



ANNUAL REPORT

1 JULY 2023 TO 30 JUNE 2024

AUSTRALIA
NEW ZEALAND
TRAUMA REGISTRY
*Management of the
Severely Injured*

ANNUAL REPORT

1 JULY 2023 TO 30 JUNE 2024

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FOREWORD

The Australia New Zealand Trauma Registry has consolidated its important position in providing data for research into serious injuries and outcomes amongst those hospitalised in Australia and Aotearoa New Zealand.

This year, following a review of our governance structure, we welcomed representatives from the Royal Australasian College of Surgeons and the Australian & New Zealand Trauma Society onto the Australia New Zealand Trauma Registry Board. Both organisations were founders of the original registry led by Queensland Surgeon Dr Cliff Pollard in 1993^[1]. This evolved into the formation of the Australian Trauma Registry in 2012, prior to combining with Aotearoa New Zealand contributors to form the current ANZTR in 2018^[2]. This partnership continues the history of Trans-Tasman collegiality born of trauma, dating back to the First World War when the Australian and New Zealand Army Corps (ANZAC) was formed.

We also welcomed a Nursing Representative to facilitate contributions from the trauma nursing community, as well as representatives from the Australian Capital Territory and Northern Territory, ensuring our board membership now reflects representation from all Australian states and territories.

The success of the registry is due to the diligence and contributions of all the contributing sites. It is a collaboration built on the uniform desire to improve the outcome of the seriously injured. The ANZTR provides a large cohort that can be used as a basis to review not only national, state and territory, but also individual sites caseloads and outcomes. We are very grateful to all the people involved in the care of the injured and to all the sites that contribute data.

To ensure more comprehensive data capture the ANZTR is now welcoming regional sites that are not level 1 trauma centers into the consortium, so that their patients, their care and their data may be represented as well. To affect both, the new governance structure and increasing inclusiveness, a new collaboration agreement has been developed and will be sent to all contributing sites in Australia in early 2026.

The continuation of the registry would not be possible without the support of the major funding

agencies - the Australian Department of Health, Disability and Ageing through the National Clinical Quality Registry Program; the Australian Bureau of Infrastructure and Transport Research Economics; and Te Whatu Ora - Health New Zealand.

This report includes a key contribution from Professor Zsolt Balogh from John Hunter Hospital in Newcastle NSW. Zsolt and co-researchers have recognized that poly system trauma is a unique disease state, with unique clinical associations and outcomes that need to be recognised to ensure the best possible recovery. We are very grateful for Zsolt's national and internationally recognised contributions to trauma care. We will include polytrauma data in future reports.

In 2026 we are looking forward to finalising the collaboration agreement, ethics and governance approvals, and policy documents across all sites, further improving the clinician and public portal, collaborating and contributing data to new and existing research projects, contributing to the Department of Health, Disability and Ageing (National Clinical Quality Registry Program) economic evaluation of clinical registries, integrating the work of the new Data Governance Group into registry functioning and governance processes, and developing data linkage projects using registry data.

Recent events across Aotearoa New Zealand and Australia have again demonstrated a defining shared principle: in times of crisis, people step forward to help one another. The often unrecognised yet unwavering actions of bystanders at the scene of injury remind us that improving outcomes for the seriously injured is a collective responsibility. From community responders through to pre-hospital and emergency teams, acute care and rehabilitation services, and the families and friends who walk alongside patients, we all carry part of the burden of trauma. This shared commitment underscores the vital role and enduring value of a bi-national trauma registry.

Finally, a huge thanks to the dedicated nurses, doctors, paramedics, administrators, allied health workers, rehabilitators and researchers who support the recovery and reintegration of the severely injured. We also thank all contributing sites for their ongoing commitment, and we look forward to welcoming further collaborations.

Professor Mark Fitzgerald
Co-Chair ANZTR Board

Professor Kirsten Vallmuur
Co-Chair ANZTR Board

ANZTR Board Members

Professor Mark Fitzgerald
Professor Kirsten Vallmuur
Dr Tim Andrews
Professor Zsolt Balogh
Professor Peter Cameron
Dr Sean Chan
Associate Professor Grant Christey
Associate Professor Dan Ellis
Professor Belinda Gabbe
Dr Matthew Hope
Ms Nicole Kelly
Dr Yen Kim
Dr Lizanne Koning
Associate Professor Adam Mahoney
Ms Ancelin McKimmie
Dr James Moore
Dr Max Raos
Professor Dieter Weber



The Patient Journey Designed by artist Sam Walker-Wilson
This image represents the journey of a patient who has experienced trauma. The hand and footprints are black signifying the darkness of trauma and the impact it has. The red medicine flowers are of great cultural significance representing healing and the care provided by all healthcare professionals. And the meeting places are the site of trauma or at hospital where family, first responders or health professionals have gathered.

2023-24 YEAR IN REVIEW

AUSTRALIA

DEMOGRAPHICS

10,719 severely injured



33% occurred on the WEEKEND

median **AGE 53**

72.5% MALE

CAUSE OF INJURY

3.7% penetrating trauma
<1% BURNS

45.6% TRANSPORT RELATED

95.1% BLUNT trauma

38.4% FALLS

PLACE OF INJURY

46.6% streets & highways

29.9% home

PRE-HOSPITAL

69.6% direct from scene to definitive HOSPITAL

Median time from injury to definitive care **1hr 37mins**

HOSPITAL

Median time spent in ED **5hrs 0mins**

MEDIAN length of stay **7.2 days**

34.0% admitted to ICU
median ICU length of stay **4.5 DAYS**

OUTCOMES

9.3% in-hospital deaths

56.6% of deaths aged 70+

6.4% of deaths OCCURRED IN ED

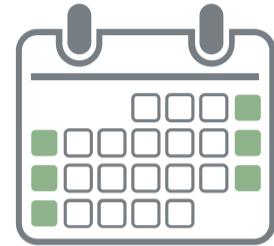
61.6% discharged home

15.8% to rehabilitation

2023-24 YEAR IN REVIEW NEW ZEALAND

DEMOGRAPHICS

1,828 severely injured



37%
occurred on the
WEEKEND

median
AGE 49

71.3%
MALE

CAUSE OF INJURY

3.2%
penetrating
trauma
<1% BURNS

47.9% TRANSPORT
RELATED

95.8%
BLUNT
trauma

32.6%
FALLS

PLACE OF INJURY

46.9% streets &
highways

22.5% home

PRE-HOSPITAL

74.9% direct
from scene
to definitive
HOSPITAL

Median time
from injury
to definitive care
1hr 45mins

HOSPITAL

Median time
spent in ED
5hrs 12mins

median
length
of stay
7.6 days

33.0%
admitted
to ICU
median ICU
length of stay
4.0 DAYS

OUTCOMES

7.3%
in-hospital
deaths

50.4%
of deaths
aged **70+**

6.8%
of deaths
OCCURRED IN ED

58.3% discharged **home**

21.5% to rehabilitation

EXECUTIVE SUMMARY

Quality improvement in the Australian and New Zealand trauma system

The Australia New Zealand Trauma Registry (ANZTR) is a bi-national clinical quality registry for major trauma. The ANZTR collects and reports on data on the most severely injured (injury severity score >12 or death following injury) from all Major Trauma Services (MTS) across Australia and New Zealand in accordance with the Bi-national Trauma Minimum Dataset (BNTMDS).

The principal purpose of the ANZTR is to monitor and benchmark the quality of trauma care. This is achieved through the systematic collection and analysis of standardised data, which enables the identification and reporting of unexplained variation for key indicators of quality and safety in trauma care. The ANZTR provides analysis of risk-adjusted outcomes for participating MTS, enabling benchmarking of performance, and importantly flagging areas in which patient outcomes could be improved. In doing so, the ANZTR informs and supports system-wide improvements in trauma service delivery bi-nationally.

Polytrauma

This year's report introduces a new focus on polytrauma. Polytrauma is defined as having at least two significant injuries in two body regions and is associated with physiological compromise and systematic inflammation, and comparatively poorer outcomes^[3]. As detailed in the focus section, the recent recognition of polytrauma by the World Health Organization as a specific and complex disease, represents an important development in trauma care. Moving forward, the ANZTR will continue to report annually on polytrauma.

Polytrauma in Australia and New Zealand

In the 2023-24 financial year, polytrauma represented approximately one quarter of major trauma admissions. These patients typically sustained injury from high-energy mechanisms, including motor vehicle and motorcycle crashes, and high falls. The

incidence of polytrauma was higher among younger adults, and was associated with a comparatively higher case-fatality rate and prolonged length of stay (acute admission and ICU). By incorporating polytrauma into routine reporting, the ANZTR will highlight the need for specific focus on this high-risk population in injury prevention, clinical care, and research.

Outcomes

The case fatality rate was 9.0%, which is slightly decreased compared with previous years. The risk-adjusted mortality rate indicates one outlier above the 95% confidence interval among older adults (≥ 70 years). For hospital length of stay there were no outliers for the paediatric groups, but outliers above the 95% confidence interval in the other groups; this variation was most prominent in the older adults group. Further examination into factors contributing to extended length of stay is required. For older adults in particular, this may relate to discharge planning, access to geriatric rehabilitation, and access to aged care accommodation.

Updates to Bi-national Trauma Minimum Data Set (BNTMDS)

The latest minimum dataset (BNTMDS V2.2) has been published, and includes a number of updates to support consistency and quality of data collection. The key updates include additional detail and clarification for ANZTR inclusion and exclusion criteria, supported by a structured decision-making algorithm to aid consistent case ascertainment across contributing MTS. These refinements will support improved data comparability across jurisdictions, and ensure analyses and benchmarking are based on consistently collected and high quality data. Many thanks to the ANZTR Data Working Group for their advice, input and review of various iterations of the update. The ANZTR will continue to develop the BNTMDS and suggestions for inclusion or improvements are welcomed, and will be considered in an open forum.

Outlier Policy

The ANZTR is establishing a formal Outlier Policy. The purpose of this policy is to detail i) the standardised and consistent processes for identifying potential outlier status for clinical outcomes reported by the ANZTR and ii) the processes for effectively communicating outlier status with the relevant MTS. The policy establishes clear thresholds for identifying statistical outliers, outlines the process for data validation and communication with sites, and provides mechanisms for review. MTS identified as outliers will be provided a comprehensive outlier report, which will enable the service to examine their data following risk adjustment, identify potentially contributing factors, and implement changes where appropriate. This policy will support and strengthen the feedback mechanism of the ANZTR, further enhancing the registry's ability to drive clinical quality improvement.

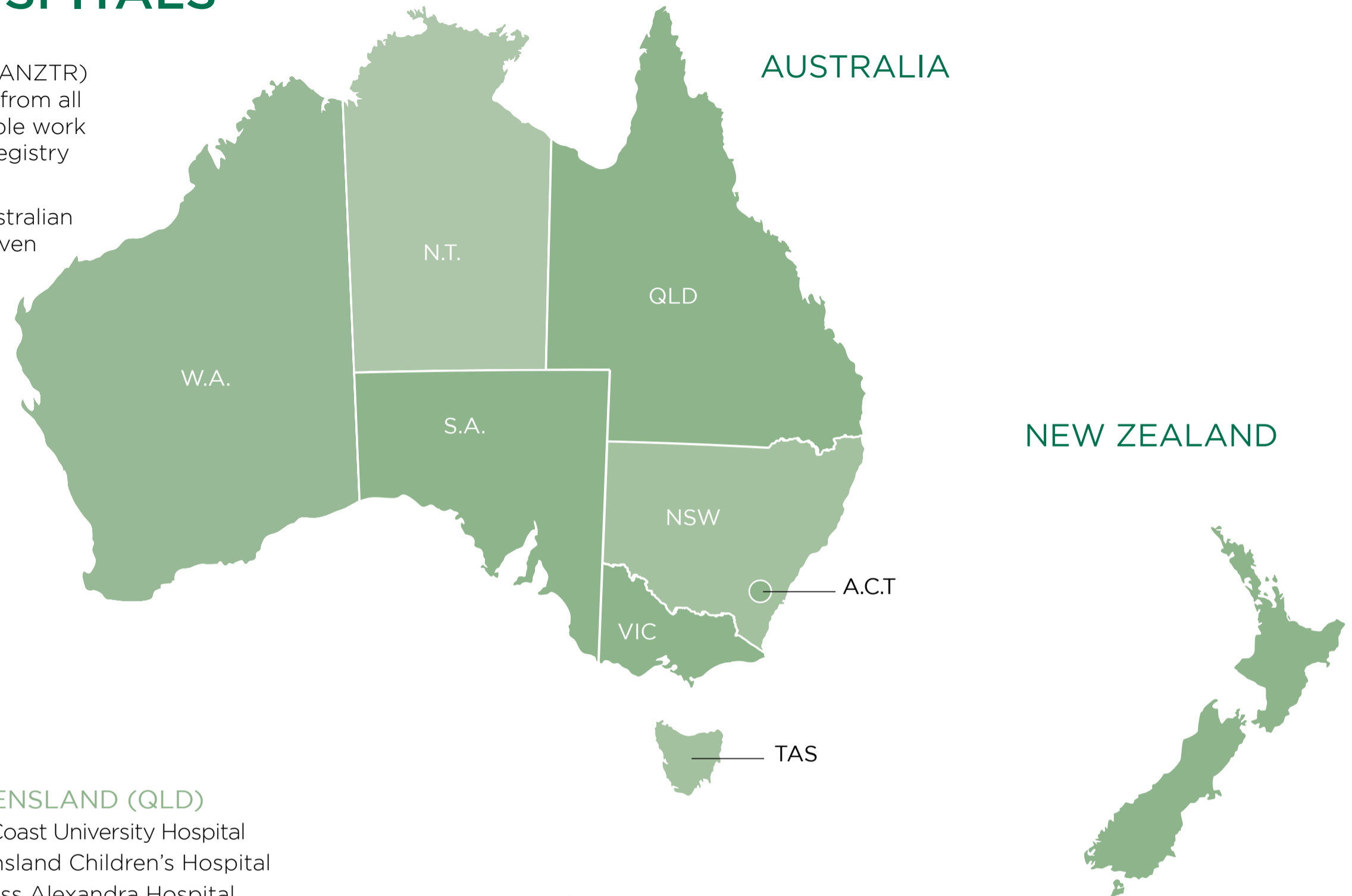
Professor Peter Cameron
University Representative
Monash University

Ancelin McKimmie
ANZTR Manager

CONTRIBUTING HOSPITALS

The Australia New Zealand Trauma Registry (ANZTR) would like to thank the Trauma Registry staff from all contributing registries and sites for the valuable work they perform on a daily basis to ensure the Registry receives quality data in a timely fashion.

The ANZTR has nine years of high quality Australian data from 1 July 2015 to 30 June 2024 and seven years of high quality New Zealand data from 1 July 2017 to 30 June 2024. Sites which have commenced data submissions after these start dates are noted below.



JURISDICTIONS

AUSTRALIAN CAPITAL TERRITORY (A.C.T.)

Canberra Hospital

NEW SOUTH WALES (N.S.W.)

NSW data submitted by the Institute of Trauma and Injury Management (ITIM)*

Children's Hospital, Westmead
 John Hunter Children's Hospital
 John Hunter Hospital
 Liverpool Hospital
 Royal North Shore Hospital
 Royal Prince Alfred Hospital
 St George Hospital
 St Vincent's Hospital
 Sydney Children's Hospital
 Westmead Hospital

**NSW data for this reporting period are incomplete. Additional cases will be captured and reported in the subsequent annual report.*

NORTHERN TERRITORY (N.T.)

Royal Darwin Hospital

QUEENSLAND (QLD)

Gold Coast University Hospital
 Queensland Children's Hospital
 Princess Alexandra Hospital
 Royal Brisbane and Women's Hospital
 Sunshine Coast University Hospital (from 1 October 2018)
 Townsville University Hospital (from 1 January 2020)

SOUTH AUSTRALIA (S.A.)

SA data submitted by the SA Department for Health and Wellbeing

Flinders Medical Centre
 Royal Adelaide Hospital
 Women's and Children's Hospital
 Lyell McEwin Hospital (from 1 January 2018)

TASMANIA (TAS)

Royal Hobart Hospital
 (from 1 April 2020)

VICTORIA (VIC)

Victorian data submitted by the Victorian State Trauma Registry (VSTR)

Alfred Hospital
 Royal Melbourne Hospital
 Royal Children's Hospital

WESTERN AUSTRALIA (W.A.)

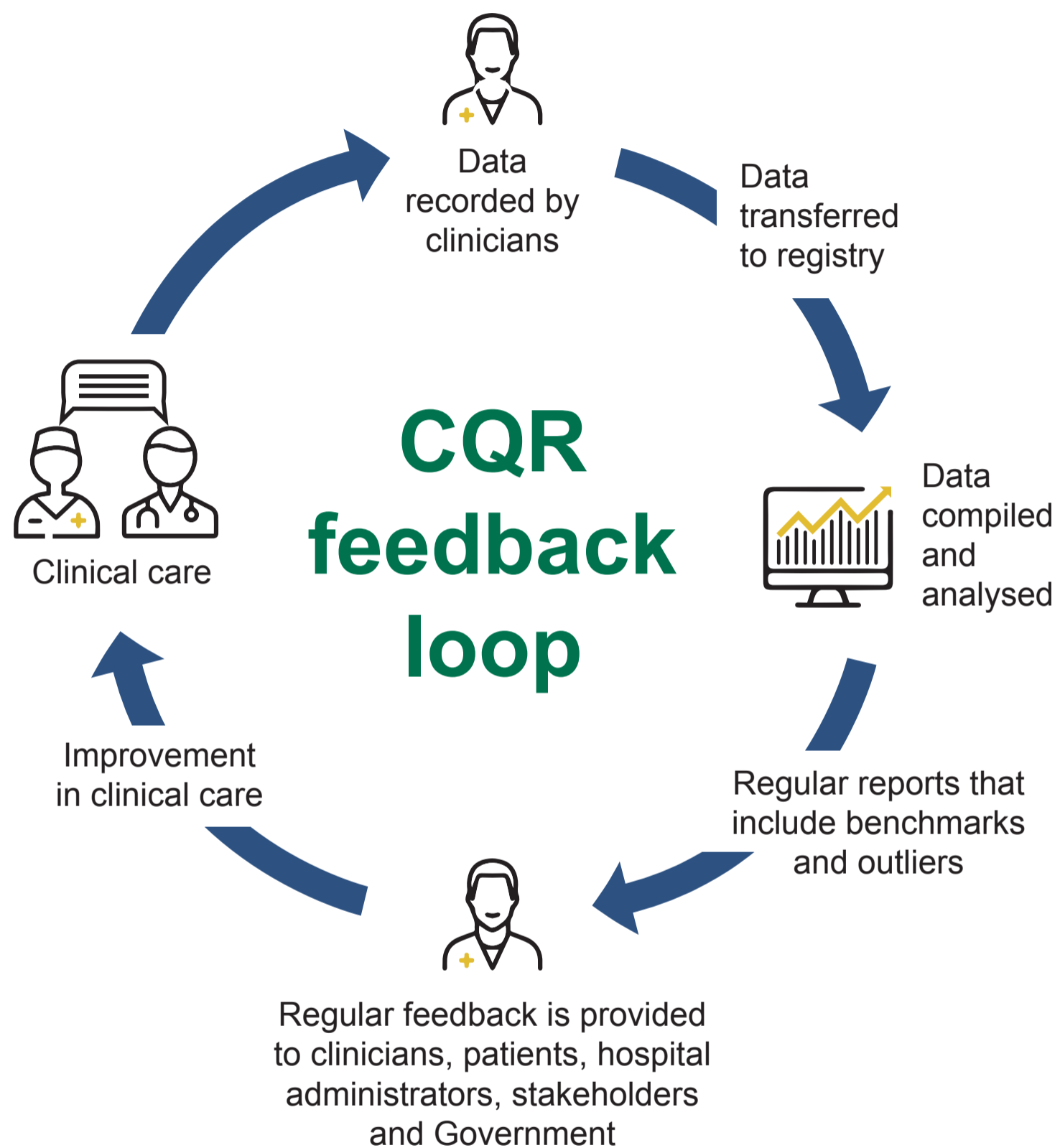
Perth Children's Hospital
 Royal Perth Hospital

NEW ZEALAND (N.Z.)

NZ data submitted by the Trauma National Clinical Network, Health New Zealand | Te Whatu Ora

Auckland City Hospital
 Starship Hospital
 Middlemore Hospital
 Waikato Hospital
 Wellington Regional Hospital
 Christchurch Hospital
 Dunedin Hospital

THE ANZTR AS A CLINICAL QUALITY REGISTRY



Operating since 2012, the ANZTR is a leading clinical quality registry (CQR). The Australian Commission on Safety and Quality in Health Care has promoted the importance of CQRs as drivers of quality improvement for over a decade, prioritising trauma due to the high burden of disease, increasing costs and unsatisfactory outcomes associated with poor quality trauma care.

In 2016, funding for the Australian Trauma Registry was the principal recommendation from the Road Safety Senate Committee. Funding was subsequently obtained from the Department of Health and the Bureau of Infrastructure, Transport, and Regional Economics to support the registry's core responsibilities and reporting. In 2018, New Zealand joined the collaboration to become the Australia New Zealand Trauma Registry. Risk-adjusted outcomes have been a feature of the ANZTR reports since 2018, providing benchmarked data to clinicians, trauma services and other stakeholders - a key component of the CQR feedback loop (Figure 1). The ANZTR collects pre-hospital and in-hospital data on the most severely injured patients, defined as an Injury Severity Score (ISS) greater than 12 or death following injury^[4]. The ANZTR continues to recruit sites with the purpose of capturing population-based data for the severely injured.

DEMOGRAPHICS

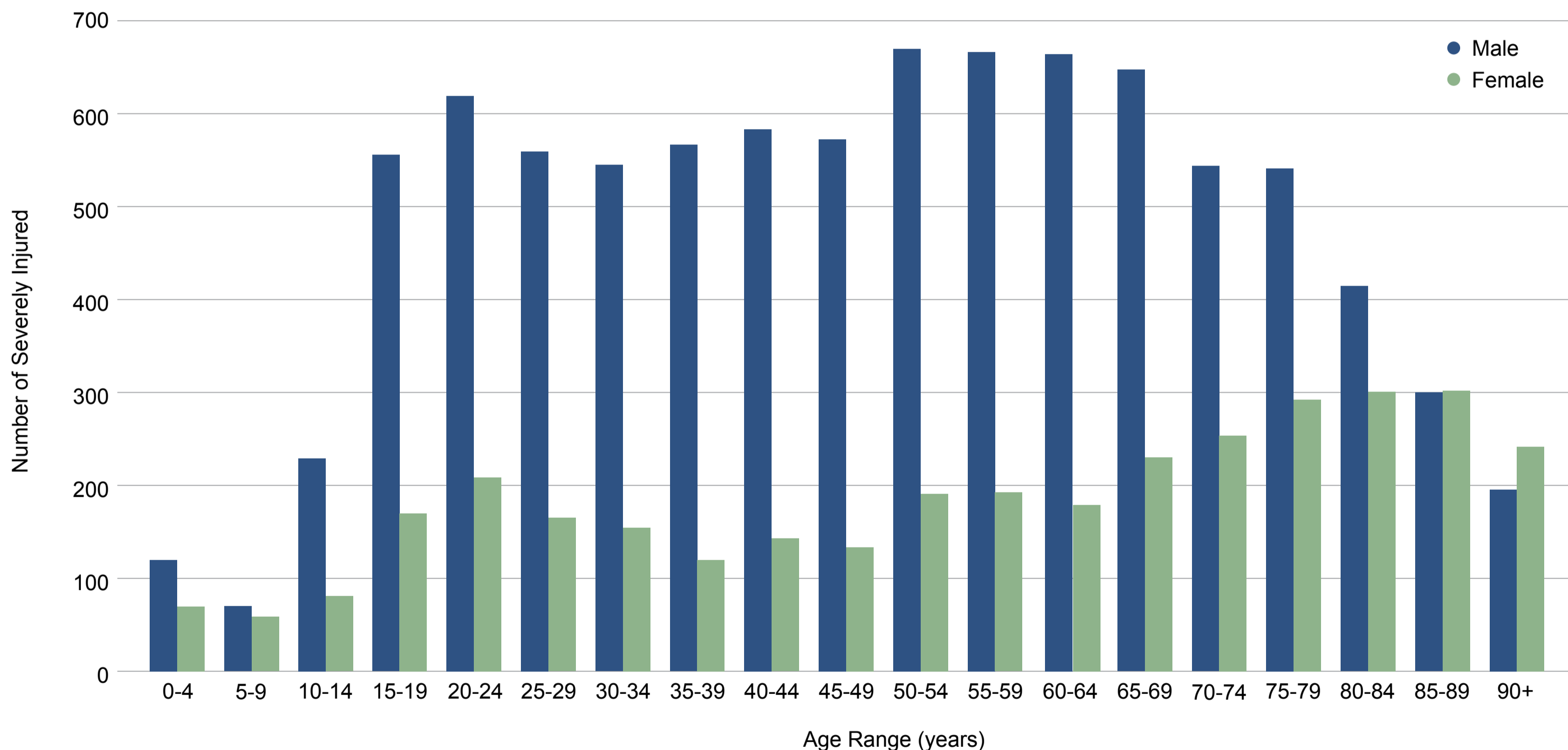
AGE AND GENDER

Incidence by age and gender showed that most severe injuries continue to involve males (72.3%). The distribution of severely injured patients according to age and gender are shown in the figure below.

The median age was 53 (IQR 31-71) years.

There were two main age-group peaks for males: the 20-29 year olds and the 50-64 year olds. For females, incidence peaked in the 15-29 year age groups and then again in the 75-89 year age groups.

median
AGE 53
72.3% MALE



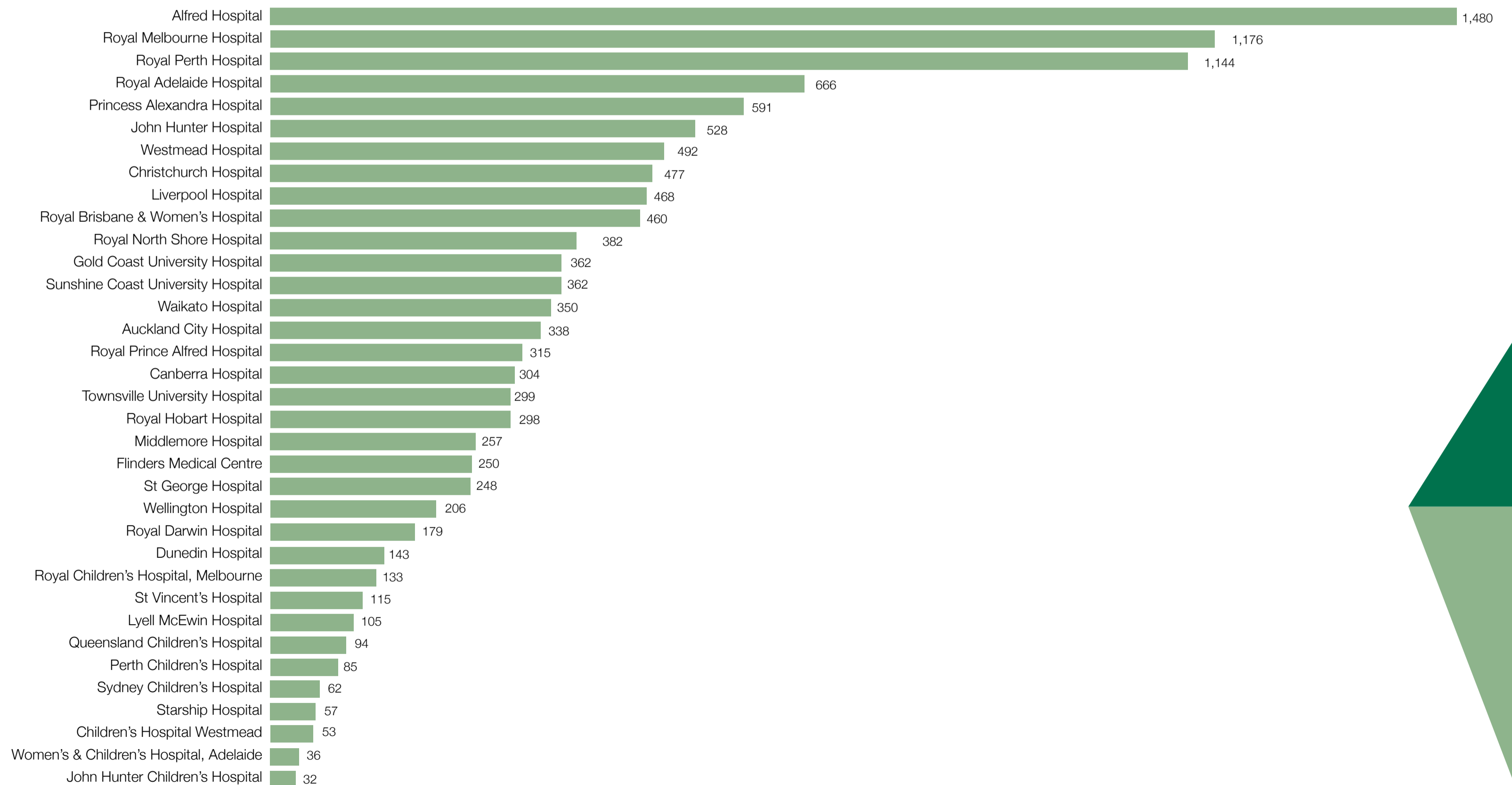
Age Group	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+
n	187	126	309	729	829	724	699	686	725	708	861	859	841	876	798	834	715	604	435

*n=2 missing age; n=5 missing gender

DEMOGRAPHICS

Across the 2023-24 financial year, 12,547 episodes of severely injured were collected by the ANZTR. 10,719 episodes were collected from 28 major trauma centres in Australia. New Zealand provided 1,828 episodes from seven trauma centres.

Number of Severely Injured 2023-24, by Hospital



INJURY EVENT

INTENT OF INJURY

Injury intent was specified for 86% of all severe injuries, 91% of which were related to unintentional injuries.

TYPE OF INJURY

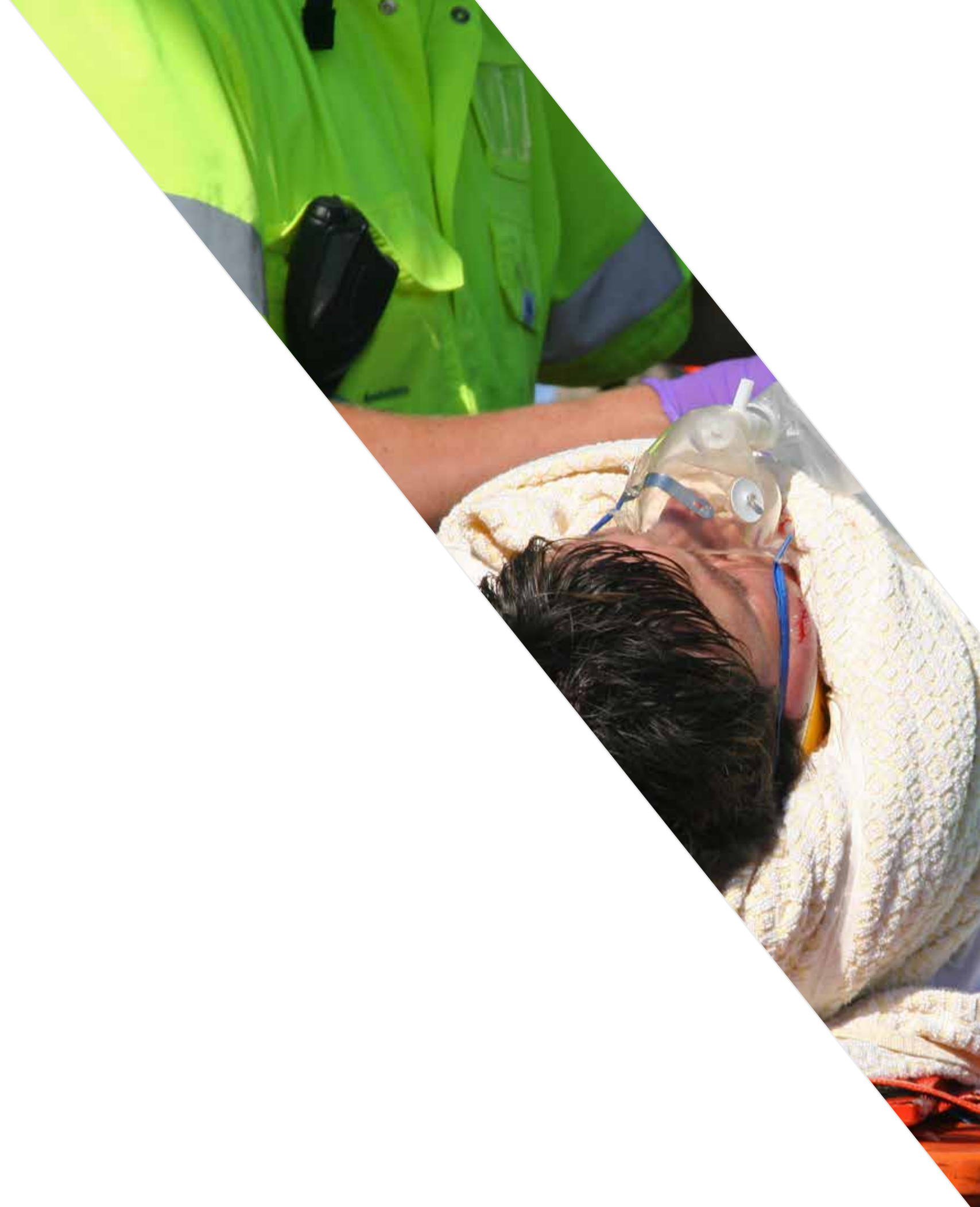
Bi-nationally, the dominant type of injury for 95% of major trauma cases was blunt injury (e.g. motor vehicle collisions, pedestrian impacts, falls, and sports injuries). Penetrating injury (e.g. stab and gunshot wounds, glass-related injuries, and impalements) accounted for 3.7% of injuries, and burns 0.7%. This is consistent with previous years.

CAUSE OF INJURY

Nearly half (45.8%) of severe injuries were transport-related, and 38% of all severe injuries were caused by falls. Combined, transport-related and falls-related injuries accounted for 83% of all severe injuries, and remain the leading cause of hospital admissions for severe injury.

PLACE OF INJURY







Eighty-five percent of severely injured patients had a known place of injury. Of those with a known place of injury, 47% occurred on the road, street or highway, followed by the home (29.2%). The home was the most common place of injury for adults aged ≥ 70 years (54.5%). The road, street or highway was the most common place of injury for all adults aged 16-69 years (56.5%) and children aged ≤ 15 years (36.4%).



INJURY EVENT

DAY OF INJURY

Approximately one third (33.8%) of severe injuries occurred on the weekend, which is consistent with previous years. Injuries relating to motorcyclists and pedal cyclists peaked on the weekend. High falls remained consistent throughout the week with a peak on Saturdays.

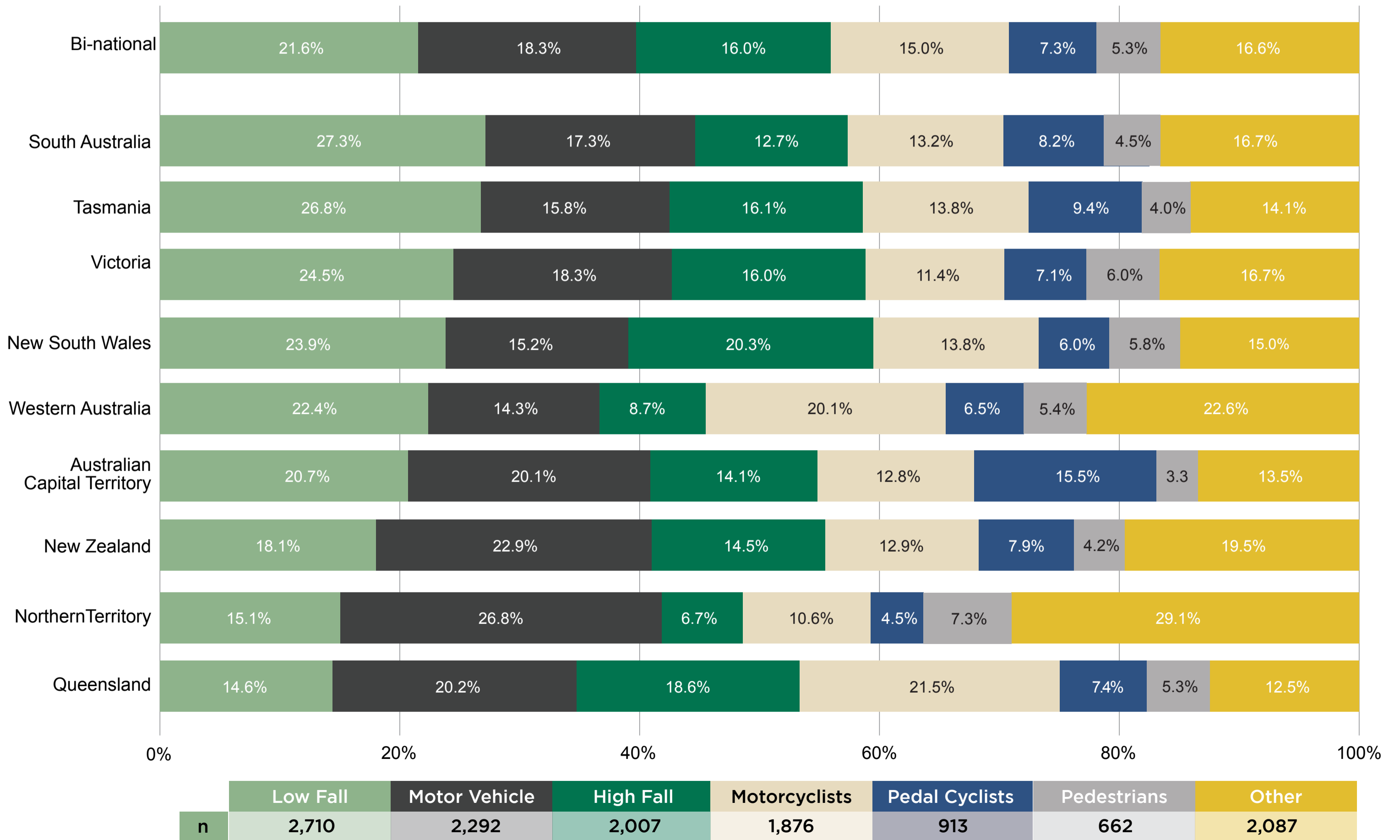
	 High Fall	 Low Fall	Transport			
			 Motor Vehicle	 Motorcyclists	 Pedal Cycle	 Pedestrian
Monday	13.2% (n=264)	13.7% (n=370)	12.4% (n=284)	10.2% (n=193)	10.5% (n=96)	13.6% (n=90)
Tuesday	12.9% (n=258)	14.8% (n=400)	13.1% (n=301)	10.7% (n=202)	10.2% (n=93)	12.1% (n=80)
Wednesday	14.0% (n=280)	12.8% (n=348)	13.6% (n=312)	10.3% (n=196)	13.6% (n=124)	17.1% (n=113)
Thursday	14.6% (n=294)	13.5% (n=366)	13.1% (n=301)	11.4% (n=216)	12.0% (n=110)	15.3% (n=101)
Friday	14.3% (n=288)	14.4% (n=389)	16.5% (n=378)	14.0% (n=265)	13.5% (n=123)	18.9% (n=125)
Saturday	17.2% (n=346)	16.9% (n=458)	16.4% (n=375)	20.6% (n=391)	22.6% (n=206)	13.0% (n=86)
Sunday	13.8% (n=277)	14.0% (n=379)	14.9% (n=341)	22.8% (n=431)	17.6% (n=161)	10.1% (n=67)
Total	100% (n=2,007)	100% (n=2,710)	100% (n=2,292)	100% (n=1,894)	100% (n=913)	100% (n=662)

INJURY EVENT

CAUSE OF INJURY BY JURISDICTIONS

Transport and falls-related injuries continue to be the most common severe injuries across all jurisdictions. In 2023-24, low falls were the most common cause in five of the nine jurisdictions and 'other specified injuries' were the most common for two jurisdictions. The category "other" includes cutting, piercing object (2.7%), includes striking against or by object (2.6%), and other transport (1.9%).

Cause of Injury by Jurisdiction



INJURY

SEVERITY OF INJURY

The Injury Severity Score (ISS) is an internationally standardised approach to describing the overall severity of injury for each patient which is derived from the Abbreviated Injury Scale (AIS). Trauma patients are allocated an ISS after injury in order to determine their status as 'major trauma'. ISS is useful for predicting hospital length of stay and associated morbidity and mortality.

In the 2023-24 financial year, most injuries admitted to hospital had an ISS in the range 16 to 24 (44%). When the cohort was broken down into gender, similar proportions by ISS range occurred.

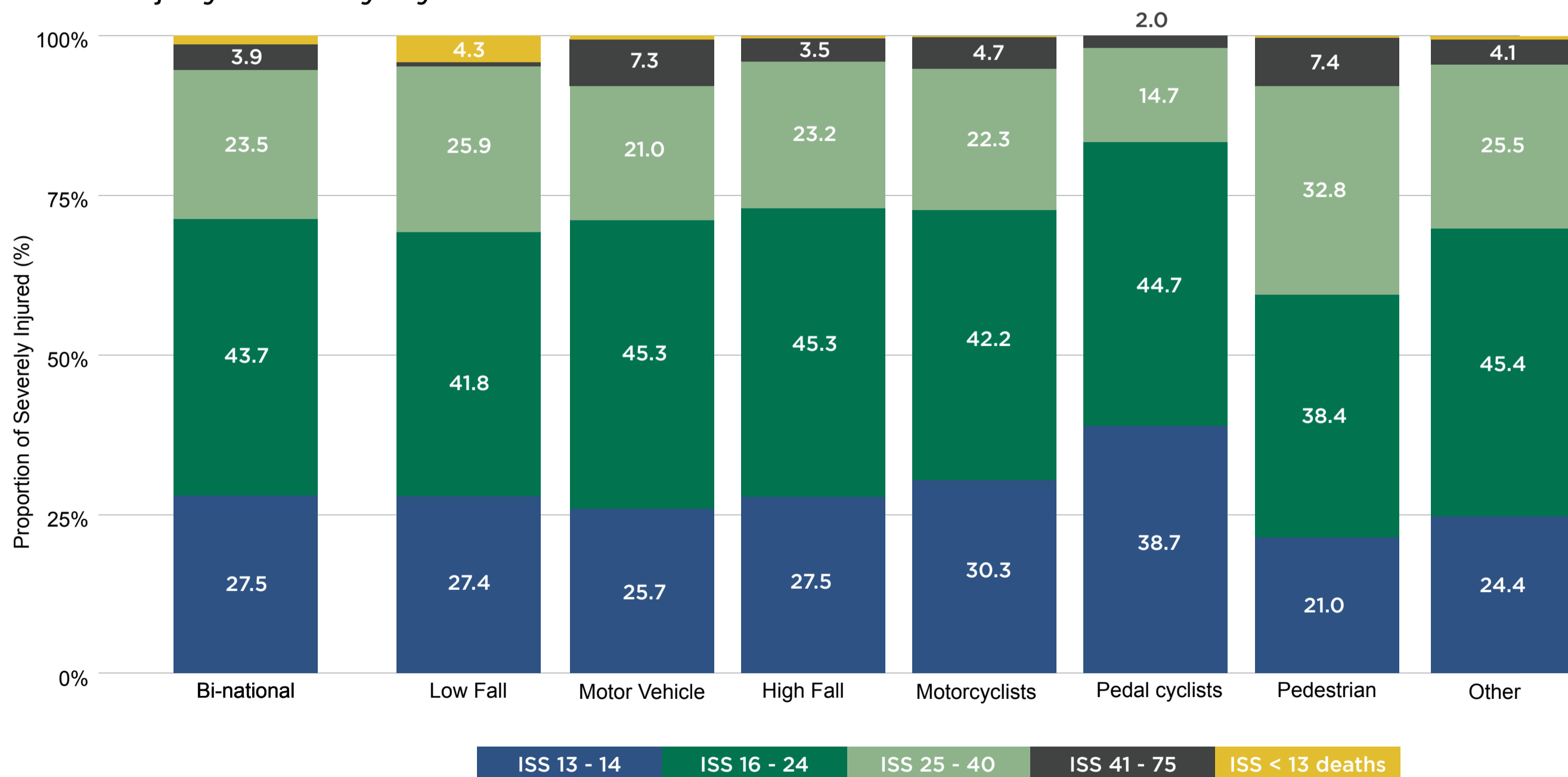
An ISS >25 was most prevalent in pedestrian and motor vehicle populations, whilst less severe injuries occurred in pedal cyclists.

DEATHS WITH ISS<13

The ANZTR also collects data on in-hospital deaths with an ISS less than 13. For the 2023-24 financial year there were 165 patients:

- 85% were aged 70+ years
- 72% were caused by a low fall
- 13% died in the emergency department

Injury Severity by Cause



INJURIES SUSTAINED

Multiple injuries (excluding serious neurotrauma) were the most prevalent across all jurisdictions for the severely injured, followed by 'head and other associated injuries', and 'isolated head injuries'. This is consistent with the previous annual report. Six patients were without AIS coding to ascertain injury severity.

Injuries Sustained by Jurisdiction



Jurisdiction	Severly Injured (n)	Jurisdiction	Severly Injured (n)
Bi National	12,547	Western Australia	1,229
Victoria	2,789	South Australia	1,057
New South Wales	2,695	Australian Capital Territory	304
Queensland	2,168	Tasmania	298
New Zealand	1,828	Northern Territory	179

Gender	Male	Female
n*	9,070	3,472

*5 without gender specified

"Multiple injuries, burns and other" includes multiple body region injuries (excluding serious neurotrauma), burns, and other injuries that do not fit into any of the other groups.

Head and other associated injuries = head injury with AIS > 2 in addition to another injury .

Isolated head injury = head injury with AIS > 2 and no other injury with AIS > 1.

Extremity and/or spine injuries only = extremity injury with AIS > 1 and/or spine injury with AIS 2 or 3 and no other injury with AIS > 1.

Chest and/or abdominal injuries only = chest and/or abdominal injury with AIS > 2 and no other injury with AIS > 1 in other body regions.

Serious spinal cord injury = spinal cord injury with AIS > 3 with or without other injuries.

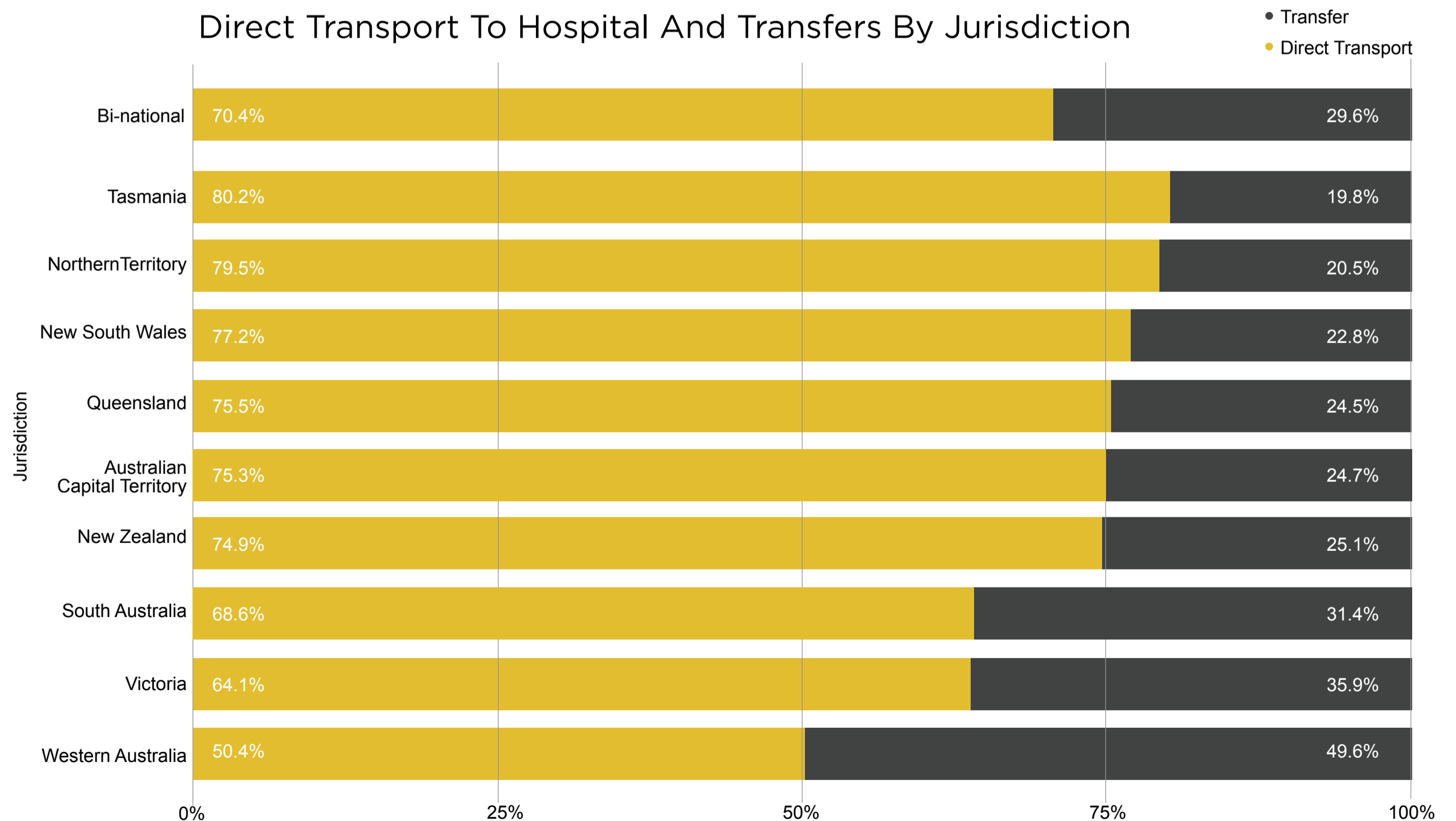
TRANSPORT TO HOSPITAL

Over two thirds (70.1%) of severely injured patients were transported from the scene to definitive care. Of those transported directly, 76% arrived via road ambulance, 16% via helicopter and 5.1% via private vehicle/walk in.

For the severely injured that arrived at a major trauma service via one or more hospitals, 58% were transported from the scene by road ambulance, 18% via private vehicle/walk-in and 3.3% via helicopter.

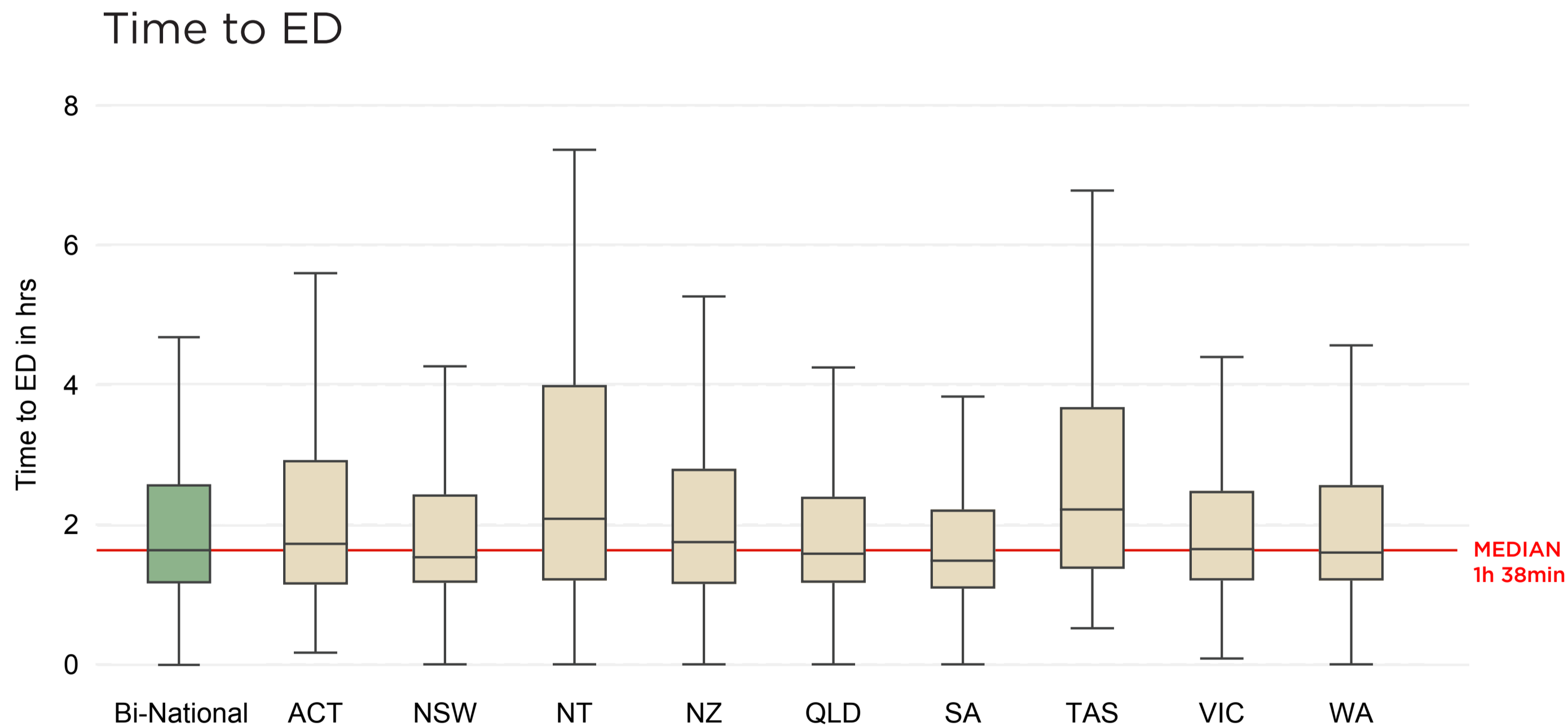
The number of patients who arrived at definitive care either directly from the scene or via a different health service varied between jurisdictions. Direct transport from the scene to hospital ranged from 50% to 80% across sites.

Direct Transport To Hospital And Transfers By Jurisdiction



TIME FROM INJURY TO EMERGENCY DEPARTMENT

Time to Emergency Department was analysed for patients conveyed directly from injury to definitive care. The median time from injury to definitive care was **1 hour 38 minutes**. The box and whisker plots presented in this report represent the median, interquartile range and range - where the edges of the box represent the lower and upper quartiles, the line in the middle of the box is the median, and the whiskers represent the range.



*Excludes outliers & transfers

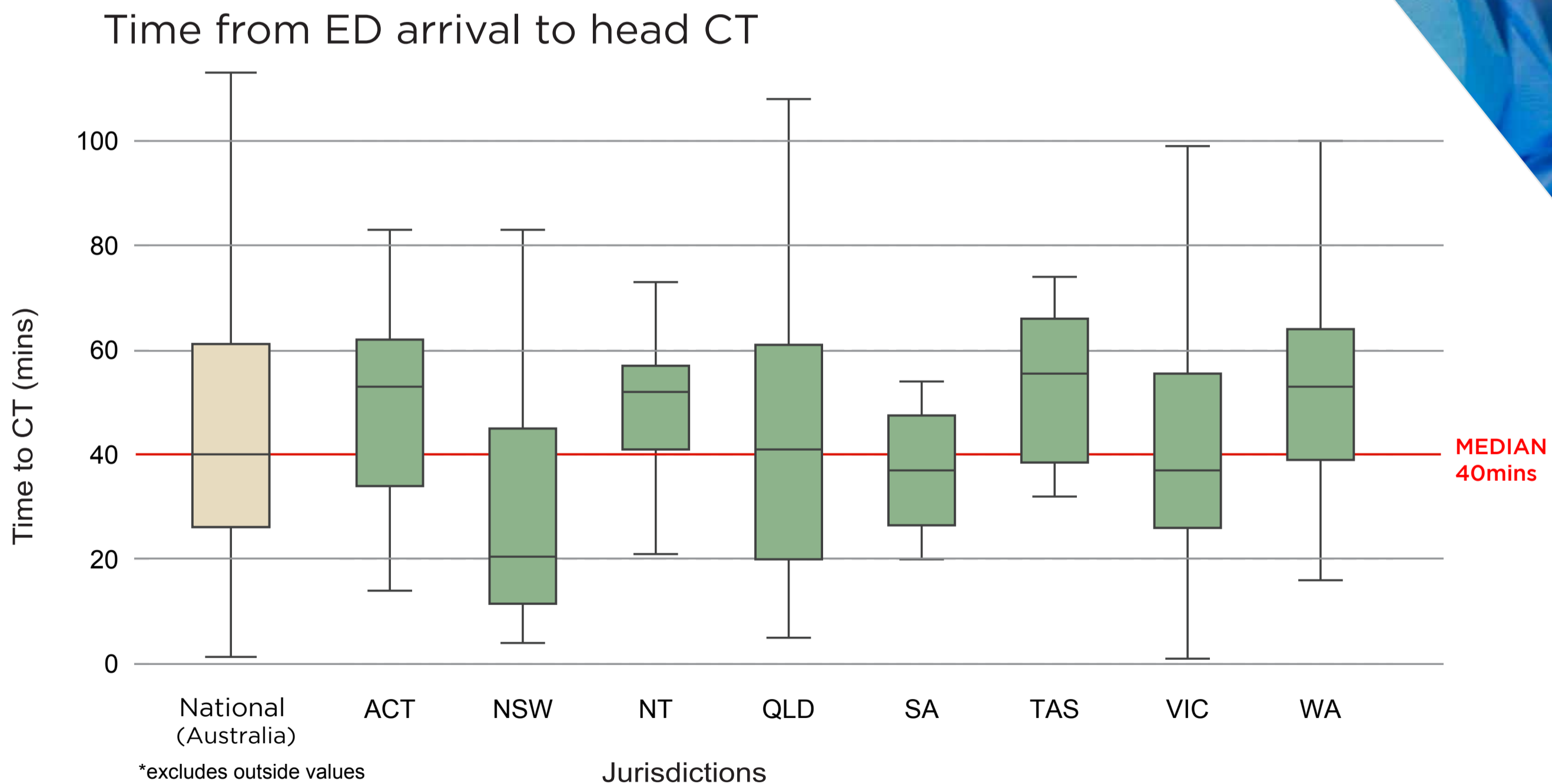
* Extreme outliers are values smaller than the lower quartile minus 1.5 times the interquartile range (IQR) or values larger than the upper quartile plus 1.5 times the IQR

** For NT, this is inclusive of 'Directly from Scene' & 'Clinic Transfers' to Royal Darwin Hospital

TRAUMA CENTRE CARE

TIME FROM ED ARRIVAL TO HEAD COMPUTED TOMOGRAPHY (CT)

The time to first head CT for patients with a total Glasgow Coma Scale (GCS) less than 13 was analysed for Australian sites. NZ does not submit data for type of CT and is excluded from the box plot below. The median time from arrival at the definitive hospital to time of head CT for patients with a total GCS less than 13 was **40 minutes** (IQR 26 to 61 minutes).



* Extreme outliers are values smaller than the lower quartile minus 1.5 times the interquartile range (IQR) or values larger than the upper quartile plus 1.5 times the IQR.

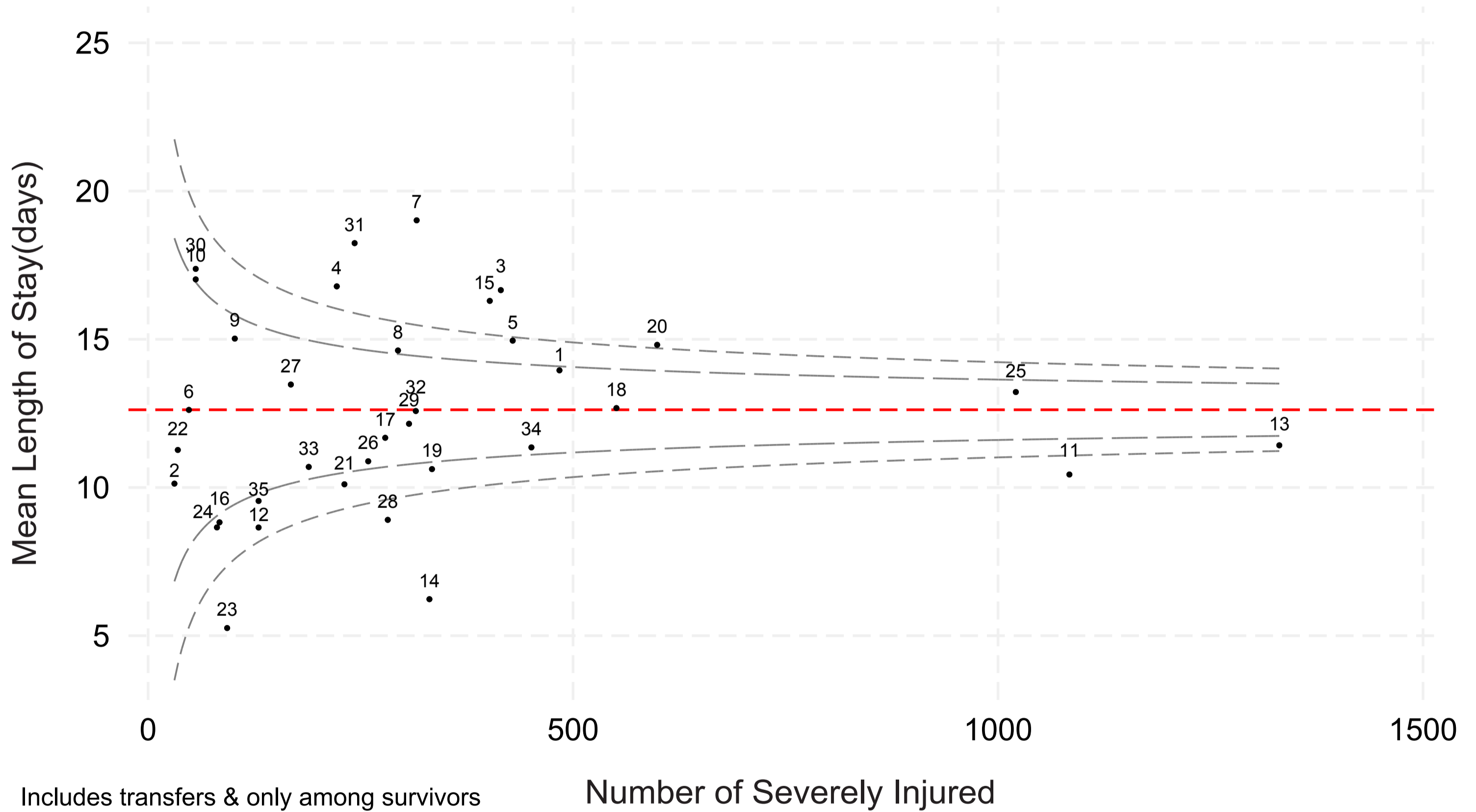
HOSPITAL LENGTH OF STAY (LOS)

Hospital Length of Stay was compared between hospitals, before and after risk adjustment. The following risk factors were included in the model as they were found to be significant predictors: Age (restricted cubic splines for age with 4 knots), shock-index (grouped in quartiles), and highest and second highest AIS scores. The mean LOS was calculated from the robust linear regression model, which accounted for the right skewness in the data. Only survivors were included in the LOS analysis. Please refer to Appendix A for more detail.

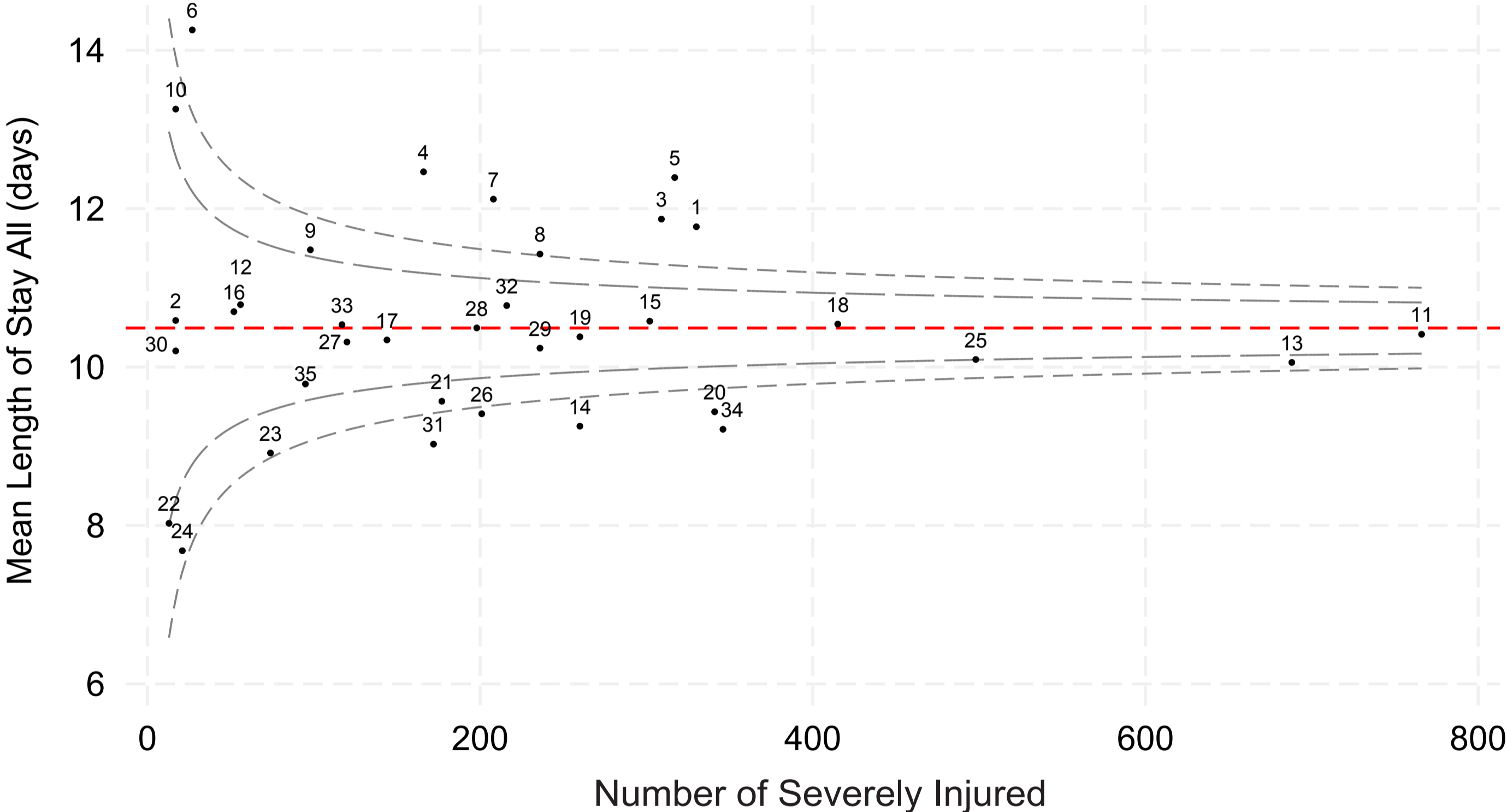
ID#	Hospital Name	Jurisdiction
1	John Hunter Hospital	NSW
2	John Hunter Children's Hospital	NSW
3	Liverpool Hospital	NSW
4	St George Hospital	NSW
5	Westmead Hospital	NSW
6	Children's Hospital, Westmead	NSW
7	Royal North Shore Hospital	NSW
8	Royal Prince Alfred Hospital	NSW
9	St Vincent's Hospital	NSW
10	Sydney Children's Hospital	NSW
11	Royal Melbourne Hospital	VIC
12	Royal Children's Hospital	VIC
13	Alfred Hospital	VIC
14	Sunshine Coast University Hospital	QLD
15	Royal Brisbane and Women's Hospital	QLD
16	Queensland Children's Hospital	QLD
17	Townsville University Hospital	QLD
18	Princess Alexandra Hospital	QLD
19	Gold Coast University Hospital	QLD
20	Royal Adelaide Hospital	SA
21	Flinders Medical Centre	SA
22	Women's and Children's Hospital	SA
23	Lyell McEwin Hospital	SA
24	Perth Children's Hospital	WA
25	Royal Perth Hospital	WA
26	Royal Hobart Hospital	TAS
27	Royal Darwin Hospital	NT
28	Canberra Hospital	ACT
29	Auckland City Hospital	NZ
30	Starship Hospital	NZ
31	Middlemore Hospital	NZ
32	Waikato Hospital	NZ
33	Wellington Hospital	NZ
34	Christchurch Hospital	NZ
35	Dunedin Hospital	NZ

RISK-ADJUSTED HOSPITAL LENGTH OF STAY BY HOSPITAL (LOS)

Unadjusted Hospital Length of Stay By Hospital



Risk-Adjusted Hospital Length of Stay By Hospital

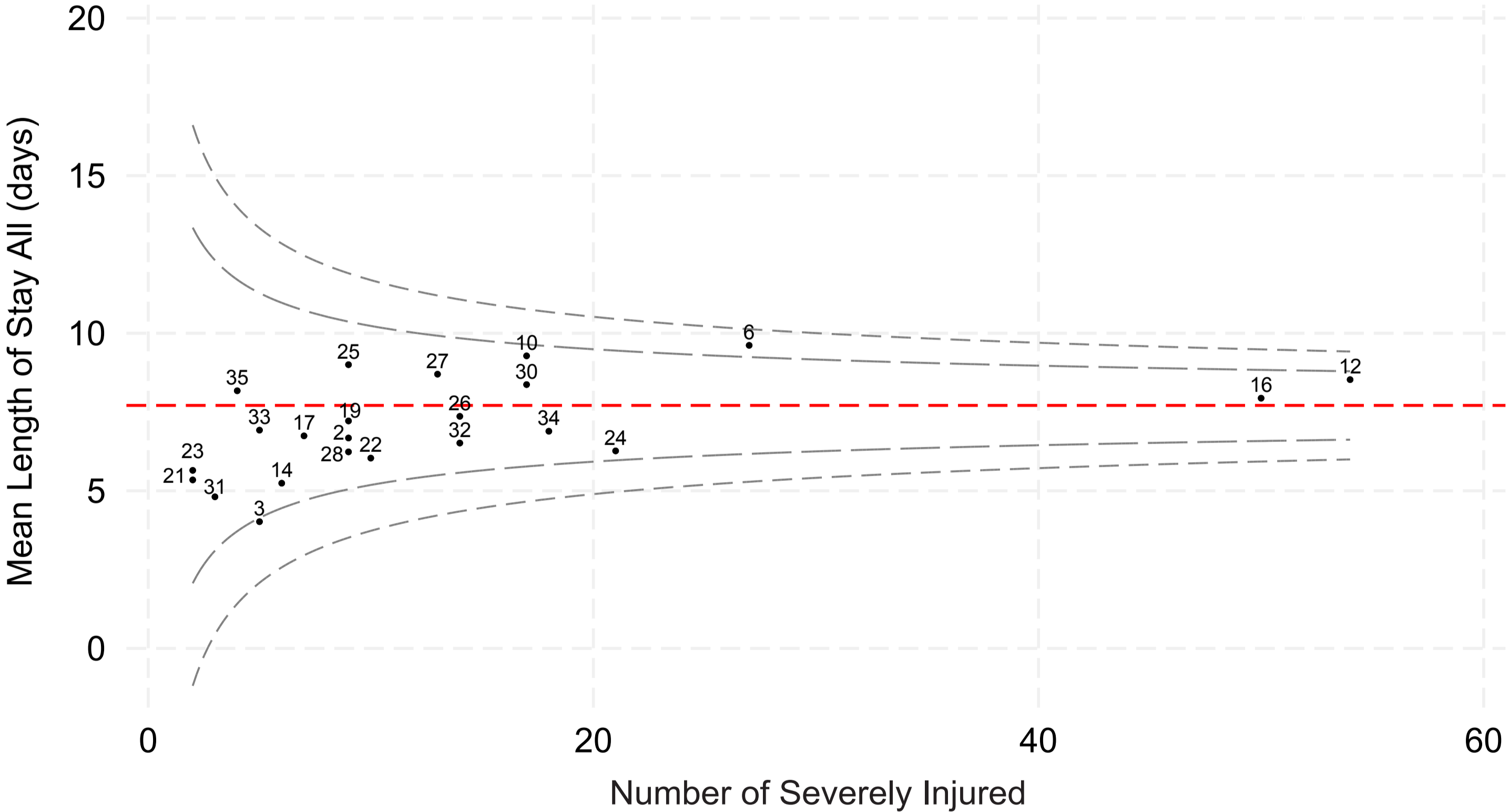


Among all age groups. Excludes transfers & includes only blunt injuries and among survivors

RISK-ADJUSTED HOSPITAL LENGTH OF STAY (LOS) BY AGE GROUPS

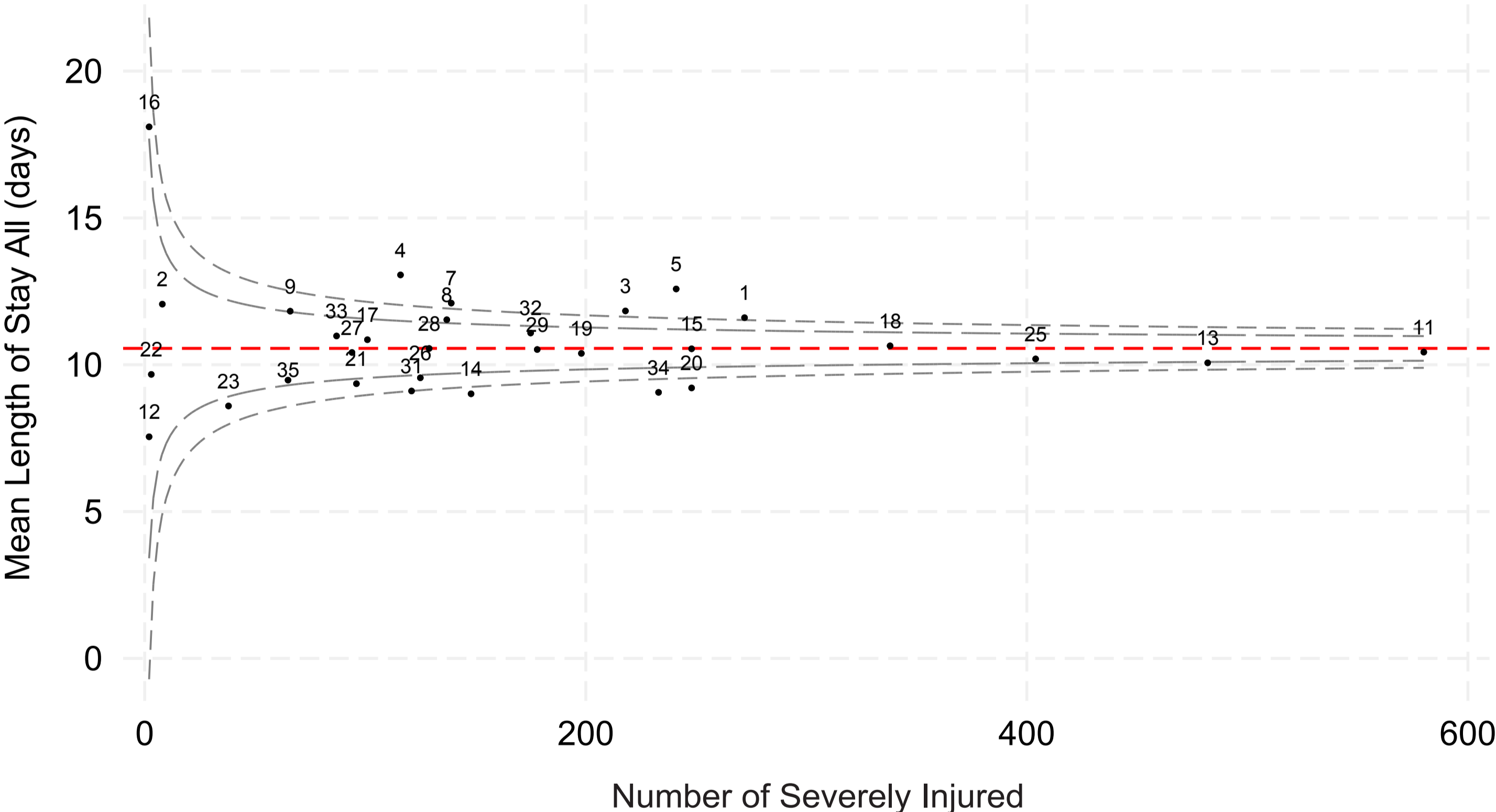
The unadjusted bi-national median (IQR) hospital LOS was 7.2 (3.7 -14.1) days. Before categorising by age, when hospitals were risk adjusted there were a number of hospitals (hospitals 1,3,4,5,6,7) with higher than expected LOS (beyond 95% confidence interval). This variation was most pronounced when presented by age group for older adults. Reasons for variations in hospital length of stay will be reviewed.

Mean Length of Stay Paediatrics (Aged ≤15years)



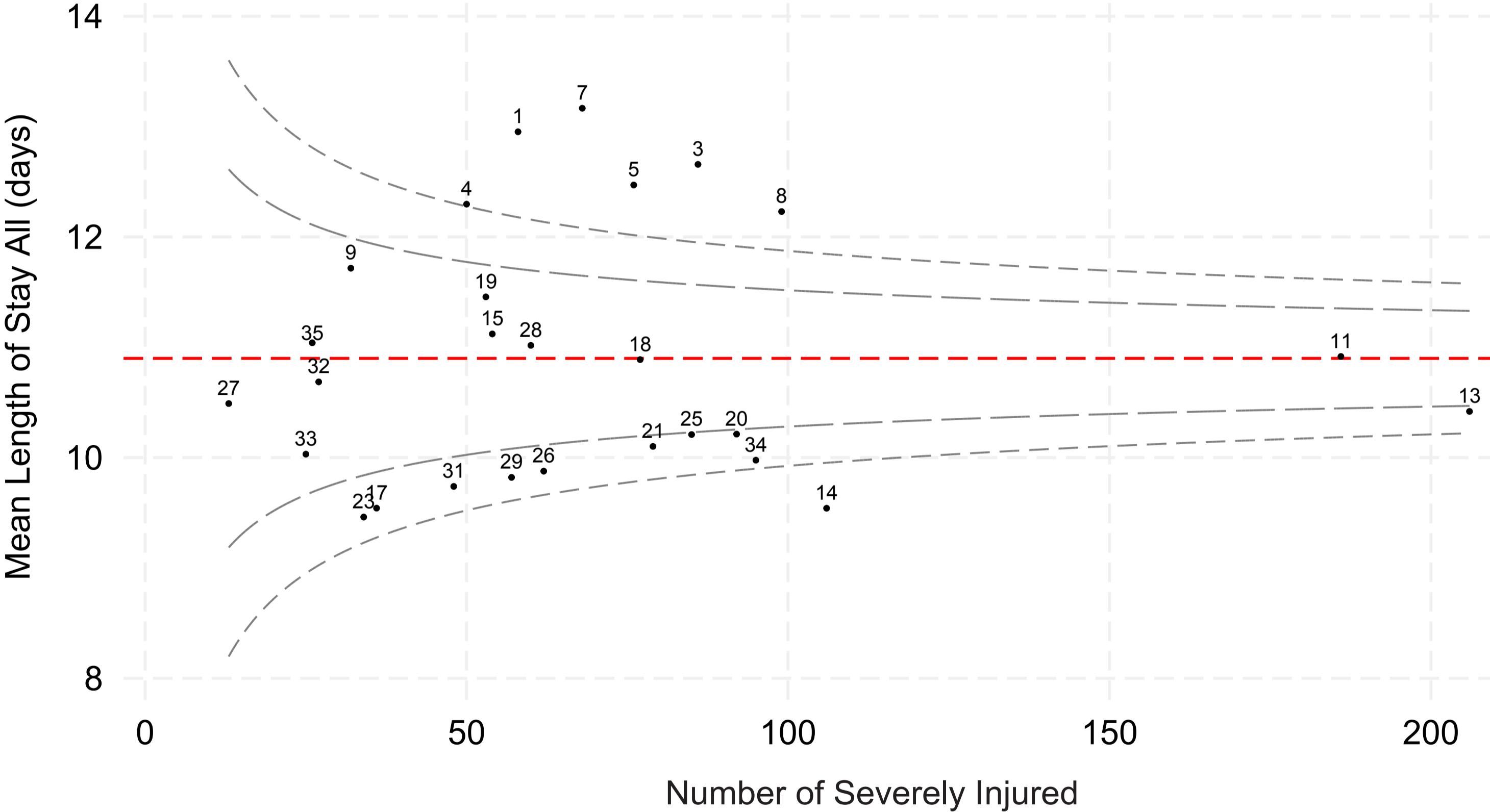
Excludes transfers & includes only blunt injuries and among survivors

Mean Length of Stay Adults (Aged ≥ 16 and ≤ 69 years)



Excludes transfers & includes only blunt injuries and among survivors

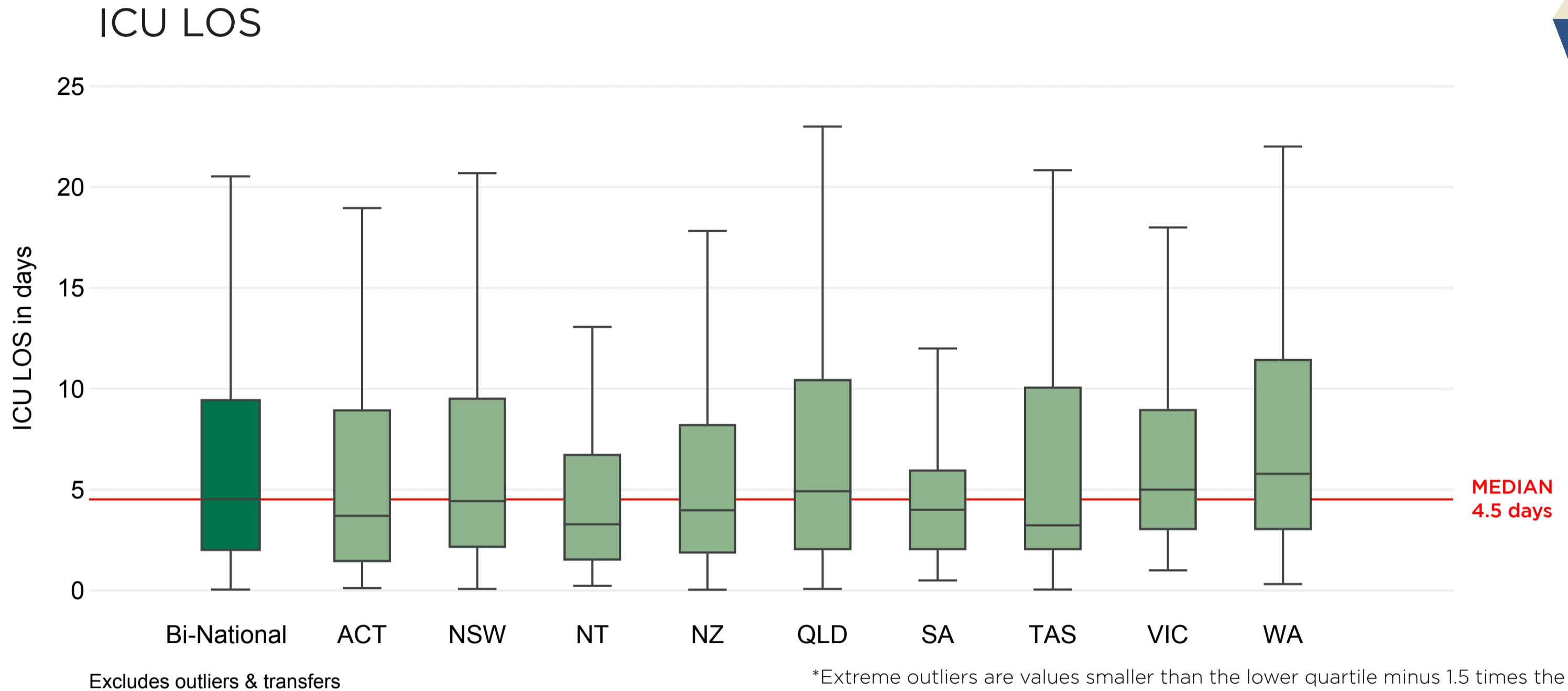
Mean Length of Stay Older Adults (Aged ≥70 years)



Excludes transfers & includes only blunt injuries and among survivors

INTENSIVE CARE UNIT (ICU) LENGTH OF STAY (LOS)

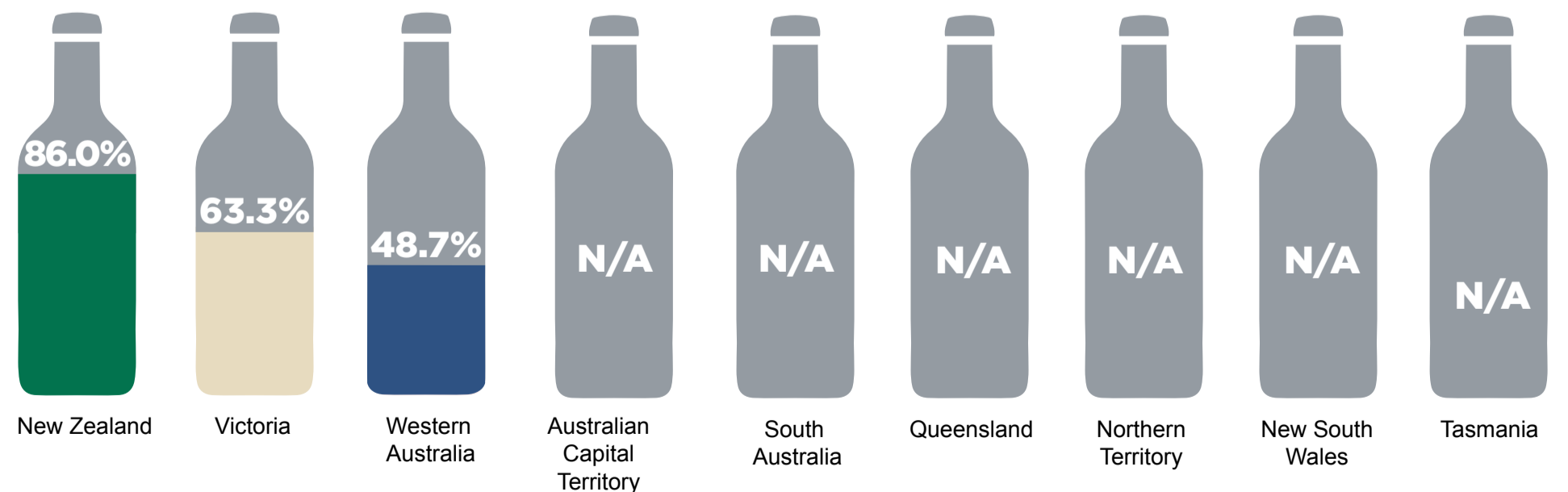
Approximately one third (34.0%) of severely injured were admitted to ICU. The bi-national median IQR for intensive care unit (ICU) length of stay was **4.5 (2.0 - 9.4) days**.



*Extreme outliers are values smaller than the lower quartile minus 1.5 times the interquartile range (IQR) or values larger than the upper quartile plus 1.5 times the IQR

BLOOD ALCOHOL CONCENTRATION COLLECTION RATE

Blood alcohol collection is one of the eight Royal Australasian College of Surgeons Trauma Quality Improvement Committee process indicators and is recommended in patients with severe injuries, defined as an ISS>12. The ANZTR does not currently receive blood alcohol concentration from all jurisdictions, and continues to work with registries and sites to improve data capture. The below figure demonstrates the proportion of severely injured cases where a blood alcohol test was performed and recorded for transport related injuries aged 15 years and older.



OUTCOMES FROM INJURY

The primary outcome collected by the ANZTR is discharge destination (including deaths). A known discharge destination was provided for 99.2% of patients.

MORTALITY

One thousand one hundred and twenty seven severely injured people died in-hospital with a bi-national mortality rate of 9.0%. Categorising by age-group identified further mortality trends in the severely injured.

Mortality Over Time

Year	Severe Injuries (n)	Deaths (n)	Deaths (%)
17/18	9,840	927	9.4
18/19	10,135	1,007	9.1
19/20	10,050	1,053	9.6
20/21	11,254	1,050	9.3
21/22	10,836	1,051	9.7
22/23	12,187	1,183	9.7
23/24	12,547	1,127	9.0

*changes in count(n) due in part to sites joining the registry (n=2 sites in 2018 and n=2 sites in 2020), and in 2023 n=2 sites resumed submission of data to the registry.



9.0% MORTALITY

↓ DECREASE FROM 9.7% IN 2022/23

8.9% OF DEATHS OCCURRED IN ED
↑ from 7.4% in 2022/23

48.0% OF DEATHS AGED 75+

68% MALE

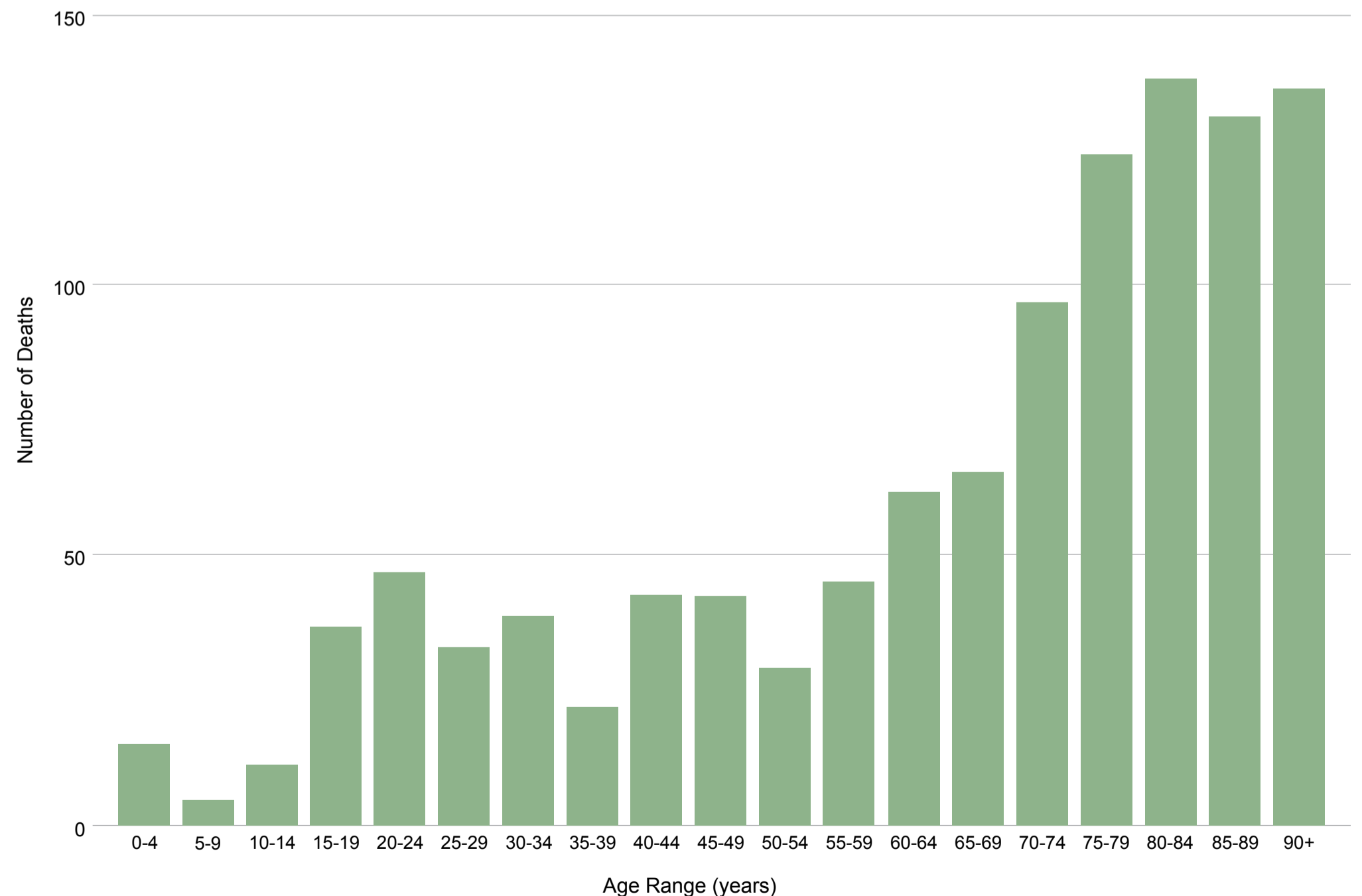
64% ISS > 24



3.9% OF DEATHS AGED ≤16 YEARS



Mortality by Age Range (years)



MORTALITY BY MECHANISM OF INJURY

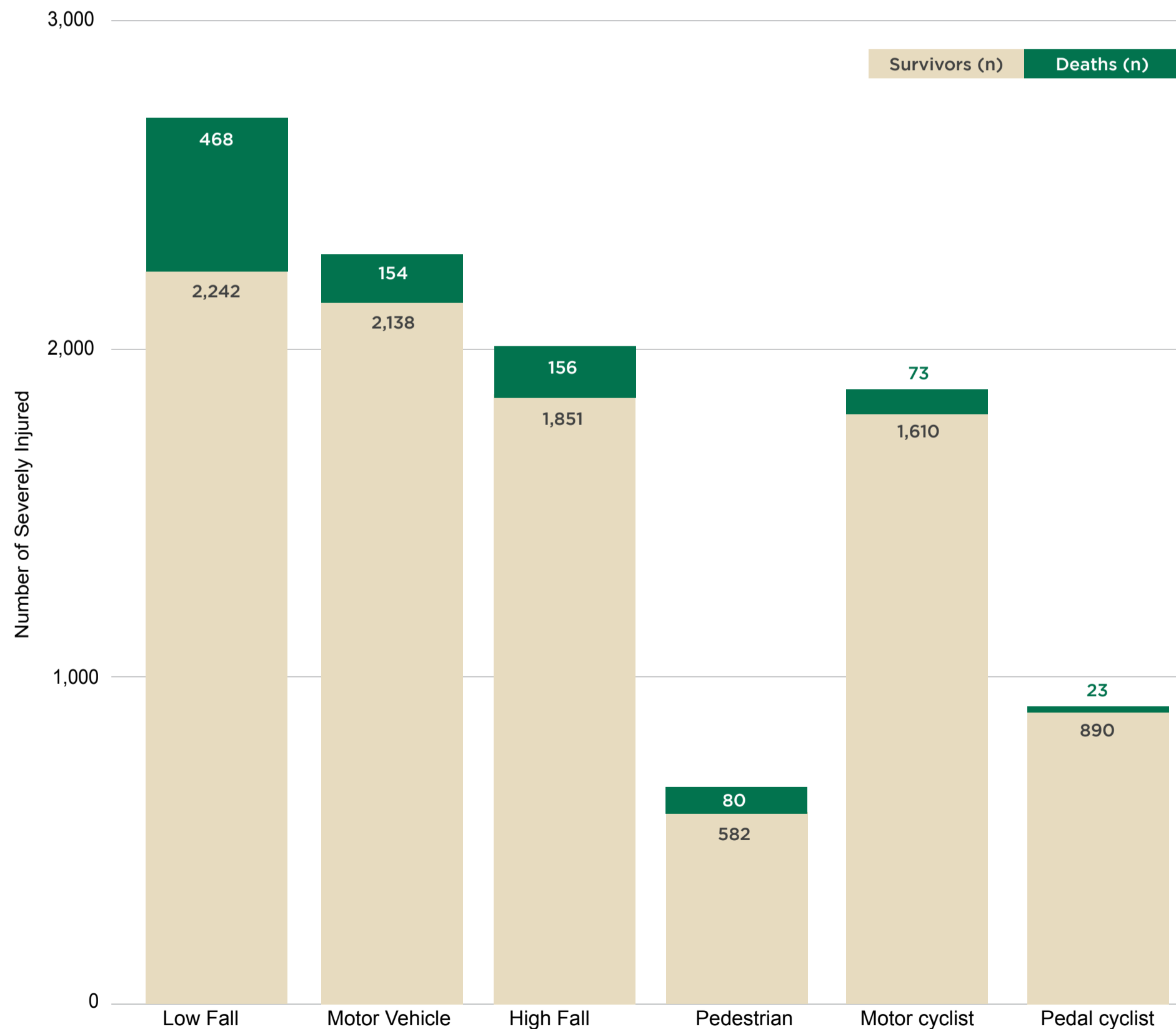
As a proportion of total deaths, low falls accounted for the highest number of deaths (41.5%) followed by transport-related deaths (29.3%). Pedal cyclists and motorcyclists had the lowest mortality rate (3.6%).

41.5% DEATHS
LOW FALLS 



29.3% DEATHS TRANSPORT
RELATED

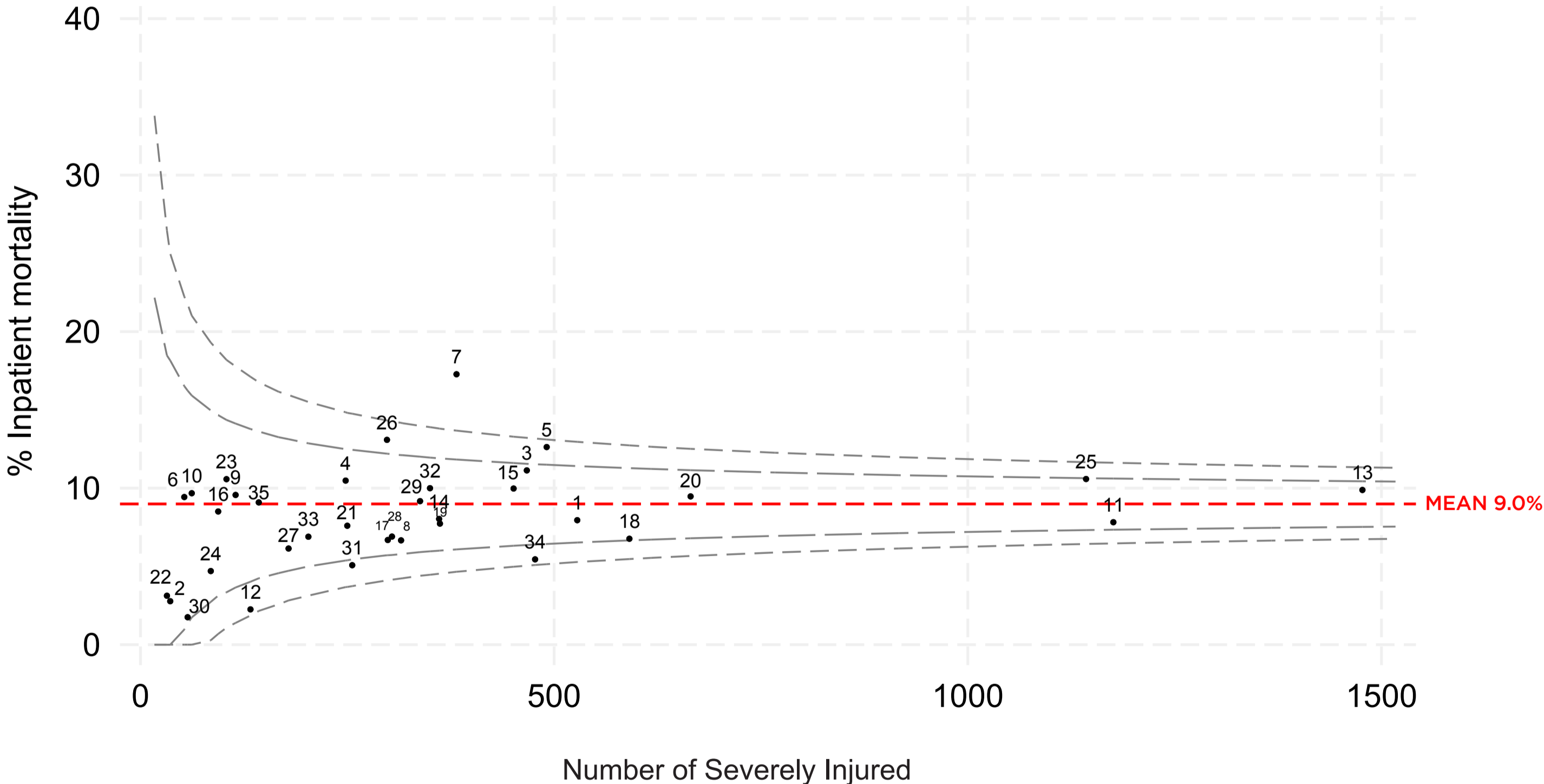
Survivors and Deaths by Injury Mechanism



UNADJUSTED MORTALITY

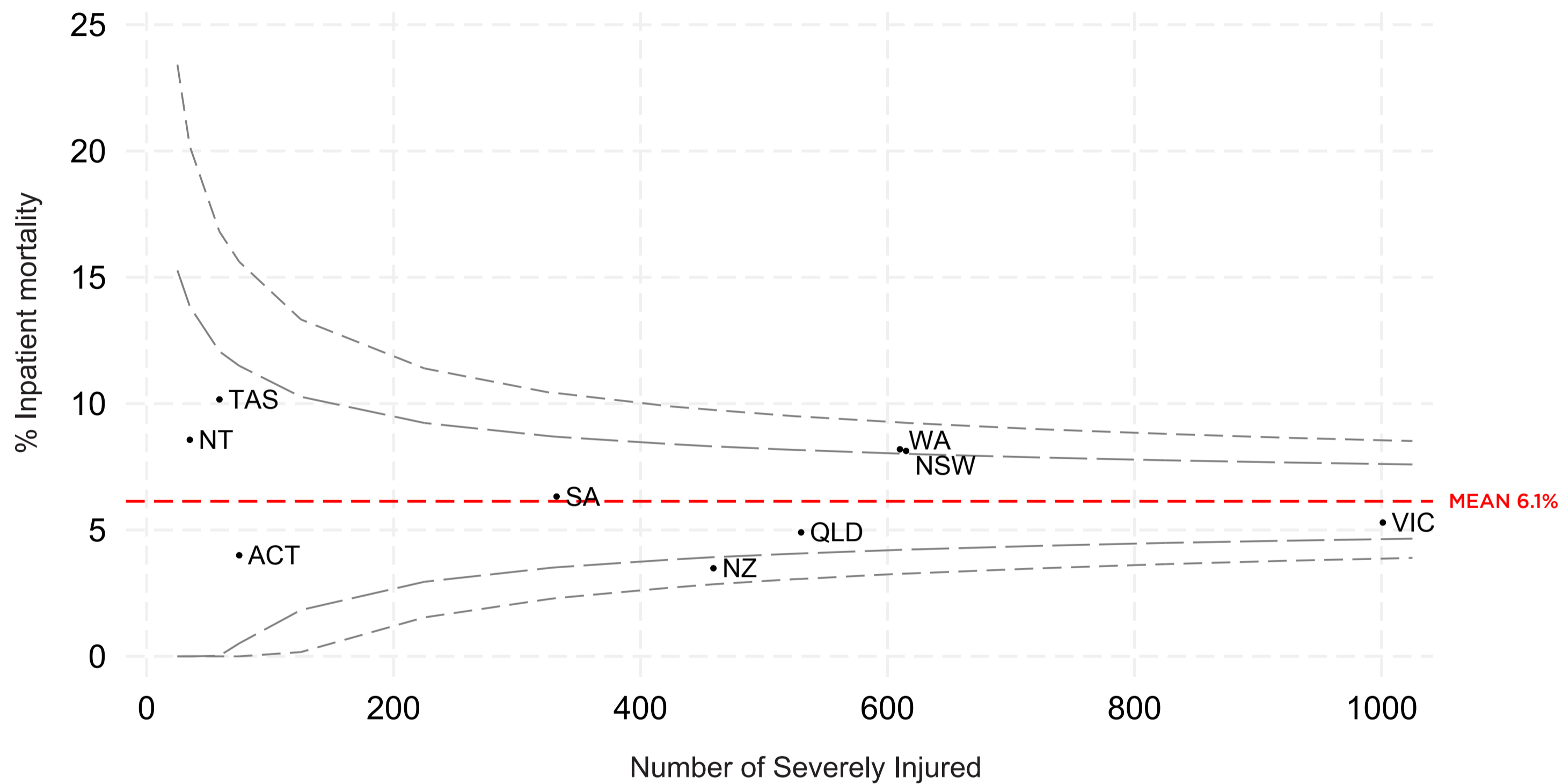
Unadjusted plots do not take into account the variations in casemix which occur between hospitals, such as patient proximity to hospital, number of transfers and prior treatment, and severity of injuries. The below plot represents unadjusted mortality by hospital, including all transfers. It allows the reader to identify the total number of severely injured patients admitted for severe injuries. Unadjusted mortality for patients who were transferred to one or more hospitals are presented on page 29, by jurisdiction.

Unadjusted Mortality By Hospital (including transfers)



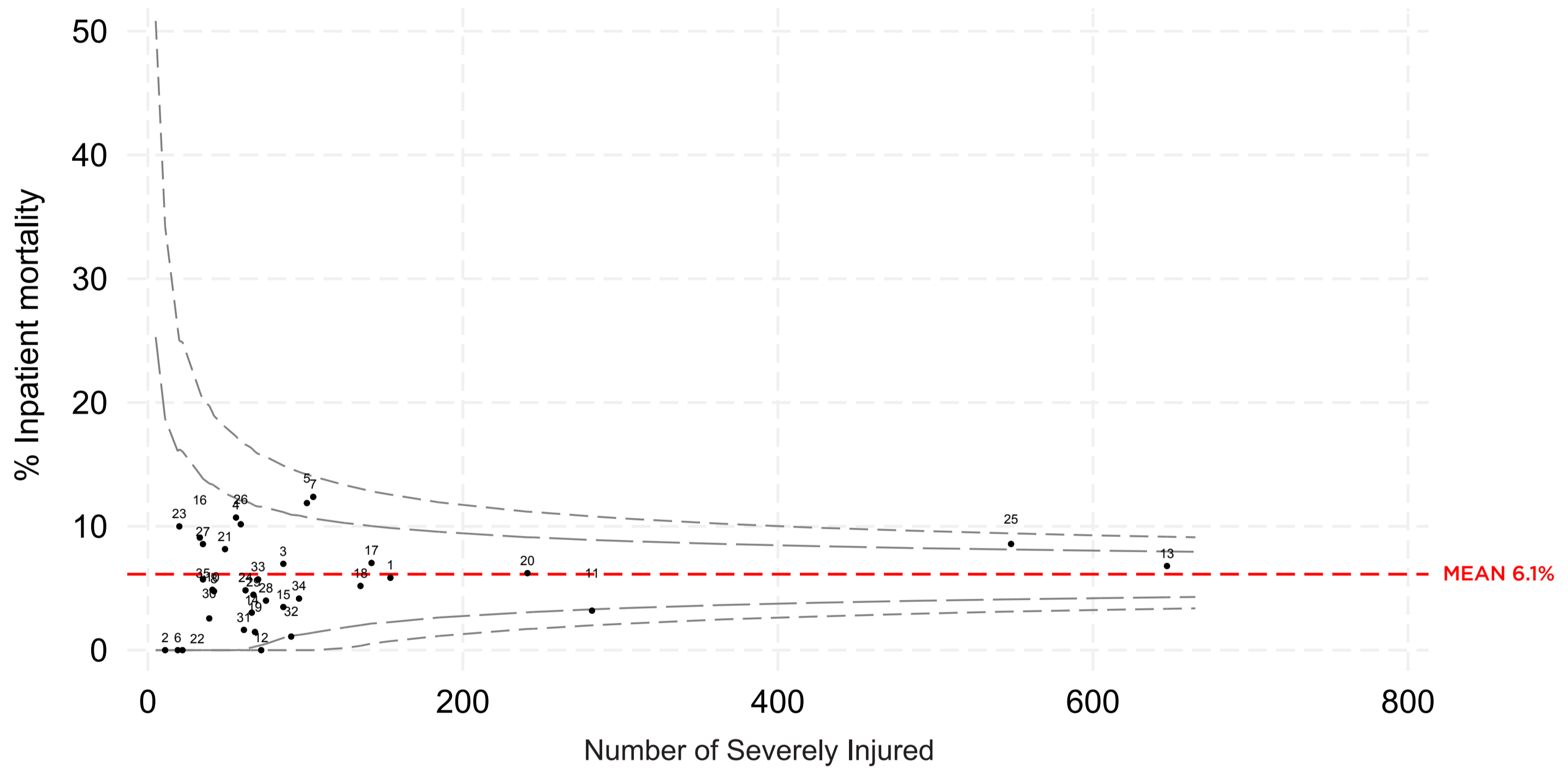
Includes transfers & non-transfers

Unadjusted Mortality By Jurisdiction (among transfers)



Among transfer patients

Unadjusted Mortality By Hospital (among transfers)



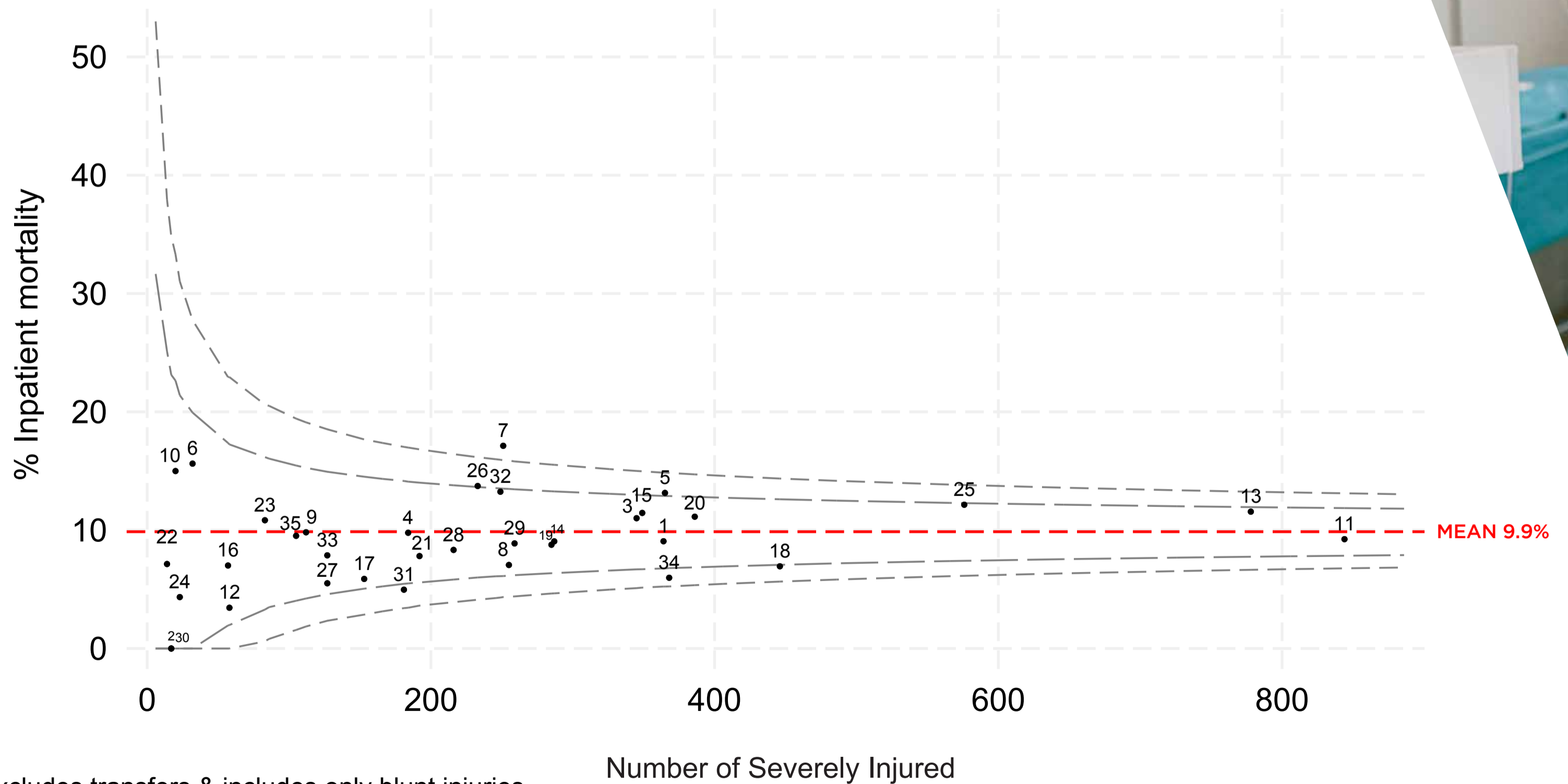
Among transfer patients

MORTALITY BY HOSPITAL (EXCLUDING TRANSFERS)

Mortality was compared between hospitals, before and after risk adjustment. The following risk factors were included in the model as they were found to be significant predictors: restricted cubic splines for age with 4 knots, cause of injury, shock-index grouped in quartiles, and highest and second highest AIS scores. The mean mortality was calculated from the binary firth logistic regression model, which accounted for the skewness in the data. Please refer to Appendix A for detailed data analysis.



Unadjusted Mortality By Hospital (excluding transfers)

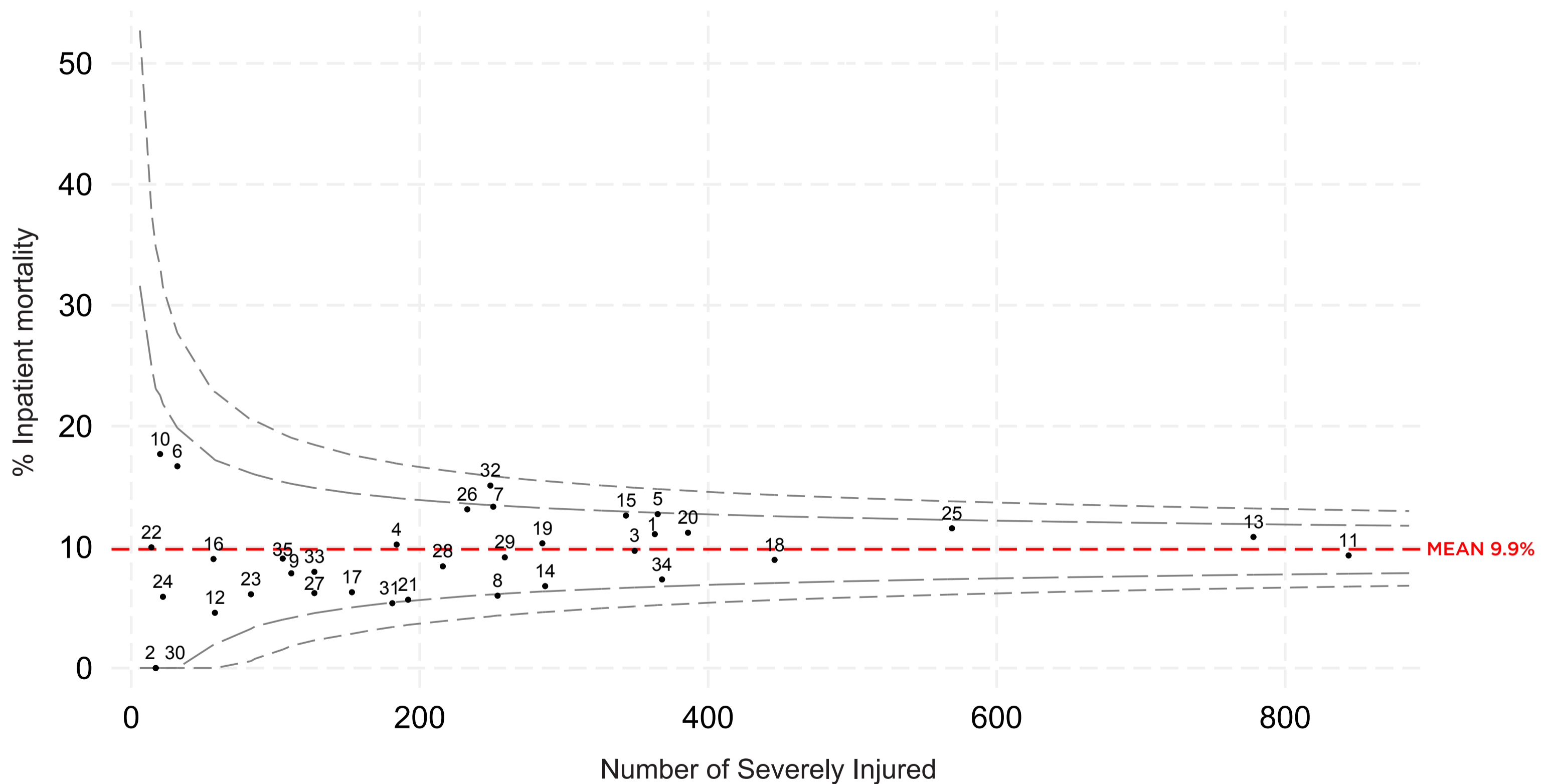


Excludes transfers & includes only blunt injuries

RISK ADJUSTED MORTALITY BY HOSPITAL AND AGE GROUP (EXCLUDING TRANSFERS)

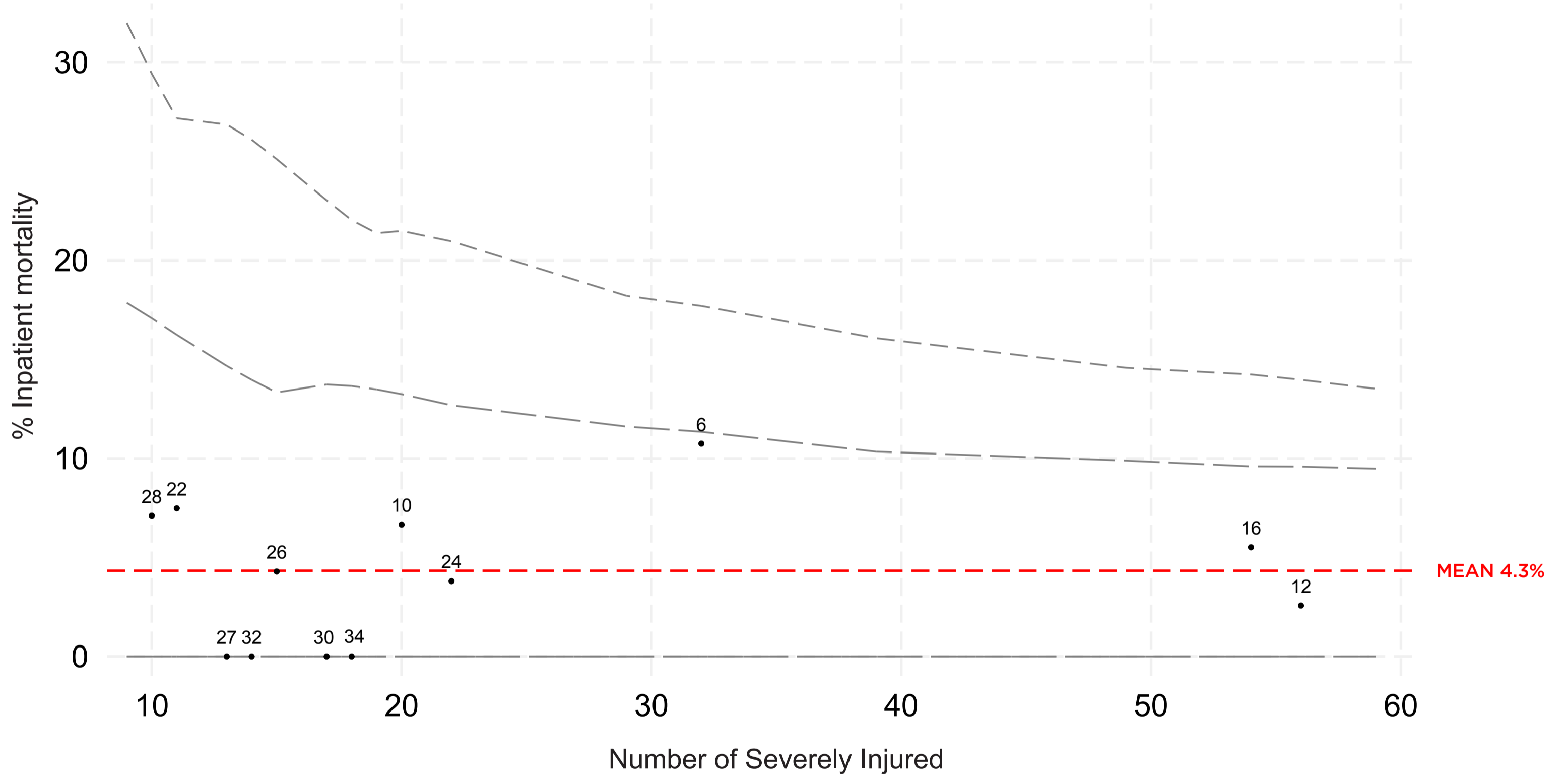
Mortality was compared between hospitals using funnel plots and risk adjusted. Patients were categorised into three age groups: children (aged ≤ 15 years), adults (≥ 16 and ≤ 69 years) and older adults (≥ 70 years). All hospitals were within the 99% control limits for risk adjusted mortality.

Risk-adjusted Mortality by Hospital



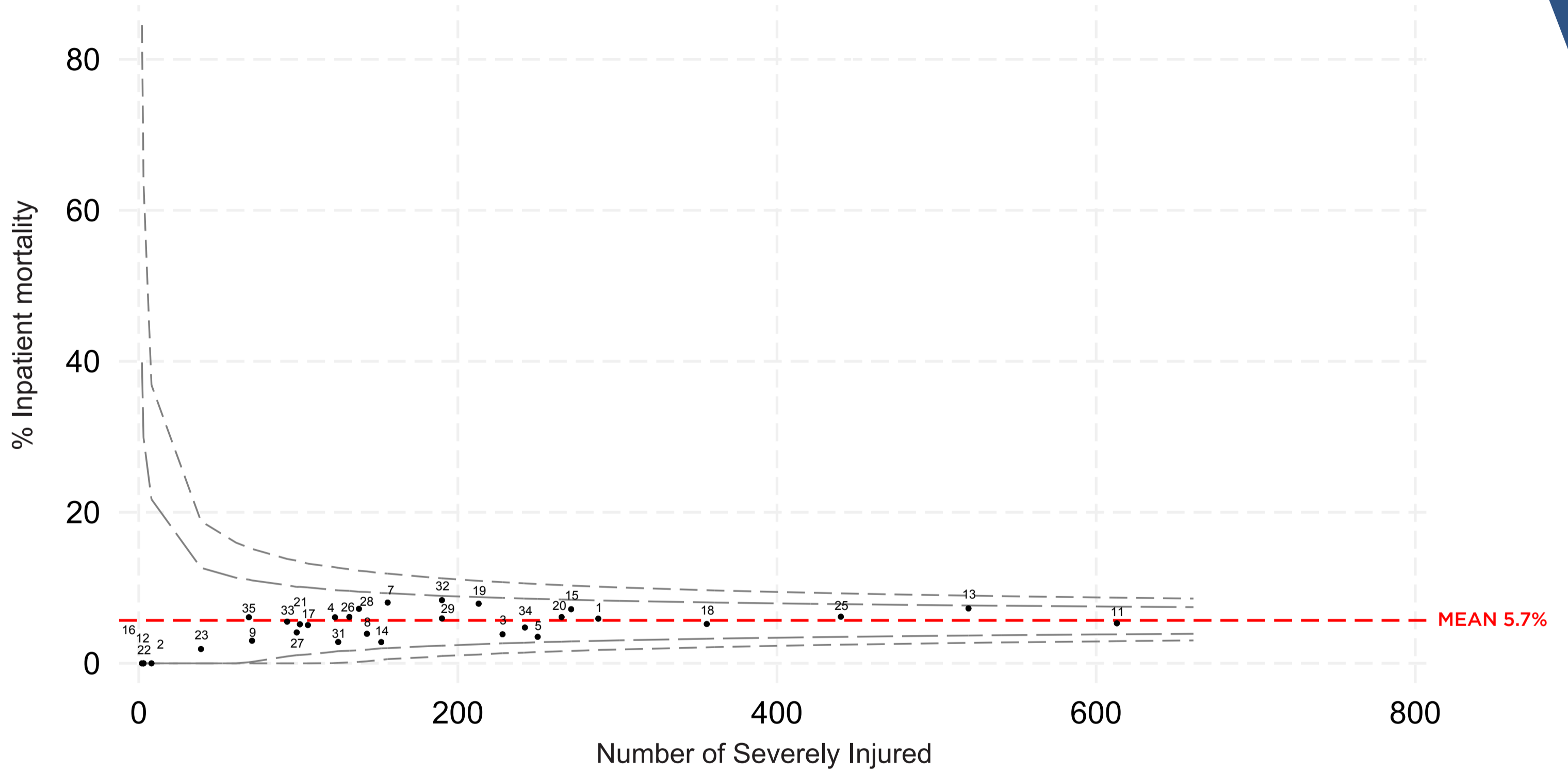
Excludes transfers & includes only blunt injuries

Risk Adjusted Mortality Paediatrics (Aged ≤15years)



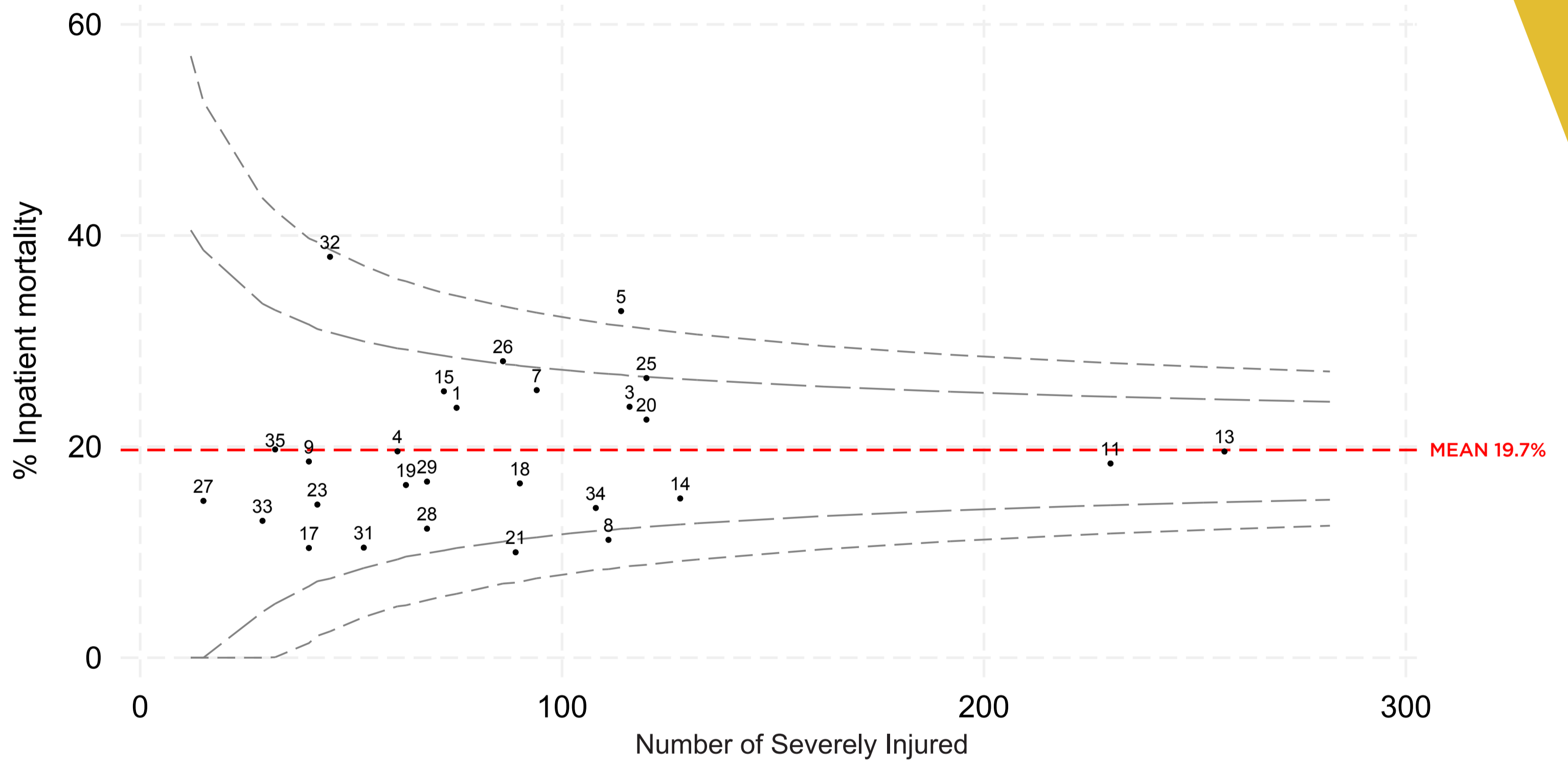
Excludes transfers and sites with <10 admissions for analysis, and includes only blunt injuries.

Risk Adjusted Mortality Adults (Aged ≥ 16 and ≤ 69 years)



Excludes transfers & includes only blunt injuries

Risk Adjusted Mortality Older Adults (Aged ≥70years)



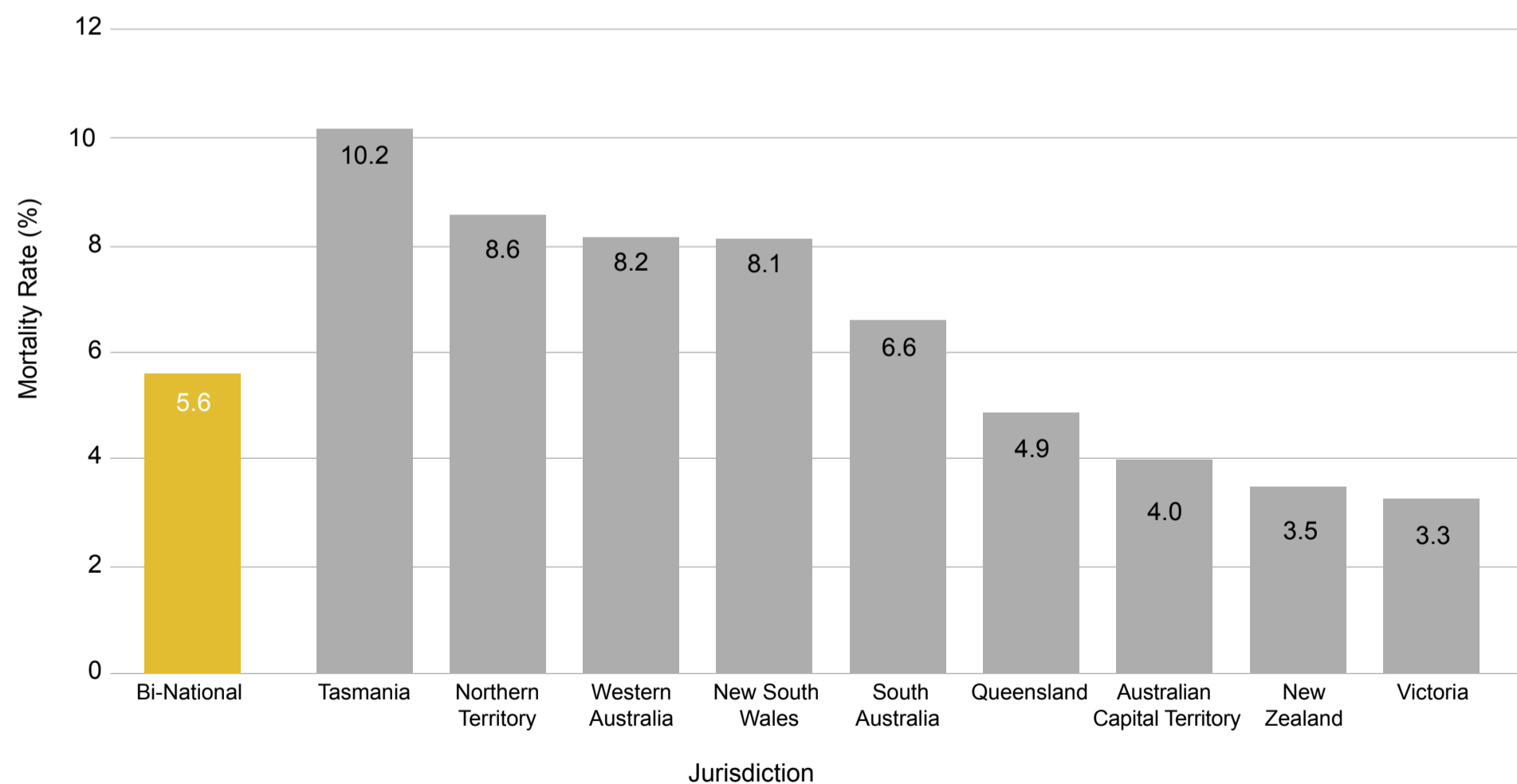
Excludes transfers & includes only blunt injuries

TRANSFER OUTCOMES

Transfers make up 29.6 percent of all major trauma patients and they are an important group of patients to consider when assessing trauma outcomes. Approximately 5.6 per cent of major trauma patients die after transfer to a major trauma service. Forty-one per cent of transferred patients were treated in the ICU.

This is an extremely heterogenous group which makes interfacility comparison of outcomes difficult. To reliably compare outcomes for this group, we will need to link with geospatial information on location of injury and with identification of pre-hospital and regional hospital deaths, prior to transfer. The ANZTR is developing processes to allow for risk adjusted comparisons over coming years.

Mortality Rate Of Transferred Patients by Jurisdiction



Jurisdiction	Total Transfers (n)	Deaths (n)	Mortality (%)
Tasmania	*	*	10.2
Northern Territory	*	*	8.6
Western Australia	610	50	8.2
New South Wales	615	50	8.1
South Australia	332	22	6.6
Queensland	531	26	4.9
Australian Capital Territory	*	*	4.0
New Zealand	459	16	3.5
Victoria	1,001	33	3.3
Bi-national	3,717	209	5.6

*total deaths n<10

DISCHARGE DESTINATION

A known discharge destination was provided for 99.2% of patients. For patients discharged alive, the proportion of patients discharged home decreased as injury severity increased. As age increased, the likelihood of being discharged home decreased and being discharged to inpatient rehabilitation increased.

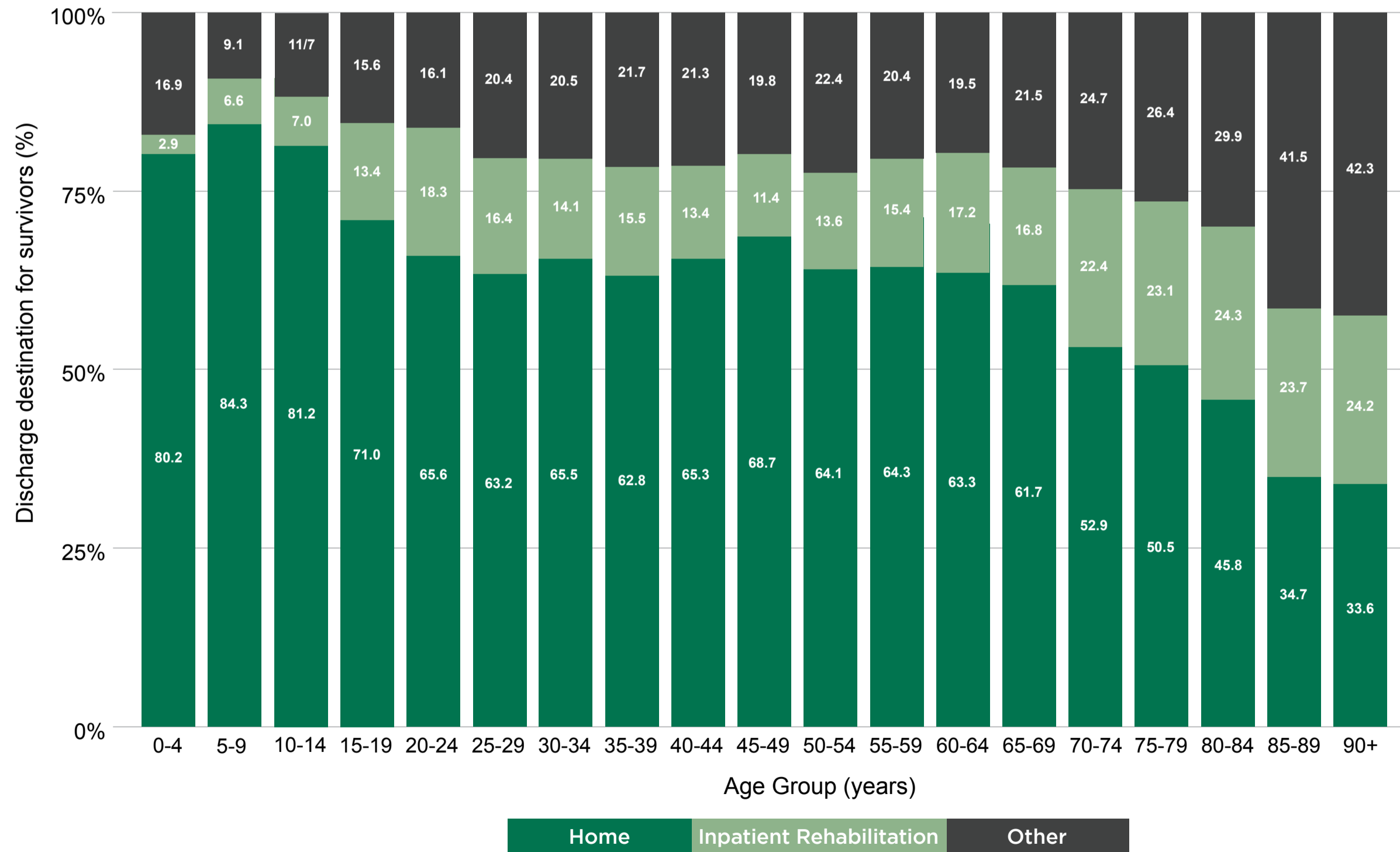


61.1%
discharged
HOME



16.6%
discharged to
**INPATIENT
REHABILITATION**

Discharge Destination by Age Group

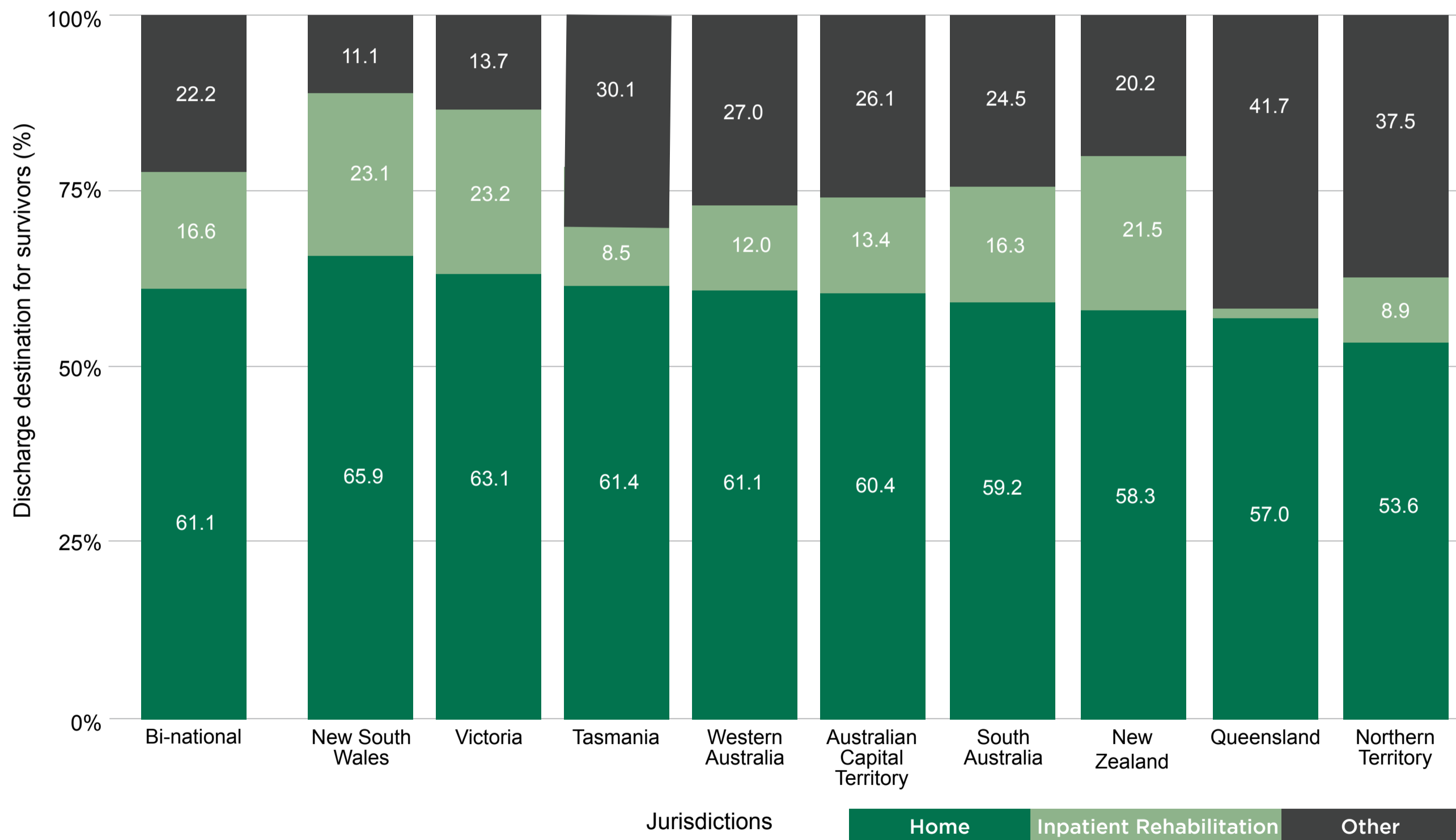


*The discharge destination 'other' includes residential aged care or nursing home, special accommodation, hospital for convalescence, left against medical advice and acute hospital for further definitive care. If the patient is discharged back to the usual or original place of residence such as an aged care facility or special accommodation, this is coded as discharge to home.

DISCHARGE DESTINATION BY JURISDICTION

When looking at discharge destination by jurisdiction the proportion of patients discharged to home and inpatient rehabilitation vary greatly. The reasons for this will be investigated further. Importantly, discharge to inpatient rehabilitation has decreased over time as new models of home rehabilitation and recovery have been developed [5].

Discharge Destination by Jurisdiction (excluding deaths)



PAEDIATRICS (0-15 YEARS OLD)

Approximately 61,000 children aged 0-14 were hospitalised following injury in Australia in 2022-23, according to the Australian Institute of Health and Welfare^[6]. The Australia New Zealand Trauma Registry collects trauma data on only the most severe injuries - those who are hospitalised with an Injury Severity Score (ISS) of greater than 12 or death after injury.

Seven hundred and thirty-eight children aged zero to 15 years were reported across Australia and New Zealand for the period 1 July 2023 to 30 June 2024, accounting for 5.9% of all severe injuries.

738
SEVERELY
INJURED

accounting for
5.9%
OF ALL SEVERELY
INJURED

CHILDREN AGED 0-4 YEARS

Children aged zero to four years accounted for just over one quarter of paediatric injuries (n=187, 25.3%) and 40% of paediatric deaths. The most common known mechanism was low fall (n=41, 21.9%), followed by high fall (n=36, 19.2%), and pedestrian (n=27, 14.5%).

Drownings and hanging are not included in this report.

The majority of cases in this age group had an ISS in the range of 16-24 (41.2%) followed by an ISS in the 25-40 range (30.5%).

The in-hospital mortality rate in children aged 0-4 years was 8.0%, lower than the bi-national mortality rate of 9.0%. The most common known cause of death was for pedestrian injuries. For 60% of deaths in this age group, injury intent was specified as 'accidental or unintentional - injury not intended'.

73.8% of children aged 0-4 years were discharged home, and 7.5% to rehabilitation. 60.3% of injuries occurred in the home, and for 13.4% the place of injury was 'road, street, or highway'.

51.4% 0-15 yo
deaths were
AGED 0-4

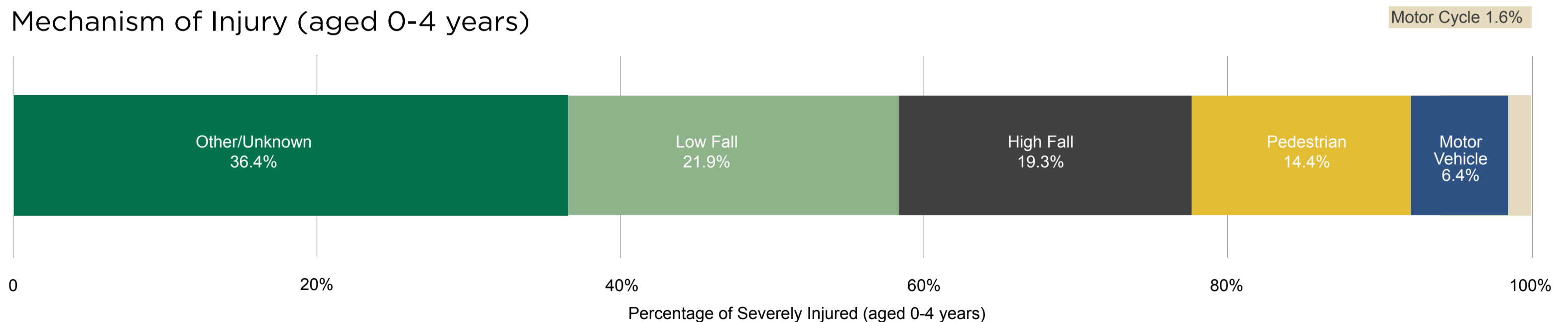


 **63.3%**
occurred in
HOME

16.7%
occurred on
THE ROAD



Mechanism of Injury (aged 0-4 years)



PAEDIATRICS (0-15 YEARS OLD)

CHILDREN AGED 5-15 YEARS

Children aged five to fifteen years accounted for over two thirds of paediatric severe injuries (n=551, 74.7%), which is slightly higher than 72.3% the previous year.

The most common cause was transport related (n=351, 63.7%) followed by falls (n=108, 19.6%) which is consistent with the previous year. Almost half of cases had an ISS within the range 16-24 (n=268, 48.6%) followed by ISS 25-40 (n=139, 25.2%).

The in-hospital mortality rate for severely injured children was 4.0% (n=22). This is below the bi-national mortality rate of 9.0%, and a decrease compared to last year (n=15, 2.8%). 72.7% of deaths were transport-related. Of those alive at discharge, 81.5% were discharged home and 9.2% to inpatient rehabilitation. 39.6% of injuries occurred on the road, 12.0% in a sports and athletics area, and 9.6% in the home.

CAUSE OF INJURY



63.7% TRANSPORT RELATED

19.6% FALLS related 

PLACE OF INJURY

39.6% ROAD 

9.6% HOME 

12.0% sports & ATHLETICS AREA 

OUTCOME

4.0% DIED in-hospital 

72.7% deaths TRANSPORT RELATED

OUTCOME

3.1% (n=17) of severely injured children aged 5-15 years died in hospital. This is below the bi-national mortality rate of 9.7% and a decrease compared to last year (n=28, 5.79%). 52.9% of deaths were transport-related. Of those alive at discharge, 83.6% were discharged home and 7.1% to inpatient rehabilitation. 39.6% of injuries occurred on the road, 15.4% in the home, and 12.8% sports and athletics area.

POLYTRAUMA

INTRODUCTION

For the first time among trauma registries worldwide, the 2023-24 Annual Report of the ANZTR introduces detailed reporting on polytrauma, defined by validated international consensus definition. The significance of this that ANZTR is a step ahead of the large-scale international recognition of this complex disease, which is accepted by the World Health Organization to be included as a new disease code into the 11th edition of the International Classification of Diseases (ICD-11).

Polytrauma is the acute onset chronic systemic disease initiated by the kinetic energy transfer to the human body. It is characterised by severe injuries to multiple body regions with associated physiological compromise and systemic inflammatory response, which all put uninjured vital organs at risk or organ failure and leads to disproportionately worse outcomes than expected from the addition of the individual injuries. The recognition of this disease will provide opportunity to advocate for resources for the care of the most severely injured, better recognition of clinicians and researchers working on this field and hopefully a more focused approach for the prevention and treatment of the aetiology of this disease rather than the symptoms and consequences. The ANZTR will be in position to monitor the epidemiology and outcomes of polytrauma in response future advancement of care in the broader context of all severely injured patients included in the registry.

The ANZTR is likely to lead international collaboration of registries to characterise the disease globally, which represents the most severely injured 25% of major trauma patients.

PROFESSOR ZSOLT BALOGH

Department of Traumatology, John Hunter Hospital; School of Medicine and Public Health, University of Newcastle

Definition

For this report, polytrauma was classified using the Newcastle Definition - an Abbreviated Injury Scale (AIS) score greater than two in at least two Injury Severity Score (ISS) body regions ($2 \times \text{AIS Score} > 2$)^[7].

Demographics

In the 2023-24 financial year, over one quarter of all severely injured were polytraumatised (n= 3365; 26.8%).

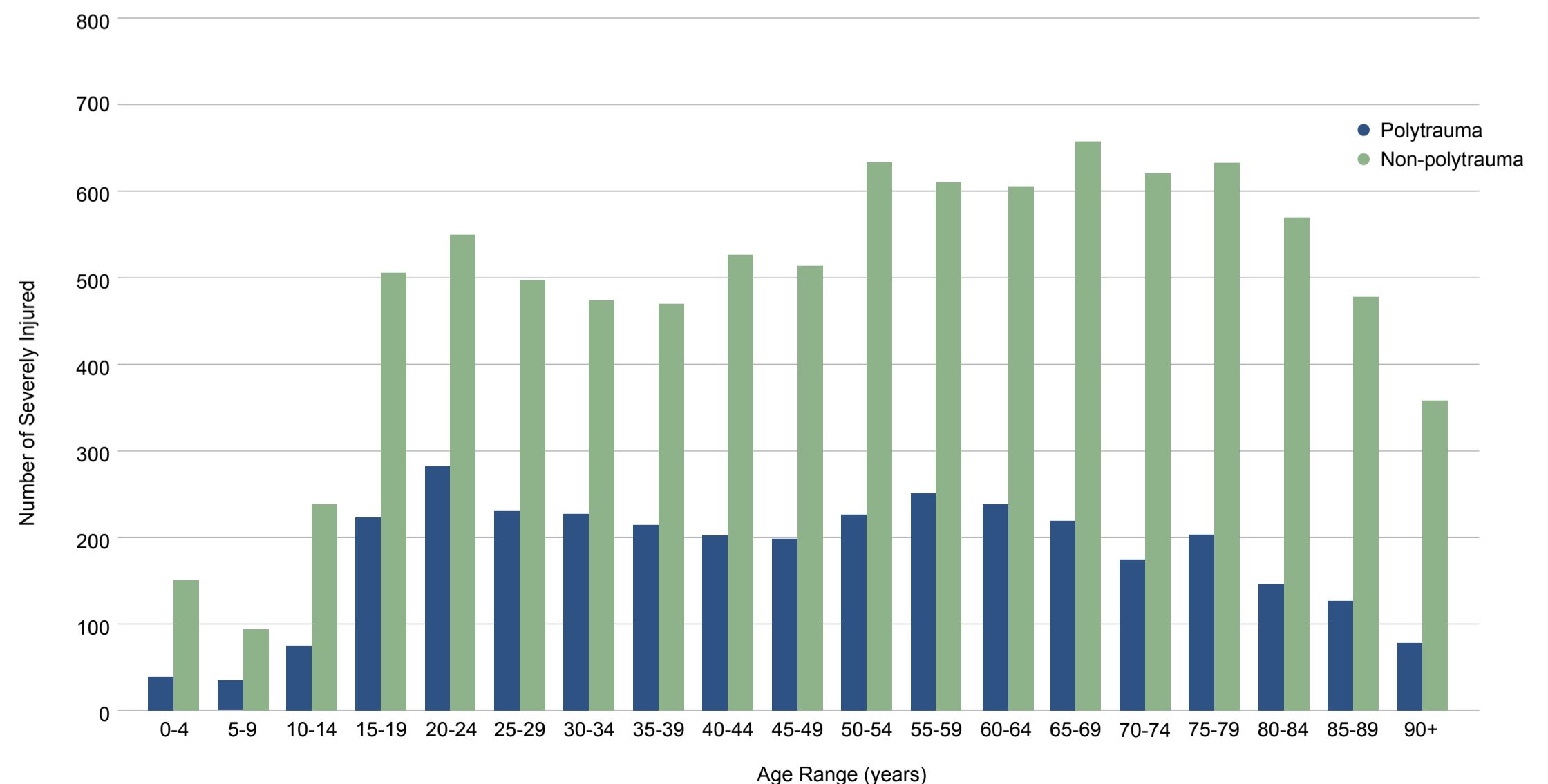
The proportion of severely injured with polytrauma varied across jurisdictions, ranging from 24.0% in ACT to 33.5% in NT.

Polytrauma patients were more likely male (n=2462; 73%) and with a lower median age (49 years versus 54 years). Polytrauma incidence was highest among the 20-24 year age groups.

Injury characteristics

Polytrauma was associated with a higher median injury severity score (26 versus 17). Polytraumatised patients were more likely to have sustained injuries due to high energy mechanisms, such as transport (in particular - motor vehicle(n=904; 26.2%), and motorcycle (n=613; 18.2%)) high falls (n=551; 16.4%).

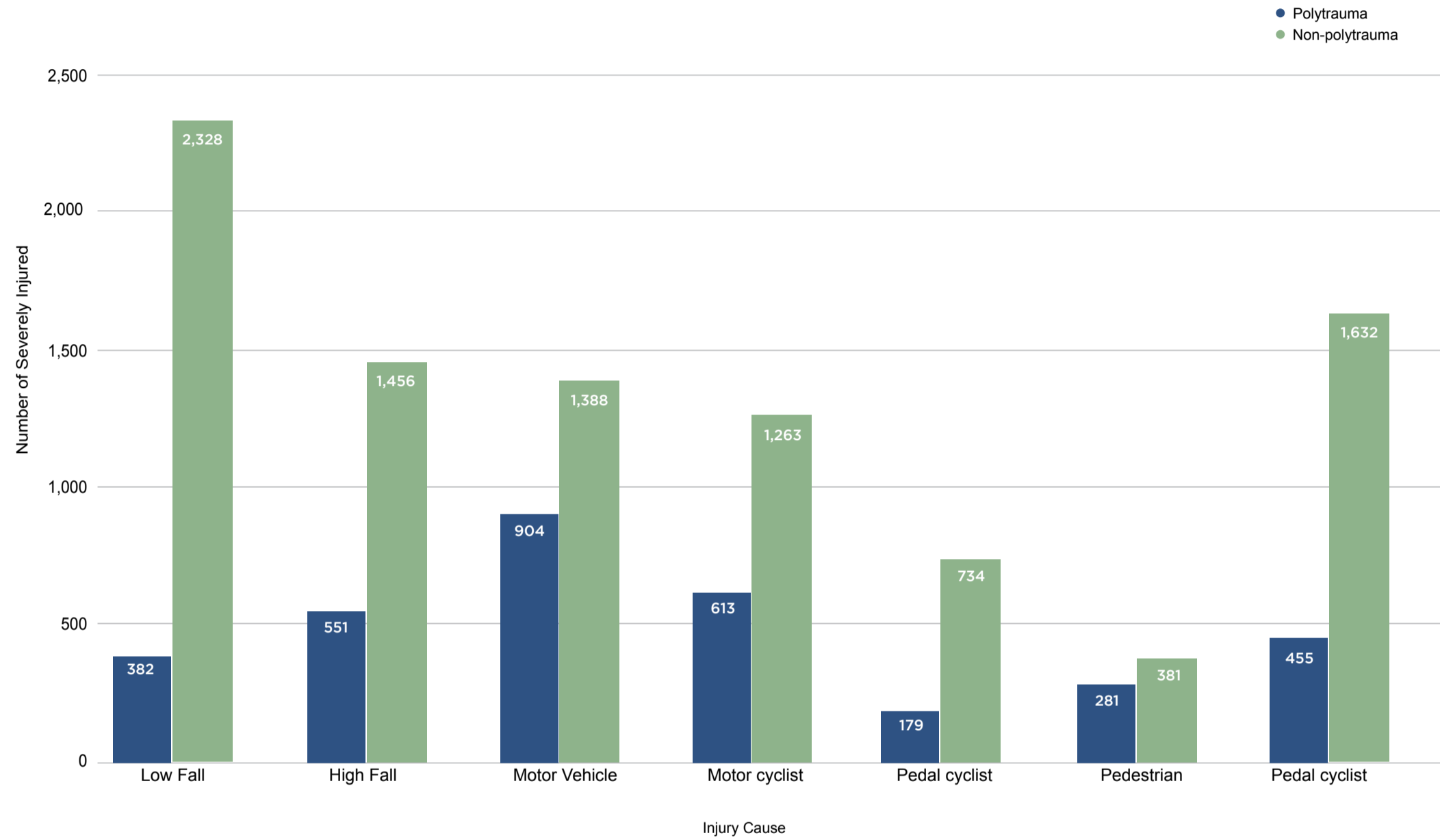
Polytrauma and Non-polytrauma - Frequency by Age Group



POLYTRAUMA

CAUSE OF INJURY

Polytrauma and Non-polytrauma by Injury Cause



Transport



High Fall



Low Fall



Motor Vehicle



Motorcyclists



Pedal Cycle



Pedestrian

Other

Total

Polytrauma	16.4% (n=551)	11.4% (n=382)	26.9% (n=904)	18.2% (n=613)	5.3% (n=179)	8.4% (n=281)	13.5% (n=455)	100% (n=3,365)
Non-polytrauma	15.9% (n=1,456)	25.4% (n=2,328)	15.1% (n=1,388)	13.8% (n=1,263)	8.0% (n=734)	4.1% (n=381)	17.8% (n=1,632)	100% (n=9,182)

POLYTRAUMA

OUTCOMES

Compared with non-polytrauma patients, polytrauma patients had a longer LOS (median 10.6 days vs 6.2 days), higher rates of ICU admission (51.6% vs 27.5%), and longer ICU LOS (median 5.0 days vs 3.7 days).

MORTALITY

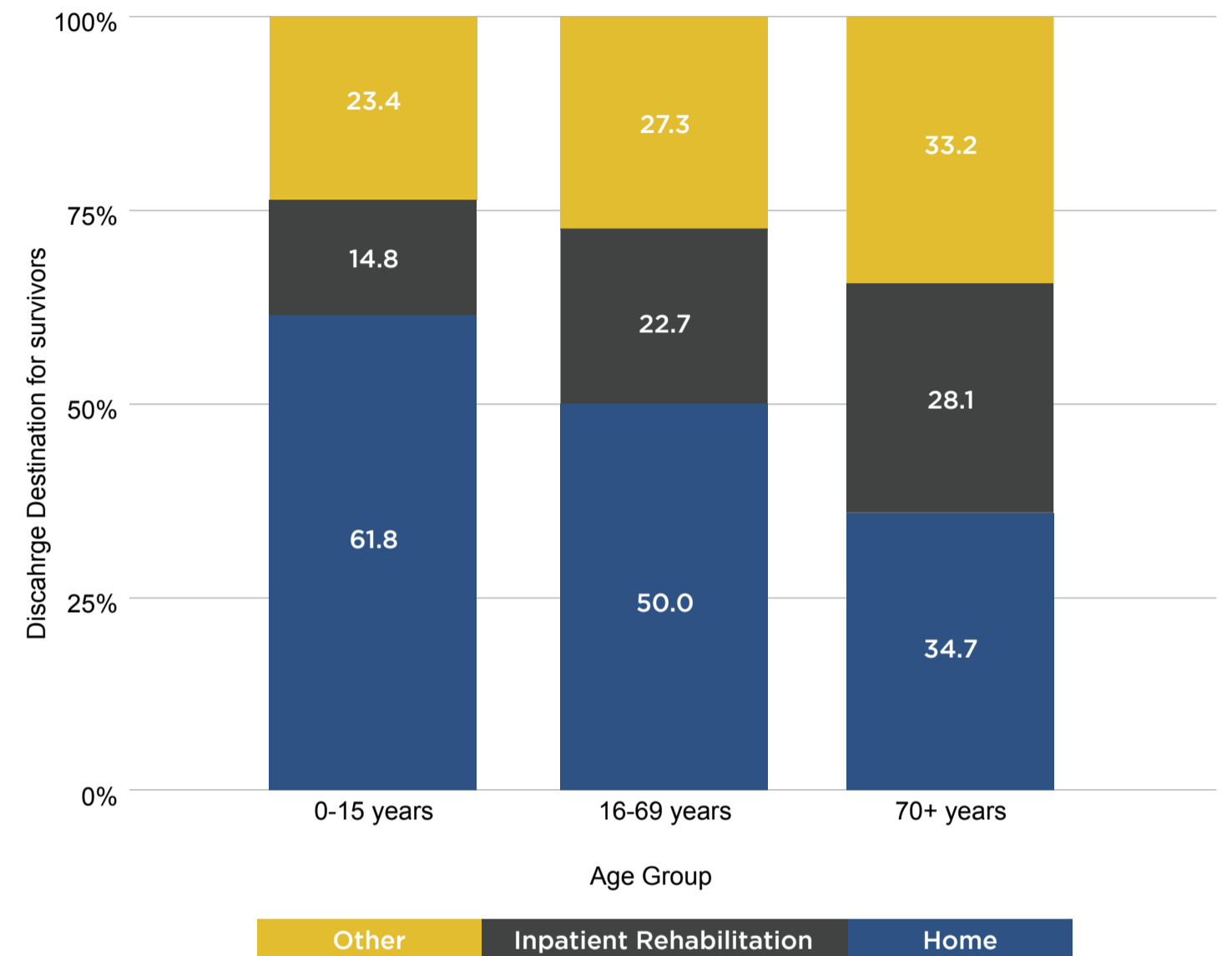
Three hundred and sixty-two (10.8%) of severely injured patients with polytrauma died in hospital; this is higher than the overall bi-national mortality rate of 9.0%, and higher than for non-polytrauma patients (8.3%).

The proportion of in-hospital deaths among polytraumatised varied by age group; mortality rate was highest in older persons aged ≥ 80 years (24.1%) and children aged 0-9 years (17.4%).

DISCHARGE DESTINATION

For polytraumatised patients surviving to discharge, the proportion discharged to home was lower than non-polytraumatised patients (47.5% vs 66.0%), and the proportion discharged to inpatient rehabilitation was higher (23.4% vs 14.2%). Children (aged ≤ 15 years) with polytrauma had a higher proportion discharged to home than other age groups (n=92, 61.8%).

Discharge Destination for Polytrauma by Age Group



POLYTRAUMA

SUMMARY

Polytrauma contributes to over a quarter of severely injured patients in Australia and New Zealand, and contrary to the current trends in trauma epidemiology, polytrauma patients still represent a younger, predominantly male population from high energy mechanisms. Despite their younger age, their outcomes are worse than the rest of the major trauma population. This preliminary assessment of Australia and New Zealand polytrauma epidemiology highlights the need for specific focus on this high-risk population in injury prevention, clinical care and research.

NON-POLYTRAUMA

9,812 TOTAL cases

 median **AGE 54**
(IQR 32-72)

72.0% MALE  **6,608**

17 ISS MEDIAN
(IQR 14-21)



2.7% penetrating trauma
n=341



28.9% TRANSPORT RELATED

MEDIAN length of stay  **7.17 days**
(IQR 3.7-14.1)

2,561

median ICU length of stay **3.7 DAYS**
(IQR 1.9-7.6)



 **27.5%** admitted to ICU
(n=2,525)

 **MORTALITY 8.6% (n=765)**

POLYTRAUMA

3,365 TOTAL cases

 median **AGE 49**
(IQR 29-67)

73.2% MALE  **2,462**

26 ISS MEDIAN
(IQR 22-34)



3.5% penetrating trauma
n=117



45.1% TRANSPORT RELATED

MEDIAN length of stay  **9.7 days**
(IQR 5.2-17.5)

1,517

median ICU length of stay **5.0 DAYS**
(IQR 2.2-10.7)



 **51.6%** admitted to ICU
(n=1,735)

 **MORTALITY 10.8% (n=366)**

ROYAL AUSTRALASIAN COLLEGE OF SURGEONS (RACS) TRAUMA QUALITY IMPROVEMENT COMMITTEE AND THE ANZTR

One of the aims of the Royal Australasian College of Surgeons (RACS) Trauma Quality Improvement (TQI) committee has been to support quality improvement for all trauma patients. By using the ANZTR data to establish benchmarks, and providing cross-comparison feedback to each trauma centre, processes of care for improvement within the trauma system can be identified.

The RACS TQI committee developed a set of bi-national process indicators which allows for cross-comparison and benchmarking of key process indicators between sites and jurisdictions. There are eight process indicators, all of which are now incorporated in the bi-national data dictionary. The ANZTR is continuing to work with sites to improve data capture and completeness of these variables so that reporting all of the process indicators will be possible in future.

RACS TQI PROCESS INDICATORS

INDICATORS	1	2	3	4	5	6	7	8
INDICATOR NAME	Mortality	Pre-hospital transport times	Discharge Destination	Time to CT scan if GCS < 13	Trauma team activation for patients with ISS > 12	Blood alcohol collection in patients with ISS > 12.	Time in first facility, if transferred.	Time in the Emergency Department.
DEFINITION	The rate of in-hospital deaths that occur, either in the Emergency Department or after inpatient admission, in patients admitted following injury.	The mean and/or median times that elapse between the time of injury and the episodes of care that occur prior to arrival at the 1st receiving hospital.	The rate at which patients are discharged to the various destinations other than death, at the conclusion of their hospital admission	The mean and/or median time that elapses between arrival at the reporting hospital and the first head CT performed at that same hospital.	The percentage of patients with major injuries, defined as an ISS > 12, who had a trauma team activated at the time of presentation to the Emergency Department.	The percentage of patients with major injuries, defined as an ISS > 12, who had a blood alcohol level collected and documented within 6 hours of first hospital admission.	The mean and/or median length of time that is spent in the first facility, prior to the transfer to definitive care.	The mean and/or median length of time that is spent in the Emergency Department, prior to discharge to the ward, or other disposition from the ED that is not death.
RATIONALE	To understand the burden of death from injury in patients that are alive on presentation to hospital.	To understand the timeliness of pre-hospital encounters.	To quantify the varying outcomes of in hospital admissions, with a view to determining resource allocation.	To measure the timeliness of CT investigation of a patient with a suspected brain injury.	To determine the accuracy of trauma team activation.	To measure the recognition of major injury by compliance with blood alcohol collection practice.	To measure the timeliness of transfer to definitive care and evaluate compliance with transfer protocols.	To measure the timeliness and efficiency of the care delivered in the Emergency Department.

APPENDIX A - ANZTR METHODOLOGY

Minimum Dataset

ANZTR data is defined by the Bi-national Trauma Minimum Dataset (BNTMDS). Data elements from existing hospital and state-based registries were mapped to the dataset according to standard definitions. If data elements were not already collected by existing data sources, they were not otherwise obtained by the ANZTR. The current version of the minimum dataset can be downloaded from the ANZTR website (www.anztr.org.au/data-set).

Inclusion/ Exclusion Criteria

The ANZTR collects data on severely injured patients presenting to one of 35 contributing trauma centres across Australia and New Zealand.

Inclusion Criteria

Patients admitted to these centres who subsequently die after injury, or who sustain major trauma (defined as an Injury Severity Score greater than 12) are included in ANZTR data.

Exclusion Criteria

Delayed presentation to hospital more than seven days post-injury, events not resulting in anatomical injury (including poisoning, drug ingestion), iatrogenic injury, isolated neck of femur fracture, isolated injury arising from pathological conditions not due to high energy trauma mechanism, deaths in Comorbid or frail patients where injury was not the primary cause of death, hanging and drowning cases, unless accompanied by significant anatomical injury ($AIS \geq 3$), patients with documented pre-injury care limitations where trauma treatment was withheld in accordance with those directives.

Data Definitions

Emergency Department length of stay (ED LOS) is calculated by the ANZTR based on the date and time of arrival at the definitive care hospital to the emergency department discharge date and time. ED LOS is presented as hours.

Intensive Care Unit length of stay (ICU LOS) is based on values provided by the designated trauma centres or as reported by the state-based trauma registries. ICU LOS is presented as days.

Hospital length of stay (LOS) is from date and time of arrival at definitive care hospital to the date and time of discharge from definitive care hospital as reported. Hospital LOS is based on values provided by the designated trauma centres or as reported by the state-based registries. Hospital length of stay is presented as days.

External cause of injury International Statistical Classification of Diseases and Related Health Problems, Twelfth Revision, Australian Modification (ICD-10-AM) codes were used to define causes/mechanisms of injury, injury type and injury intent.

Polytrauma (Newcastle definition) was classified using the Newcastle Definition - an Abbreviated Injury Scale (AIS) score greater than 2 in at least two Injury Severity Score (ISS) body regions.

Data Analysis

Risk adjusted outcomes are provided in this report. The primary outcomes were inpatient mortality and length of stay (LOS). Total numbers for risk adjustment have been reduced because the transferred group of patients has been excluded. This resulted in a 30% reduction in numbers. A further reduction in numbers was the exclusion of non-blunt

trauma cases such as burns and penetrating injury as they are a small heterogenous group (5%). For both outcomes, funnel plots were created as a visual representation of how individual sites fare compared to their peers and the overall average; it also identifies those who are performing better or worse than the average. The funnel plot contours represent two standard deviations (95% control limits) and three standard deviations (99.8% control limits) from the mean; those above and below these lines are considered outliers, with a 5% and 0.2% chance of a false positive respectively. For inpatient mortality, a binary Firth logistic regression method was used. For the paediatric age group (≤ 15 years) sites with fewer than ten admissions for analysis were excluded to enable more robust estimates; $n=18$ (95%) of sites excluded were not paediatric trauma services. Only survivors were included in the LOS analysis. The following risk factors were included in the model: restricted cubic splines for age with 4 knots, cause of injury, shock-index grouped in quartiles, highest and second highest AIS scores. Data analysis was performed in Stata and level of significance set at 5%. The relationship between age and mortality among trauma patients is nonlinear. There are several options to dealing with non-linearity, including categorising based on arbitrary cut-offs, including a quadratic term or including cubic splines. We compared the various methods and found that cubic splines to be the most appropriate^[8]. The model assumes that the relationship is polynomial between the knots, locations set by the model at 18, 52 and 82 years. Although the splines are not easily interpretable, note that this is used in the context of benchmarking and not patient risk-stratification, which would probably require a different approach.

Data Confidentiality

Monash University is the Data Custodian for ANZTR data and is responsible for reporting. Patient level data are not reported. Only hospital and jurisdictional aggregate data are provided in this report.

Data Quality

Data Quality Data submitted to the ANZTR underwent various validity checks such as date and time formats and chronology, and correct classification as per the ICD-10-AM and Abbreviated Injury Scale 2005 (Updated 2008) and IS2015 codes prior to data processing. If data did not pass these validations, an error file was generated and a notification sent to sites submitting the data to address and correct the error, if possible. Data contribution varies between hospitals as not all hospitals have all the BNTMDS data points available. Data for this reporting period are incomplete as a result of variations in jurisdictional submission timeframes. Cases identified after the reporting period will be incorporated into future reports.

Severity of Injury

Injury Severity Score (ISS) is an internationally standardised approach to describing the overall severity of injury for each patient. The calculated value enables comparison between cohorts of injured patients, and can be used for inclusion into trauma registries. The higher the number the more severe the injury, ranging from one to 75. Trauma patients are allocated an ISS after injury in order to determine their status as 'major trauma'. For this report major trauma is defined as an $ISS > 12$. ISS is useful for predicting hospital length of stay, and associated morbidity and mortality.

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NSW data submitted by the Institute of Trauma and Injury Management (ITIM)

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Royal North Shore Hospital
Royal Prince Alfred Hospital
St George Hospital
St Vincent's Hospital
Sydney Children's Hospital
Westmead Hospital

NORTHERN TERRITORY (NT)

Royal Darwin Hospital

QUEENSLAND (QLD)

Gold Coast University Hospital
Queensland Children's Hospital
Princess Alexandra Hospital
Royal Brisbane and Women's Hospital
Sunshine Coast University Hospital
Townsville University Hospital

SOUTH AUSTRALIA (SA)

SA data submitted by SA Health & Preventive Health SA
Flinders Medical Centre
Royal Adelaide Hospital
Women's and Children's Hospital
Lyell McEwin Hospital

TASMANIA (TAS)

Royal Hobart Hospital

VICTORIA (VIC)

Victorian data submitted by the Victorian State Trauma Registry (VSTR)
Alfred Hospital
Royal Melbourne Hospital
Royal Children's Hospital

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Perth Children's Hospital
Royal Perth Hospital

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This report has been prepared by Ms Ancelin McKimmie, Manager, ANZTR.

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