. It provides a common tool for comparing and selecting patient records for inclusion in the NSW Trauma Registry. Scoring is undertaken retrospectively but usually within 24-48 hours after admission to allow for identification of all injuries. On initial evaluation, these patients typically have abnormal vital signs or a significant anatomical injury.

Injuries are individually allocated to one of six body regions and the severities of the top three injuries in different body regions are used to calculate the ISS. The ISS along with the body regions and injury and severity codes used in this calculation are recorded in the NSW Trauma Registry (see Appendix 5 for further detail).

The calculated ISS value ranges from 1-75. Serious to critically injured trauma patients are defined as those patients with an ISS >15, which is an internationally recognised indicator of serious injury.

In this report the ISS is reported in ranges:

- 13-15 (moderate injury)
- 16-24 (serious injury)
- 25-40 (severe injury)
- 41-75 (critical injury).

Revised Trauma Score

The Revised Trauma Score is a physiological scoring system used as a predictor of mortality in trauma populations. It consists of data from the first set of vital signs obtained on arrival at hospital, including the Glasgow Coma Scale, systolic blood pressure and respiratory rate. Each element is scored with a weighting as outlined in Table 2.[9] Values for the Revised Trauma Score are in the range 0 to 7.8408. The lower the score, the higher the likelihood of death.

Table 2: Revised Trauma Score points system

Glasgow Coma Scale	Systolic blood pressure	Respiratory rate	Points
15-13	>89	10-29	**4**
12-9	76-89	>29	**3**
8-6	50-75	6-9	**2**
5-4	1-49	1-5	**1**
3	0	0	**0**

Revised Trauma Score = 0.9368 Glasgow Coma Scale + 0.7326 systolic blood pressure + 0.2908 respiratory rate

Major trauma patients

Introduction

The information in this section of the report is based on the number of major trauma patients who received care in a NSW trauma service (n=3964), not the number of major trauma admissions (n=4097), as some patients were treated in more than one NSW reporting facility. Trauma admission data (hospital activity) is discussed in detail in the Major trauma admissions section.

Summary profile

During the period 1 July 2017 to 30 June 2018, there were 3964 major trauma patients treated at NSW trauma services. Of these, 73.2% (n=2660) were injured in a metropolitan location and 344 died (case fatality rate for ISS >12 of 9.9%). The age-standardised injury rate was 47.1 per 100,000 persons and the age-standardised death rate was 4.5 per 100,000 persons.* The standardised mortality ratio† was 4.2, indicating that the proportion of deaths in major trauma patients during the reporting period was more than four times greater than that of the general Australian population (Table 3).

Table 3: Summary statistics for major trauma and mortality

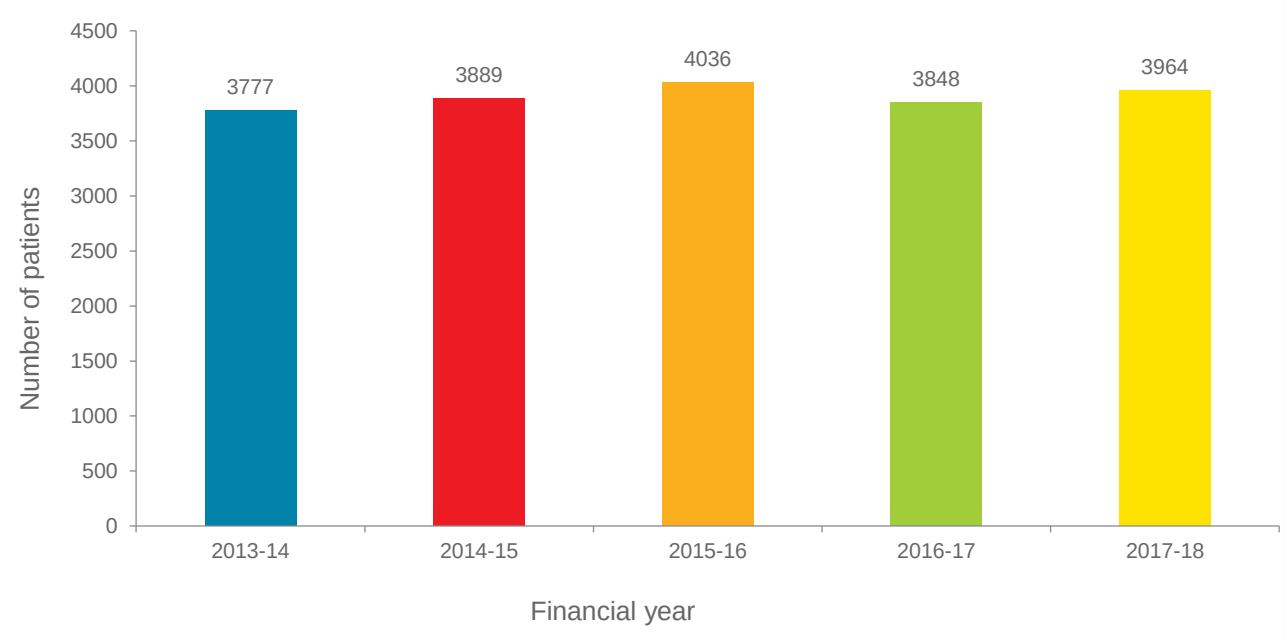
Summary statistics	Value
Total number of patients injured overall	3964
Total number of patients injured with ISS >12	3458
Injury rate per 100,000 persons (age-standardised)	47.1 (95% CI 45.7 - 48.7)
Location of injury (metropolitan / rural)	2660 (73.2%) / 974 (26.8%)
Total number of deaths overall	420 (10.6%)
Total number of traumatic deaths on arrival	25 (0.6%)
Total number of deaths with ISS >12 (case fatality rate)	344 (9.9%)
Death rate per 100,000 persons (age-standardised) all ISS	4.5 (95% CI 4.1 - 4.9)
Standardised mortality ratio	4.2 (95% CI 3.8 - 4.6)
Average age (years)	52
Average ISS (All ISS / ISS >12 patients)	18.8 / 20.5

* See Glossary for definition of age-standardised rate. Annualised rate given as per 100,000 persons, standardised to the Australian population at 30 June 2001.[10]

† See Glossary for definition of the standardised mortality ratio. Standardised to the Australian population at 30 June 2001.[10]

From 2013-14 to 2017-18 financial years, there has been a 5.0% increase overall in the number of major trauma patients (Figure 1).

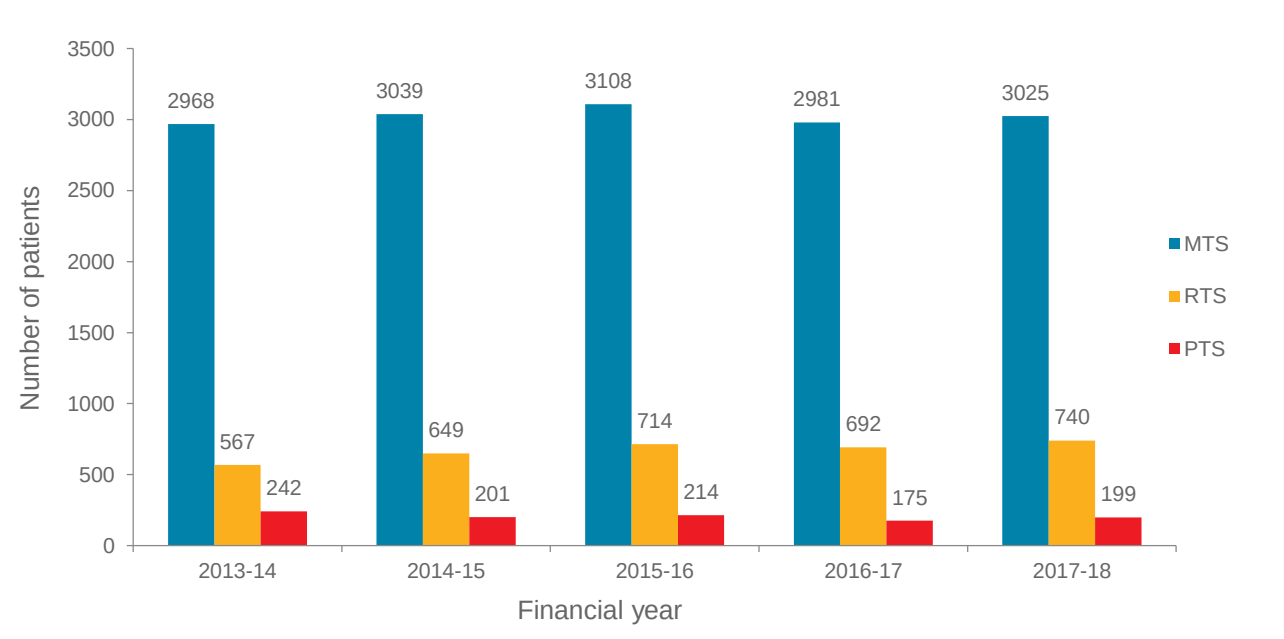
Figure 1: Five-year trend in the number of major trauma patients (n=19,514)



Please note the methodology for identifying and excluding duplicate admissions has been refined for this year's report resulting in minor changes to the five year trend in the number of major trauma patients.

The largest proportional increase from 2016-17 compared to 2017-18 was seen in the paediatric trauma services (13.7%), compared to adult major trauma services (1.5%) and regional trauma services (6.9%), as seen in Figure 2.

Figure 2: Five year trend in the number of major trauma patients by facility type (n=19,514)



Age and sex

The average age of a major trauma patient in NSW during the reporting period was 52 years old. Table 4 outlines the age distribution, which demonstrates a sharp rise in the incidence of major trauma in the geriatric population,* especially those aged 75 years and older, as it has in previous years. The 75 years and older age group also had a higher case fatality rate for ISS >12 (19.2%, n=833) compared with the under 75 years age group (7.0%, n=2623).

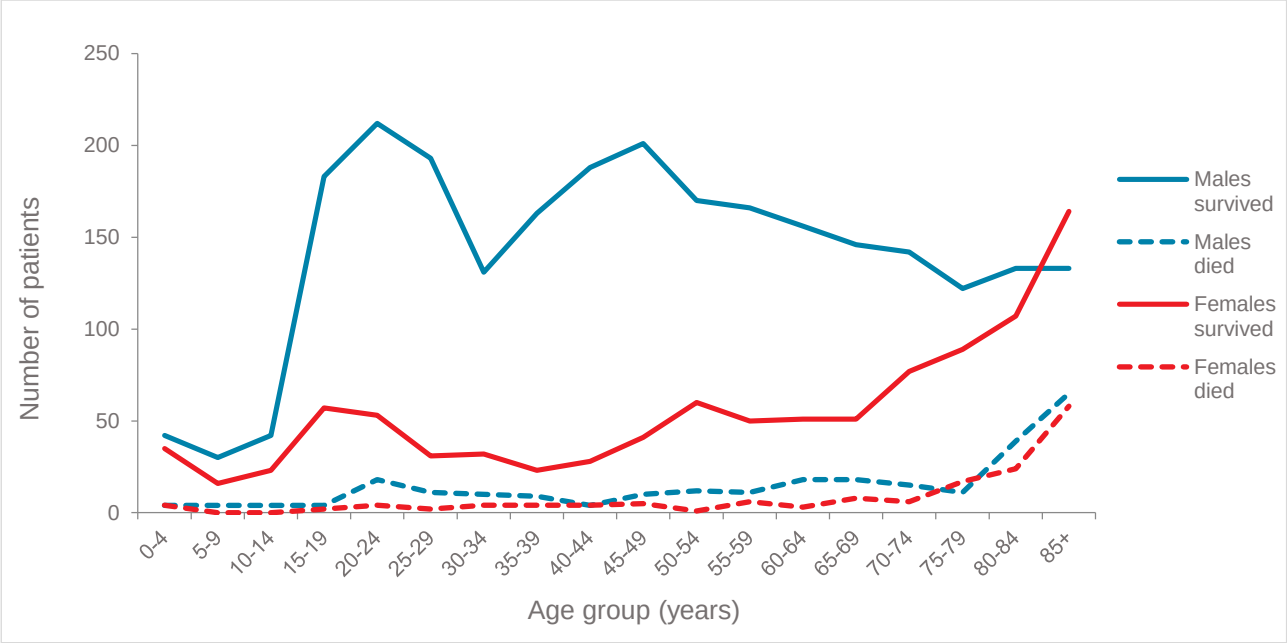
Table 4: Major trauma patients, injury and mortality by age group (n=3962)

Age group (years)	Number of injured (%of total)	Cumulative number of injured (% of total)	Age-specific injury rate per 100,000	Age-specific death rate Per 100,000	Case fatality rate (ISS >12)
0-4	85 (2.1%)	85 (2.1%)	17.1	1.6	9.5%
5-9	50 (1.3%)	135 (3.4%)	9.9	0.8	7.9%
10-14	69 (1.7%)	204 (5.1%)	14.8	0.9	8.2%
15-19	246 (6.2%)	450 (11.4%)	52.5	1.3	2.4%
20-24	287 (7.2%)	737 (18.6%)	53.1	4.1	7.5%
25-29	238 (6.0%)	975 (24.6%)	40.2	2.2	6.6%
30-34	177 (4.5%)	1152 (29.1%)	30.3	2.4	8.8%
35-39	199 (5.0%)	1351 (34.1%)	37.4	2.4	6.3%
40-44	224 (5.7%)	1575 (39.8%)	43.9	1.6	4.1%
45-49	257 (6.5%)	1832 (46.2%)	50	2.9	6.0%
50-54	243 (6.1%)	2075 (52.4%)	50	2.7	6.0%
55-59	233 (5.9%)	2308 (58.3%)	48	3.5	7.1%
60-64	228 (5.8%)	2536 (64.0%)	52.9	4.9	8.6%
65-69	223 (5.6%)	2759 (69.6%)	58	6.8	12.1%
70-74	241 (6.1%)	3000 (75.7%)	76.7	6.7	7.8%
75-79	239 (6.0%)	3239 (81.8%)	106.8	12.5	12.5%
80-84	303 (7.6%)	3542 (89.4%)	191.6	39.8	18.1%
85+	420 (10.6%)	3962 (100%)	247.8	72.6	24.0%

* Geriatric defined as aged 65 years and older.

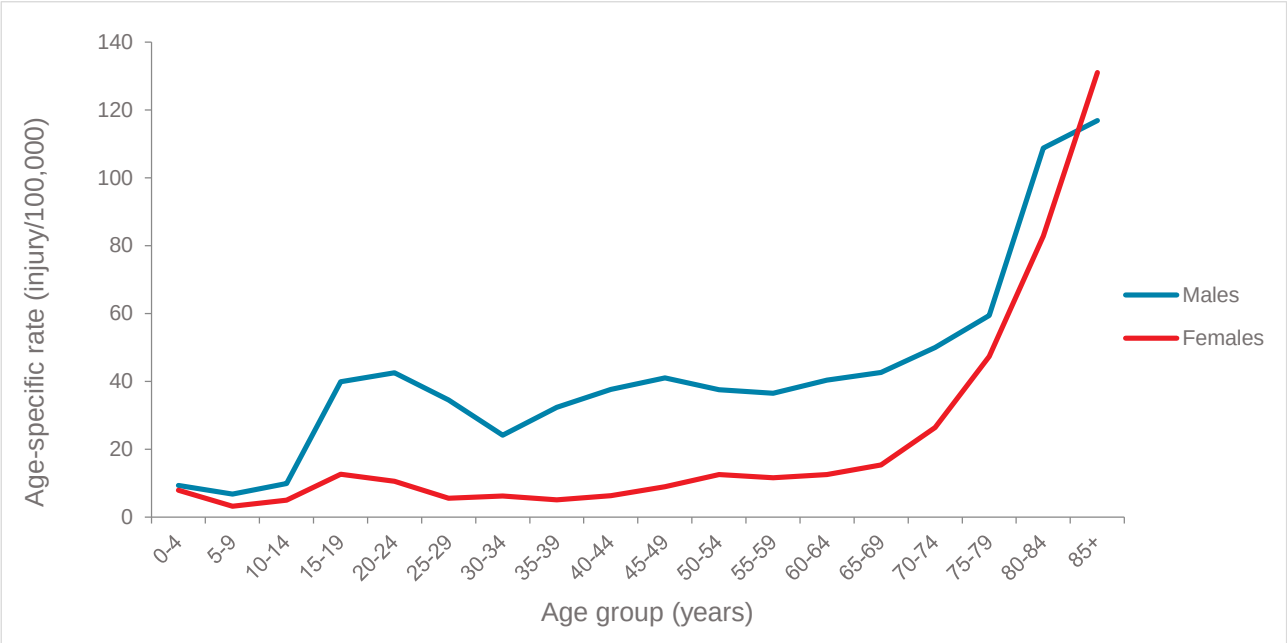
Males have a higher number of major trauma injuries (n=2820) compared to females (n=1140), except in the 85 years and over age groups (Figure 3). Overall, males are 2.5 times more likely to be injured than females.

Figure 3: Number of major trauma patients by age, sex and mortality (n=3960)



The age-specific injury rate* for males ranged from 9.3 to 116.9 per 100,000 persons and in females ranged 7.9 to 131 per 100,000 persons (Figure 4).

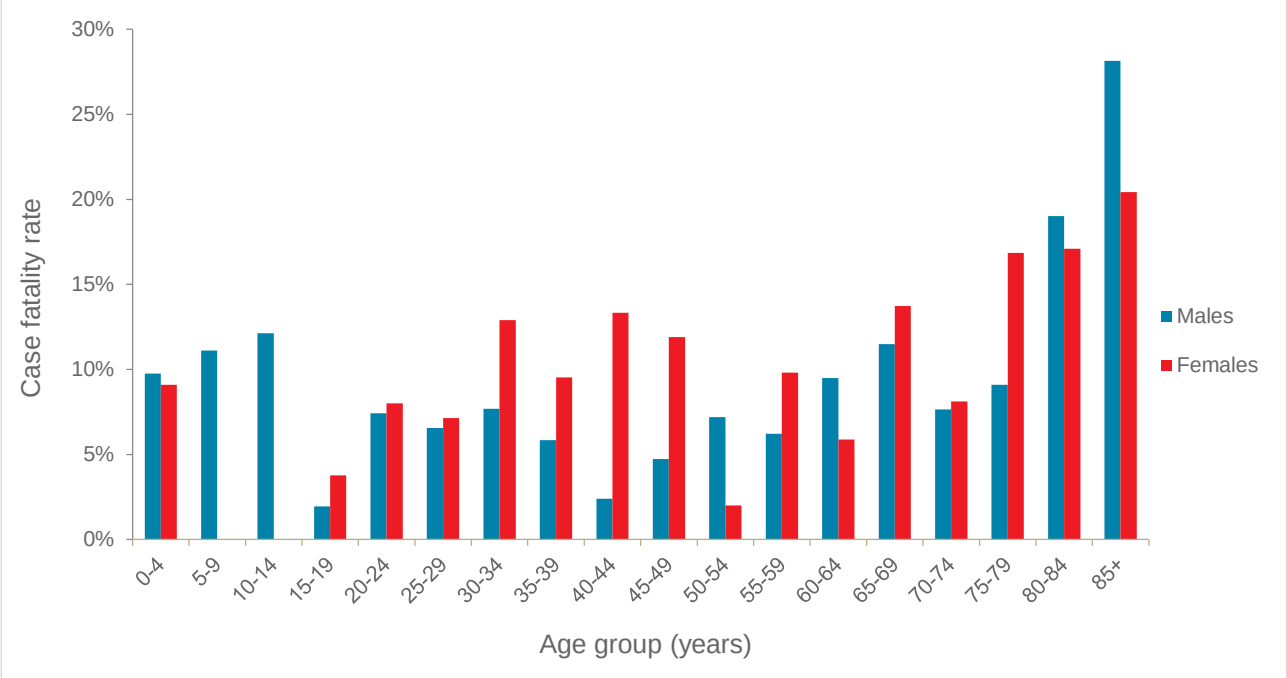
Figure 4: Age-specific injury rate by age and sex (n=3960)



* See Glossary for definition of the age-specific rate, based on the estimated NSW population during the reporting period (end of December).[11]

The case fatality rate for ISS >12 (n=3456) was higher for females (12.4%, n=123) than for males (9.0%, n=221), with the overall case fatality rate being 9.9% (Figure 5).

Figure 5: Case fatality rate by age and sex (ISS >12) (n=3456)



While females have a higher case fatality rate for ISS >12, males have a higher age-specific mortality rate per 100,000 persons (Figure 6).

Figure 6: Age-specific mortality rate by age and sex (n=3960)

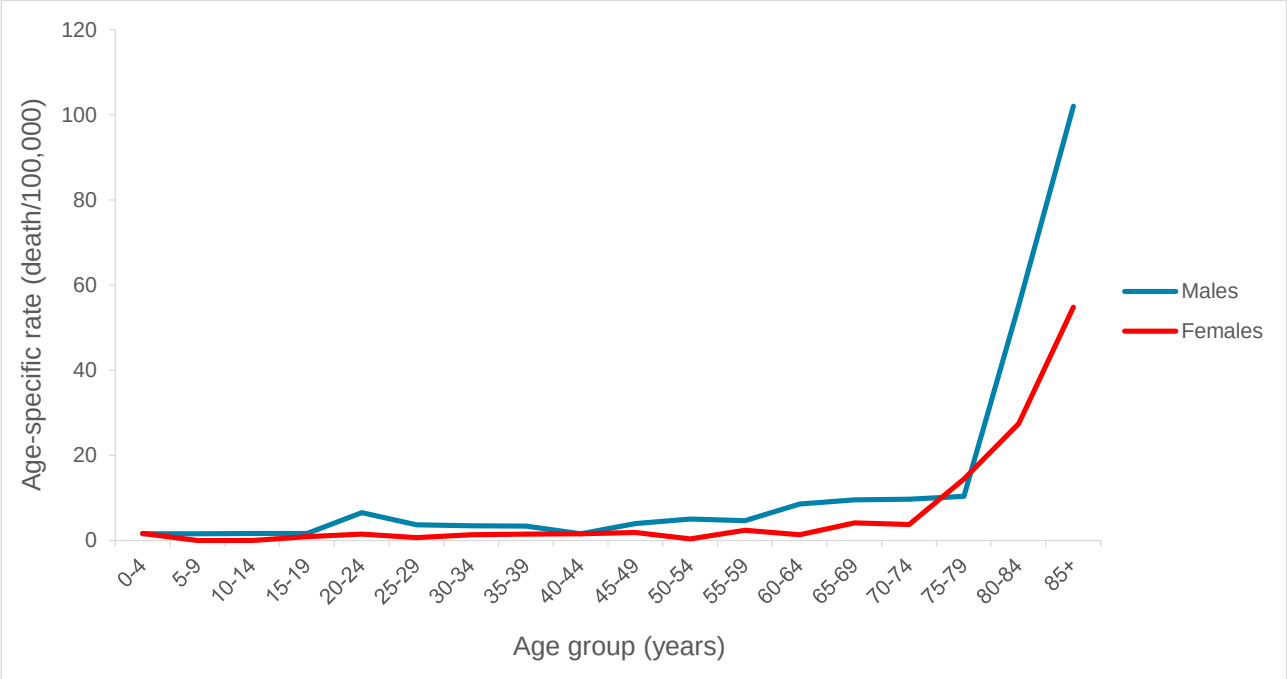
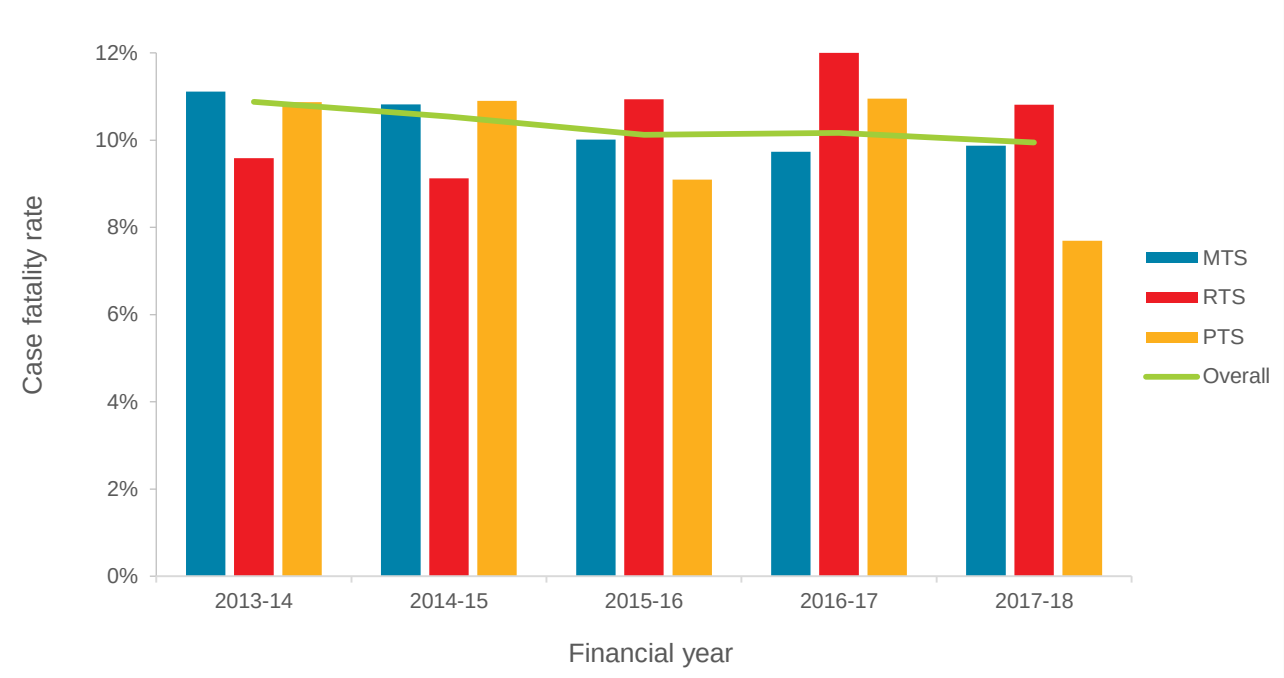


Figure 7 shows the five year trend of case fatality rates (ISS >12) for the three facility types. Overall, the case fatality rate has decreased from 10.9% to 9.9% during the last five years.

Figure 7: Five year trend of case fatality rate by facility type (ISS >12) (n=17,143)



Mechanism of injury

The vast majority of major trauma in NSW in the reporting period was caused by blunt injuries (96.1%), such as falls and transport incidents (Table 5).

Table 5: Type of injury (n=3867)*

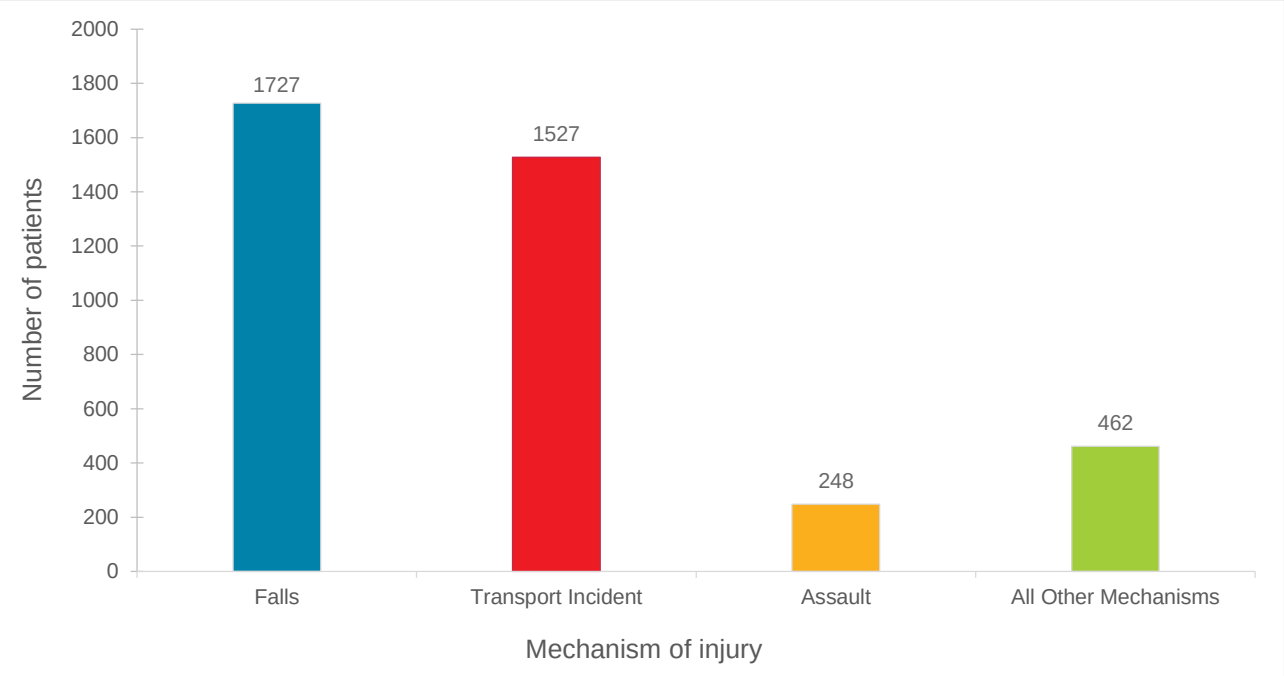
Type of injury	Number of patients (% of total)	Case fatality rate (ISS >12)
Blunt	3716 (96.1%)	9.9%
Penetrating	151 (3.9%)	3.4%

The top three mechanisms of major trauma were:

- falls (43.6%, n=1727)
- transport incidents (38.5%, n=1527) out of which 1148 were road trauma incidents†
- assaults (6.3%, n=248).

All other mechanisms combined accounted for 11.7% (n=462) (Figure 8). The distribution of these mechanisms of injury by age group is demonstrated in Table 6.

Figure 8: Mechanism of injury (n=3964)



* Only blunt and penetrating injury types are reported. Other injury types are recorded as 'N/A' or 'Unknown'.

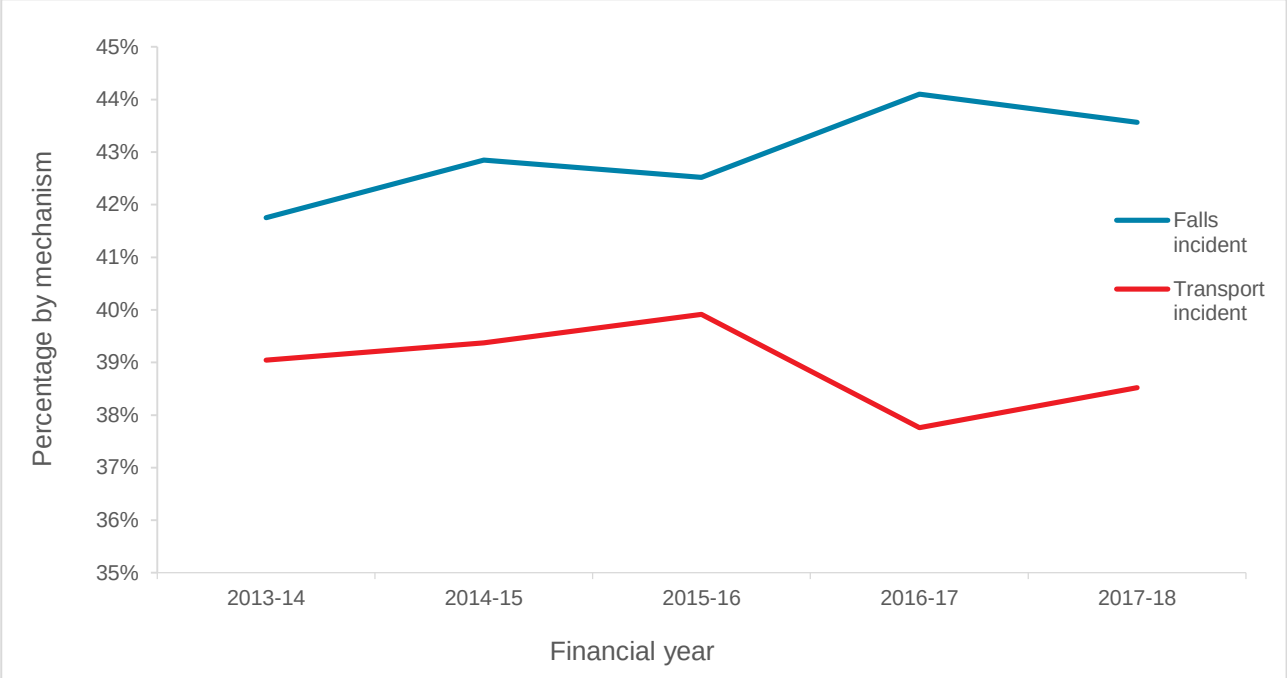
† See Glossary for the definition of road trauma.

Table 6: Mechanism of injury by age (n=3962)

Age group	Number of patients (age-specific rate per 100,000)			
	Falls	Transport incident	Assault	All other mechanisms
0-4	43 (8.7)	13 (2.6)	6 (1.2)	23 (4.6)
5-9	15 (3.0)	25 (5.0)	1 (0.2)	9 (1.8)
10-14	26 (5.6)	27 (5.8)	2 (0.4)	14 (3.0)
15-19	32 (6.8)	140 (29.9)	22 (4.7)	52 (11.1)
20-24	45 (8.3)	167 (30.9)	25 (4.6)	50 (9.2)
25-29	52 (8.8)	114 (19.3)	29 (4.9)	43 (7.3)
30-34	33 (5.7)	88 (15.1)	26 (4.5)	30 (5.1)
35-39	42 (7.9)	86 (16.1)	26 (4.9)	45 (8.4)
40-44	44 (8.6)	115 (22.5)	33 (6.5)	32 (6.3)
45-49	71 (13.8)	110 (21.4)	29 (5.6)	47 (9.1)
50-54	83 (17.1)	119 (24.5)	18 (3.7)	23 (4.7)
55-59	89 (18.4)	113 (23.3)	15 (3.1)	16 (3.3)
60-64	107 (24.8)	97 (22.5)	5 (1.2)	19 (4.4)
65-69	122 (31.7)	76 (19.8)	3 (0.8)	22 (5.7)
70-74	156 (49.6)	68 (21.6)	4 (1.3)	13 (4.1)
75-79	166 (74.2)	59 (26.4)	2 (0.9)	12 (5.4)
80-84	236 (149.2)	60 (37.9)	0 (0)	7 (4.4)
85 +	363 (214.2)	50 (29.5)	2 (1.2)<	5 (3.0)
Total	**1725**	**1527**	**248**	**462**

Figure 9 shows the overall five year trend of increasing falls and the decreasing transport incidents resulting in major trauma, although there is variability from year to year.

Figure 9: Five year trend in the number of falls and transport incidents (n=19,504)



The greatest burden of major trauma for people aged 65 years and older is falls (73.1%, n=1043), whilst for those aged under 65 years it is transport incidents (47.8% n=1214).

The highest incidence of assaults are in the 40-44 years age group (13.3%, n=33). See Table 6 and Figures 10-12.

Figure 10: Mechanism of injury by age (n=3962)

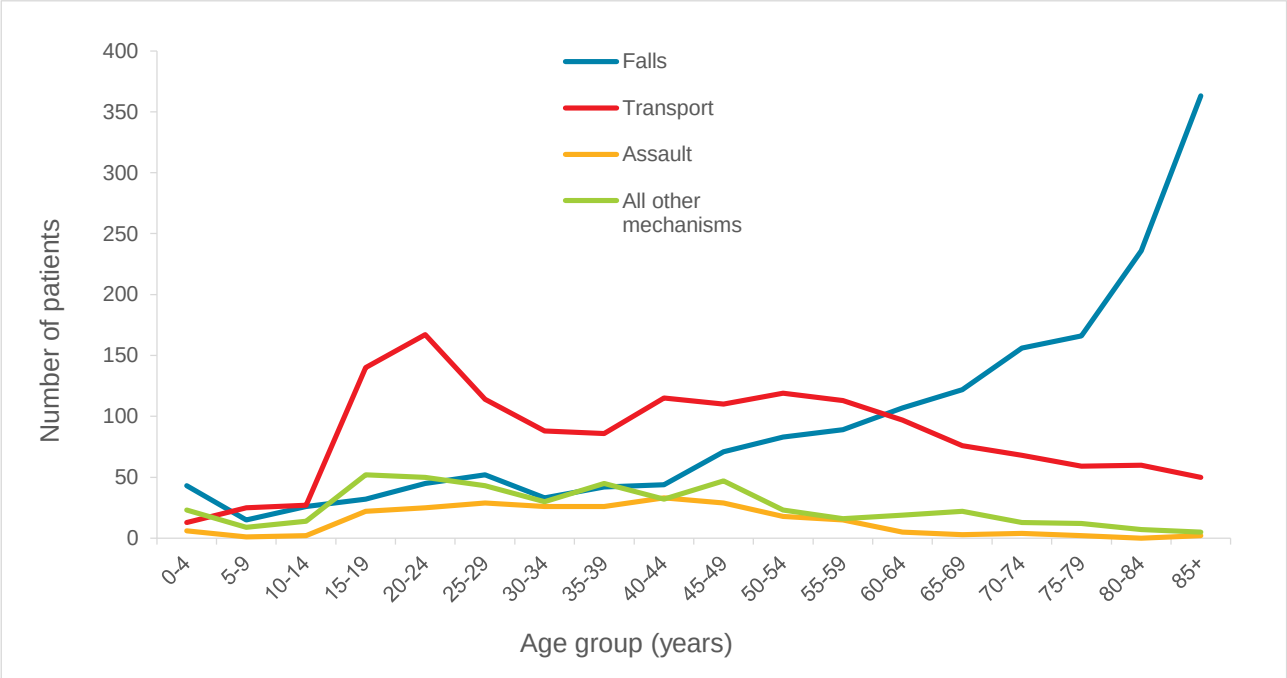


Figure 11: Mechanism of injury as a percentage by age (n=3962)

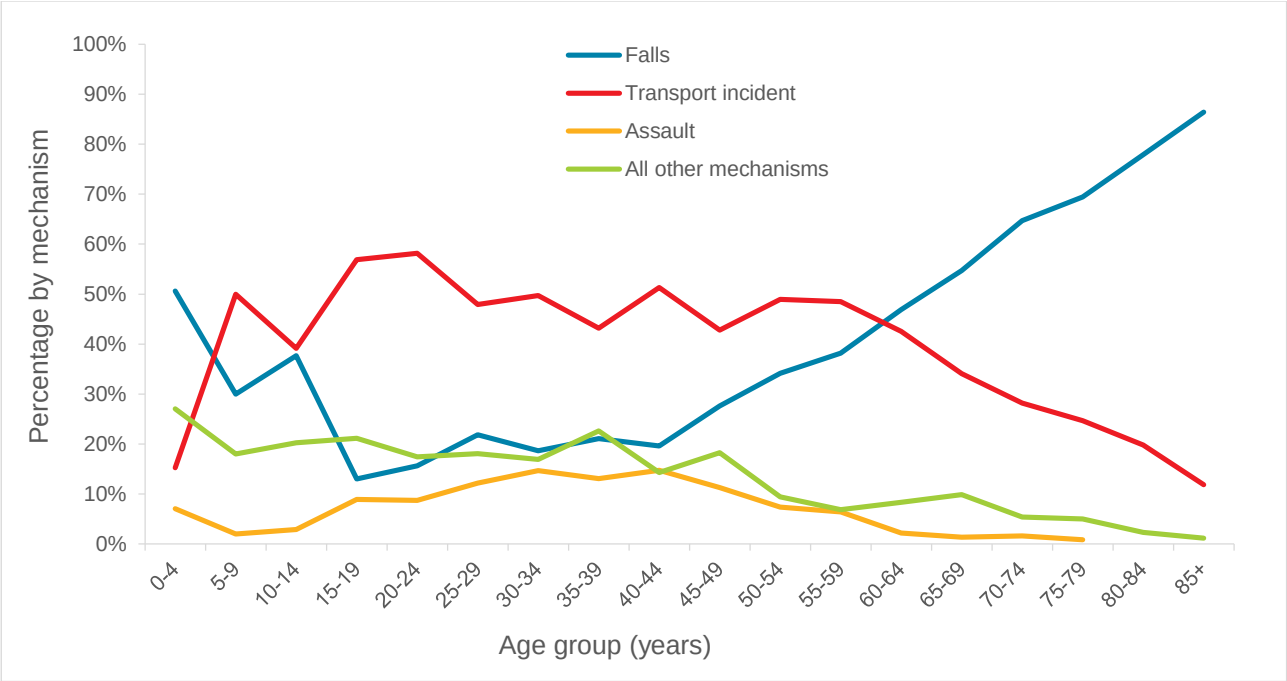
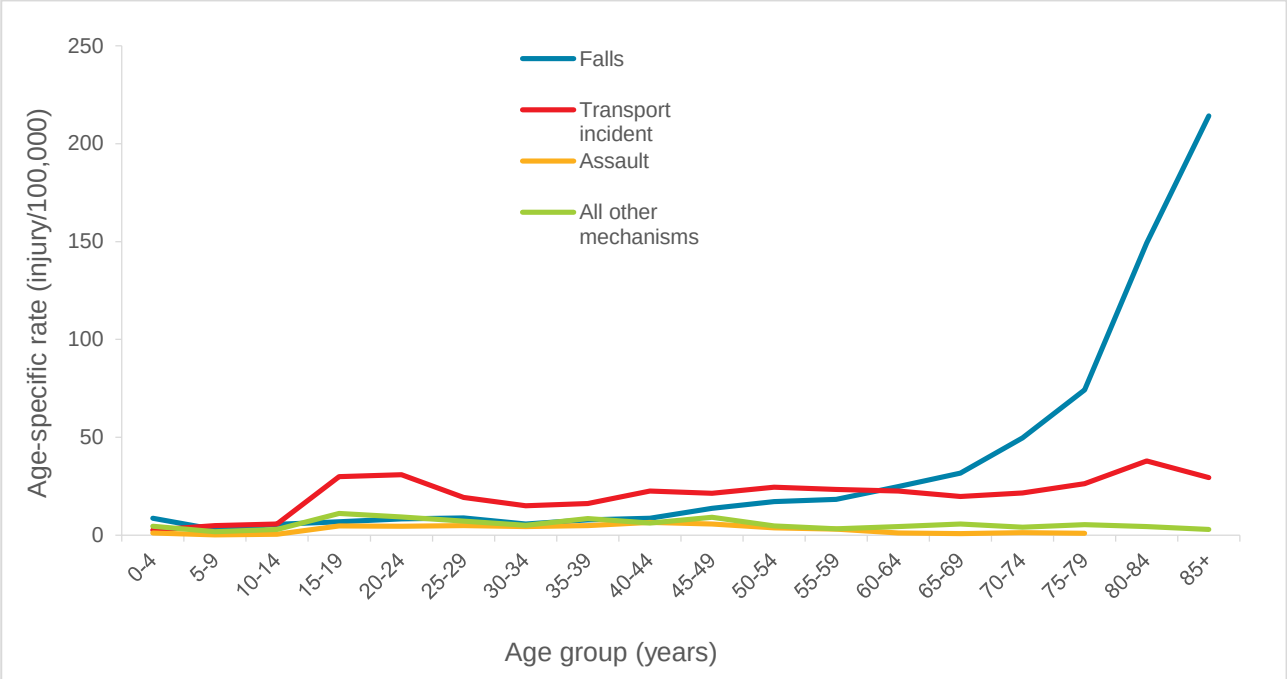


Figure 12: Age-specific injury rate by mechanism of injury (n=3962)



Falls were responsible for 50.0% of the injuries in the metropolitan area, compared to 31.6% in rural areas.

Transport incidents accounted for a higher percentage of injuries in rural areas, 51.3%, than in metropolitan areas, 32.0% (Table 7, Figures 13-14).

Table 7: Mechanism of injury by location (n=3634)

Mechanism of Injury	Metropolitan (% of metropolitan)	Rural (% of rural)
Falls	1330 (50.0%)	308 (31.6%)
Transport incident	851 (32.0%)	500 (51.3%)
Assault	171 (6.4%)	50 (5.1%)
All other mechanisms	308 (11.6%)	116 (11.9%)
Total	**2660 (73.2%)**	**974 (26.8%)**

Figure 13: Mechanism of injury by location (n=3634)

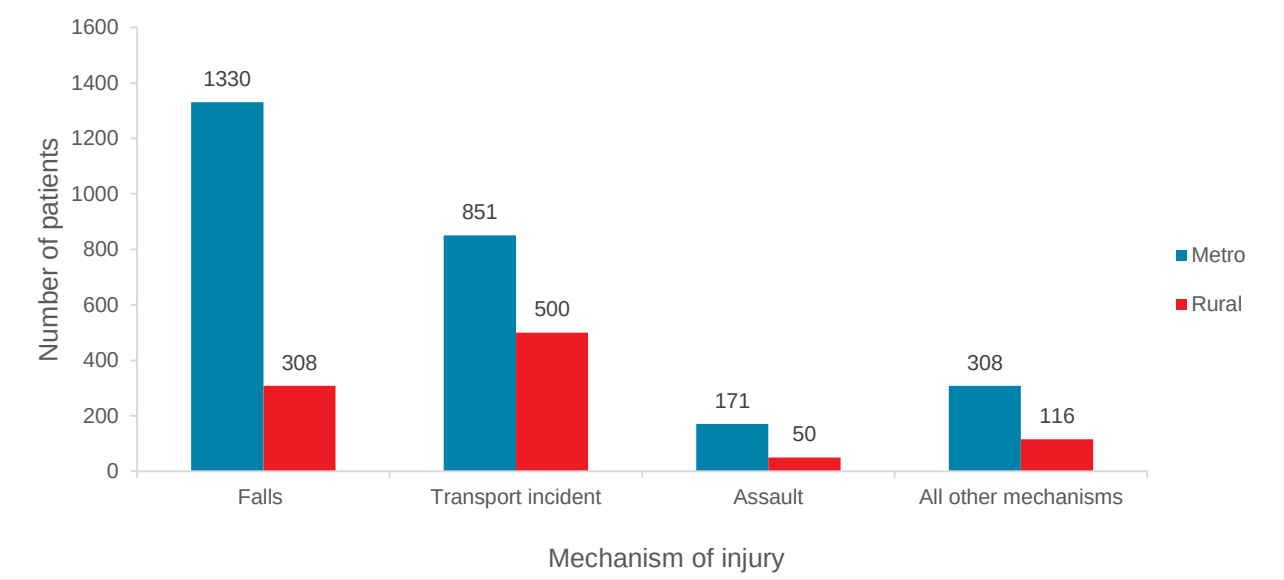
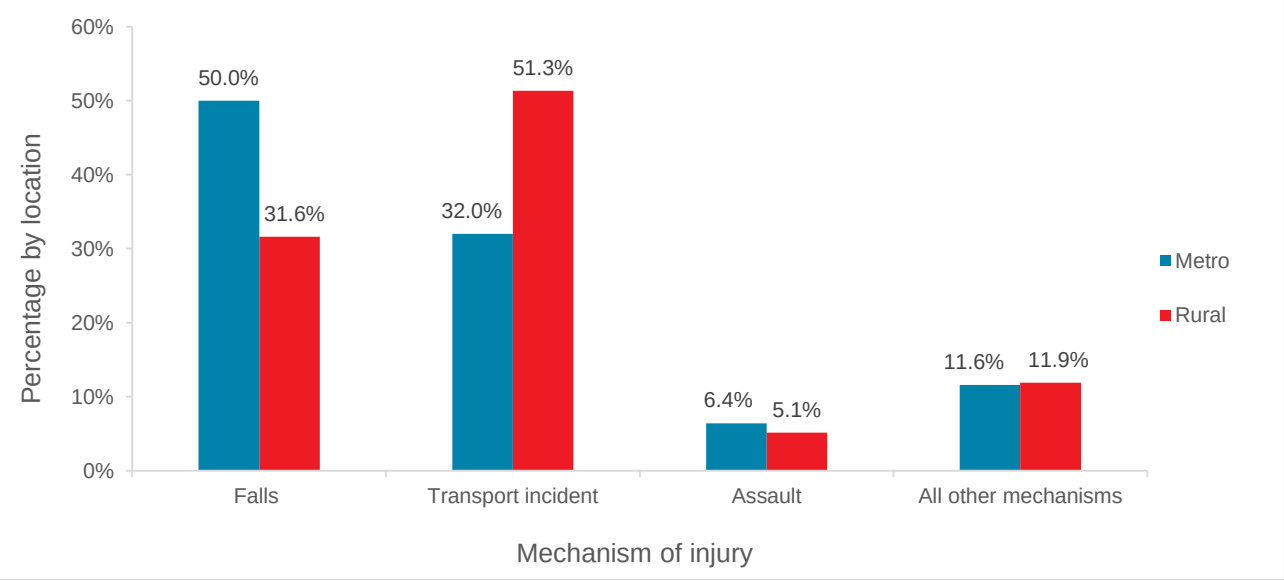


Figure 14: Mechanism of injury as a percentage by location (n=3634)



The mechanisms of injury are outlined in more detail in Tables 8-11.

Falls from a standing height (lowest level, <1m) accounted for the greatest burden of all heights. They accounted for 62.6% of all falls, 27.3% of all trauma mechanisms, 32.1% of all trauma deaths, and had case fatality rate for ISS >12 of 14.8% (Table 8).

Table 8: Falls in detail (n=1727)

Mechanism	Number injured (% of all mechanisms)	Number of deaths, ISS >12 (case fatality rate)	Percentage of all trauma deaths
Low (<1m)	1081 (27.3%)	135 (14.8%)	32.1%
Medium (1-5m)	480 (12.1%)	38 (7.9%)	9.1%
High (>5m)	87 (2.2%)	8 (9.2%)	1.9%
Unspecified	79 (2.0%)	8 (10.1%)	1.9%
Total	**1727 (43.6%)**	**189 (10.9%)**	**45.0%**

Pedestrian trauma had the highest case fatality rate for ISS >12 (19.1%) (Table 9) well above other forms of transport incidents.

Table 9: Transport incidents in detail (n=1527)

Mechanism	Number injured (% of all mechanisms)	Number of deaths, ISS >12 (case fatality rate)	Percentage of all trauma deaths
Car occupant	549 (13.8%)	35 (7.2%)	8.3%
Motorcycle rider	410 (10.3%)	4 (1.0%)	1.0%
Pedestrian	226 (5.7%)	41 (19.1%)	9.8%
Pedal cyclist	193 (4.9%)	5 (2.8%)	1.2%
All other transport	149 (3.8%)	6 (4.4%)	1.4%
Total	**1527 (38.5%)**	**91 (6.5%)**	**21.7%**

The most common mechanisms of injury in the assault group were assaults involving bodily force (n=106, 2.7% of all mechanisms), assault by knife (n=52, 1.3%), and assault by blunt object (n=33, 0.8%). In comparison there were only nine recorded cases assault by firearm (0.2%) (Table 10).

Table 10: Assaults in detail (n=248)

Mechanism	Number injured (% of all mechanisms)	Number of deaths, ISS >12 (case fatality rate)	Percentage of all trauma deaths
Assault by bodily force	106 (2.7%)	1 (1.2%)	0.2%
Assault by knife	52 (1.3%)	2 (4.7%)	0.5%
All other assaults	48 (1.2%)	4 (9.5%)	1.0%
Assault by blunt object	33 (0.8%)	1 (3.6%)	0.2%
Assault by firearm	9 (0.2%)	0 (0%)	0%
Total	**248 (6.3%)**	**8 (4.0%)**	**1.9%**

Of the other mechanisms of injury, self-harm was the most common (n=168, 4.2%). Drownings and self-harm had the highest case fatality rate for ISS >12 in the 'all other mechanisms' group at 34.6% and 28.3% respectively (Table 11).

Table 11: All other mechanisms in detail (n=462)

Mechanism	Number injured (% of all mechanisms)	Number of deaths, ISS >12 (case fatality rate)	Percentage of all trauma deaths
Self-harm	168 (4.2%)	36 (28.3%)	8.6%
Burns	55 (1.4%)	4 (14.3%)	1.0%
Drownings	30 (0.8%)	9 (34.6%)	2.1%
Other	40 (1.0%)	3 (11.5%)	0.7%
Animate mechanical forces	52 (1.3%)	1 (2.4%)	0.2%
Inanimate mechanical forces	117 (3.0%)	3 (3.0%)	0.7%
Total	**462 (11.7%)**	**56 (16.0%)**	**13.3%**

Transport incidents by place of occurrence

In order to provide a greater analysis of the burden road trauma has on the health system, a 'place of occurrence' code qualifier was applied to all transport incidents resulting in two categories: road trauma; and other transport incidents. For the purpose of this report, road trauma is defined as a transport incident which occurred on a street, highway or other paved roadway.*

Road trauma accounts for 29.0% (n=1148) of all mechanisms of injury, the second highest behind falls at 43.6% (n=1727). The rate of 'road trauma' and 'other transport incidents' were higher in rural areas, 34.4% and 16.9% respectively, than in metropolitan areas, 26.2% and 5.8% respectively (Table 12).

Table 12: Transport incidents by location of injury (n=1527)

Mechanism of Injury (place of occurrence)	Metropolitan (% of metropolitan)	Rural (% of rural)	Unknown location (% of unknown)
Road trauma	697 (26.2%)	335 (34.4%)	116 (35.2%)
Other transport incidents	154 (5.8%)	165 (16.9%)	58 (17.6%)
Unspecified place of occurrence	0 (0%)	0 (0%)	2 (0.6%)
Total	**851**	**500**	**176**

Injuries to car occupants remains the highest mechanism of injury in the road trauma group (n=516, 13%) with pedestrian trauma having the highest case fatality rate for ISS >12 (16.8%), well above other forms of road trauma (Table 13).

Table 13: Road trauma in detail (n=1148)

Mechanism	Number injured (% of all mechanisms)	Number of deaths (ISS >12) (case fatality rate)	Percentage of all trauma deaths
Car occupant	516 (13.0%)	31 (6.9%)	7.4%
Motorcycle rider	265 (6.7%)	4 (1.6%)	1.0%
Pedestrian	182 (4.6%)	29 (16.8%)	6.9%
Pedal cyclist	145 (3.7%)	4 (3.0%)	1.0%
All other road transport	40 (1.0%)	2 (5.3%)	0.5%
Total	**1148 (29.0%)**	**70 (6.7%)**	**16.7%**

* See Glossary for a detailed definition of 'road trauma' and 'other transport incident'.

The most common mechanisms in the 'other transport incidents' group were motorcycle riders (n=145), other land transport incidents (n=93), pedal cyclists (n=48), and pedestrians (n=44). Of the 'other land transport' incident group, animal-rider or animal-drawn vehicle were the most common (n=53) followed by all-terrain vehicle (including quad bike) incidents (n=28) (Table 14).

Table 14: Other transport incidents in detail (n=379)

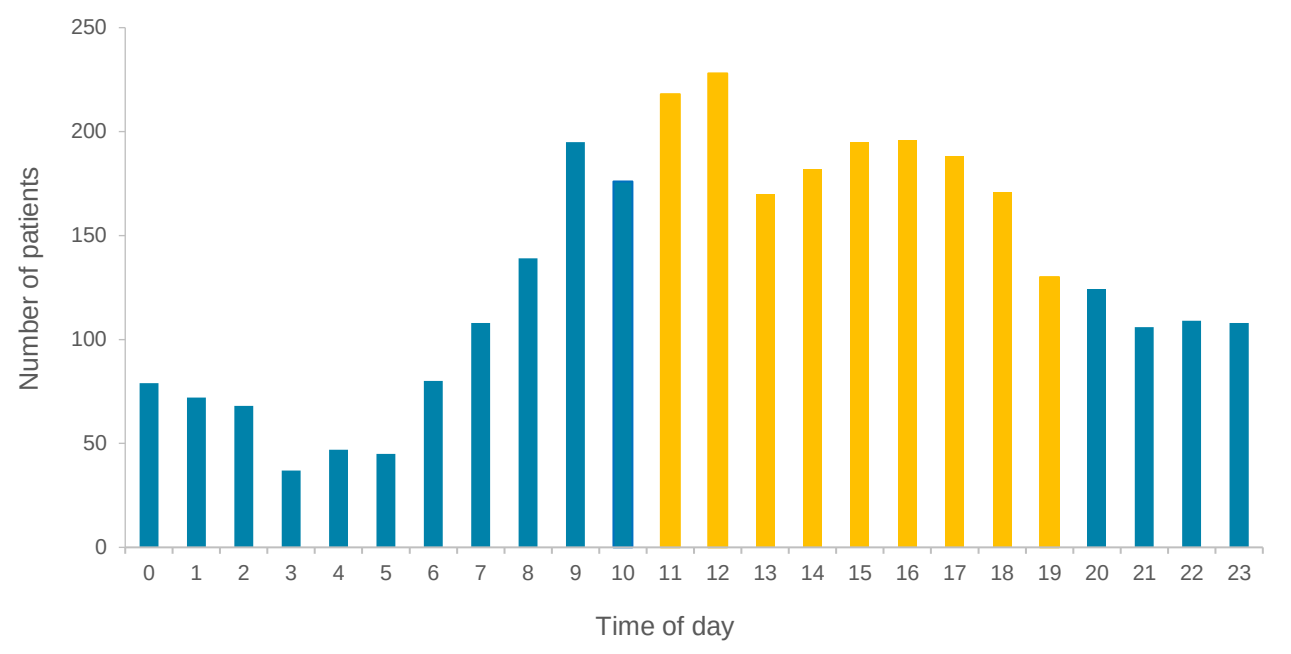
Other transport incidents include incidents being reported as occurring NOT on a street, highway or other paved roadway.

Mechanism	Number injured (% of all mechanisms)	Number of deaths, ISS >12 (case fatality rate)	Percentage of all trauma deaths
Motorcycle rider	145 (3.7%)	0 (0%)	0%
Other land transport accidents	93 (2.3%)	3 (3.7%)	0.7%
Pedal cyclist	48 (1.2%)	1 (2.2%)	0.2%
Pedestrian	44 (1.1%)	12 (28.6%)	2.9%
Car occupant	33 (0.8%)	4 (12.9%)	0.9%
Air and space transport accidents	9 (0.2%)	1 (11.1%)	0.2%
Water transport accidents	5 (0.1%)	0 (0%)	0%
Occupant of heavy transport vehicle	1 (0%)	0 (0%)	0%
Occupant of three-wheeled motor vehicle	1 (0%)	0 (0%)	0%
Total	**379 (9.6%)**	**21 (5.9%)**	**5.0%**

Time and day of injury

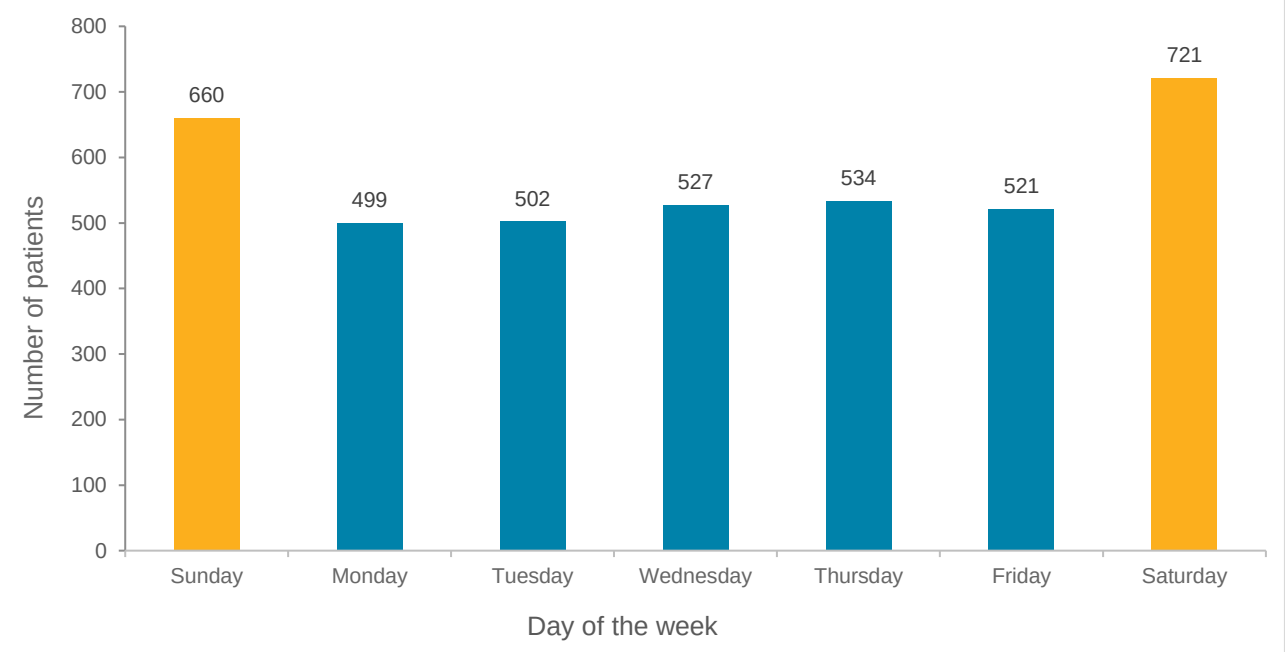
Of note is that 52.9% of patients (n=1678) were injured between 11 am and 8 pm, which resulted in peak activity in the hospitals during the afternoon and evening (Figure 15).

Figure 15: Number of patients by time of injury (n=3171)



The mean daily number of persons injured on a weekday was 9.9. The number of persons injured on weekends was higher, with a mean of 13.2 per day (Figure 16).*

Figure 16: Number of patients by day of injury (n=3964)



* In the reporting period there were 260 week days and 105 weekend days.

Injuries

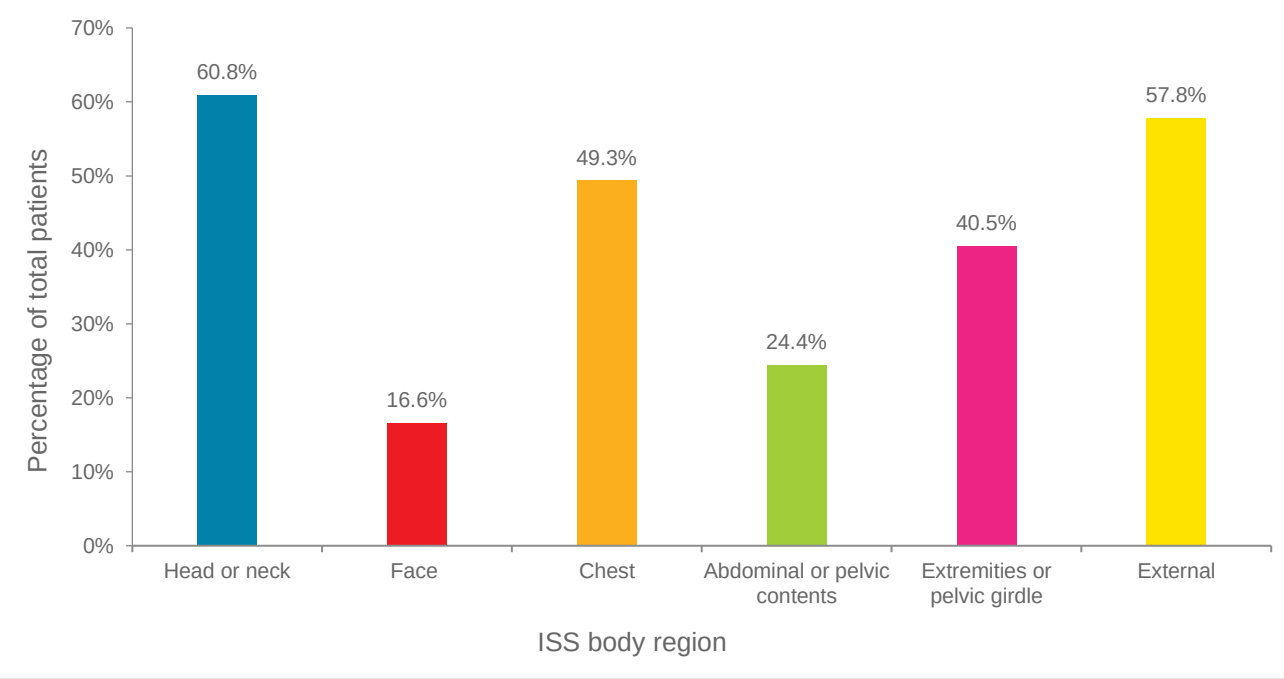
Three or more fractured ribs without a flail segment* continued to be the most common single serious injury sustained (23.0%, n=910) where the AIS severity was greater than 2 (Table 15). Cerebral haematomas occupied three of the top five injuries.

Table 15: Top 5 injuries with an AIS severity >2 (n=3964)

Injury description	AIS severity	Number of patients (% of total)
Fractured ≥3 ribs without flail, not further specified	3	910 (23.0%)
Cerebrum hematoma - subdural - small; moderate	4	404 (10.2%)
Cerebrum hematoma - subdural - large; massive; extensive	5	217 (5.5%)
Cerebrum hematoma - subdural - tiny	3	204 (5.1%)
Base of skull fracture, not further specified	3	177 (4.5%)

In addition, 60.8% of major trauma patients sustained injuries to the head or neck body region, with the chest region injured in 49.3% of major trauma patients (Figure 17).

Figure 17: All injuries by ISS body region (n=3964)



* Flail is defined as three or more ribs fractured in more than one location and/or resulting in paradoxical chest movement.[8]

The majority of major trauma patients (74.5%) sustained serious injury (AIS severity >2) to only one ISS body region (Table 16).

Table 16: Number of ISS body regions injured with an AIS severity >2 (n=3964)

Number of ISS body regions injured with an AIS severity >2	Number of patients – All ISS (% of total)	Number of patients (% of total) (ISS >12)
0	284 (7.2%)	2 (0.1%)
1	2955 (74.5%)	2731 (79.0%)
2	614 (15.5%)	614 (17.8%)
3	99 (2.5%)	99 (2.9%)
4	11 (0.3%)	11 (0.3%)
5	1 (0%)	1 (0%)

19.7% of major trauma patients sustained polytrauma, defined as sustaining serious injury (AIS severity >2) in two or more ISS body regions (Table 17).[11]

Table 17: Single body region versus polytrauma with an AIS severity >2 (n=3680)

	Number of patients – All ISS (% of total)	Case fatality rate (ISS >12)
Single body region	2955 (80.3%)	9.2%
Polytrauma	725 (19.7%)	12.8%

Injury Severity Score

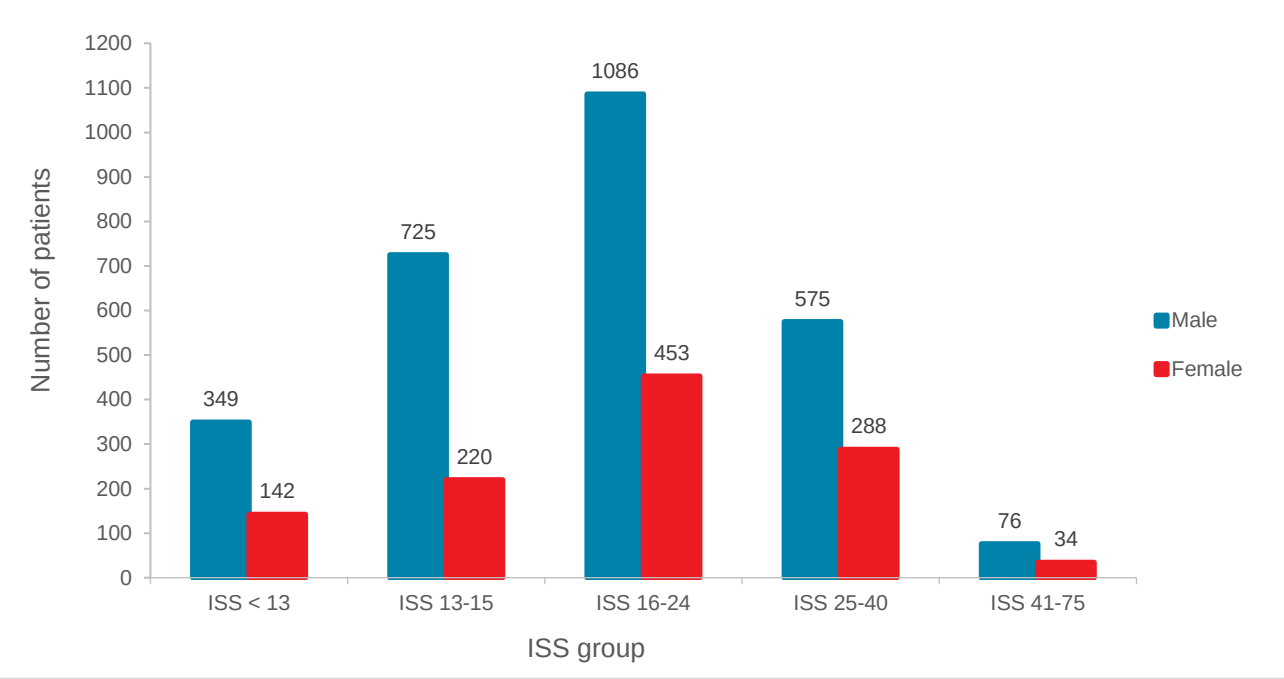
An ISS of greater than 12 is a key identifier of a major trauma patient. The ISS correlates with mortality – the higher the ISS, the higher the mortality rate (Table 18). It is important to note that ISS is only calculated on injuries sustained and does not include other potential contributors to mortality and morbidity such as patient's age and comorbidities. The average ISS for all major trauma patients was 18.8. This increased to 20.5 when excluding those with an ISS less than 13.

Table 18: Major trauma patients by ISS group (n=3950)

ISS group	Number of patients (% of total)	Number of deaths (case fatality rate)
ISS <13	492 (12.5%)	65 (13.2%)
ISS 13-15	945 (23.9%)	19 (2.0%)
ISS 16-24	1540 (39.0%)	66 (4.3%)
ISS 25-40	863 (21.8%)	209 (24.2%)
ISS 41-75	110 (2.8%)	50 (45.5%)

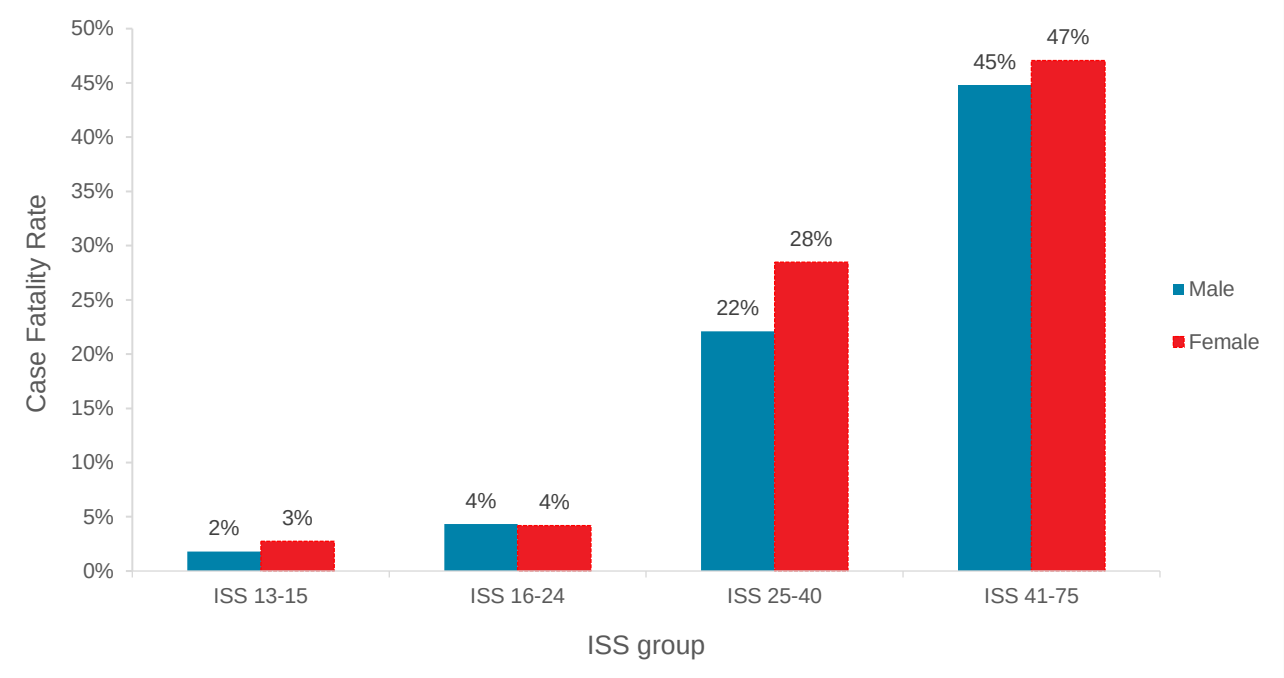
The serious injury category (ISS 16-24) contained the highest number of injured at 1540 (39.0%), followed by the moderate injury category (ISS 13-15) which had 945 (23.9%) injured and the severe injury category (ISS 25-40) had 863 (21.8%) (Figure 18).

Figure 18: Number of major trauma patients by ISS group and sex (n=3948)



Females had a higher case fatality rate than males in all the ISS groups (Figure 19). Overall the case fatality rates were higher in females than males (13.2% versus 9.2%).

Figure 19: Case fatality rate by ISS and sex (n=3457)



Pre-hospital time

The time from injury to arrival at a designated trauma service can have a significant impact on morbidity and mortality in the major trauma patient cohort. The regional population and geography of NSW is vastly spread and this impacts on the variation in the time of arrival to a designated trauma service. Patients who were injured in a metropolitan region arrived at a designated trauma service faster (77 mins) than those injured in a rural location (140 mins) (Table 19).

Table 19: Median time of injury to arrival at a designated trauma service (n=3704)

Location of injury	Direct from scene	Transferred from another hospital	Overall
Metropolitan	77 mins (n=2240)	487 mins (n=319)	81 mins (n=2559)
Rural	140 mins (n=578)	546 mins (n=259)	182 mins (n=837)
NSW overall	83 mins (n=3043)	532 mins (n=661)	95 mins (n=3704)

See the Methodology section of this report for more information regarding the definitions of metropolitan and rural.

A number of major trauma patients (n=236), who arrived at a designated trauma service, needed to be transferred to a higher level of care for specialised treatment. While vital, this transfer prolongs the time before the required (definitive) care can be provided, such as specialised surgery, interventional radiology or paediatric services. Overall, 863 major trauma patients were transferred from another acute care facility with a median time of injury to definitive care of 599 minutes (Table 20).*

Table 20: Median time of injury to arrival at definitive care (n=3773)

Location of injury	Direct from scene	Transferred from another acute care facility	Overall
Metropolitan	77 mins (n=2189)	532 mins (n=400)	84 mins (n=2589)
Rural	141 mins (n=508)	669 mins (n=369)	226 mins (n=877)
NSW overall	83 mins (n=2910)	599 mins (n=863)	101 mins (n=3773)

Mode of transport

Major trauma patients are transported to a designated trauma service from either the scene of the injury or from another hospital. Road ambulance was by far the most common mode of transport (77.7%), with helicopter, fixed wing and private transport also used (Table 21, Figures 20-21).

Table 21: Mode of transport to definitive care (n=3940)

Transport mode	Direct from scene of injury	Transfer from another acute care facility	Total
Road ambulance	2485 (81.7%)	575 (64.1%)	3060 (77.7%)
Helicopter	322 (10.6%)	170 (19.0%)	492 (12.5%)
Private vehicle	212 (7.0%)	7 (0.8%)	219 (5.6%)
Fixed wing	3 (0.1%)	112 (12.5%)	115 (2.9%)
Unknown	17 (0.6%)	22 (2.5%)	39 (1.0%)
Other	4 (0.1%)	11 (1.2%)	15 (0.4%)
Total	**3043**	**897**	**3940**

* See Glossary for definition of definitive care

Figure 20: Mode of transport to definitive care when transported direct from the scene of injury, by injury location (n=2818)

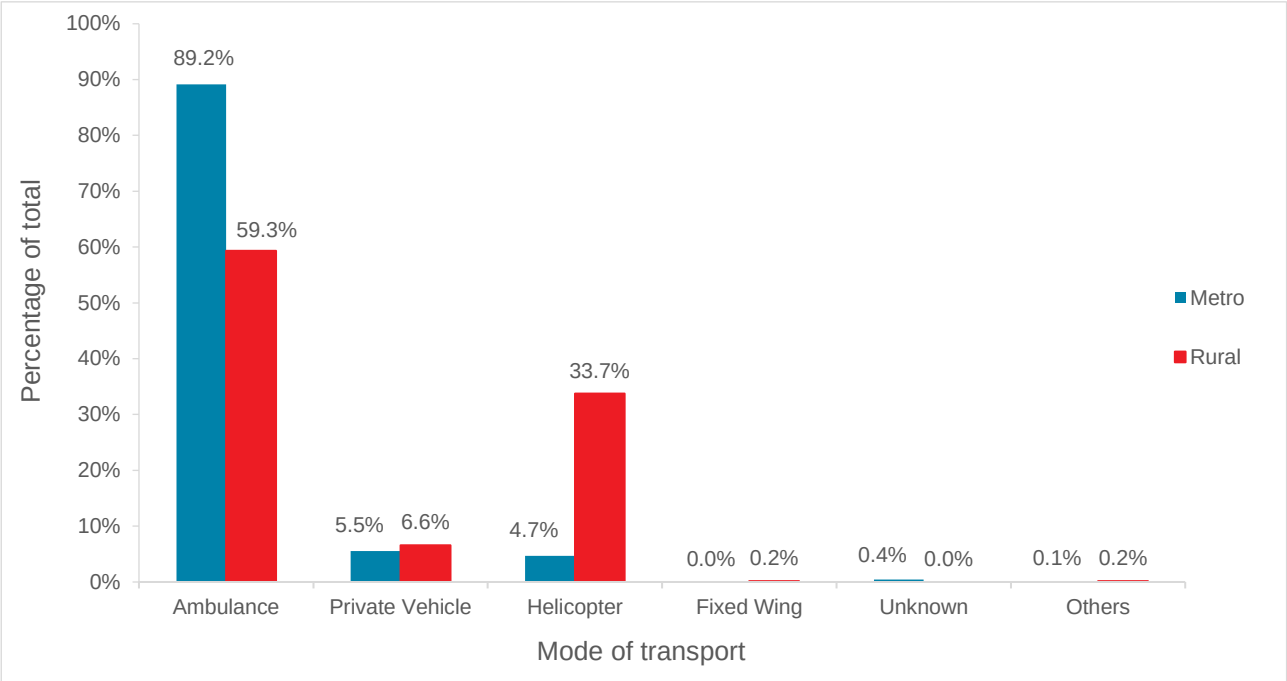
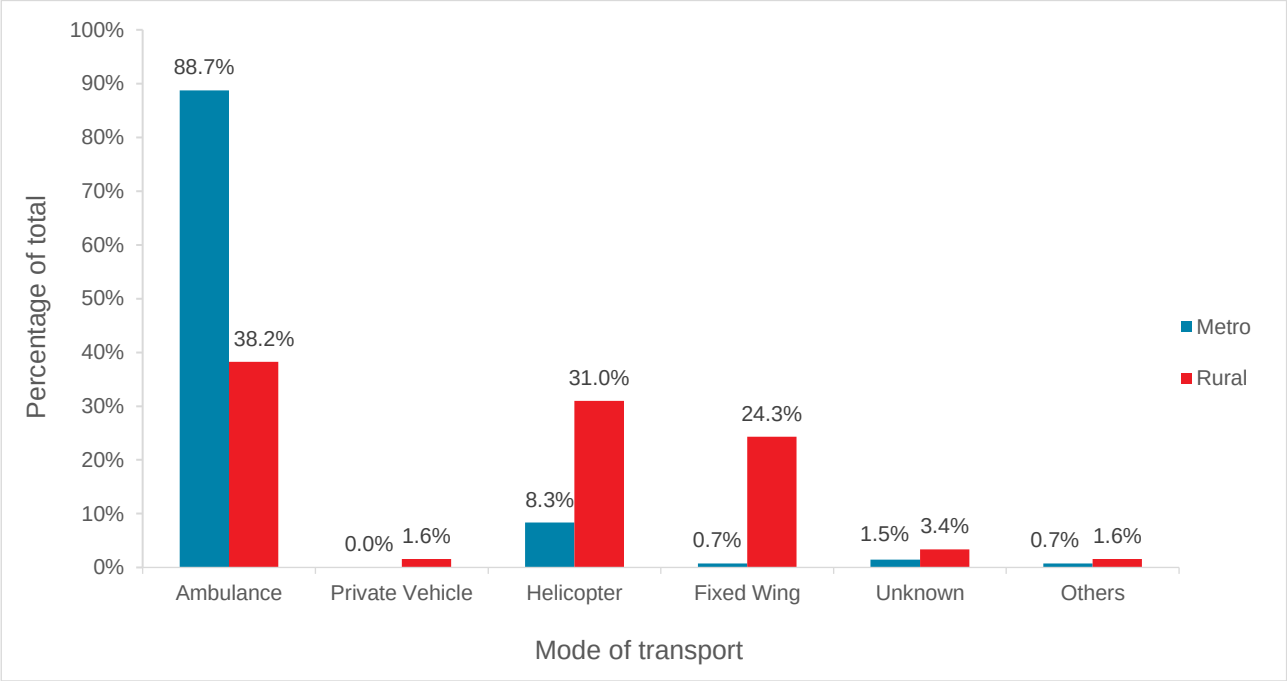


Figure 21: Mode of transport to definitive care when transferred from another acute care facility, by injury location (n=795)



Major trauma admissions

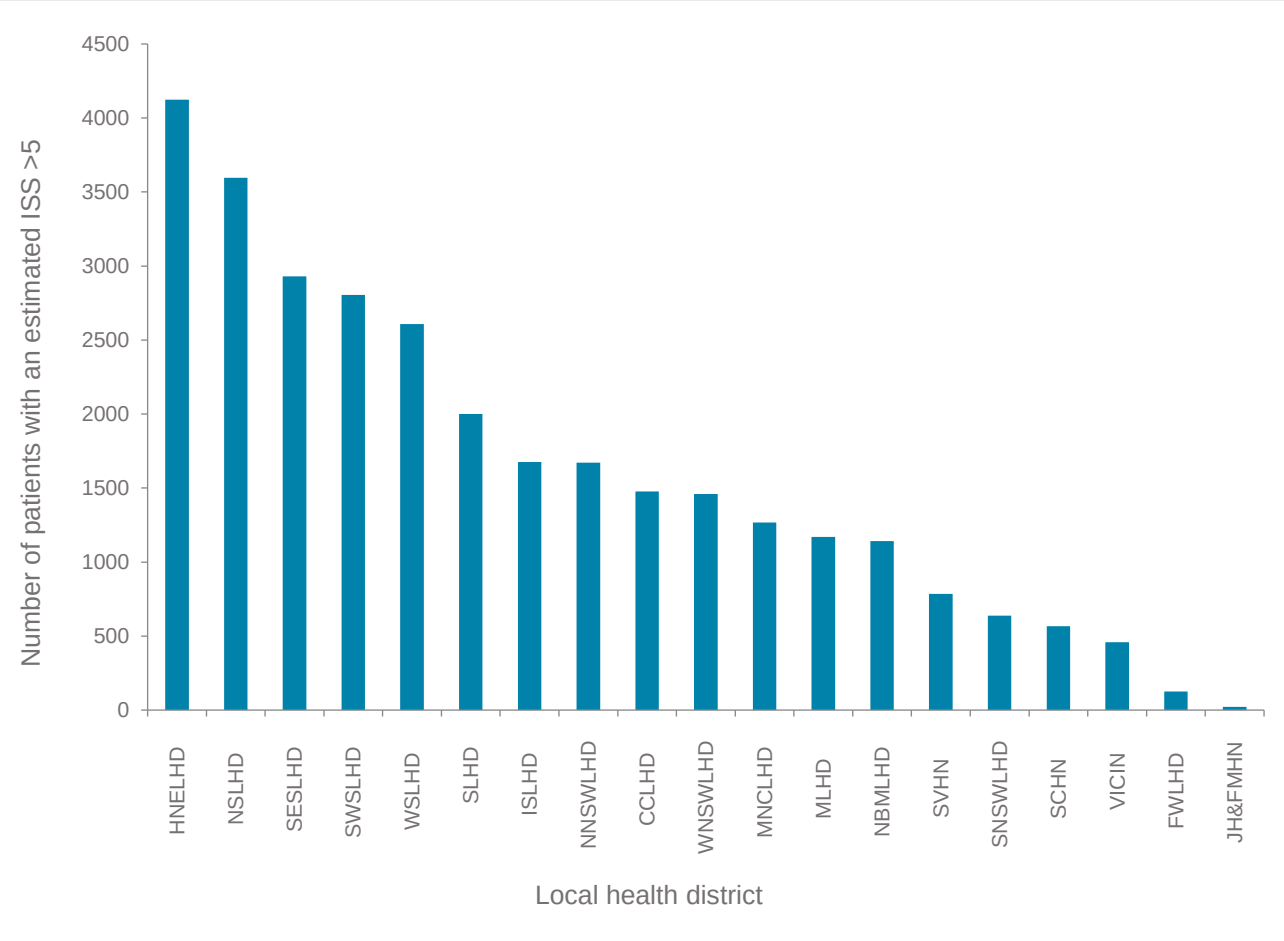
Introduction

The information in this section of the report is based on the number of major trauma patients admitted to NSW trauma services (n=4097), not the number of major trauma patients (n=3964), as some patients were treated in more than one NSW reporting facility. Trauma patient data is discussed in detail in the Major trauma patients section.

Overall burden of trauma

Major trauma patients are an important cohort, but only represent a fraction of all trauma patients who are admitted to facilities across NSW. Based on data from the Admitted Patient Data Collection (APDC) and using an International Classification of Diseases (ICD) to AIS mapping tool, 30,518 patients with an estimated ISS >5 were admitted to a NSW health facility during the reporting period (Figure 22).[13,14] This demonstrates the significant burden that trauma as a whole places on the health system.

Figure 22: Number of patients with an estimated ISS >5 by local health district (n=30,518)



Facility overview

The table below provides an overview of the major trauma admissions for each designated trauma service together with averages from the three trauma service types (Table 22).

Table 22: Overview of trauma service admissions (n=4097)

Facility	Number of admissions	Number of admissions (ISS > 12)	Average age	Average ISS	Case fatality rate (ISS >12) excluding traumatic DOA
Adult major trauma services	**3048**	**2687**	**53.7**	**19**	**9.3%**
John Hunter Hospital	630	597	52.1	20	8.6%
Liverpool Hospital	451	386	54.1	18	8.5%
Royal North Shore Hospital	582	497	56.7	20	12.2%
Royal Prince Alfred Hospital	359	307	55.0	18	5.9%
St George Hospital	202	177	53.8	19	11.3%
St Vincent's Hospital	195	163	52.0	18	13.7%
Westmead Hospital	629	560	51.8	17	8.1%
Paediatric major trauma services	**200**	**157**	**7.7**	**20**	**7.1%**
John Hunter Children's Hospital	50	43	9.0	19	0%
Sydney Children's Hospital	71	54	6.5	17	7.4%
The Children's Hospital at Westmead	79	60	8.1	23	12.3%
Regional trauma services	**849**	**747**	**54.0**	**18**	**8.5%**
Coffs Harbour Base Hospital	77	71	47.5	21	7.1%
Gosford Hospital	69	65	51.6	17	12.5%
Lismore Base Hospital	56	53	56.4	19	5.7%
Nepean Hospital	101	61	61.7	13	10.0%
Orange Health Service	103	87	51.9	18	5.7%
Port Macquarie Base Hospital	65	63	55.2	20	12.9%
Tamworth Base Hospital	98	85	50.1	19	6.0%
The Tweed Hospital	41	37	56.0	17	10.8%
Wagga Wagga Base Hospital	85	76	48.8	17	5.3%
Wollongong Hospital	154	149	58.2	19	10.1%

Admission type

The majority of major trauma patients (77.5%, n=3173) were admitted to a trauma service direct from the scene of injury, however, there were differences in the admission type between adult and paediatric patient groups (Table 23).

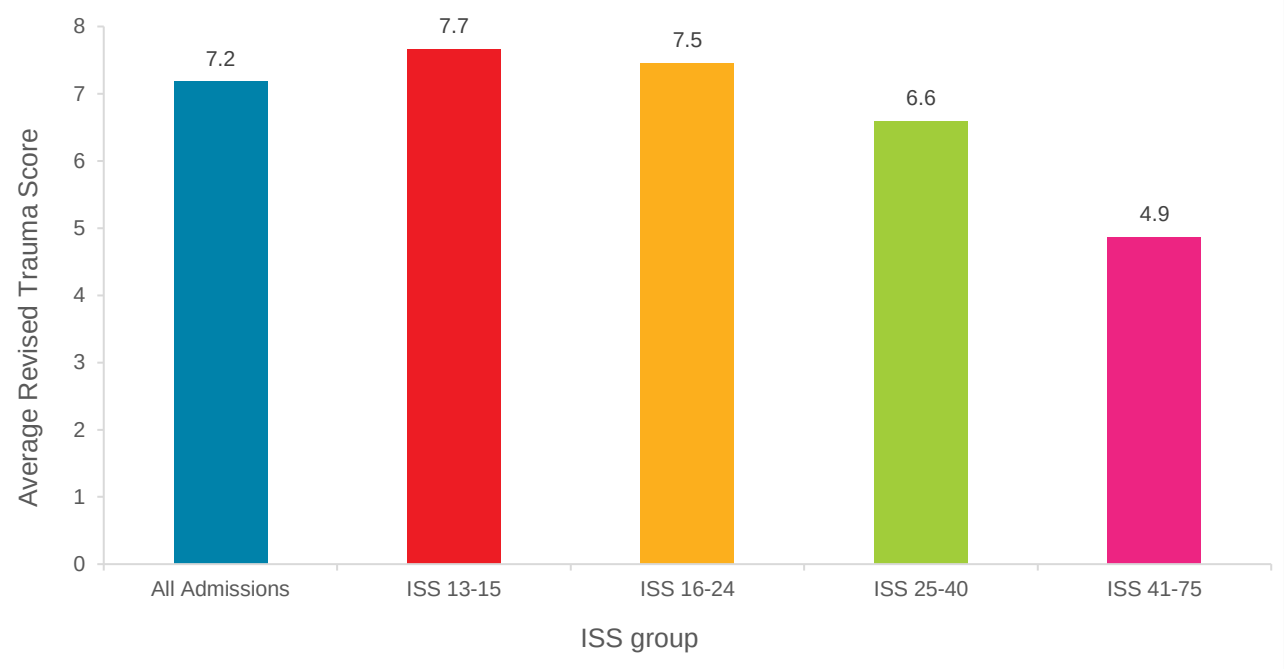
Table 23: Number of admissions by type (n=4095)

Admission type	Number of admissions (paediatric / adult)	Percentage of admissions (paediatric / adult)
Direct from scene	179 / 2994	61.9% / 78.7%
Transfer from another acute care facility	109 / 789	37.7% / 20.7%
Unknown and other	1 / 23	0.3% / 0.6%

Revised Trauma Score

The Revised Trauma Score* is an early (<24 hours) indicator of trauma outcomes. The lower the score, the higher is the likelihood of death. There was a negative correlation between the Revised Trauma Score and ISS, showing that the higher the ISS, the lower the Revised Trauma Score. The average Revised Trauma Score was 7.2 (Figure 23).

Figure 23: Average Revised Trauma Score by ISS group (n=3799)

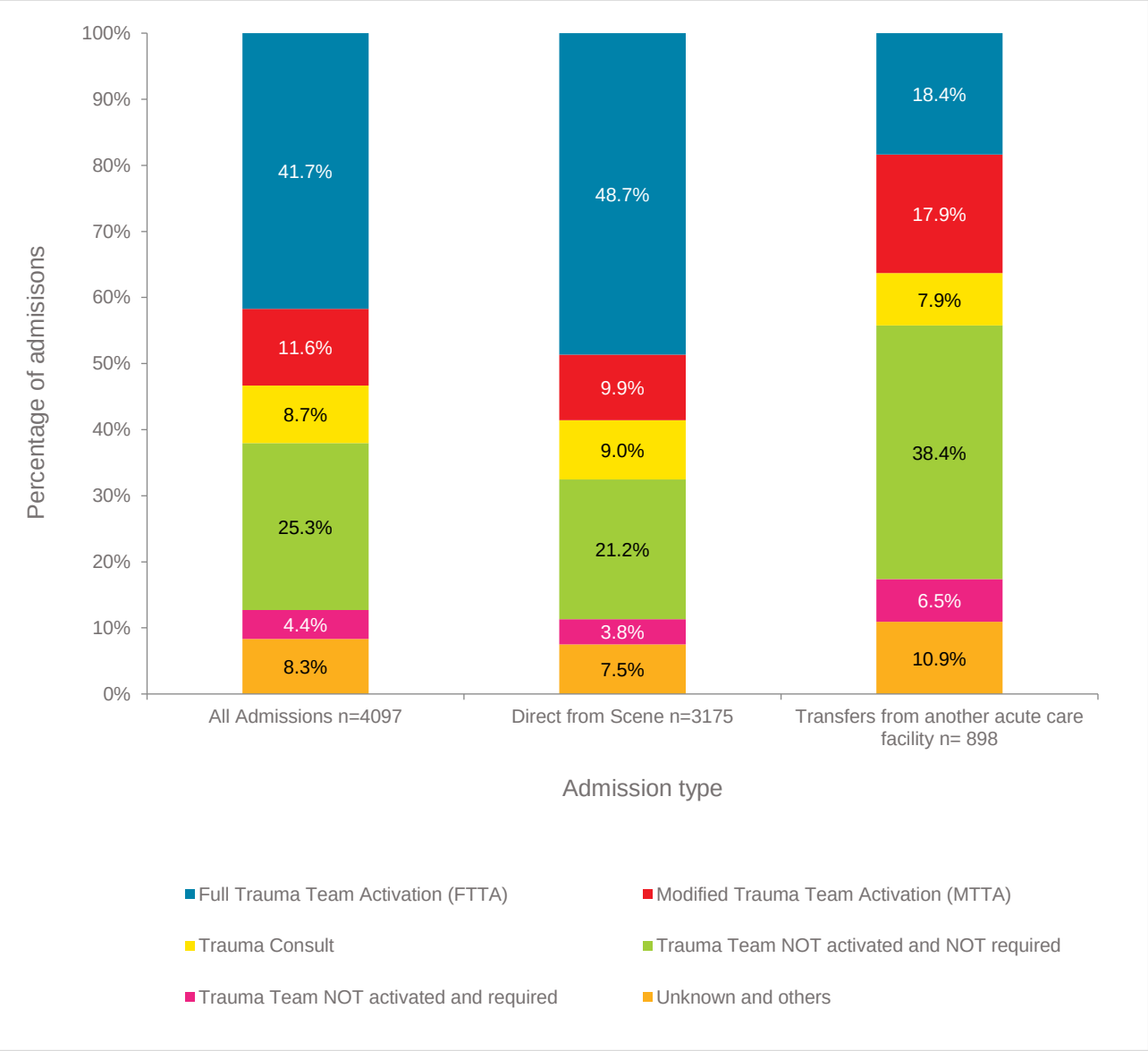


* See the Glossary for a definition of the Revised Trauma Score.[9]

Trauma team activation

Major trauma patients require rapid, thorough and systematic assessment and resuscitation. This is conducted on arrival by a multidisciplinary team known as a trauma team. The activation of the trauma team is based on a locally derived set of criteria including mechanism of injury and physiological parameters. 48.7% of patients who arrived at a trauma service direct from scene received a full trauma team activation compared to 18.4% of those who were transferred from another acute care facility (Figure 24).

Figure 24: Trauma team activation by admission type (n=4097)



As expected, the activation of the trauma team increased with severity of injury with 33.7% (n=324) of the ISS 13-15 group receiving a full trauma team activation compared to 83.9% (n=99) of the ISS 41-75 group (Figure 25).

Figure 25: Trauma team activation by ISS group (n=4083)

Vital signs on arrival to the emergency department

The initial vital signs on arrival to the emergency department (ED) are useful indicators of injury severity and predictors of death. Major trauma patients who presented with hypotension (systolic blood pressure <100mmHg), a Glasgow Coma Scale <13 or hypothermia (temperature <35°C) represented a higher proportion of those who died compared to all patients (Figures 26-28).

Figure 26: Initial systolic blood pressure on arrival to the ED and mortality (n= 3918)

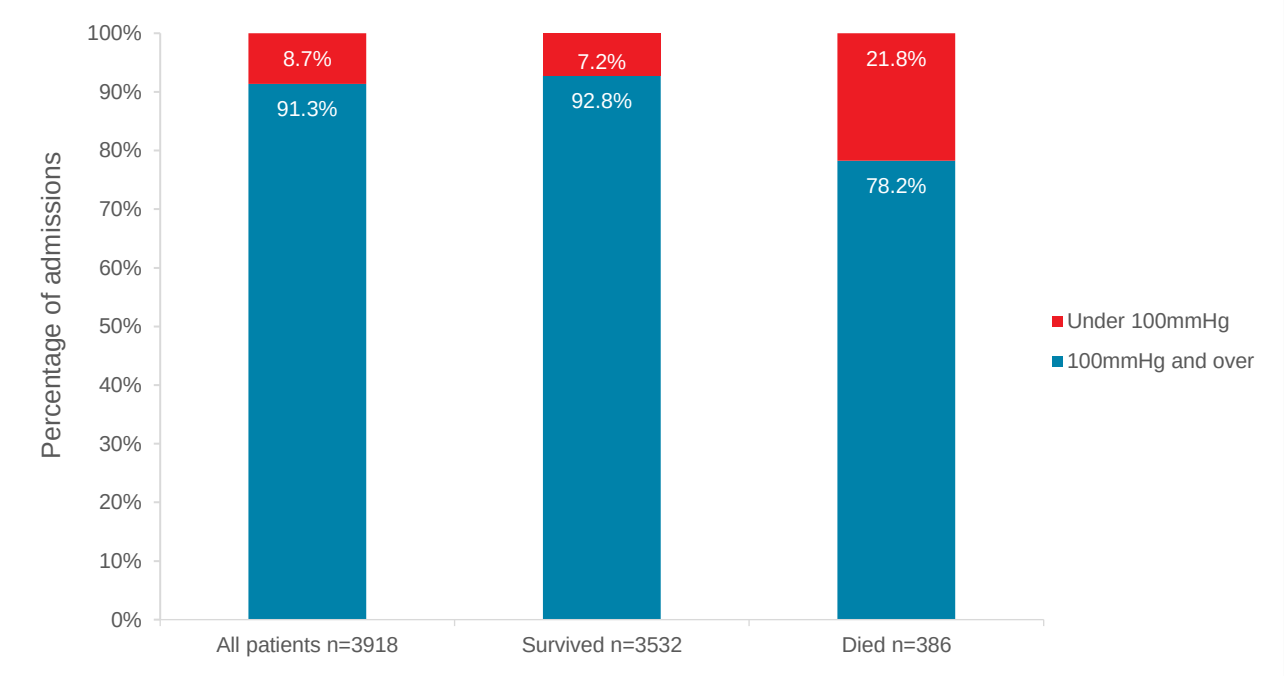


Figure 27: Initial Glasgow Coma Scale on arrival to the ED and mortality (n=3892)

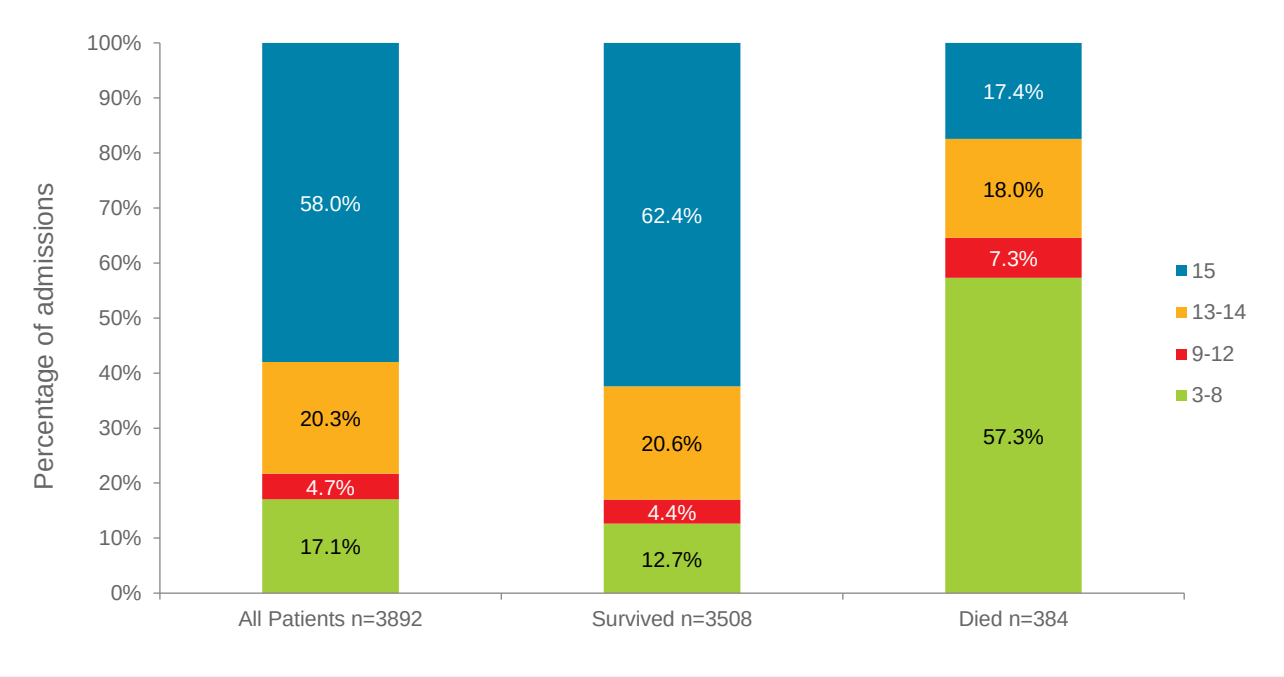
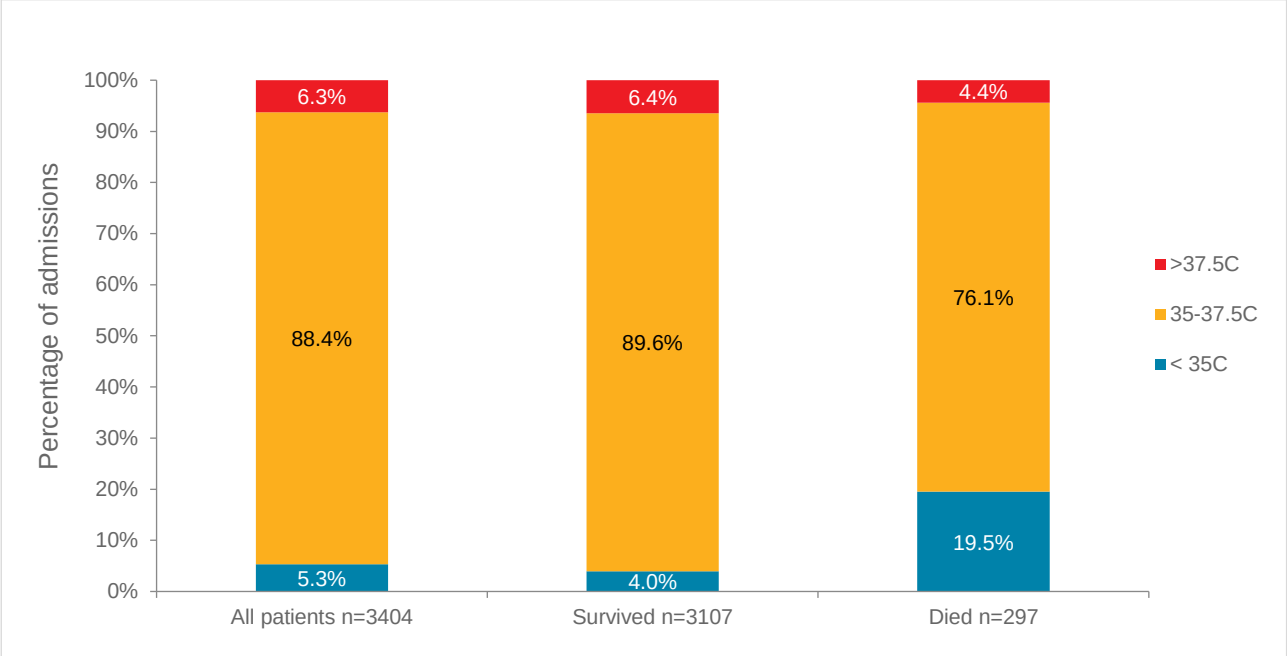


Figure 28: Initial temperature on arrival to ED and mortality (n=3404)

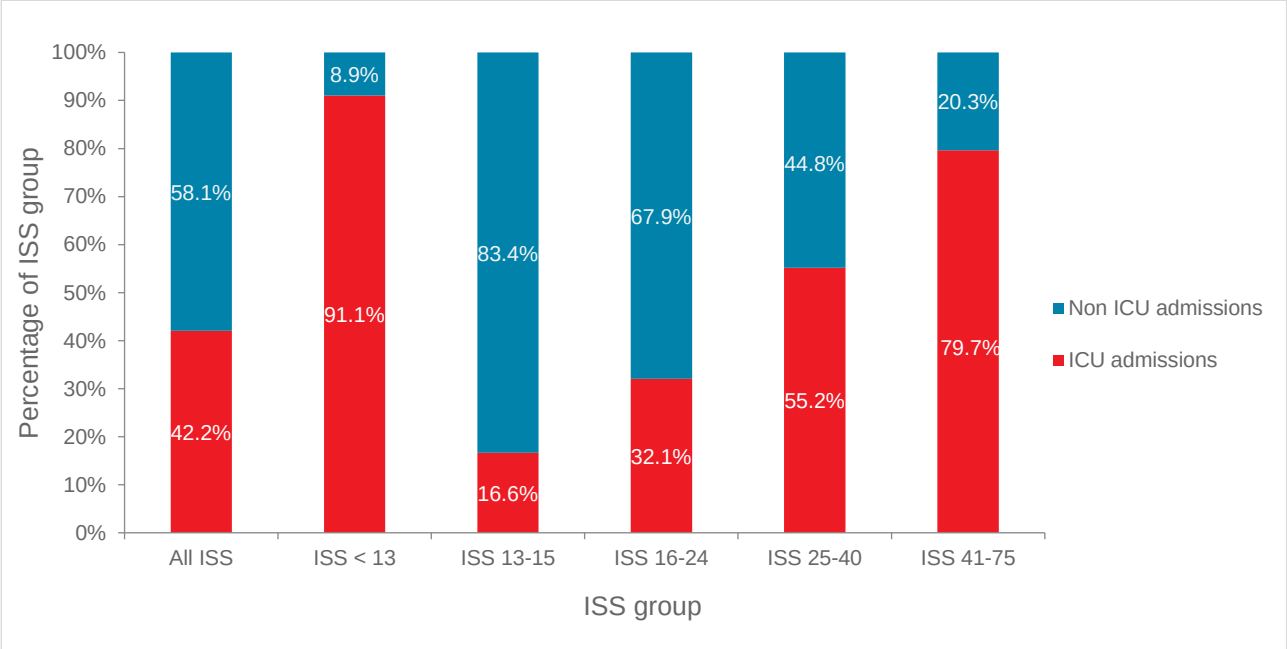


Intensive care unit admissions

Overall 42.2% (n=1724) of major trauma patients received an intensive care unit (ICU) admission, with the percentage increasing with the level of injury severity (Figure 29). While the number of ICU admissions may be explained by the level of severity of injury, the complexity of injury and other factors such as comorbidities may also influence the requirement for an ICU admission.

It is important to note that the ISS <13 group is only included in the report if they have been admitted to ICU or died, hence the high proportion of ICU admissions in this group.

Figure 29: ICU admission by ISS group (n=4083)



Length of stay

The length of stay (LOS) in hospital, and in particular the LOS in an ICU, is an indicator of the severity and complexity of the injury. The average hospital LOS for major trauma patients was 11.3 days (Table 24).

Table 24: Overview of ICU and hospital length of stay (n=4097)

	Number of patients	Average days	Median days
ICU LOS	1724	5.0	2.0
Total hospital LOS	4097	11.3	6.0

The average ICU length of stay increased with severity, with ISS 13-15 group being 3.28 days and ISS 41-75 group being 11.4 days. A similar increasing pattern was also shown in the hospital length of stay as expected (Table 25).

Table 25: ICU and hospital length of stay by ISS (n=4083)

ISS group	Average ICU LOS	Median ICU LOS	Average hospital LOS	Median hospital LOS
ISS <13	2.7	1	10.7	6
ISS 13-15	3.3	2	8.6	5
ISS 16-24	4.8	3	11.1	7
ISS 25-40	6.5	3	13.6	7
ISS 41-75	11.4	6	23.1	11.5

No considerable change was observed in the median values of ICU LOS and hospital LOS across different age groups (Table 26).

Table 26: ICU and hospital length of stay by age (n=4095)

Age group	Average ICU LOS	Median ICU LOS	Average hospital LOS	Median hospital LOS
0-4	4.5	2	10.2	4
5-9	6.3	2	11.3	5.5
10-14	2.3	1	8.4	4
15-19	4.1	2	10.6	5
20-24	4.2	2	9.4	5
25-29	4.6	2	9.5	5
30-34	4.3	2	8.6	5
35-39	5.7	2	10.5	5
40-44	5.4	3	11.2	6
45-49	5.1	2	13.1	6
50-54	5.3	2	10.6	6
55-59	6.0	3	11.7	7
60-64	6.1	2	14.2	7
65-69	4.9	2	12.7	7
70-74	5.3	3	12.9	8
75-79	5.9	2	11.4	7
80-84	5.4	3	14.5	10
85+	3.6	2	10.2	7

Procedures

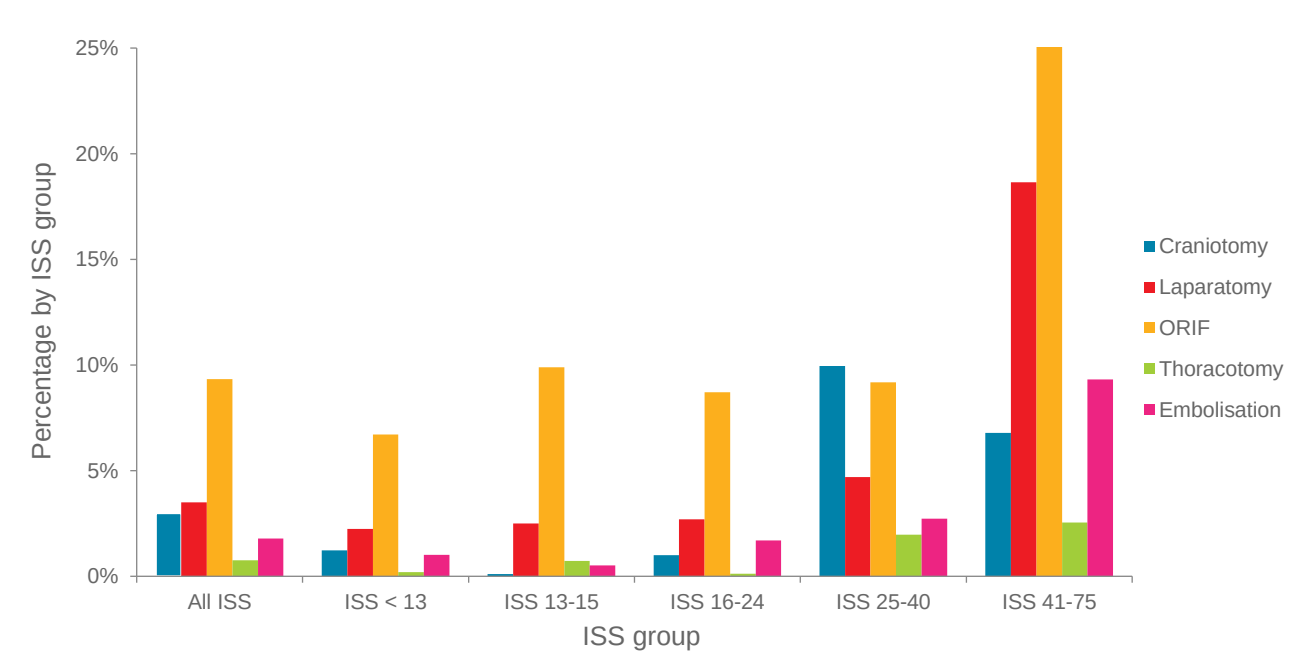
Despite the serious nature of the injuries sustained by major trauma patients, the number of surgical or interventional radiology procedures performed was very low. 750 procedures were performed on 678 patients (16.5% of all admissions). The highest percentage of procedures were performed in the ISS 41-75 group (Table 27, Figure 30).

Table 27: Procedures performed by type (n=678)

Procedure	Number of procedures	Percentage of total admissions
Open reduction internal fixation	381	9.3%
Laparotomy	143	3.5%
Craniotomy	122	3.0%
Embolisation	73	1.9%
Thoracotomy	31	0.9%
Total	**750**	**16.5%***

An increase in the proportion of laparotomy, open reduction internal fixation and embolisation procedures performed is noted in the ISS 41-75 group (Figure 30).

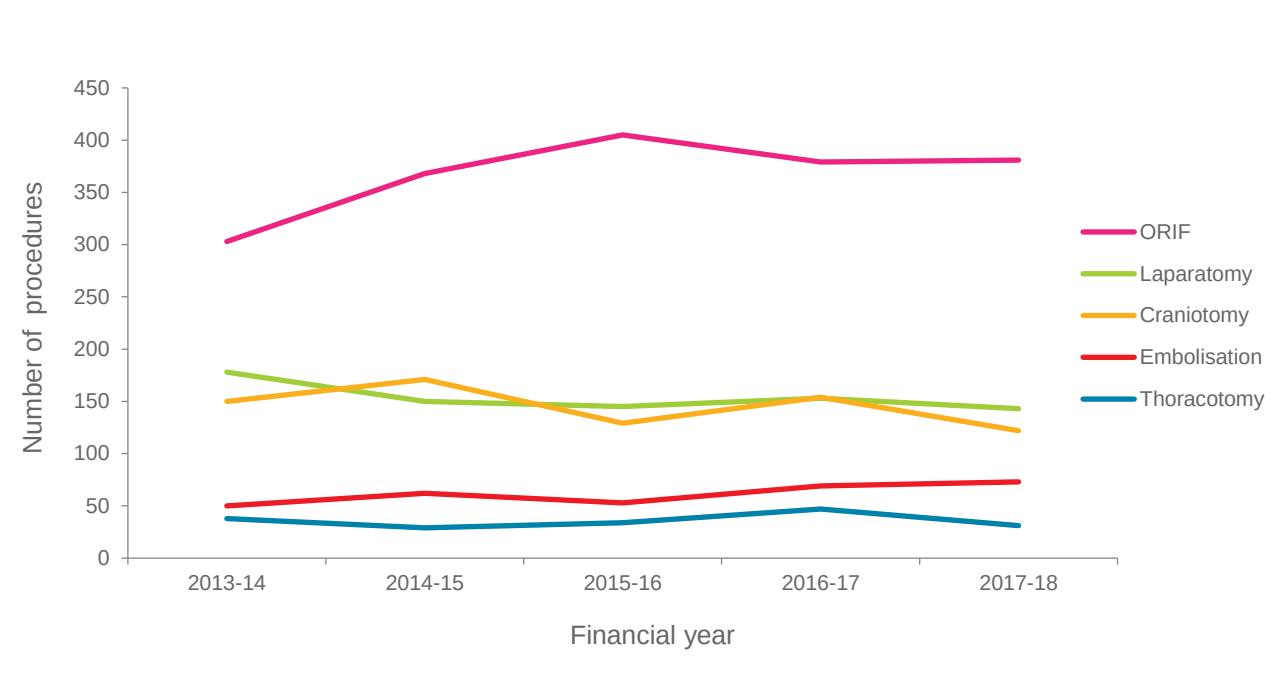
Figure 30: Procedures performed by ISS group (n=1500)



* The total percentage of admissions where a surgical procedure(s) was performed is based on the number of admissions where one or more procedures were performed (n=678), not the total number of procedures performed (n=750).

Over the last five years there has been an increased use of open reduction internal fixation and embolisation procedures, along with a decrease laparotomy procedures (Figure 31).

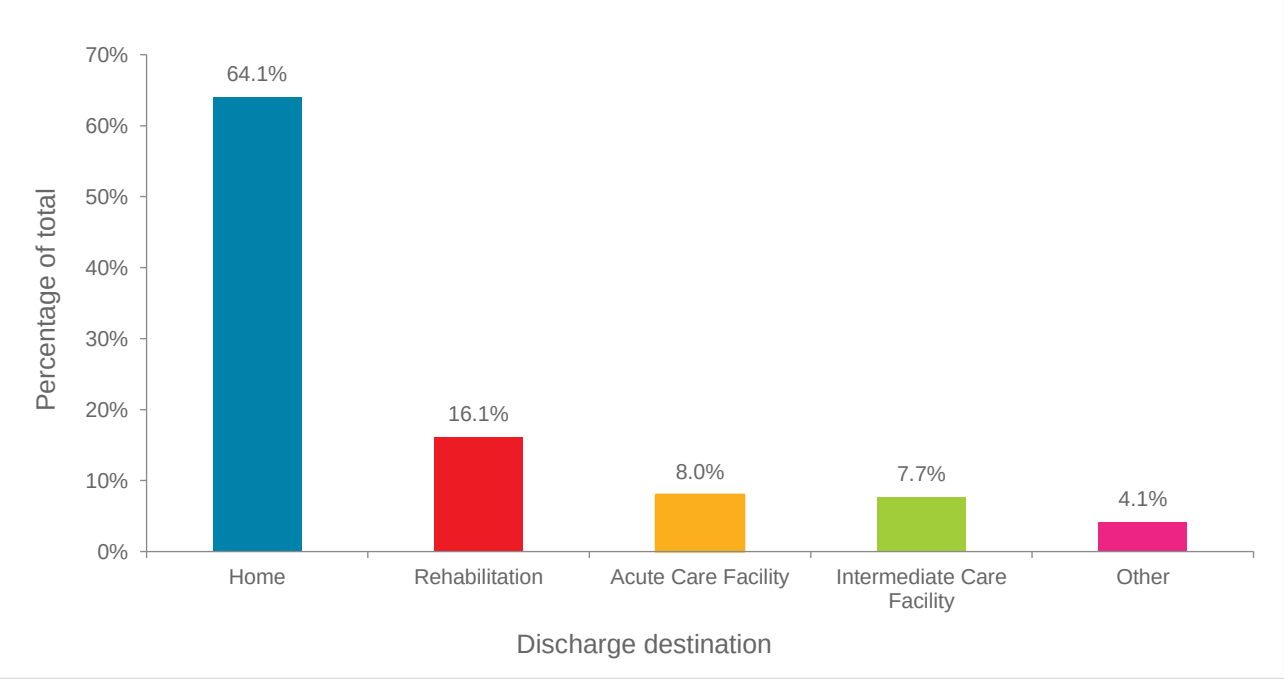
Figure 31: Five year trend of procedures performed



Discharge destination of survivors

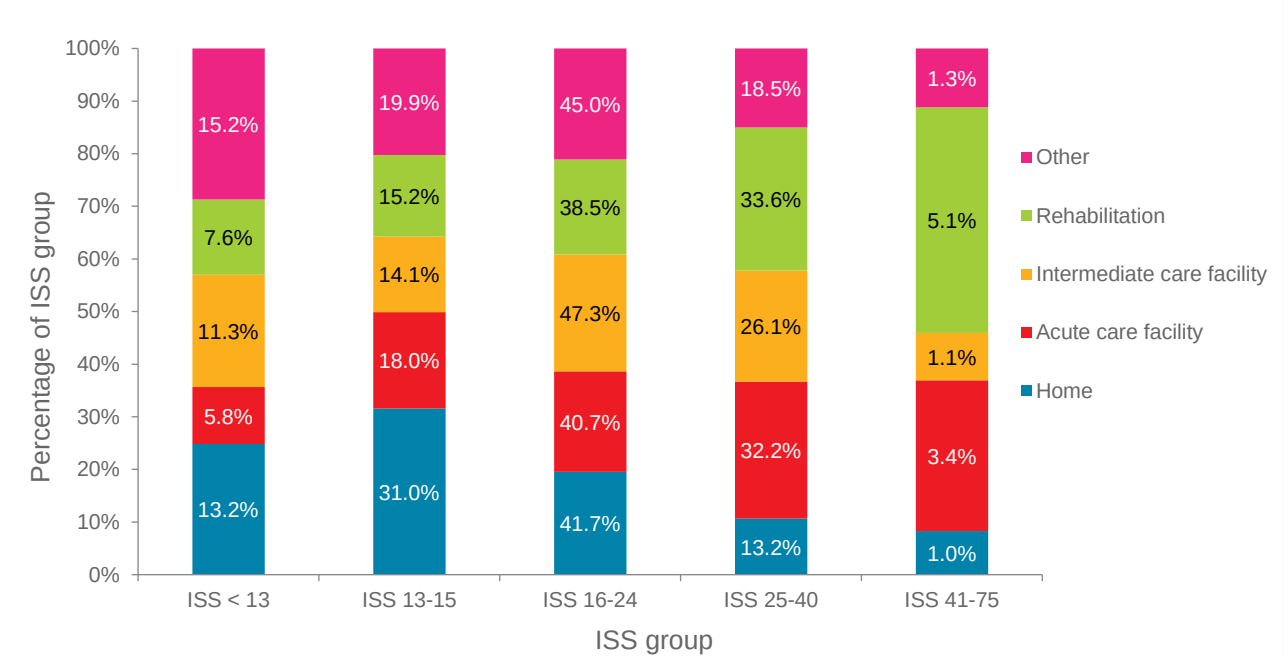
Survivors of major trauma (n= 3677) were discharged to various locations, with home being the most common (64.1%) followed by rehabilitation (16.1%). 'Other' incorporates locations such as board and care, burns centre, foster care, residential institution, missing and unknown (Figure 32).

Figure 32: Discharge destination of survivors (n=3677)



Overall the rate of discharge home decreased as the injury severity increased, coinciding with an increase in the rate of discharge to rehabilitation services (Figure 33).

Figure 33: Discharge destination of survivors by ISS group (n=3674)



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Glossary

Abbreviated Injury Scale (AIS) is an anatomically-based, consensus-derived, global severity scoring system that classifies each injury by body region, according to its relative importance on a six point ordinal scale. The AIS is the basis for the Injury Severity Score (ISS) calculation of the multiply injured patient.

Age-specific rate is an annualised rate given as per 100,000 persons, based on the estimated NSW population during the reporting period (end of December). Source: Australian Bureau of Statistics. Australian Demographic Statistics, Catalogue No. 3101.0. Canberra: ABS.[11]

Age-standardised rate is an annualised rate given as per 100,000 persons, standardised to the Australian population at 30 June 2001. Source: Australian Bureau of Statistics. Standard Population for Use in Age-Standardisation Table. Australian Demographic Statistics, Mar 2013. Catalogue No. 3101. Canberra: ABS, Dec 2013.[10]

Case fatality rate is the proportion of deaths for a designated population expressed as a percentage. The NSW Trauma Minimum Data Set does not include all survivors with an ISS of less than or equal to 12. The case fatality rate in this report is only calculated on patients with an ISS of greater than 12, and will be expressed as 'case fatality rate for ISS >12'.

Definitive care is defined as the hospital providing the highest level of care to meet all the clinical needs of the patient. Many patients receive definitive care at regional trauma services, but a small number of patients are transferred to a major trauma service (higher level) for specialised care.

Geriatric population is defined as those aged 65 years or older.

Location of injury is defined as either metropolitan or rural based on the recorded postcode of injury. The process used to define the two categories is outlined in the Methodology section.

Injury Severity Score (ISS) assesses the combined effects of the multiply injured patient and is based on an anatomical injury severity classification, the AIS. The ISS is an internationally recognised scoring system which correlates with mortality, morbidity and other measures of severity. The ISS is calculated as the sum of the squares of the highest AIS code in each of the three most severely injured ISS body regions.

ISS body regions consists of six anatomical regions as defined in the AIS dictionary:

- head or neck
- face
- chest
- abdominal or pelvic contents
- extremities or pelvic girdle
- external.

Isolated fractured neck of femur is defined as the AIS codes 853161.3 and 853162.3 and where no other injury is recorded.

Major trauma is defined as all patients of any age, who were admitted to a designated NSW trauma service within seven days of sustaining an injury, and:

- had an ISS >12 (moderate to critically injured), or
- were admitted to an intensive care unit (irrespective of ISS) following injury, or

- died in hospital (irrespective of ISS) following injury, except those with an isolated fractured neck of femur injury sustained from a fall from a standing height (<1 metre) and those aged 65 years or older who die with minor soft tissue injury only.

Major trauma services can provide the full spectrum of care for major and moderately injured patients, from initial resuscitation through to rehabilitation and discharge. There are currently seven adult and three paediatric designated major trauma services in NSW.

Mechanism of injury refers to the mechanisms whereby energy is transferred from the environment to the person.

Minor soft tissue injury is defined as a superficial injury including abrasions, contusions, and lacerations (AIS codes: 910000.1; 910200.1; 910400.1; 910600.1, 810099.1, 810202.1, 810402.1, 810600.1, 810602.1, 710099.1, 710202.1, 710402.1, 710600.1, 710602.1, 510099.1, 510202.1, 510402.1, 510600.1, 510602.1, 410099.1, 410202.1, 410402.1, 410600.1, 410602.1, 310099.1, 310202.1, 310402.1, 310600.1, 310602.1, 210099.1, 210202.1, 210402.1, 210600.1, 210602.1).

Not further specified is an injury descriptor used in AIS coding where detailed information is lacking including injury type or severity.

Other transport incident is defined as a patient involved in an accident involving a device designed primarily for, or being used at the time primarily for, conveying persons or goods from one place to another (ICD 10 codes: V00 – V99 inclusive) that did not meet place of occurrence road trauma criteria.

Polytrauma is defined as serious injury (AIS severity >2) in two or more ISS body regions.

Regional trauma services can provide all aspects of care to patients with minor to moderate trauma, and definitive care to a limited number of major trauma patients in collaboration with the major trauma service. A regional trauma service provides initial assessment, stabilisation, definitive care and initiates transfer to a major trauma service when a patient requires services not available at the regional trauma service. There are currently ten designated regional trauma services in NSW.

Road trauma is defined as a patient involved in an accident involving a device designed primarily for, or being used at the time primarily for, conveying persons or goods from one place to another (ICD 10 codes: V00 – V89 inclusive) AND had a street, highway and other paved roadways as the place of occurrence of the external cause (ICD 10 codes: Y92.4 inclusive).

Revised Trauma Score is a physiological scoring system used for predicting death. It consists of the first set of vital signs data obtained on the patient after arrival at hospital including Glasgow Coma Scale, systolic blood pressure and respiratory rate. Values for the Revised Trauma Score are in the range 0 to 7.8408. The lower the score, the higher the likelihood of death.[9]

Standardised mortality ratio is a ratio between the observed number of deaths in a study population and the number of deaths that would be expected, based on the age or ISS specific rates in a standard population and the age or ISS distribution of the study population.

Traumatic death on arrival is defined as a patient presenting to the emergency department with no recordable pulse or blood pressure (pulse rate = 0; systolic blood pressure = 0), no motor response elicited during the Glasgow Coma Scale (GCS) assessment (GCS motor score = 1), and the post emergency disposition recorded as ‘died’.

Abbreviations

AIS	Abbreviated Injury Scale
ASGS-RA	Australian Statistical Geography Standard Remoteness Areas
CCLHD	Central Coast Local Health District
DOA	Dead on arrival
ED	Emergency department
FWLHD	Far West Local Health District
HNELHD	Hunter New England Local Health District
ICD	International Classification of Diseases
ICU	Intensive care unit
ISLHD	Illawarra Shoalhaven Local Health District
ISS	Injury Severity Score
ITIM	NSW Institute of Trauma and Injury Management
JH&FMHN	Justice Health & Forensic Mental Health Service Network
LOS	Length of stay
NBMLHD	Nepean Blue Mountains Local Health District
MLHD	Murrumbidgee Local Health District
MNCLHD	Mid North Coast Local Health District
NNSWLHD	Northern New South Wales Local Health District
MTS	Major trauma service
NSLHD	Northern Sydney Local Health District
PTS	Paediatric trauma service
RTS	Regional trauma service
SCHN	Sydney Children's Hospital Network
SESLHD	South Eastern Sydney Local Health District

SNSWLHD	Southern New South Wales Local Health District
SVHN	St. Vincent's Health Network Local Health District
SWSLHD	South Western Sydney Local Health District
SLHD	Sydney Local Health District
WNSWLHD	Western New South Wales Local Health District
WSLHD	Western Sydney Local Health District

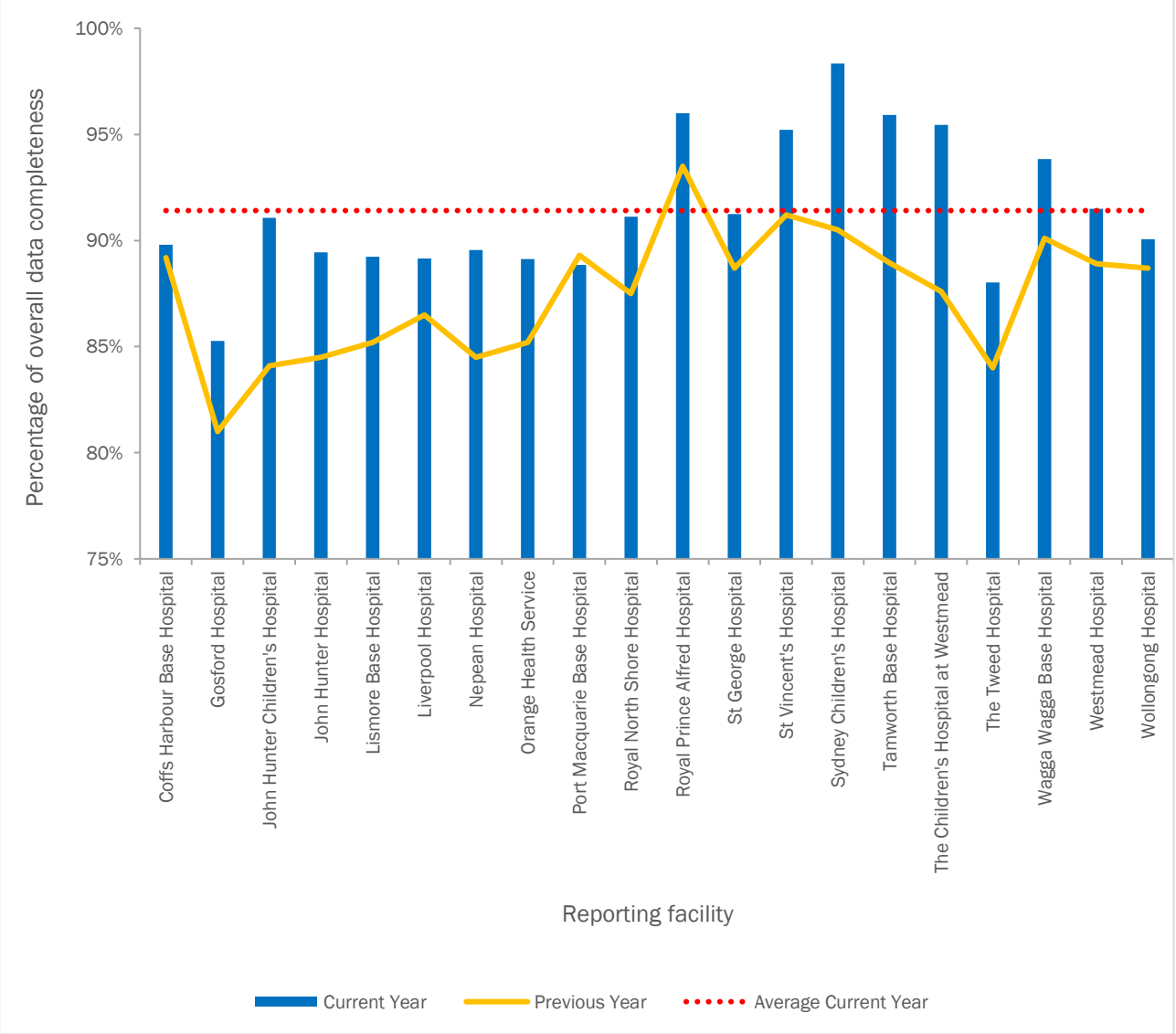
Appendices

List of appendices

Appendix 1: Data completeness

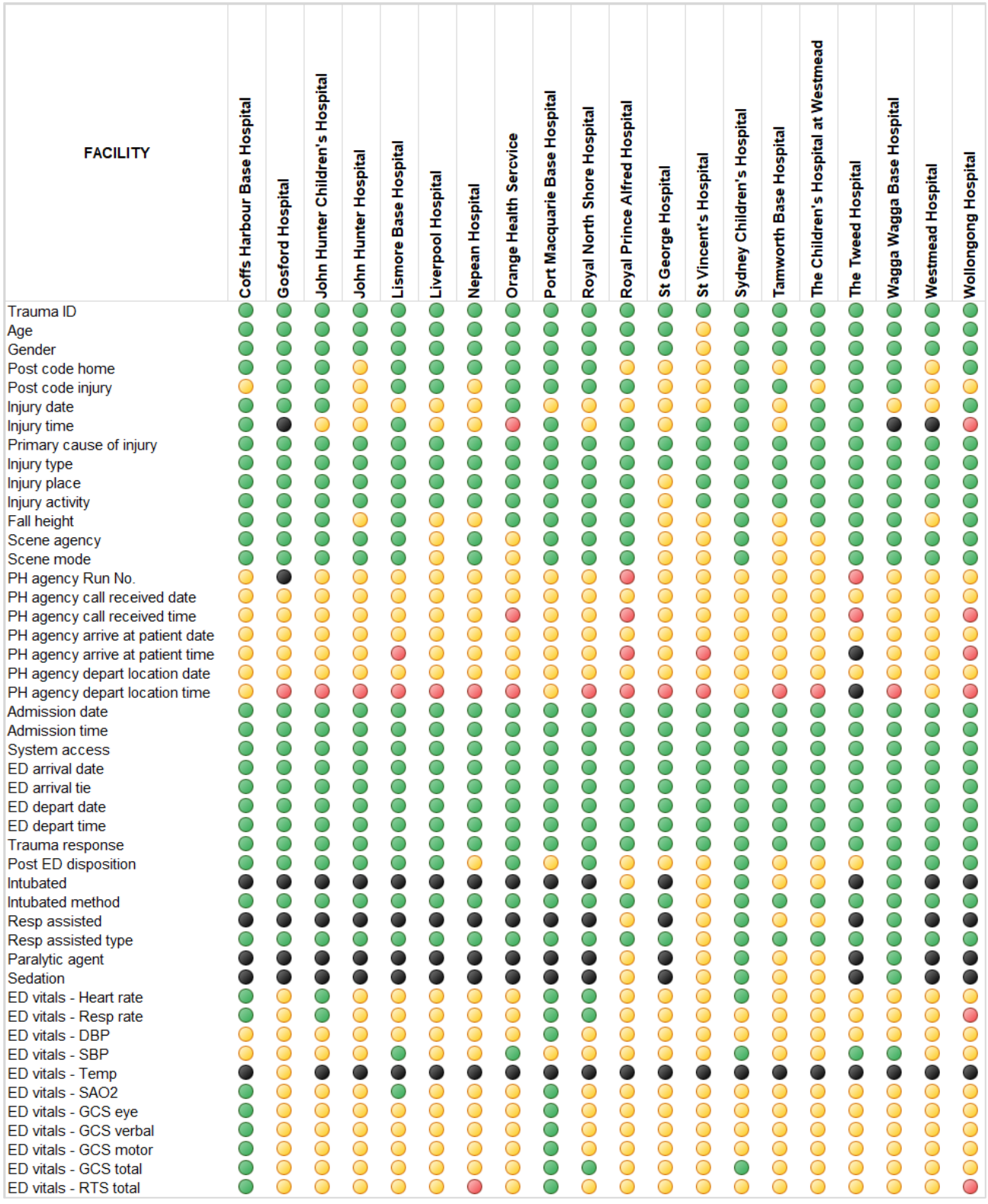
High levels of data accuracy and entry completion, as entered by the trauma facilities, is crucial in enabling accurate and thorough data analysis as part of a broader trauma quality assurance program. The average overall data completion of mandatory data elements completed was 90.1% with completion rates ranging from 84.4% to 96.9% (Figure 34).

Figure 34: Overall data completeness by facility



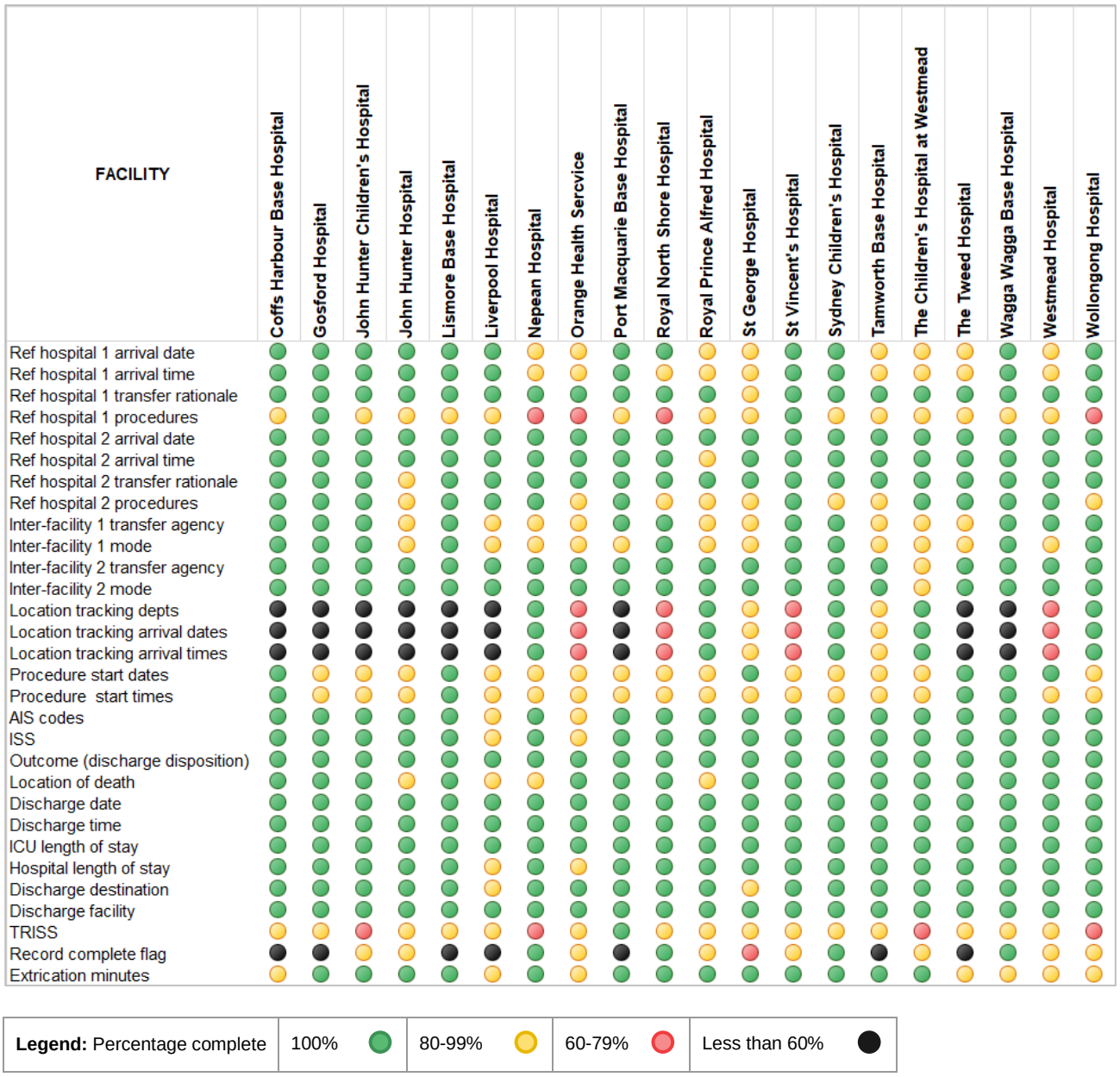
A detailed breakdown of data completion by facility, showing each mandatory data element can be seen in Table 28.

Table 28: Detailed data completeness by facility



Legend: Percentage complete	100%	80-99%	60-79%	Less than 60%

Table 28 continued



Legend: Percentage complete	100%	80-99%	60-79%	Less than 60%

Appendix 2: Adult major trauma service summaries

Table 29: Trauma data profile, John Hunter Hospital

	Facility	Peer group
Total admissions	630	435.4
Mean monthly admissions	52.5	36.3
Case fatality rate (ISS >12 excl. traumatic DOA)	8.6%	9.3%
Sex		
Male / Female	443 / 187	314 / 121
Age ranges		
Mean age	52.1	53.7
0-4	0 (0%)	0.6 (0.1%)
5-9	0 (0%)	0.7 (0.2%)
10-14	0 (0%)	1.3 (0.3%)
15-19	45 (7.1%)	26.4 (6.1%)
20-24	57 (9.0%)	35.4 (8.1%)
25-29	31 (4.9%)	28.7 (6.6%)
30-34	41 (6.5%)	22.1 (5.1%)
35-39	36 (5.7%)	24.1 (5.5%)
40-44	34 (5.4%)	25.7 (5.9%)
45-49	54 (8.6%)	30.4 (7.0%)
50-54	43 (6.8%)	26.7 (6.1%)
55-59	42 (6.7%)	27.1 (6.2%)
60-64	39 (6.2%)	25.7 (5.9%)
65-69	36 (5.7%)	25.4 (5.8%)
70-74	44 (7.0%)	27.9 (6.4%)
75-79	36 (5.7%)	26.1 (6.0%)
80-84	41 (6.5%)	33.4 (7.7%)
85+	51 (8.1%)	47.1 (10.8%)
Injury Severity Score ranges		
Mean ISS	20.7	19.1
ISS <13	33 (5.2%)	49.7 (11.4%)
ISS 13-15	117 (18.6%)	103.1 (23.7%)
ISS 16-24	294 (46.7%)	171.1 (39.3%)
ISS 25-40	162 (25.7%)	96.0 (22.0%)
ISS 41-75	24 (3.8%)	13.6 (3.1%)
Mechanisms of injury		
Assault	53 (8.4%)	29.3 (6.7%)
Falls	229 (36.3%)	193.0 (44.3%)
Falls ≥65 years (% of all MOIs for ≥65 years)	149 (71.6%)	118.7 (74.2%)
Road trauma	207 (32.9%)	136.7 (31.4%)
Other transport incident	69 (11.0%)	27.7 (6.4%)
All other injuries	72 (11.4%)	48.7 (11.2%)

Injury type		
Blunt	587 (93.2%)	409.9 (94.1%)
Penetrating	26 (4.1%)	17.1 (3.9%)
Unknown	17 (2.7%)	8.4 (1.9%)
Admission type		
Direct admission	447 (71%)	338.7 (77.8%)
Transfer in	181 (28.7%)	95 (21.8%)
Unknown	2 (0.3%)	1.7 (0.4%)
Arrival modes		
Ambulance	465 (73.8%)	342.4 (78.6%)
Helicopter	101 (16.0%)	41 (9.4%)
Other (private vehicle, fixed wing, unknown)	64 (10.2%)	52 (11.9%)
Revised Trauma Score		
Mean - overall	7.1	7.1
ISS <13	6.3	6.8
ISS 13-15	7.7	7.6
ISS 16-24	7.5	7.4
ISS 25-40	6.8	6.6
ISS 41-75	5.1	4.8
Hospital length of stay		
Total bed days	7047	5454
Mean - overall	11.2	12.5
ISS <13	8.0	11.5
ISS 13-15	8.3	9.0
ISS 16-24	10.9	12.3
ISS 25-40	12.6	15.5
ISS 41-75	23.9	26.2
ICU length of stay		
ICU total bed days (number of ICU admissions)	1384 (225)	1026.4 (186.6)
Mean - overall	6.2	5.5
ISS <13	3.4	2.9
ISS 13-15	2.8	4.0
ISS 16-24	5.0	5.2
ISS 25-40	8.3	6.9
ISS 41-75	9.3	12.4
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	852 (140)	663.1 (117.3)
Mean - overall	6.1	5.7
ISS <13	4.0	2.7
ISS 13-15	3.9	4.8
ISS 16-24	5.7	5.3
ISS 25-40	6.0	6.7
ISS 41-75	9.8	10.0

Table 30: Trauma data profile, Liverpool Hospital

	Facility	Peer group
Total admissions	451	435.4
Mean monthly admissions	37.6	36.3
Case fatality rate (ISS >12 excl. traumatic DOA)	8.5%	9.3%
Sex		
Male / Female	332 / 119	314 / 121
Age ranges		
Mean age	54.1	53.7
0-4	1 (0.2%)	0.6 (0.1%)
5-9	1 (0.2%)	0.7 (0.2%)
10-14	3 (0.7%)	1.3 (0.3%)
15-19	31 (6.9%)	26.4 (6.1%)
20-24	37 (8.2%)	35.4 (8.1%)
25-29	27 (6.0%)	28.7 (6.6%)
30-34	20 (4.4%)	22.1 (5.1%)
35-39	20 (4.4%)	24.1 (5.5%)
40-44	20 (4.4%)	25.7 (5.9%)
45-49	26 (5.8%)	30.4 (7.0%)
50-54	29 (6.4%)	26.7 (6.1%)
55-59	35 (7.8%)	27.1 (6.2%)
60-64	27 (6.0%)	25.7 (5.9%)
65-69	32 (7.1%)	25.4 (5.8%)
70-74	30 (6.7%)	27.9 (6.4%)
75-79	25 (5.5%)	26.1 (6.0%)
80-84	40 (8.9%)	33.4 (7.7%)
85+	47 (10.4%)	47.1 (10.8%)
Injury Severity Score ranges		
Mean ISS	18.4	19.1
ISS <13	52 (11.5%)	49.7 (11.4%)
ISS 13-15	109 (24.2%)	103.1 (23.7%)
ISS 16-24	172 (38.1%)	171.1 (39.3%)
ISS 25-40	95 (21.1%)	96.0 (22.0%)
ISS 41-75	10 (2.2%)	13.6 (3.1%)
Mechanisms of injury		
Assault	23 (5.1%)	29.3 (6.7%)
Falls	190 (42.1%)	193.0 (44.3%)
Falls ≥65 years (% of all MOIs for ≥65 years)	123 (70.7%)	118.7 (74.2%)
Road trauma	191 (42.4%)	136.7 (31.4%)
Other transport incident	11 (2.4%)	27.7 (6.4%)
All other injuries	36 (8.0%)	48.7 (11.2%)

Injury type		
Blunt	439 (97.3%)	409.9 (94.1%)
Penetrating	12 (2.7%)	17.1 (3.9%)
Unknown	0 (0%)	8.4 (1.9%)
Admission type		
Direct admission	371 (82.3%)	338.7 (77.8%)
Transfer in	79 (17.5%)	95 (21.8%)
Unknown	1 (0.2%)	1.7 (0.4%)
Arrival modes		
Ambulance	352 (78.0%)	342.4 (78.6%)
Helicopter	30 (6.7%)	41 (9.4%)
Other (private vehicle, fixed wing, unknown)	69 (15.3%)	52 (11.9%)
Revised Trauma Score		
Mean - overall	7.1	7.1
ISS <13	6.6	6.8
ISS 13-15	7.6	7.6
ISS 16-24	7.4	7.4
ISS 25-40	6.6	6.6
ISS 41-75	4.9	4.8
Hospital length of stay		
Total bed days	6296	5454
Mean - overall	14.0	12.5
ISS <13	10.7	11.5
ISS 13-15	9.6	9.0
ISS 16-24	15.1	12.3
ISS 25-40	18.0	15.5
ISS 41-75	34.7	26.2
ICU length of stay		
ICU total bed days (number of ICU admissions)	962 (164)	1026.4 (186.6)
Mean - overall	5.9	5.5
ISS <13	3.0	2.9
ISS 13-15	6.3	4.0
ISS 16-24	7.1	5.2
ISS 25-40	7.5	6.9
ISS 41-75	9.1	12.4
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	719 (127)	663.1 (117.3)
Mean - overall	5.7	5.7
ISS <13	3.0	2.7
ISS 13-15	4.6	4.8
ISS 16-24	6.2	5.3
ISS 25-40	7.2	6.7
ISS 41-75	9.0	10.0

Table 31: Trauma data profile, Royal North Shore Hospital

	Facility	Peer group
Total admissions	582	435.4
Mean monthly admissions	48.5	36.3
Case fatality rate (ISS >12 excl. traumatic DOA)	12.2%	9.3%
Sex		
Male / Female	411 / 171	314 / 121
Age ranges		
Mean age	56.7	53.7
0-4	1 (0.2%)	0.6 (0.1%)
5-9	3 (0.5%)	0.7 (0.2%)
10-14	5 (0.9%)	1.3 (0.3%)
15-19	35 (6.0%)	26.4 (6.1%)
20-24	34 (5.8%)	35.4 (8.1%)
25-29	42 (7.2%)	28.7 (6.6%)
30-34	21 (3.6%)	22.1 (5.1%)
35-39	18 (3.1%)	24.1 (5.5%)
40-44	26 (4.5%)	25.7 (5.9%)
45-49	40 (6.9%)	30.4 (7.0%)
50-54	37 (6.4%)	26.7 (6.1%)
55-59	34 (5.8%)	27.1 (6.2%)
60-64	38 (6.5%)	25.7 (5.9%)
65-69	32 (5.5%)	25.4 (5.8%)
70-74	39 (6.7%)	27.9 (6.4%)
75-79	36 (6.2%)	26.1 (6.0%)
80-84	48 (8.2%)	33.4 (7.7%)
85+	93 (16.0%)	47.1 (10.8%)
Injury Severity Score ranges		
Mean ISS	20.1	19.1
ISS <13	85 (14.6%)	49.7 (11.4%)
ISS 13-15	109 (18.7%)	103.1 (23.7%)
ISS 16-24	196 (33.7%)	171.1 (39.3%)
ISS 25-40	165 (28.4%)	96.0 (22.0%)
ISS 41-75	27 (4.6%)	13.6 (3.1%)
Mechanisms of injury		
Assault	18 (3.1%)	29.3 (6.7%)
Falls	325 (55.8%)	193.0 (44.3%)
Falls ≥65 years (% of all MOIs for ≥65 years)	197 (79.4%)	118.7 (74.2%)
Road trauma	145 (24.9%)	136.7 (31.4%)
Other transport incident	27 (4.6%)	27.7 (6.4%)
All other injuries	67 (11.5%)	48.7 (11.2%)

Injury type		
Blunt	540 (92.8%)	409.9 (94.1%)
Penetrating	9 (1.5%)	17.1 (3.9%)
Unknown	33 (5.7%)	8.4 (1.9%)
Admission type		
Direct admission	391 (67.2%)	338.7 (77.8%)
Transfer in	187 (32.1%)	95 (21.8%)
Unknown	4 (0.7%)	1.7 (0.4%)
Arrival modes		
Ambulance	446 (76.6%)	342.4 (78.6%)
Helicopter	57 (9.8%)	41 (9.4%)
Other (private vehicle, fixed wing, unknown)	79 (13.6%)	52 (11.9%)
Revised Trauma Score		
Mean - overall	7.1	7.1
ISS <13	7.2	6.8
ISS 13-15	7.7	7.6
ISS 16-24	7.5	7.4
ISS 25-40	6.8	6.6
ISS 41-75	5.2	4.8
Hospital length of stay		
Total bed days	7851	5454
Mean - overall	13.5	12.5
ISS <13	10.9	11.5
ISS 13-15	8.4	9.0
ISS 16-24	12.4	12.3
ISS 25-40	17.3	15.5
ISS 41-75	27.0	26.2
ICU length of stay		
ICU total bed days (number of ICU admissions)	1638 (350)	1026.4 (186.6)
Mean - overall	4.7	5.5
ISS <13	3.0	2.9
ISS 13-15	3.3	4.0
ISS 16-24	3.5	5.2
ISS 25-40	5.1	6.9
ISS 41-75	15.5	12.4
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	885 (163)	663.1 (117.3)
Mean - overall	5.4	5.7
ISS <13	3.4	2.7
ISS 13-15	3.7	4.8
ISS 16-24	3.6	5.3
ISS 25-40	5.5	6.7
ISS 41-75	10.9	10.0

Table 32: Trauma data profile, Royal Prince Alfred Hospital

	Facility	Peer group
Total admissions	359	435.4
Mean monthly admissions	29.9	36.3
Case fatality rate (ISS >12 excl. traumatic DOA)	5.9%	9.3%
Sex		
Male / Female	267 / 92	314 / 121
Age ranges		
Mean age	55.0	53.7
0-4	2 (0.6%)	0.6 (0.1%)
5-9	0 (0%)	0.7 (0.2%)
10-14	1 (0.3%)	1.3 (0.3%)
15-19	13 (3.6%)	26.4 (6.1%)
20-24	29 (8.1%)	35.4 (8.1%)
25-29	25 (7.0%)	28.7 (6.6%)
30-34	19 (5.3%)	22.1 (5.1%)
35-39	23 (6.4%)	24.1 (5.5%)
40-44	23 (6.4%)	25.7 (5.9%)
45-49	19 (5.3%)	30.4 (7.0%)
50-54	19 (5.3%)	26.7 (6.1%)
55-59	19 (5.3%)	27.1 (6.2%)
60-64	15 (4.2%)	25.7 (5.9%)
65-69	28 (7.8%)	25.4 (5.8%)
70-74	29 (8.1%)	27.9 (6.4%)
75-79	29 (8.1%)	26.1 (6.0%)
80-84	33 (9.2%)	33.4 (7.7%)
85+	33 (9.2%)	47.1 (10.8%)
Injury Severity Score ranges		
Mean ISS	18.2	19.1
ISS <13	52 (14.5%)	49.7 (11.4%)
ISS 13-15	79 (22.0%)	103.1 (23.7%)
ISS 16-24	153 (42.6%)	171.1 (39.3%)
ISS 25-40	66 (18.4%)	96.0 (22.0%)
ISS 41-75	9 (2.5%)	13.6 (3.1%)
Mechanisms of injury		
Assault	23 (6.4%)	29.3 (6.7%)
Falls	194 (54.0%)	193.0 (44.3%)
Falls ≥65 years (% of all MOIs for ≥65 years)	116 (76.3%)	118.7 (74.2%)
Road trauma	76 (21.2%)	136.7 (31.4%)
Other transport incident	16 (4.5%)	27.7 (6.4%)
All other injuries	50 (13.9%)	48.7 (11.2%)

Injury type		
Blunt	336 (93.6%)	409.9 (94.1%)
Penetrating	22 (6.1%)	17.1 (3.9%)
Unknown	1 (0.3%)	8.4 (1.9%)
Admission type		
Direct admission	317 (88.3%)	338.7 (77.8%)
Transfer in	42 (11.7%)	95 (21.8%)
Unknown	0 (0%)	1.7 (0.4%)
Arrival modes		
Ambulance	311 (86.6%)	342.4 (78.6%)
Helicopter	2 (0.6%)	41 (9.4%)
Other (private vehicle, fixed wing, unknown)	46 (12.8%)	52 (11.9%)
Revised Trauma Score		
Mean - overall	7.4	7.1
ISS <13	7.2	6.8
ISS 13-15	7.7	7.6
ISS 16-24	7.6	7.4
ISS 25-40	6.9	6.6
ISS 41-75	4.9	4.8
Hospital length of stay		
Total bed days	4037	5454
Mean - overall	11.2	12.5
ISS <13	11.9	11.5
ISS 13-15	12.6	9.0
ISS 16-24	9.9	12.3
ISS 25-40	9.2	15.5
ISS 41-75	32.9	26.2
ICU length of stay		
ICU total bed days (number of ICU admissions)	678 (169)	1026.4 (186.6)
Mean - overall	4.0	5.5
ISS <13	2.5	2.9
ISS 13-15	2.9	4.0
ISS 16-24	4.0	5.2
ISS 25-40	4.0	6.9
ISS 41-75	15.0	12.4
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	286 (68)	663.1 (117.3)
Mean - overall	4.2	5.7
ISS <13	1.9	2.7
ISS 13-15	3.0	4.8
ISS 16-24	4.7	5.3
ISS 25-40	6.1	6.7
ISS 41-75	5.2	10.0

Table 33: Trauma data profile, St George Hospital

	Facility	Peer group
Total admissions	202	435.4
Mean monthly admissions	16.8	36.3
Case fatality rate (ISS >12 excl. traumatic DOA)	11.3%	9.3%
Sex		
Male / Female	143 / 59	314 / 121
Age ranges		
Mean age	53.8	53.7
0-4	0 (0%)	0.6 (0.1%)
5-9	1 (0.5%)	0.7 (0.2%)
10-14	0 (0%)	1.3 (0.3%)
15-19	12 (5.9%)	26.4 (6.1%)
20-24	14 (6.9%)	35.4 (8.1%)
25-29	13 (6.4%)	28.7 (6.6%)
30-34	13 (6.4%)	22.1 (5.1%)
35-39	13 (6.4%)	24.1 (5.5%)
40-44	10 (5.0%)	25.7 (5.9%)
45-49	16 (7.9%)	30.4 (7.0%)
50-54	9 (4.5%)	26.7 (6.1%)
55-59	12 (5.9%)	27.1 (6.2%)
60-64	14 (6.9%)	25.7 (5.9%)
65-69	11 (5.4%)	25.4 (5.8%)
70-74	14 (6.9%)	27.9 (6.4%)
75-79	15 (7.4%)	26.1 (6.0%)
80-84	15 (7.4%)	33.4 (7.7%)
85+	20 (9.9%)	47.1 (10.8%)
Injury Severity Score ranges		
Mean ISS	19.1	19.1
ISS <13	25 (12.4%)	49.7 (11.4%)
ISS 13-15	64 (31.7%)	103.1 (23.7%)
ISS 16-24	66 (32.7%)	171.1 (39.3%)
ISS 25-40	38 (18.8%)	96.0 (22.0%)
ISS 41-75	9 (4.5%)	13.6 (3.1%)
Mechanisms of injury		
Assault	8 (4.0%)	29.3 (6.7%)
Falls	79 (39.1%)	193.0 (44.3%)
Falls ≥65 years (% of all MOIs for ≥65 years)	49 (65.3%)	118.7 (74.2%)
Road trauma	79 (39.1%)	136.7 (31.4%)
Other transport incident	18 (8.9%)	27.7 (6.4%)
All other injuries	18 (8.9%)	48.7 (11.2%)

Injury type		
Blunt	194 (96.0%)	409.9 (94.1%)
Penetrating	5 (2.5%)	17.1 (3.9%)
Unknown	3 (1.5%)	8.4 (1.9%)
Admission type		
Direct admission	139 (68.8%)	338.7 (77.8%)
Transfer in	63 (31.2%)	95 (21.8%)
Unknown	0 (0%)	1.7 (0.4%)
Arrival modes		
Ambulance	145 (71.8%)	342.4 (78.6%)
Helicopter	29 (14.4%)	41 (9.4%)
Other (private vehicle, fixed wing, unknown)	28 (13.9%)	52 (11.9%)
Revised Trauma Score		
Mean - overall	6.8	7.1
ISS <13	6.6	6.8
ISS 13-15	7.7	7.6
ISS 16-24	7.2	7.4
ISS 25-40	5.9	6.6
ISS 41-75	3.0	4.8
Hospital length of stay		
Total bed days	3233	5454
Mean - overall	16.0	12.5
ISS <13	15.1	11.5
ISS 13-15	10.1	9.0
ISS 16-24	16.3	12.3
ISS 25-40	23.2	15.5
ISS 41-75	27.8	26.2
ICU length of stay		
ICU total bed days (number of ICU admissions)	606 (93)	1026.4 (186.6)
Mean - overall	6.5	5.5
ISS <13	2.8	2.9
ISS 13-15	2.8	4.0
ISS 16-24	3.8	5.2
ISS 25-40	9.8	6.9
ISS 41-75	15.1	12.4
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	501 (65)	663.1 (117.3)
Mean - overall	7.7	5.7
ISS <13	3.1	2.7
ISS 13-15	3.4	4.8
ISS 16-24	4.1	5.3
ISS 25-40	10.0	6.7
ISS 41-75	14.6	10.0

Table 34: Trauma data profile, St Vincent's Hospital

	Facility	Peer group
Total admissions	195	435.4
Mean monthly admissions	16.3	36.3
Case fatality rate (ISS >12 excl. traumatic DOA)	13.7%	9.3%
Sex		
Male / Female	135 / 58	314 / 121
Age ranges		
Mean age	52.0	53.7
0-4	0 (0%)	0.6 (0.1%)
5-9	0 (0%)	0.7 (0.2%)
10-14	0 (0%)	1.3 (0.3%)
15-19	7 (3.6%)	26.4 (6.1%)
20-24	17 (8.7%)	35.4 (8.1%)
25-29	20 (10.3%)	28.7 (6.6%)
30-34	11 (5.6%)	22.1 (5.1%)
35-39	16 (8.2%)	24.1 (5.5%)
40-44	14 (7.2%)	25.7 (5.9%)
45-49	16 (8.2%)	30.4 (7.0%)
50-54	7 (3.6%)	26.7 (6.1%)
55-59	13 (6.7%)	27.1 (6.2%)
60-64	9 (4.6%)	25.7 (5.9%)
65-69	10 (5.1%)	25.4 (5.8%)
70-74	11 (5.6%)	27.9 (6.4%)
75-79	11 (5.6%)	26.1 (6.0%)
80-84	6 (3.1%)	33.4 (7.7%)
85+	25 (12.8%)	47.1 (10.8%)
Injury Severity Score ranges		
Mean ISS	18.4	19.1
ISS <13	32 (16.4%)	49.7 (11.4%)
ISS 13-15	43 (22.1%)	103.1 (23.7%)
ISS 16-24	75 (38.5%)	171.1 (39.3%)
ISS 25-40	40 (20.5%)	96.0 (22.0%)
ISS 41-75	5 (2.6%)	13.6 (3.1%)
Mechanisms of injury		
Assault	24 (12.3%)	29.3 (6.7%)
Falls	99 (50.8%)	193.0 (44.3%)
Falls ≥65 years (% of all MOIs for ≥65 years)	47 (74.6%)	118.7 (74.2%)
Road trauma	31 (15.9%)	136.7 (31.4%)
Other transport incident	8 (4.1%)	27.7 (6.4%)
All other injuries	33 (16.9%)	48.7 (11.2%)

Injury type		
Blunt	182 (93.3%)	409.9 (94.1%)
Penetrating	8 (4.1%)	17.1 (3.9%)
Unknown	5 (2.6%)	8.4 (1.9%)
Admission type		
Direct admission	195 (100%)	338.7 (77.8%)
Transfer in	0 (0%)	95 (21.8%)
Unknown	0 (0%)	1.7 (0.4%)
Arrival modes		
Ambulance	185 (94.9%)	342.4 (78.6%)
Helicopter	0 (0%)	41 (9.4%)
Other (private vehicle, fixed wing, unknown)	10 (5.1%)	52 (11.9%)
Revised Trauma Score		
Mean - overall	7.0	7.1
ISS <13	6.8	6.8
ISS 13-15	7.5	7.6
ISS 16-24	7.5	7.4
ISS 25-40	6.2	6.6
ISS 41-75	3.9	4.8
Hospital length of stay		
Total bed days	2202	5454
Mean - overall	11.3	12.5
ISS <13	7.7	11.5
ISS 13-15	5.0	9.0
ISS 16-24	14.8	12.3
ISS 25-40	14.1	15.5
ISS 41-75	12.8	26.2
ICU length of stay		
ICU total bed days (number of ICU admissions)	466 (103)	1026.4 (186.6)
Mean - overall	4.5	5.5
ISS <13	2.3	2.9
ISS 13-15	2.3	4.0
ISS 16-24	5.4	5.2
ISS 25-40	6.1	6.9
ISS 41-75	10.7	12.4
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	314 (72)	663.1 (117.3)
Mean - overall	4.4	5.7
ISS <13	2.2	2.7
ISS 13-15	2.3	4.8
ISS 16-24	6.2	5.3
ISS 25-40	5.3	6.7
ISS 41-75	5.6	10.0

Table 35: Trauma data profile, Westmead Hospital

	Facility	Peer group
Total admissions	629	435.4
Mean monthly admissions	52.4	36.3
Case fatality rate (ISS >12 excl. traumatic DOA)	8.1%	9.3%
Sex		
Male / Female	466 / 163	314 / 121
Age ranges		
Mean age	51.8	53.7
0-4	0 (0%)	0.6 (0.1%)
5-9	0 (0%)	0.7 (0.2%)
10-14	0 (0%)	1.3 (0.3%)
15-19	42 (6.7%)	26.4 (6.1%)
20-24	60 (9.5%)	35.4 (8.1%)
25-29	43 (6.8%)	28.7 (6.6%)
30-34	30 (4.8%)	22.1 (5.1%)
35-39	43 (6.8%)	24.1 (5.5%)
40-44	53 (8.4%)	25.7 (5.9%)
45-49	42 (6.7%)	30.4 (7.0%)
50-54	43 (6.8%)	26.7 (6.1%)
55-59	35 (5.6%)	27.1 (6.2%)
60-64	38 (6.0%)	25.7 (5.9%)
65-69	29 (4.6%)	25.4 (5.8%)
70-74	28 (4.5%)	27.9 (6.4%)
75-79	31 (4.9%)	26.1 (6.0%)
80-84	51 (8.1%)	33.4 (7.7%)
85+	61 (9.7%)	47.1 (10.8%)
Injury Severity Score ranges		
Mean ISS	17.7	19.1
ISS <13	69 (11.0%)	49.7 (11.4%)
ISS 13-15	201 (32.0%)	103.1 (23.7%)
ISS 16-24	242 (38.5%)	171.1 (39.3%)
ISS 25-40	106 (16.9%)	96.0 (22.0%)
ISS 41-75	11 (1.7%)	13.6 (3.1%)
Mechanisms of injury		
Assault	56 (8.9%)	29.3 (6.7%)
Falls	235 (37.4%)	193.0 (44.3%)
Falls ≥65 years (% of all MOIs for ≥65 years)	150 (75.0%)	118.7 (74.2%)
Road trauma	228 (36.2%)	136.7 (31.4%)
Other transport incident	45 (7.2%)	27.7 (6.4%)
All other injuries	65 (10.3%)	48.7 (11.2%)

Injury type		
Blunt	591 (94.0%)	409.9 (94.1%)
Penetrating	38 (6.0%)	17.1 (3.9%)
Unknown	0 (0%)	8.4 (1.9%)
Admission type		
Direct admission	511 (81.2%)	338.7 (77.8%)
Transfer in	113 (18%)	95 (21.8%)
Unknown	5 (0.8%)	1.7 (0.4%)
Arrival modes		
Ambulance	493 (78.4%)	342.4 (78.6%)
Helicopter	68 (10.8%)	41 (9.4%)
Other (private vehicle, fixed wing, unknown)	68 (10.8%)	52 (11.9%)
Revised Trauma Score		
Mean - overall	7.1	7.1
ISS <13	6.4	6.8
ISS 13-15	7.6	7.6
ISS 16-24	7.3	7.4
ISS 25-40	6.4	6.6
ISS 41-75	5.1	4.8
Hospital length of stay		
Total bed days	7509	5454
Mean - overall	11.9	12.5
ISS <13	14.5	11.5
ISS 13-15	8.5	9.0
ISS 16-24	11.8	12.3
ISS 25-40	16.2	15.5
ISS 41-75	21.1	26.2
ICU length of stay		
ICU total bed days (number of ICU admissions)	1451 (202)	1026.4 (186.6)
Mean - overall	7.2	5.5
ISS <13	2.9	2.9
ISS 13-15	6.8	4.0
ISS 16-24	8.5	5.2
ISS 25-40	9.8	6.9
ISS 41-75	11.9	12.4
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	1085 (186)	663.1 (117.3)
Mean - overall	5.8	5.7
ISS <13	2.3	2.7
ISS 13-15	7.6	4.8
ISS 16-24	5.6	5.3
ISS 25-40	8.0	6.7
ISS 41-75	10.1	10.0

Appendix 3: Paediatric major trauma service summaries

Table 36: Trauma data profile, John Hunter Children's Hospital

	Facility	Peer group
Total admissions	50	66.7
Mean monthly admissions	4.2	5.6
Case fatality rate (ISS >12 excl. traumatic DOA)	0%	7.1%
Sex		
Male / Female	30 / 20	42 / 25
Age ranges		
Mean age	9.0	7.7
0-4	16 (32.0%)	23.7 (35.6%)
5-9	7 (14.0%)	14.7 (22.1%)
10-14	12 (24.0%)	19.3 (29.0%)
15-19	15 (30.0%)	9 (13.5%)
Injury Severity Score ranges		
Mean ISS	19.6	20.5
ISS <13	7 (14.0%)	14.3 (21.5%)
ISS 13-15	6 (12.0%)	8.7 (13.1%)
ISS 16-24	20 (40.0%)	20.7 (31.1%)
ISS 25-40	16 (32.0%)	19.3 (29.0%)
ISS 41-75	1 (2.0%)	3.7 (5.6%)
Mechanisms of injury		
Assault	4 (8.0%)	3.0 (4.5%)
Falls	6 (12.0%)	23.3 (35.0%)
Road trauma	19 (38.0%)	15.3 (23.0%)
Other transport incident	7 (14.0%)	9.0 (13.5%)
All other injuries	14 (28.0%)	16.0 (24.0%)
Injury type		
Blunt	39 (78.0%)	56.0 (84.0%)
Penetrating	1 (2.0%)	2.0 (3.0%)
Unknown	10 (20.0%)	8.7 (13.0%)
Admission type		
Direct admission	34 (68%)	32.7 (49%)
Transfer in	16 (32%)	33.7 (50.5%)
Unknown	0 (0%)	0.3 (0.5%)
Arrival modes		
Ambulance	31 (62.0%)	40 (60.0%)
Helicopter	11 (22.0%)	7.7 (11.5%)
Other (private vehicle, fixed wing, unknown)	8 (16.0%)	19 (28.5%)

Revised Trauma Score		
Mean - overall	6.3	6.3
ISS <13	7.2	6.3
ISS 13-15	7.2	7.1
ISS 16-24	7.0	6.9
ISS 25-40	5.5	5.7
ISS 41-75	4.1	4.4
Hospital length of stay		
Total bed days	688	761
Mean - overall	13.8	11.4
ISS <13	6.3	6.8
ISS 13-15	13.0	6.5
ISS 16-24	4.7	9.2
ISS 25-40	27.4	18.2
ISS 41-75	34.0	17.7
ICU length of stay		
ICU total bed days (number of ICU admissions)	118 (28)	180.7 (42.0)
Mean - overall	4.2	4.3
ISS <13	1.2	1.9
ISS 13-15	2.0	1.6
ISS 16-24	2.2	2.8
ISS 25-40	6.2	7.8
ISS 41-75	13.0	7.2
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	88 (17)	163.0 (31.3)
Mean - overall	5.2	5.2
ISS <13	2.0	2.4
ISS 13-15	4.0	2.7
ISS 16-24	2.8	3.3
ISS 25-40	6.4	7.5
ISS 41-75	10.0	9.4

Table 37: Trauma data profile, Sydney Children's Hospital

	Facility	Peer group
Total admissions	71	66.7
Mean monthly admissions	5.9	5.6
Case fatality rate (ISS >12 excl. traumatic DOA)	7.4%	7.1%
Sex		
Male / Female	45 / 26	42 / 25
Age ranges		
Mean age	6.5	7.7
0-4	32 (45.1%)	23.7 (35.6%)
5-9	16 (22.5%)	14.7 (22.1%)
10-14	19 (26.8%)	19.3 (29.0%)
15-19	4 (5.6%)	9 (13.5%)
Injury Severity Score ranges		
Mean ISS	17.7	20.5
ISS <13	17 (23.9%)	14.3 (21.5%)
ISS 13-15	14 (19.7%)	8.7 (13.1%)
ISS 16-24	20 (28.2%)	20.7 (31.1%)
ISS 25-40	18 (25.4%)	19.3 (29.0%)
ISS 41-75	2 (2.8%)	3.7 (5.6%)
Mechanisms of injury		
Assault	1 (1.4%)	3.0 (4.5%)
Falls	38 (53.5%)	23.3 (35.0%)
Road trauma	15 (21.1%)	15.3 (23.0%)
Other transport incident	4 (5.6%)	9.0 (13.5%)
All other injuries	13 (18.3%)	16.0 (24.0%)
Injury type		
Blunt	70 (98.6%)	56.0 (84.0%)
Penetrating	1 (1.4%)	2.0 (3.0%)
Unknown	0 (0%)	8.7 (13.0%)
Admission type		
Direct admission	19 (26.8%)	32.7 (49%)
Transfer in	52 (73.2%)	33.7 (50.5%)
Unknown	0 (0%)	0.3 (0.5%)
Arrival modes		
Ambulance	39 (54.9%)	40 (60.0%)
Helicopter	3 (4.2%)	7.7 (11.5%)
Other (private vehicle, fixed wing, unknown)	29 (40.8%)	19 (28.5%)

Revised Trauma Score		
Mean - overall	6.1	6.3
ISS <13	5.8	6.3
ISS 13-15	7.3	7.1
ISS 16-24	6.1	6.9
ISS 25-40	5.7	5.7
ISS 41-75	3.9	4.4
Hospital length of stay		
Total bed days	578	761
Mean - overall	8.1	11.4
ISS <13	3.4	6.8
ISS 13-15	5.0	6.5
ISS 16-24	11.6	9.2
ISS 25-40	8.9	18.2
ISS 41-75	29.0	17.7
ICU length of stay		
ICU total bed days (number of ICU admissions)	155 (52)	180.7 (42.0)
Mean - overall	3.0	4.3
ISS <13	1.5	1.9
ISS 13-15	1.8	1.6
ISS 16-24	3.6	2.8
ISS 25-40	3.5	7.8
ISS 41-75	10.0	7.2
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	109 (35)	163.0 (31.3)
Mean - overall	3.1	5.2
ISS <13	1.8	2.4
ISS 13-15	0.0	2.7
ISS 16-24	3.9	3.3
ISS 25-40	3.6	7.5
ISS 41-75	4.5	9.4

Table 38: Trauma data profile, The Children's Hospital at Westmead

	Facility	Peer group
Total admissions	79	66.7
Mean monthly admissions	6.6	5.6
Case fatality rate (ISS >12 excl. traumatic DOA)	12.3%	7.1%
Sex		
Male / Female	50 / 29	42 / 25
Age ranges		
Mean age	8.1	7.7
0-4	23 (29.1%)	23.7 (35.6%)
5-9	21 (26.6%)	14.7 (22.1%)
10-14	27 (34.2%)	19.3 (29.0%)
15-19	8 (10.1%)	9 (13.5%)
Injury Severity Score ranges		
Mean ISS	23.6	20.5
ISS <13	19 (24.1%)	14.3 (21.5%)
ISS 13-15	6 (7.6%)	8.7 (13.1%)
ISS 16-24	22 (27.8%)	20.7 (31.1%)
ISS 25-40	24 (30.4%)	19.3 (29.0%)
ISS 41-75	8 (10.1%)	3.7 (5.6%)
Mechanisms of injury		
Assault	4 (5.1%)	3.0 (4.5%)
Falls	26 (32.9%)	23.3 (35.0%)
Road trauma	12 (15.2%)	15.3 (23.0%)
Other transport incident	16 (20.3%)	9.0 (13.5%)
All other injuries	21 (26.6%)	16.0 (24.0%)
Injury type		
Blunt	59 (74.7%)	56.0 (84.0%)
Penetrating	4 (5.1%)	2.0 (3.0%)
Unknown	16 (20.3%)	8.7 (13.0%)
Admission type		
Direct admission	45 (57%)	32.7 (49%)
Transfer in	33 (41.8%)	33.7 (50.5%)
Unknown	1 (1.3%)	0.3 (0.5%)
Arrival modes		
Ambulance	50 (63.3%)	40 (60.0%)
Helicopter	9 (11.4%)	7.7 (11.5%)
Other (private vehicle, fixed wing, unknown)	20 (25.3%)	19 (28.5%)

Revised Trauma Score		
Mean - overall	6.4	6.3
ISS <13	6.4	6.3
ISS 13-15	6.3	7.1
ISS 16-24	7.6	6.9
ISS 25-40	6.0	5.7
ISS 41-75	4.6	4.4
Hospital length of stay		
Total bed days	1016	761
Mean - overall	12.9	11.4
ISS <13	10.2	6.8
ISS 13-15	3.3	6.5
ISS 16-24	11.2	9.2
ISS 25-40	18.9	18.2
ISS 41-75	12.9	17.7
ICU length of stay		
ICU total bed days (number of ICU admissions)	269 (46)	180.7 (42.0)
Mean - overall	5.8	4.3
ISS <13	2.5	1.9
ISS 13-15	1.0	1.6
ISS 16-24	1.7	2.8
ISS 25-40	12.5	7.8
ISS 41-75	3.3	7.2
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	292 (42)	163.0 (31.3)
Mean - overall	7.0	5.2
ISS <13	2.9	2.4
ISS 13-15	2.0	2.7
ISS 16-24	2.3	3.3
ISS 25-40	10.9	7.5
ISS 41-75	10.7	9.4

Appendix 4: Regional trauma service summaries

Table 39: Trauma data profile, Coffs Harbour Base Hospital

	Facility	Peer group
Total admissions	77	84.9
Mean monthly admissions	6.4	7.1
Case fatality rate (ISS >12 excl. traumatic DOA)	7.1%	8.5%
Sex		
Male / Female	53 / 24	60 / 25
Age ranges		
Mean age	47.5	54.0
0-4	3 (3.9%)	2 (2.4%)
5-9	1 (1.3%)	0.7 (0.8%)
10-14	3 (3.9%)	0.9 (1.1%)
15-19	4 (5.2%)	4.4 (5.2%)
20-24	8 (10.4%)	5 (5.9%)
25-29	4 (5.2%)	4.7 (5.5%)
30-34	3 (3.9%)	3.4 (4.0%)
35-39	3 (3.9%)	3.7 (4.4%)
40-44	6 (7.8%)	5.2 (6.1%)
45-49	4 (5.2%)	5.6 (6.6%)
50-54	4 (5.2%)	6.2 (7.3%)
55-59	6 (7.8%)	5 (5.9%)
60-64	7 (9.1%)	5.8 (6.8%)
65-69	3 (3.9%)	4.8 (5.7%)
70-74	7 (9.1%)	5.1 (6.0%)
75-79	4 (5.2%)	5.8 (6.8%)
80-84	1 (1.3%)	7.3 (8.6%)
85+	6 (7.8%)	9.3 (11.0%)
Injury Severity Score ranges		
Mean ISS	21.3	18.5
ISS <13	6 (7.8%)	10.1 (11.9%)
ISS 13-15	12 (15.6%)	21.3 (25.1%)
ISS 16-24	34 (44.2%)	33.7 (39.7%)
ISS 25-40	21 (27.3%)	18.5 (21.8%)
ISS 41-75	4 (5.2%)	1.2 (1.4%)
Mechanisms of injury		
Assault	5 (6.5%)	4.3 (5.1%)
Falls	23 (29.9%)	34.4 (40.5%)
Falls ≥65 years (% of all MOIs for ≥65 years)	10 (47.6%)	22 (68.1%)
Road trauma	26 (33.8%)	24.5 (28.9%)
Other transport incident	12 (15.6%)	13.0 (15.3%)
All other injuries	11 (14.3%)	8.7 (10.2%)

Injury type		
Blunt	67 (87.0%)	80.9 (95.3%)
Penetrating	7 (9.1%)	2.7 (3.2%)
Unknown	3 (3.9%)	1.3 (1.5%)
Admission type		
Direct admission	71 (92.2%)	70.6 (83.2%)
Transfer in	6 (7.8%)	13.2 (15.5%)
Unknown	0 (0%)	1.1 (1.3%)
Arrival modes		
Ambulance	66 (85.7%)	67 (78.9%)
Helicopter	2 (2.6%)	4.9 (5.8%)
Other (private vehicle, fixed wing, unknown)	9 (11.7%)	13 (15.3%)
Revised Trauma Score		
Mean - overall	7.3	7.4
ISS <13	7.3	7.6
ISS 13-15	7.8	7.8
ISS 16-24	7.7	7.6
ISS 25-40	6.8	6.9
ISS 41-75	6.3	5.5
Hospital length of stay		
Total bed days	302	597
Mean - overall	3.9	7.0
ISS <13	4.5	9.7
ISS 13-15	4.5	7.3
ISS 16-24	4.6	7.2
ISS 25-40	2.9	5.2
ISS 41-75	1.0	3.2
ICU length of stay		
ICU total bed days (number of ICU admissions)	68 (28)	82.0 (29.2)
Mean - overall	2.4	2.8
ISS <13	1.8	2.5
ISS 13-15	1.8	1.7
ISS 16-24	2.3	3.6
ISS 25-40	3.7	2.8
ISS 41-75	1.0	2.3
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	43 (16)	35.2 (11.7)
Mean - overall	2.7	3.0
ISS <13	2.5	2.5
ISS 13-15	2.0	3.1
ISS 16-24	1.0	4.1
ISS 25-40	3.9	2.5
ISS 41-75	1.0	1.7

Table 40: Trauma data profile, Gosford Hospital

	Facility	Peer group
Total admissions	69	84.9
Mean monthly admissions	5.8	7.1
Case fatality rate (ISS >12 excl. traumatic DOA)	12.5%	8.5%
Sex		
Male / Female	45 / 24	60 / 25
Age ranges		
Mean age	51.6	54.0
0-4	1 (1.4%)	2 (2.4%)
5-9	0 (0%)	0.7 (0.8%)
10-14	0 (0%)	0.9 (1.1%)
15-19	4 (5.8%)	4.4 (5.2%)
20-24	6 (8.7%)	5 (5.9%)
25-29	3 (4.3%)	4.7 (5.5%)
30-34	4 (5.8%)	3.4 (4.0%)
35-39	2 (2.9%)	3.7 (4.4%)
40-44	9 (13.0%)	5.2 (6.1%)
45-49	5 (7.2%)	5.6 (6.6%)
50-54	5 (7.2%)	6.2 (7.3%)
55-59	5 (7.2%)	5 (5.9%)
60-64	7 (10.1%)	5.8 (6.8%)
65-69	1 (1.4%)	4.8 (5.7%)
70-74	3 (4.3%)	5.1 (6.0%)
75-79	3 (4.3%)	5.8 (6.8%)
80-84	3 (4.3%)	7.3 (8.6%)
85+	8 (11.6%)	9.3 (11.0%)
Injury Severity Score ranges		
Mean ISS	17.5	18.5
ISS <13	4 (5.8%)	10.1 (11.9%)
ISS 13-15	25 (36.2%)	21.3 (25.1%)
ISS 16-24	24 (34.8%)	33.7 (39.7%)
ISS 25-40	16 (23.2%)	18.5 (21.8%)
ISS 41-75	0 (0%)	1.2 (1.4%)
Mechanisms of injury		
Assault	7 (10.1%)	4.3 (5.1%)
Falls	29 (42.0%)	34.4 (40.5%)
Falls ≥65 years (% of all MOIs for ≥65 years)	15 (83.3%)	22 (68.1%)
Road trauma	21 (30.4%)	24.5 (28.9%)
Other transport incident	3 (4.3%)	13.0 (15.3%)
All other injuries	9 (13.0%)	8.7 (10.2%)

Injury type		
Blunt	67 (97.1%)	80.9 (95.3%)
Penetrating	2 (2.9%)	2.7 (3.2%)
Unknown	0 (0%)	1.3 (1.5%)
Admission type		
Direct admission	69 (100%)	70.6 (83.2%)
Transfer in	0 (0%)	13.2 (15.5%)
Unknown	0 (0%)	1.1 (1.3%)
Arrival modes		
Ambulance	58 (84.1%)	67 (78.9%)
Helicopter	0 (0%)	4.9 (5.8%)
Other (private vehicle, fixed wing, unknown)	11 (15.9%)	13 (15.3%)
Revised Trauma Score		
Mean - overall	7.1	7.4
ISS <13	7.8	7.6
ISS 13-15	7.8	7.8
ISS 16-24	7.5	7.6
ISS 25-40	5.7	6.9
ISS 41-75	0.0	5.5
Hospital length of stay		
Total bed days	677	597
Mean - overall	9.8	7.0
ISS <13	3.5	9.7
ISS 13-15	17.0	7.3
ISS 16-24	7.8	7.2
ISS 25-40	3.3	5.2
ISS 41-75	0.0	3.2
ICU length of stay		
ICU total bed days (number of ICU admissions)	22 (14)	82.0 (29.2)
Mean - overall	1.6	2.8
ISS <13	1.5	2.5
ISS 13-15	1.5	1.7
ISS 16-24	1.0	3.6
ISS 25-40	1.8	2.8
ISS 41-75	0.0	2.3
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	0 (0)	35.2 (11.7)
Mean - overall	0.0	3.0
ISS <13	0.0	2.5
ISS 13-15	0.0	3.1
ISS 16-24	0.0	4.1
ISS 25-40	0.0	2.5
ISS 41-75	0.0	1.7

Table 41: Trauma data profile, Lismore Base Hospital

	Facility	Peer group
Total admissions	56	84.9
Mean monthly admissions	4.7	7.1
Case fatality rate (ISS >12 excl. traumatic DOA)	5.7%	8.5%
Sex		
Male / Female	38 / 18	60 / 25
Age ranges		
Mean age	56.4	54.0
0-4	0 (0%)	2 (2.4%)
5-9	0 (0%)	0.7 (0.8%)
10-14	0 (0%)	0.9 (1.1%)
15-19	5 (8.9%)	4.4 (5.2%)
20-24	3 (5.4%)	5 (5.9%)
25-29	4 (7.1%)	4.7 (5.5%)
30-34	0 (0%)	3.4 (4.0%)
35-39	2 (3.6%)	3.7 (4.4%)
40-44	4 (7.1%)	5.2 (6.1%)
45-49	2 (3.6%)	5.6 (6.6%)
50-54	6 (10.7%)	6.2 (7.3%)
55-59	3 (5.4%)	5 (5.9%)
60-64	2 (3.6%)	5.8 (6.8%)
65-69	4 (7.1%)	4.8 (5.7%)
70-74	4 (7.1%)	5.1 (6.0%)
75-79	7 (12.5%)	5.8 (6.8%)
80-84	4 (7.1%)	7.3 (8.6%)
85+	6 (10.7%)	9.3 (11.0%)
Injury Severity Score ranges		
Mean ISS	19.3	18.5
ISS <13	3 (5.4%)	10.1 (11.9%)
ISS 13-15	15 (26.8%)	21.3 (25.1%)
ISS 16-24	26 (46.4%)	33.7 (39.7%)
ISS 25-40	10 (17.9%)	18.5 (21.8%)
ISS 41-75	2 (3.6%)	1.2 (1.4%)
Mechanisms of injury		
Assault	0 (0%)	4.3 (5.1%)
Falls	17 (30.4%)	34.4 (40.5%)
Falls ≥65 years (% of all MOIs for ≥65 years)	12 (48.0%)	22 (68.1%)
Road trauma	32 (57.1%)	24.5 (28.9%)
Other transport incident	5 (8.9%)	13.0 (15.3%)
All other injuries	2 (3.6%)	8.7 (10.2%)

Injury type		
Blunt	55 (98.2%)	80.9 (95.3%)
Penetrating	0 (0%)	2.7 (3.2%)
Unknown	1 (1.8%)	1.3 (1.5%)
Admission type		
Direct admission	52 (92.9%)	70.6 (83.2%)
Transfer in	4 (7.1%)	13.2 (15.5%)
Unknown	0 (0%)	1.1 (1.3%)
Arrival modes		
Ambulance	46 (82.1%)	67 (78.9%)
Helicopter	5 (8.9%)	4.9 (5.8%)
Other (private vehicle, fixed wing, unknown)	5 (8.9%)	13 (15.3%)
Revised Trauma Score		
Mean - overall	7.5	7.4
ISS <13	7.8	7.6
ISS 13-15	7.8	7.8
ISS 16-24	7.5	7.6
ISS 25-40	7.2	6.9
ISS 41-75	5.7	5.5
Hospital length of stay		
Total bed days	477	597
Mean - overall	8.5	7.0
ISS <13	8.0	9.7
ISS 13-15	5.9	7.3
ISS 16-24	10.7	7.2
ISS 25-40	5.8	5.2
ISS 41-75	14.0	3.2
ICU length of stay		
ICU total bed days (number of ICU admissions)	111 (18)	82.0 (29.2)
Mean - overall	6.2	2.8
ISS <13	3.7	2.5
ISS 13-15	1.0	1.7
ISS 16-24	10.6	3.6
ISS 25-40	1.0	2.8
ISS 41-75	5.0	2.3
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	67 (10)	35.2 (11.7)
Mean - overall	6.7	3.0
ISS <13	0.0	2.5
ISS 13-15	2.0	3.1
ISS 16-24	18.0	4.1
ISS 25-40	1.0	2.5
ISS 41-75	3.5	1.7

Table 42: Trauma data profile, Nepean Hospital

	Facility	Peer group
Total admissions	101	84.9
Mean monthly admissions	8.4	7.1
Case fatality rate (ISS >12 excl. traumatic DOA)	10.0%	8.5%
Sex		
Male / Female	62 / 39	60 / 25
Age ranges		
Mean age	61.7	54.0
0-4	1 (1.0%)	2 (2.4%)
5-9	0 (0%)	0.7 (0.8%)
10-14	0 (0%)	0.9 (1.1%)
15-19	3 (3.0%)	4.4 (5.2%)
20-24	1 (1.0%)	5 (5.9%)
25-29	3 (3.0%)	4.7 (5.5%)
30-34	8 (7.9%)	3.4 (4.0%)
35-39	5 (5.0%)	3.7 (4.4%)
40-44	4 (4.0%)	5.2 (6.1%)
45-49	4 (4.0%)	5.6 (6.6%)
50-54	9 (8.9%)	6.2 (7.3%)
55-59	8 (7.9%)	5 (5.9%)
60-64	6 (5.9%)	5.8 (6.8%)
65-69	7 (6.9%)	4.8 (5.7%)
70-74	4 (4.0%)	5.1 (6.0%)
75-79	10 (9.9%)	5.8 (6.8%)
80-84	11 (10.9%)	7.3 (8.6%)
85+	17 (16.8%)	9.3 (11.0%)
Injury Severity Score ranges		
Mean ISS	13.4	18.5
ISS <13	40 (39.6%)	10.1 (11.9%)
ISS 13-15	23 (22.8%)	21.3 (25.1%)
ISS 16-24	27 (26.7%)	33.7 (39.7%)
ISS 25-40	11 (10.9%)	18.5 (21.8%)
ISS 41-75	0 (0%)	1.2 (1.4%)
Mechanisms of injury		
Assault	3 (3.0%)	4.3 (5.1%)
Falls	51 (50.5%)	34.4 (40.5%)
Falls ≥65 years (% of all MOIs for ≥65 years)	37 (75.5%)	22 (68.1%)
Road trauma	21 (20.8%)	24.5 (28.9%)
Other transport incident	10 (9.9%)	13.0 (15.3%)
All other injuries	16 (15.8%)	8.7 (10.2%)

Injury type		
Blunt	95 (94.1%)	80.9 (95.3%)
Penetrating	6 (5.9%)	2.7 (3.2%)
Unknown	0 (0%)	1.3 (1.5%)
Admission type		
Direct admission	80 (79.2%)	70.6 (83.2%)
Transfer in	21 (20.8%)	13.2 (15.5%)
Unknown	0 (0%)	1.1 (1.3%)
Arrival modes		
Ambulance	87 (86.1%)	67 (78.9%)
Helicopter	0 (0%)	4.9 (5.8%)
Other (private vehicle, fixed wing, unknown)	14 (13.9%)	13 (15.3%)
Revised Trauma Score		
Mean - overall	7.5	7.4
ISS <13	7.8	7.6
ISS 13-15	7.7	7.8
ISS 16-24	7.5	7.6
ISS 25-40	6.4	6.9
ISS 41-75	0.0	5.5
Hospital length of stay		
Total bed days	1016	597
Mean - overall	10.1	7.0
ISS <13	12.6	9.7
ISS 13-15	6.7	7.3
ISS 16-24	7.7	7.2
ISS 25-40	13.9	5.2
ISS 41-75	0.0	3.2
ICU length of stay		
ICU total bed days (number of ICU admissions)	143 (54)	82.0 (29.2)
Mean - overall	2.6	2.8
ISS <13	2.7	2.5
ISS 13-15	1.3	1.7
ISS 16-24	2.5	3.6
ISS 25-40	3.4	2.8
ISS 41-75	0.0	2.3
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	0 (0)	35.2 (11.7)
Mean - overall	0.0	3.0
ISS <13	0.0	2.5
ISS 13-15	0.0	3.1
ISS 16-24	0.0	4.1
ISS 25-40	0.0	2.5
ISS 41-75	0.0	1.7

Table 43: Trauma data profile, Orange Health Service

	Facility	Peer group
Total admissions	103	84.9
Mean monthly admissions	8.6	7.1
Case fatality rate (ISS >12 excl. traumatic DOA)	5.7%	8.5%
Sex		
Male / Female	75 / 28	60 / 25
Age ranges		
Mean age	51.9	54.0
0-4	2 (1.9%)	2 (2.4%)
5-9	1 (1.0%)	0.7 (0.8%)
10-14	2 (1.9%)	0.9 (1.1%)
15-19	4 (3.9%)	4.4 (5.2%)
20-24	8 (7.8%)	5 (5.9%)
25-29	4 (3.9%)	4.7 (5.5%)
30-34	3 (2.9%)	3.4 (4.0%)
35-39	6 (5.8%)	3.7 (4.4%)
40-44	9 (8.7%)	5.2 (6.1%)
45-49	11 (10.7%)	5.6 (6.6%)
50-54	6 (5.8%)	6.2 (7.3%)
55-59	8 (7.8%)	5 (5.9%)
60-64	6 (5.8%)	5.8 (6.8%)
65-69	5 (4.9%)	4.8 (5.7%)
70-74	3 (2.9%)	5.1 (6.0%)
75-79	7 (6.8%)	5.8 (6.8%)
80-84	9 (8.7%)	7.3 (8.6%)
85+	9 (8.7%)	9.3 (11.0%)
Injury Severity Score ranges		
Mean ISS	18.8	18.5
ISS <13	15 (14.6%)	10.1 (11.9%)
ISS 13-15	21 (20.4%)	21.3 (25.1%)
ISS 16-24	44 (42.7%)	33.7 (39.7%)
ISS 25-40	21 (20.4%)	18.5 (21.8%)
ISS 41-75	1 (1.0%)	1.2 (1.4%)
Mechanisms of injury		
Assault	5 (4.9%)	4.3 (5.1%)
Falls	34 (33.0%)	34.4 (40.5%)
Falls ≥65 years (% of all MOIs for ≥65 years)	21 (63.6%)	22 (68.1%)
Road trauma	18 (17.5%)	24.5 (28.9%)
Other transport incident	39 (37.9%)	13.0 (15.3%)
All other injuries	7 (6.8%)	8.7 (10.2%)

Injury type		
Blunt	101 (98.1%)	80.9 (95.3%)
Penetrating	2 (1.9%)	2.7 (3.2%)
Unknown	0 (0%)	1.3 (1.5%)
Admission type		
Direct admission	73 (70.9%)	70.6 (83.2%)
Transfer in	21 (20.4%)	13.2 (15.5%)
Unknown	9 (8.7%)	1.1 (1.3%)
Arrival modes		
Ambulance	59 (57.3%)	67 (78.9%)
Helicopter	22 (21.4%)	4.9 (5.8%)
Other (private vehicle, fixed wing, unknown)	22 (21.4%)	13 (15.3%)
Revised Trauma Score		
Mean - overall	7.6	7.4
ISS <13	7.4	7.6
ISS 13-15	7.8	7.8
ISS 16-24	7.8	7.6
ISS 25-40	7.5	6.9
ISS 41-75	3.4	5.5
Hospital length of stay		
Total bed days	577	597
Mean - overall	5.7	7.0
ISS <13	10.4	9.7
ISS 13-15	5.0	7.3
ISS 16-24	6.5	7.2
ISS 25-40	1.9	5.2
ISS 41-75	1.0	3.2
ICU length of stay		
ICU total bed days (number of ICU admissions)	64 (33)	82.0 (29.2)
Mean - overall	1.9	2.8
ISS <13	2.1	2.5
ISS 13-15	1.0	1.7
ISS 16-24	2.4	3.6
ISS 25-40	1.3	2.8
ISS 41-75	1.0	2.3
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	19 (14)	35.2 (11.7)
Mean - overall	1.4	3.0
ISS <13	2.0	2.5
ISS 13-15	0.0	3.1
ISS 16-24	1.0	4.1
ISS 25-40	1.2	2.5
ISS 41-75	1.0	1.7

Table 44: Trauma data profile, Port Macquarie Base Hospital

	Facility	Peer group
Total admissions	65	84.9
Mean monthly admissions	5.4	7.1
Case fatality rate (ISS >12 excl. traumatic DOA)	12.9%	8.5%
Sex		
Male / Female	51 / 14	60 / 25
Age ranges		
Mean age	55.2	54.0
0-4	1 (1.5%)	2 (2.4%)
5-9	2 (3.1%)	0.7 (0.8%)
10-14	1 (1.5%)	0.9 (1.1%)
15-19	2 (3.1%)	4.4 (5.2%)
20-24	2 (3.1%)	5 (5.9%)
25-29	4 (6.2%)	4.7 (5.5%)
30-34	3 (4.6%)	3.4 (4.0%)
35-39	4 (6.2%)	3.7 (4.4%)
40-44	4 (6.2%)	5.2 (6.1%)
45-49	3 (4.6%)	5.6 (6.6%)
50-54	5 (7.7%)	6.2 (7.3%)
55-59	3 (4.6%)	5 (5.9%)
60-64	5 (7.7%)	5.8 (6.8%)
65-69	3 (4.6%)	4.8 (5.7%)
70-74	3 (4.6%)	5.1 (6.0%)
75-79	4 (6.2%)	5.8 (6.8%)
80-84	7 (10.8%)	7.3 (8.6%)
85+	9 (13.8%)	9.3 (11.0%)
Injury Severity Score ranges		
Mean ISS	20.1	18.5
ISS <13	2 (3.1%)	10.1 (11.9%)
ISS 13-15	18 (27.7%)	21.3 (25.1%)
ISS 16-24	30 (46.2%)	33.7 (39.7%)
ISS 25-40	13 (20.0%)	18.5 (21.8%)
ISS 41-75	2 (3.1%)	1.2 (1.4%)
Mechanisms of injury		
Assault	5 (7.7%)	4.3 (5.1%)
Falls	24 (36.9%)	34.4 (40.5%)
Falls ≥65 years (% of all MOIs for ≥65 years)	18 (69.2%)	22 (68.1%)
Road trauma	27 (41.5%)	24.5 (28.9%)
Other transport incident	5 (7.7%)	13.0 (15.3%)
All other injuries	4 (6.2%)	8.7 (10.2%)

Injury type		
Blunt	63 (96.9%)	80.9 (95.3%)
Penetrating	2 (3.1%)	2.7 (3.2%)
Unknown	0 (0%)	1.3 (1.5%)
Admission type		
Direct admission	62 (95.4%)	70.6 (83.2%)
Transfer in	3 (4.6%)	13.2 (15.5%)
Unknown	0 (0%)	1.1 (1.3%)
Arrival modes		
Ambulance	60 (92.3%)	67 (78.9%)
Helicopter	0 (0%)	4.9 (5.8%)
Other (private vehicle, fixed wing, unknown)	5 (7.7%)	13 (15.3%)
Revised Trauma Score		
Mean - overall	7.4	7.4
ISS <13	7.8	7.6
ISS 13-15	7.8	7.8
ISS 16-24	7.7	7.6
ISS 25-40	7.1	6.9
ISS 41-75	3.6	5.5
Hospital length of stay		
Total bed days	301	597
Mean - overall	4.6	7.0
ISS <13	4.0	9.7
ISS 13-15	4.4	7.3
ISS 16-24	5.9	7.2
ISS 25-40	2.6	5.2
ISS 41-75	1.0	3.2
ICU length of stay		
ICU total bed days (number of ICU admissions)	51 (14)	82.0 (29.2)
Mean - overall	3.6	2.8
ISS <13	1.0	2.5
ISS 13-15	1.0	1.7
ISS 16-24	4.4	3.6
ISS 25-40	1.0	2.8
ISS 41-75	0.0	2.3
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	19 (10)	35.2 (11.7)
Mean - overall	1.9	3.0
ISS <13	0.0	2.5
ISS 13-15	0.0	3.1
ISS 16-24	3.3	4.1
ISS 25-40	1.0	2.5
ISS 41-75	1.0	1.7

Table 45: Trauma data profile, Tamworth Base Hospital

	Facility	Peer group
Total admissions	98	84.9
Mean monthly admissions	8.2	7.1
Case fatality rate (ISS >12 excl. traumatic DOA)	6.0%	8.5%
Sex		
Male / Female	76 / 22	60 / 25
Age ranges		
Mean age	50.1	54.0
0-4	3 (3.1%)	2 (2.4%)
5-9	1 (1.0%)	0.7 (0.8%)
10-14	1 (1.0%)	0.9 (1.1%)
15-19	8 (8.2%)	4.4 (5.2%)
20-24	6 (6.1%)	5 (5.9%)
25-29	4 (4.1%)	4.7 (5.5%)
30-34	6 (6.1%)	3.4 (4.0%)
35-39	6 (6.1%)	3.7 (4.4%)
40-44	4 (4.1%)	5.2 (6.1%)
45-49	7 (7.1%)	5.6 (6.6%)
50-54	8 (8.2%)	6.2 (7.3%)
55-59	6 (6.1%)	5 (5.9%)
60-64	7 (7.1%)	5.8 (6.8%)
65-69	9 (9.2%)	4.8 (5.7%)
70-74	4 (4.1%)	5.1 (6.0%)
75-79	4 (4.1%)	5.8 (6.8%)
80-84	6 (6.1%)	7.3 (8.6%)
85+	8 (8.2%)	9.3 (11.0%)
Injury Severity Score ranges		
Mean ISS	19.2	18.5
ISS <13	13 (13.3%)	10.1 (11.9%)
ISS 13-15	15 (15.3%)	21.3 (25.1%)
ISS 16-24	44 (44.9%)	33.7 (39.7%)
ISS 25-40	26 (26.5%)	18.5 (21.8%)
ISS 41-75	0 (0%)	1.2 (1.4%)
Mechanisms of injury		
Assault	4 (4.1%)	4.3 (5.1%)
Falls	24 (24.5%)	34.4 (40.5%)
Falls ≥65 years (% of all MOIs for ≥65 years)	12 (38.7%)	22 (68.1%)
Road trauma	32 (32.7%)	24.5 (28.9%)
Other transport incident	24 (24.5%)	13.0 (15.3%)
All other injuries	14 (14.3%)	8.7 (10.2%)

Injury type		
Blunt	93 (94.9%)	80.9 (95.3%)
Penetrating	1 (1.0%)	2.7 (3.2%)
Unknown	4 (4.1%)	1.3 (1.5%)
Admission type		
Direct admission	75 (76.5%)	70.6 (83.2%)
Transfer in	22 (22.4%)	13.2 (15.5%)
Unknown	1 (1%)	1.1 (1.3%)
Arrival modes		
Ambulance	67 (68.4%)	67 (78.9%)
Helicopter	18 (18.4%)	4.9 (5.8%)
Other (private vehicle, fixed wing, unknown)	13 (13.3%)	13 (15.3%)
Revised Trauma Score		
Mean - overall	7.3	7.4
ISS <13	7.5	7.6
ISS 13-15	7.7	7.8
ISS 16-24	7.5	7.6
ISS 25-40	6.8	6.9
ISS 41-75	0.0	5.5
Hospital length of stay		
Total bed days	781	597
Mean - overall	8.0	7.0
ISS <13	10.0	9.7
ISS 13-15	6.4	7.3
ISS 16-24	9.9	7.2
ISS 25-40	4.5	5.2
ISS 41-75	0.0	3.2
ICU length of stay		
ICU total bed days (number of ICU admissions)	152 (50)	82.0 (29.2)
Mean - overall	3.0	2.8
ISS <13	2.8	2.5
ISS 13-15	2.6	1.7
ISS 16-24	3.3	3.6
ISS 25-40	3.1	2.8
ISS 41-75	0.0	2.3
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	49 (14)	35.2 (11.7)
Mean - overall	3.5	3.0
ISS <13	3.3	2.5
ISS 13-15	5.0	3.1
ISS 16-24	3.8	4.1
ISS 25-40	2.7	2.5
ISS 41-75	0.0	1.7

Table 46: Trauma data profile, The Tweed Hospital

	Facility	Peer group
Total admissions	41	84.9
Mean monthly admissions	3.4	7.1
Case fatality rate (ISS >12 excl. traumatic DOA)	10.8%	8.5%
Sex		
Male / Female	35 / 6	60 / 25
Age ranges		
Mean age	56.0	54.0
0-4	2 (4.9%)	2 (2.4%)
5-9	0 (0%)	0.7 (0.8%)
10-14	0 (0%)	0.9 (1.1%)
15-19	0 (0%)	4.4 (5.2%)
20-24	3 (7.3%)	5 (5.9%)
25-29	2 (4.9%)	4.7 (5.5%)
30-34	1 (2.4%)	3.4 (4.0%)
35-39	2 (4.9%)	3.7 (4.4%)
40-44	3 (7.3%)	5.2 (6.1%)
45-49	5 (12.2%)	5.6 (6.6%)
50-54	1 (2.4%)	6.2 (7.3%)
55-59	1 (2.4%)	5 (5.9%)
60-64	5 (12.2%)	5.8 (6.8%)
65-69	1 (2.4%)	4.8 (5.7%)
70-74	2 (4.9%)	5.1 (6.0%)
75-79	1 (2.4%)	5.8 (6.8%)
80-84	9 (22.0%)	7.3 (8.6%)
85+	3 (7.3%)	9.3 (11.0%)
Injury Severity Score ranges		
Mean ISS	17.9	18.5
ISS <13	4 (9.8%)	10.1 (11.9%)
ISS 13-15	12 (29.3%)	21.3 (25.1%)
ISS 16-24	17 (41.5%)	33.7 (39.7%)
ISS 25-40	8 (19.5%)	18.5 (21.8%)
ISS 41-75	0 (0%)	1.2 (1.4%)
Mechanisms of injury		
Assault	2 (4.9%)	4.3 (5.1%)
Falls	21 (51.2%)	34.4 (40.5%)
Falls ≥65 years (% of all MOIs for ≥65 years)	11 (68.8%)	22 (68.1%)
Road trauma	13 (31.7%)	24.5 (28.9%)
Other transport incident	0 (0%)	13.0 (15.3%)
All other injuries	5 (12.2%)	8.7 (10.2%)

Injury type		
Blunt	37 (90.2%)	80.9 (95.3%)
Penetrating	3 (7.3%)	2.7 (3.2%)
Unknown	1 (2.4%)	1.3 (1.5%)
Admission type		
Direct admission	37 (90.2%)	70.6 (83.2%)
Transfer in	4 (9.8%)	13.2 (15.5%)
Unknown	0 (0%)	1.1 (1.3%)
Arrival modes		
Ambulance	33 (80.5%)	67 (78.9%)
Helicopter	0 (0%)	4.9 (5.8%)
Other (private vehicle, fixed wing, unknown)	8 (19.5%)	13 (15.3%)
Revised Trauma Score		
Mean - overall	7.4	7.4
ISS <13	7.4	7.6
ISS 13-15	7.8	7.8
ISS 16-24	7.5	7.6
ISS 25-40	6.8	6.9
ISS 41-75	0.0	5.5
Hospital length of stay		
Total bed days	160	597
Mean - overall	3.9	7.0
ISS <13	4.3	9.7
ISS 13-15	3.5	7.3
ISS 16-24	5.4	7.2
ISS 25-40	1.1	5.2
ISS 41-75	0.0	3.2
ICU length of stay		
ICU total bed days (number of ICU admissions)	29 (10)	82.0 (29.2)
Mean - overall	2.9	2.8
ISS <13	2.0	2.5
ISS 13-15	2.0	1.7
ISS 16-24	5.0	3.6
ISS 25-40	0.0	2.8
ISS 41-75	0.0	2.3
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	13 (5)	35.2 (11.7)
Mean - overall	2.6	3.0
ISS <13	2.0	2.5
ISS 13-15	4.0	3.1
ISS 16-24	2.0	4.1
ISS 25-40	1.0	2.5
ISS 41-75	0.0	1.7

Table 47: Trauma data profile, Wagga Wagga Base Hospital

	Facility	Peer group
Total admissions	85	84.9
Mean monthly admissions	7.1	7.1
Case fatality rate (ISS >12 excl. traumatic DOA)	5.3%	8.5%
Sex		
Male / Female	55 / 30	60 / 25
Age ranges		
Mean age	48.8	54.0
0-4	3 (3.5%)	2 (2.4%)
5-9	0 (0%)	0.7 (0.8%)
10-14	0 (0%)	0.9 (1.1%)
15-19	9 (10.6%)	4.4 (5.2%)
20-24	4 (4.7%)	5 (5.9%)
25-29	9 (10.6%)	4.7 (5.5%)
30-34	3 (3.5%)	3.4 (4.0%)
35-39	3 (3.5%)	3.7 (4.4%)
40-44	5 (5.9%)	5.2 (6.1%)
45-49	8 (9.4%)	5.6 (6.6%)
50-54	8 (9.4%)	6.2 (7.3%)
55-59	2 (2.4%)	5 (5.9%)
60-64	4 (4.7%)	5.8 (6.8%)
65-69	5 (5.9%)	4.8 (5.7%)
70-74	8 (9.4%)	5.1 (6.0%)
75-79	2 (2.4%)	5.8 (6.8%)
80-84	5 (5.9%)	7.3 (8.6%)
85+	7 (8.2%)	9.3 (11.0%)
Injury Severity Score ranges		
Mean ISS	17.8	18.5
ISS <13	9 (10.6%)	10.1 (11.9%)
ISS 13-15	30 (35.3%)	21.3 (25.1%)
ISS 16-24	32 (37.6%)	33.7 (39.7%)
ISS 25-40	12 (14.1%)	18.5 (21.8%)
ISS 41-75	2 (2.4%)	1.2 (1.4%)
Mechanisms of injury		
Assault	5 (5.9%)	4.3 (5.1%)
Falls	29 (34.1%)	34.4 (40.5%)
Falls ≥65 years (% of all MOIs for ≥65 years)	22 (81.5%)	22 (68.1%)
Road trauma	27 (31.8%)	24.5 (28.9%)
Other transport incident	13 (15.3%)	13.0 (15.3%)
All other injuries	11 (12.9%)	8.7 (10.2%)

Injury type		
Blunt	79 (92.9%)	80.9 (95.3%)
Penetrating	2 (2.4%)	2.7 (3.2%)
Unknown	4 (4.7%)	1.3 (1.5%)
Admission type		
Direct admission	66 (77.6%)	70.6 (83.2%)
Transfer in	19 (22.4%)	13.2 (15.5%)
Unknown	0 (0%)	1.1 (1.3%)
Arrival modes		
Ambulance	65 (76.5%)	67 (78.9%)
Helicopter	0 (0%)	4.9 (5.8%)
Other (private vehicle, fixed wing, unknown)	20 (23.5%)	13 (15.3%)
Revised Trauma Score		
Mean - overall	7.6	7.4
ISS <13	7.8	7.6
ISS 13-15	7.8	7.8
ISS 16-24	7.7	7.6
ISS 25-40	6.6	6.9
ISS 41-75	6.0	5.5
Hospital length of stay		
Total bed days	296	597
Mean - overall	3.5	7.0
ISS <13	4.0	9.7
ISS 13-15	3.6	7.3
ISS 16-24	3.5	7.2
ISS 25-40	3.2	5.2
ISS 41-75	1.0	3.2
ICU length of stay		
ICU total bed days (number of ICU admissions)	71 (36)	82.0 (29.2)
Mean - overall	2.0	2.8
ISS <13	1.9	2.5
ISS 13-15	1.9	1.7
ISS 16-24	2.4	3.6
ISS 25-40	1.0	2.8
ISS 41-75	1.0	2.3
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	37 (19)	35.2 (11.7)
Mean - overall	1.9	3.0
ISS <13	2.3	2.5
ISS 13-15	3.0	3.1
ISS 16-24	2.2	4.1
ISS 25-40	1.2	2.5
ISS 41-75	1.0	1.7

Table 48: Trauma data profile, Wollongong Hospital

	Facility	Peer group
Total admissions	154	84.9
Mean monthly admissions	12.8	7.1
Case fatality rate (ISS >12 excl. traumatic DOA)	10.1%	8.5%
Sex		
Male / Female	107 / 47	60 / 25
Age ranges		
Mean age	58.2	54.0
0-4	4 (2.6%)	2 (2.4%)
5-9	2 (1.3%)	0.7 (0.8%)
10-14	2 (1.3%)	0.9 (1.1%)
15-19	5 (3.2%)	4.4 (5.2%)
20-24	9 (5.8%)	5 (5.9%)
25-29	10 (6.5%)	4.7 (5.5%)
30-34	3 (1.9%)	3.4 (4.0%)
35-39	4 (2.6%)	3.7 (4.4%)
40-44	4 (2.6%)	5.2 (6.1%)
45-49	7 (4.5%)	5.6 (6.6%)
50-54	10 (6.5%)	6.2 (7.3%)
55-59	8 (5.2%)	5 (5.9%)
60-64	9 (5.8%)	5.8 (6.8%)
65-69	10 (6.5%)	4.8 (5.7%)
70-74	13 (8.4%)	5.1 (6.0%)
75-79	16 (10.4%)	5.8 (6.8%)
80-84	18 (11.7%)	7.3 (8.6%)
85+	20 (13.0%)	9.3 (11.0%)
Injury Severity Score ranges		
Mean ISS	19.7	18.5
ISS <13	5 (3.2%)	10.1 (11.9%)
ISS 13-15	42 (27.3%)	21.3 (25.1%)
ISS 16-24	59 (38.3%)	33.7 (39.7%)
ISS 25-40	47 (30.5%)	18.5 (21.8%)
ISS 41-75	1 (0.6%)	1.2 (1.4%)
Mechanisms of injury		
Assault	7 (4.5%)	4.3 (5.1%)
Falls	92 (59.7%)	34.4 (40.5%)
Falls ≥65 years (% of all MOIs for ≥65 years)	62 (80.5%)	22 (68.1%)
Road trauma	28 (18.2%)	24.5 (28.9%)
Other transport incident	19 (12.3%)	13.0 (15.3%)
All other injuries	8 (5.2%)	8.7 (10.2%)

Injury type		
Blunt	152 (98.7%)	80.9 (95.3%)
Penetrating	2 (1.3%)	2.7 (3.2%)
Unknown	0 (0%)	1.3 (1.5%)
Admission type		
Direct admission	121 (78.6%)	70.6 (83.2%)
Transfer in	32 (20.8%)	13.2 (15.5%)
Unknown	1 (0.6%)	1.1 (1.3%)
Arrival modes		
Ambulance	129 (83.8%)	67 (78.9%)
Helicopter	2 (1.3%)	4.9 (5.8%)
Other (private vehicle, fixed wing, unknown)	23 (14.9%)	13 (15.3%)
Revised Trauma Score		
Mean - overall	7.4	7.4
ISS <13	6.2	7.6
ISS 13-15	7.8	7.8
ISS 16-24	7.7	7.6
ISS 25-40	7.1	6.9
ISS 41-75	7.1	5.5
Hospital length of stay		
Total bed days	1380	597
Mean - overall	9.0	7.0
ISS <13	12.8	9.7
ISS 13-15	9.7	7.3
ISS 16-24	8.6	7.2
ISS 25-40	8.5	5.2
ISS 41-75	1.0	3.2
ICU length of stay		
ICU total bed days (number of ICU admissions)	109 (35)	82.0 (29.2)
Mean - overall	3.1	2.8
ISS <13	2.8	2.5
ISS 13-15	1.3	1.7
ISS 16-24	3.3	3.6
ISS 25-40	3.6	2.8
ISS 41-75	0.0	2.3
Hospital ventilation days		
Total ventilation bed days (number of ventilated cases)	105 (29)	35.2 (11.7)
Mean - overall	3.6	3.0
ISS <13	2.4	2.5
ISS 13-15	2.0	3.1
ISS 16-24	4.5	4.1
ISS 25-40	3.7	2.5
ISS 41-75	0.0	1.7

Appendix 5: Calculation of the Injury Severity Score

An ISS is calculated for each patient based on the AIS injury severity classification of their specific injuries. The ISS value ranges from 1-75 and is calculated as:

$$ISS = A^2 + B^2 + C^2$$

Where A, B, and C are the highest AIS severity codes in each of the (up to) three most severely injured ISS body regions.

The six ISS body regions are:

- head or neck
- face
- chest
- abdominal or pelvic contents
- extremities or pelvic girdle
- external.

The following example shows how an ISS is calculated from a set of injuries.

Table 49: ISS calculation example

ISS body region	Injury	AIS severity code	Include in ISS calculation?
Head or neck	Small subdural haematoma	AIS-4	Yes
Chest	Bilateral lung contusion	AIS-4	No
Chest	Bilateral flail chest	AIS-5	Yes
Abdominal or pelvic contents	Superficial spleen laceration	AIS-2	Yes
Extremities or pelvic girdle	Left phalange (little toe) fracture	AIS-1	No

On the basis of the above injuries, the ISS is calculated as:

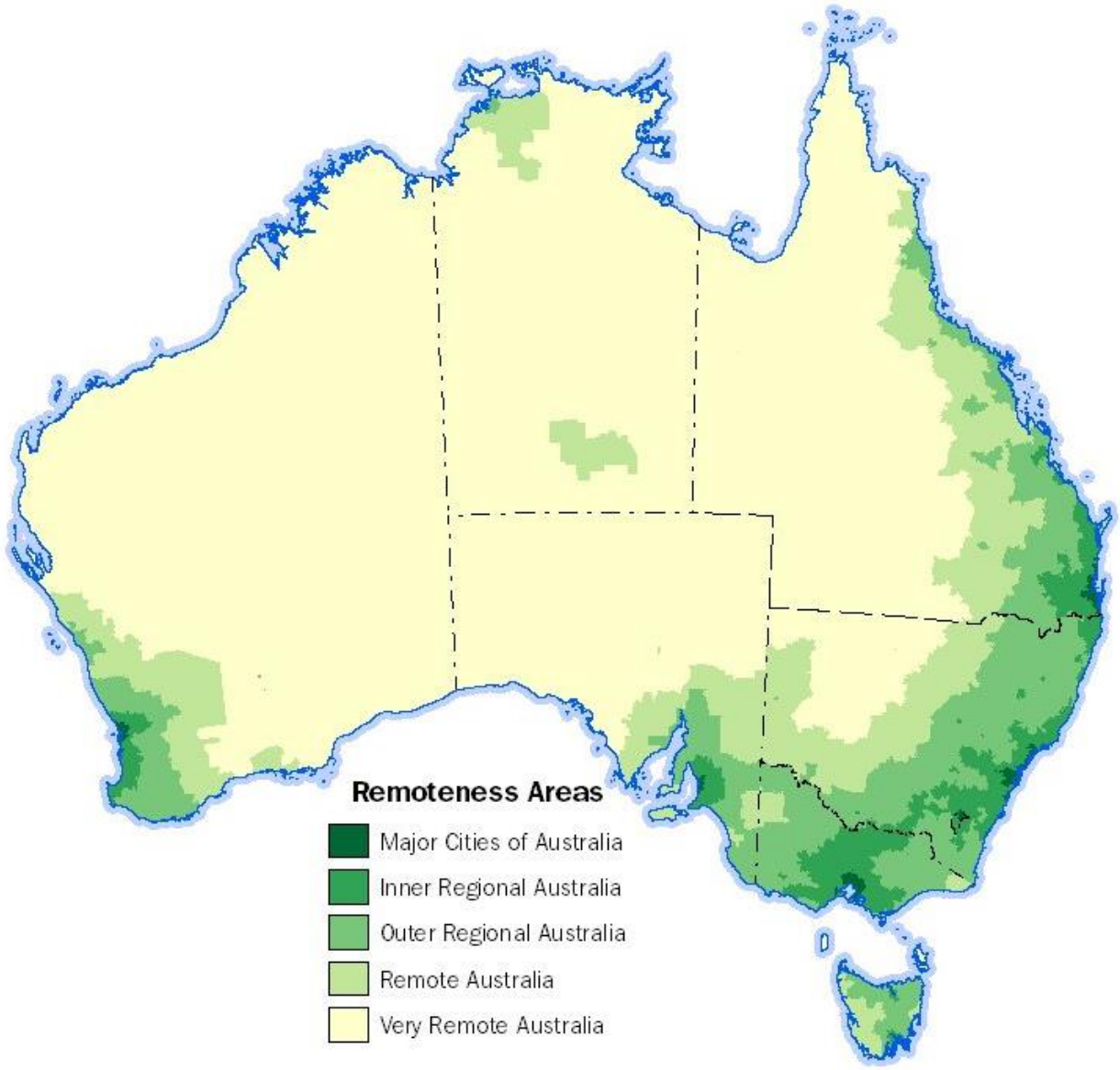
$ISS = 4^2 + 5^2 + 2^2$

ISS = 45 (critical injury)

Appendix 6: Australian Statistical Geography Standard Remoteness Areas

The Australian Statistical Geography Standard (ASGS) Remoteness Areas (RA) is based on the Accessibility and Remoteness Index of Australia which defines locations in terms of remoteness, i.e. the physical distance of a location from the nearest urban centre (access to goods and services) based on population size.

Figure 35: Map of 2016 Remoteness areas for Australia



Source: ABS, http://www.abs.gov.au/websitedbs/d3310114.nsf/home/remoteness+structure

For further information on ASGS-RA please see The Australian Statistical Geography Standard (ASGS) Remoteness Structure on the Australian Bureau of Statistics website.