

VICTORIAN ORTHOPAEDIC TRAUMA OUTCOMES REGISTRY



Annual Report 2022-23



MONASH
University



**TRANSPORT
ACCIDENT
COMMISSION**

OVERVIEW OF THE VOTOR REGISTRY



BACKGROUND

The Victorian Orthopaedic Trauma Outcomes Registry (VOTOR) is a clinical quality registry managed through a collaboration of hospitals and academic institutions. The Registry documents the nature and extent of orthopaedic injuries, and resulting treatment, rehabilitation and complication rates and outcomes of admitted patients. It provides a robust monitoring system for orthopaedic trauma admitted to the participating hospitals in Victoria and is funded by the Transport Accident Commission (TAC). It allows a mechanism to apply evidence-based methods to priority research areas and to examine variations in clinical practice and their impact on the short and longer-term outcomes of injured patients.

The Registry started as a collaboration between The Alfred, the Royal Melbourne Hospital and the Department of Epidemiology and Preventive Medicine (DEPM) at Monash University in 2003 and expanded in 2007 to include University Hospital Geelong (UHG) and the Northern Hospital. From the start of 2021 Box Hill Hospital commenced data contribution whilst data collection from the Northern Hospital ceased.

ELIGIBILITY

VOTOR captures data about all patients with an emergency admission greater than 24 hours to the participating hospitals for an orthopaedic injury. Eligible patients are identified by the discharge diagnosis through ICD-10-AM reports, or from Abbreviated Injury Scale codes if ICD-10-AM reports are not available.

INCLUSION CRITERIA

- All patients admitted with a new orthopaedic (bone or soft tissue) injury with a length of stay > 24 hours
- Death after orthopaedic injury

EXCLUSION CRITERIA

- Pathological fracture related to metastatic disease, and/or
- Age <16 years
- Isolated soft tissue injury managed non-operatively
- Isolated soft tissue injury managed operatively from 1st Jan 2018



Northern Health



YEAR IN REVIEW 2022-23 | SUMMARY



DEMOGRAPHICS

7683
↑ from **7071** in 2021-22

MEDIAN AGE
65 years

53%
MALE

32%
occurred on weekends

CAUSES OF INJURY

LOW FALLS
48%
Unchanged from 2021-22

ROAD TRAFFIC CRASHES
29%
Small ↓ from 28% last year

HIGH FALLS
13%
Unchanged from 2021-22

LOCATIONS OF INJURY

HOME
40%
Down 1% from 2021-22

ROAD, STREET OR HIGHWAY
32%
Unchanged from 2021-22

TYPES OF INJURY

ISOLATED LOWER EXTREMITY
33%
Consistent with 2021-22

ONLY SPINAL INJURIES
23%
Small increase over 2021-22

ISOLATED UPPER EXTREMITY
17%
Similar to 2021-22

HOSPITAL OUTCOMES

LENGTH OF STAY

MEDIAN STAY
5.4 days

Increase from 5.1 days

ICU ADMIT

10%

Unchanged from 2021-22

DISCHARGE DESTINATIONS

HOME **62%** REHAB **25%**

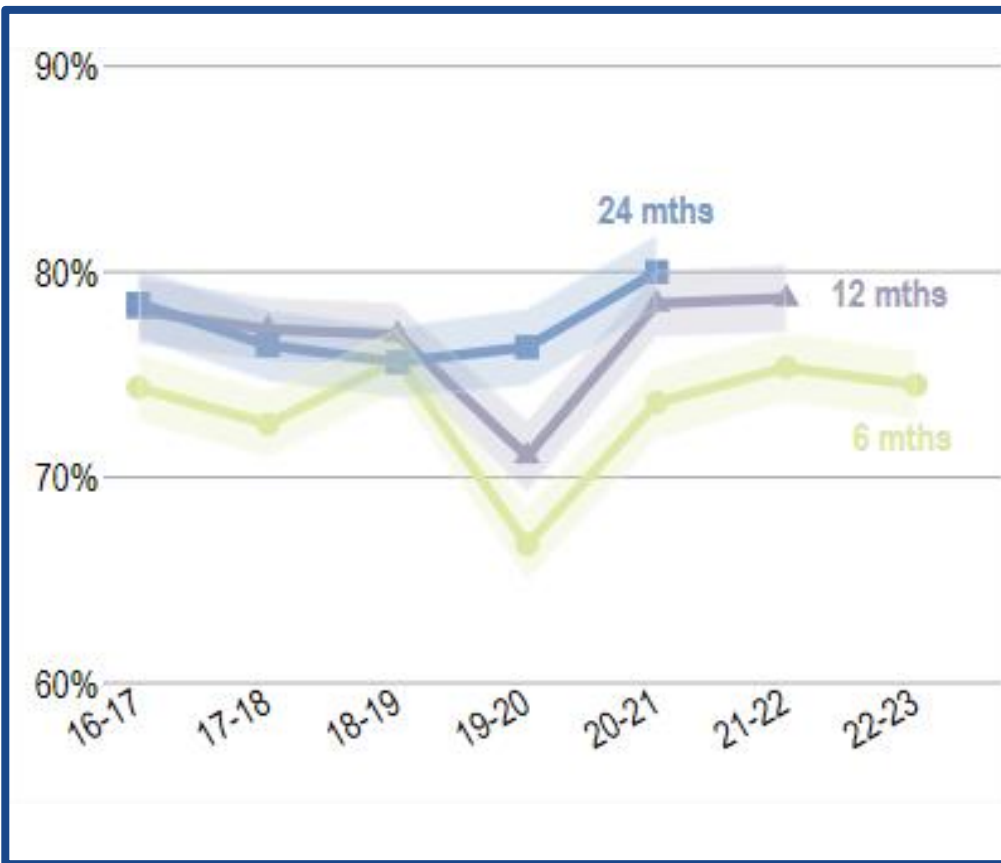
In 2021-22, home 61%, rehab 26%

IN-HOSPITAL DEATHS

3%
66% male, av. 73yrs

Female deaths av. 80yrs

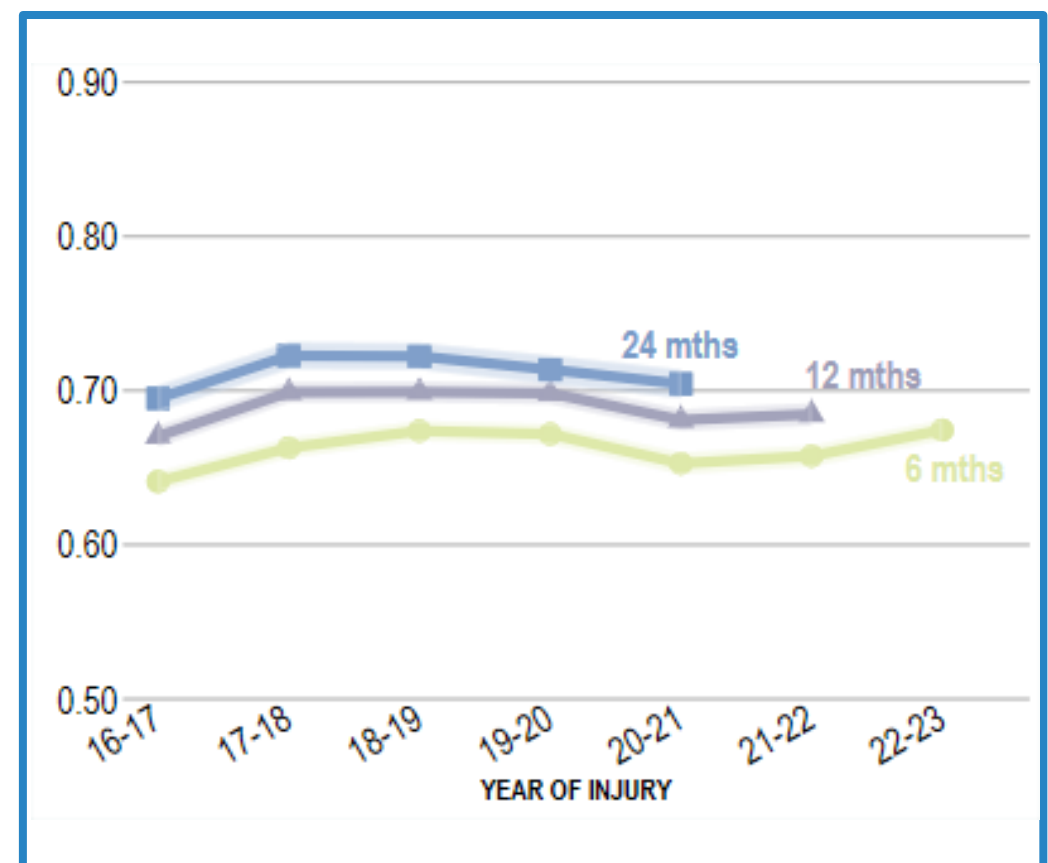
OUTCOMES ANALYSIS | 2016-17 TO 2022-23



PREDICTED PROBABILITY RETURNED TO WORK (95% CI)

For patients working prior to their injury, the probability of returning to work (RTW), adjusted for demographic and injury factors is shown on the left.

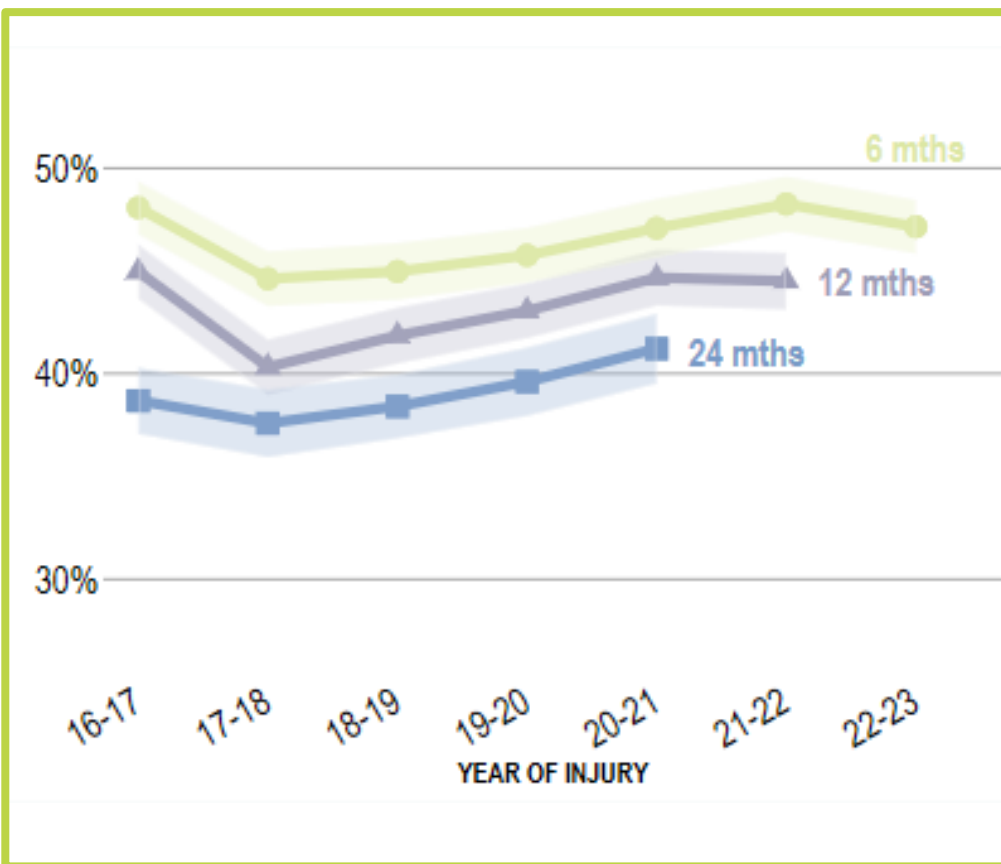
A decrease in RTW was observed at 6 and 12 months post-injury for patients injured in 2019-20. This corresponded with the early COVID period. 24 month RTW outcomes were not affected and appear to be improving.



AVERAGE EQ-5D HEALTH UTILITY SCORE (95% CI)

The health status of patients at follow-up is measured using the EQ-5D scores covering five domains of life utility such as mobility, mood and pain levels. Scores of 0.0 or less are equivalent of a health state of death or worse, whilst a score of 1.0 reflects perfect health.

The adjusted average health utility scores consistently showed improvement at each follow-up time point. This outcome has been largely stable since 2016-17.



PREDICTED PROBABILITY WHODAS 2.0 DISABILITY ≥ 10 (95% CI)

The WHODAS 2.0 measures disability due to six different health conditions covering physical, mental and drug/alcohol problems. A cut-off score of 10 or more has been used to assign disability status in normative data from an Australian population.

The adjusted probability of reporting a WHODAS 2.0 score ≥ 10 decreased at each follow-up timepoint, indicating a reduction in disability.

Validating the ICDMap to assess injury severity

The AAAM has developed the ICDMap to enable administrative ICD codes collected by hospitals to be automatically mapped to the AIS codes used as the 'gold standard' to detect injuries and assess their severity. We compared the agreement between the injuries and their severity assigned by AIS coding by trained professionals with the injuries coded by ICDMap in 21,378 patients with transport-related admissions from VOTOR and the Victorian State Trauma Registry.

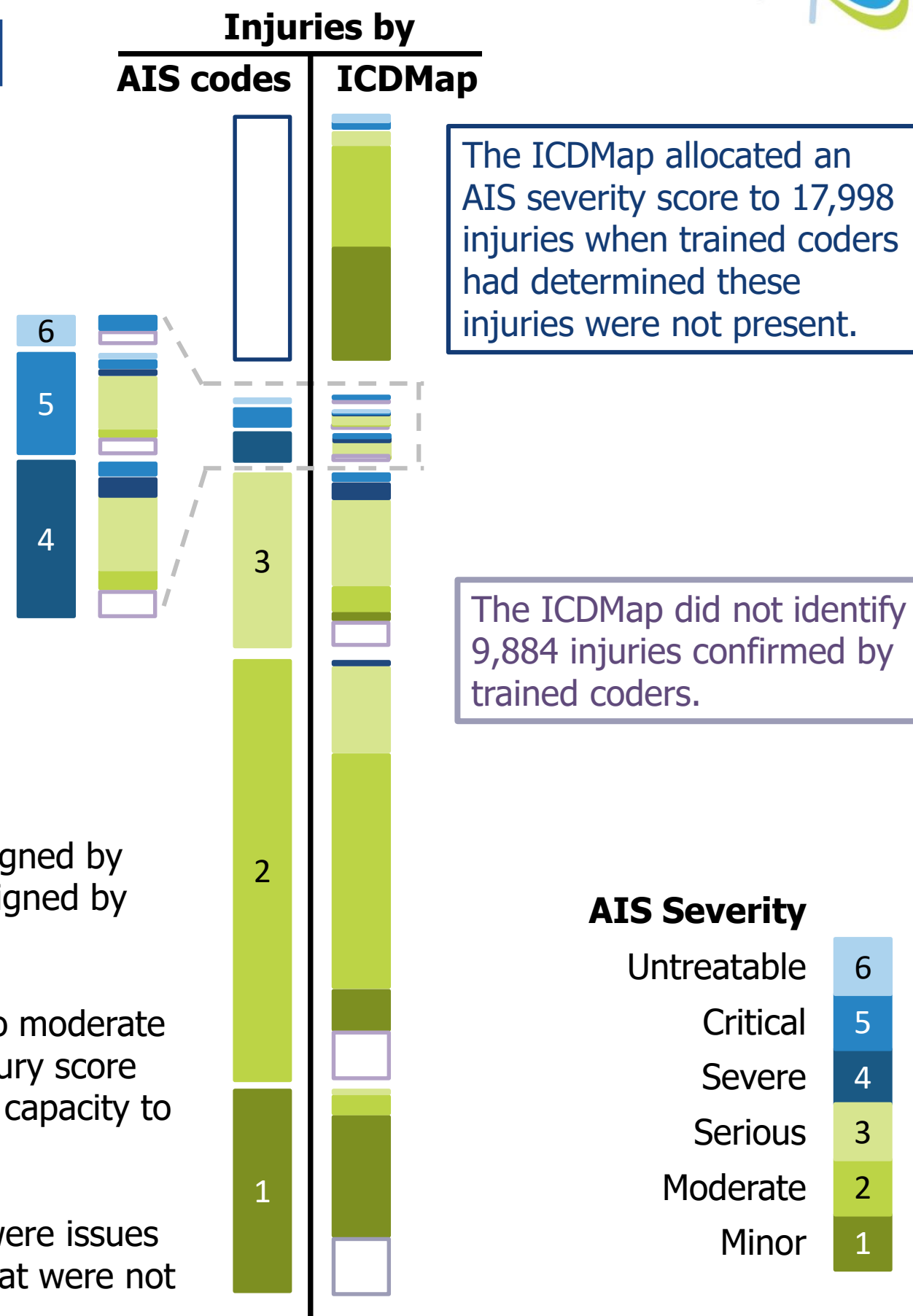
A total of 80,583 injuries from up to six body regions were identified by one or both methods and mapped to an AIS severity score. Of these, 17,998 (22%) were incorrectly identified as injuries by the ICDMap since trained coders had determined that no injury was present.

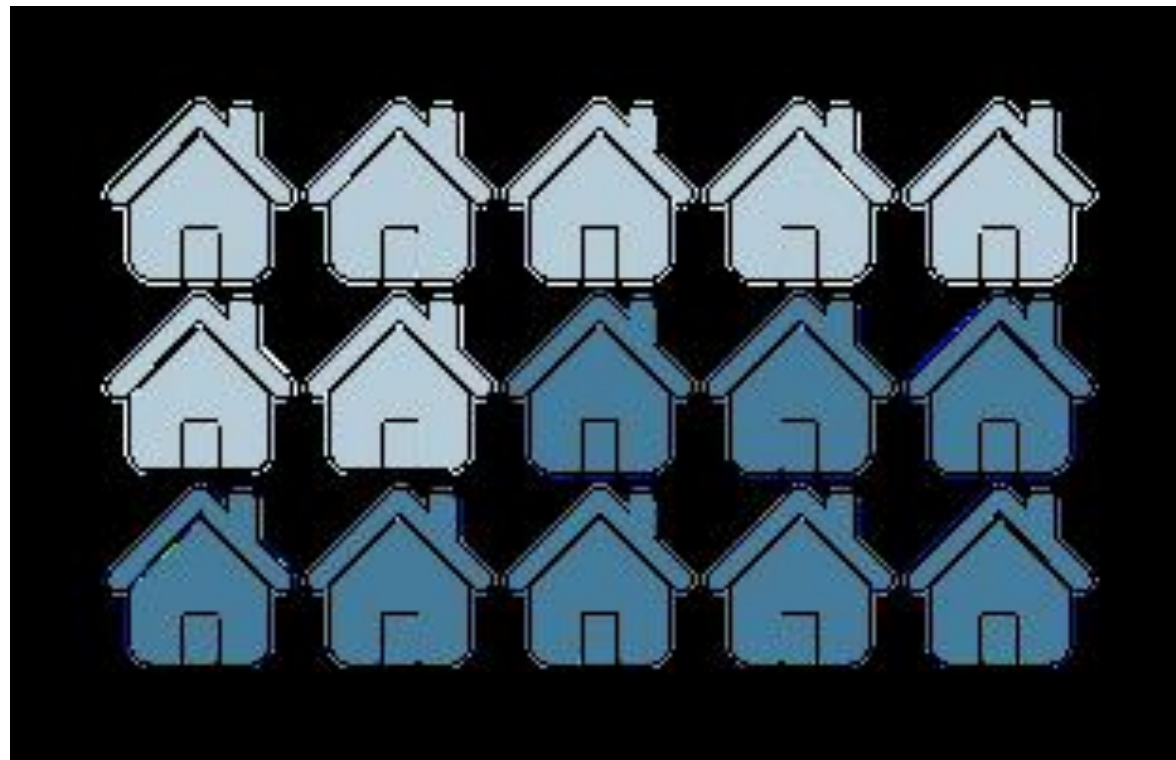
There were 62,585 (78%) injuries confirmed by AIS coding, nearly three-quarters of which were minor or moderate injuries (AIS 1 or 2) and a quarter were serious or worse injuries (AIS 3 or more). The ICDMap did not identify 9,884 (16%) of injuries confirmed as present by AIS coding.

When AIS coded injuries were also identified by the ICDMap, the severity assigned by the ICDMap tended to be either the same or less severe than the severity assigned by the AIS codes.

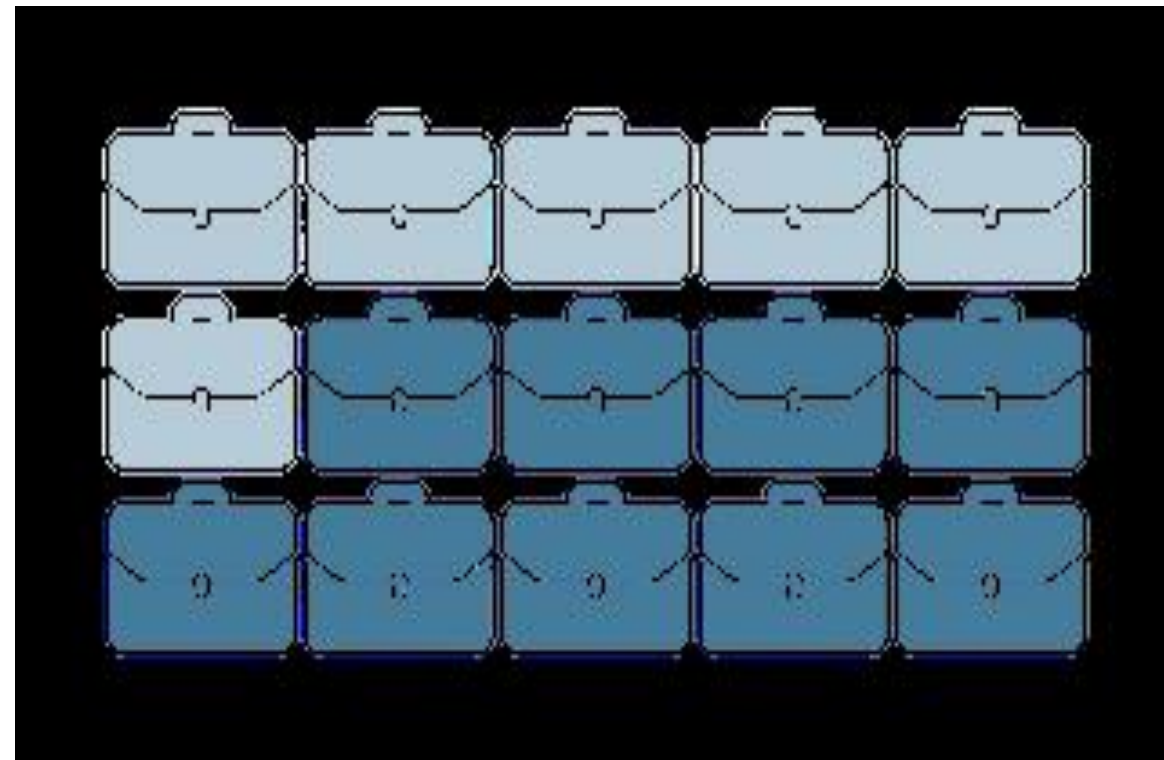
At a patient level, assignment of any serious injury status showed only poor to moderate agreement with the serious injury status from trained coders. The average injury score by ICDMap was lower (average 12.1 compared to 17.0 by AIS codes) and the capacity to predict longer term outcomes was impaired using the ICDMap.

The ICDMap is not a replacement for trained professional AIS coders. There were issues with (i) missing injuries that were present, (ii) mis-identification of injuries that were not present and (iii) the assignment of severity to confirmed injuries.





53% increase in adjusted odds of discharge directly home



65% increase in adjusted odds of returning to work at 12 months

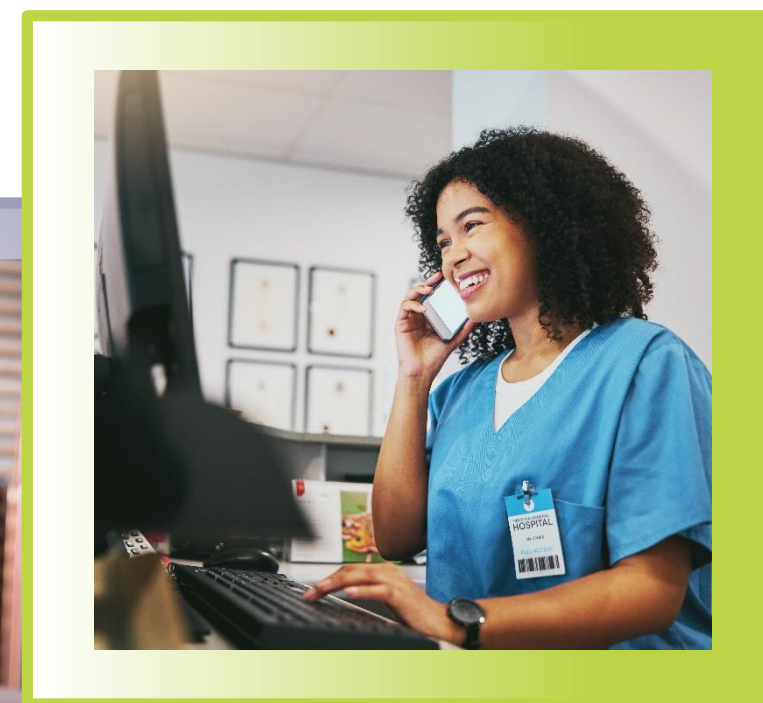
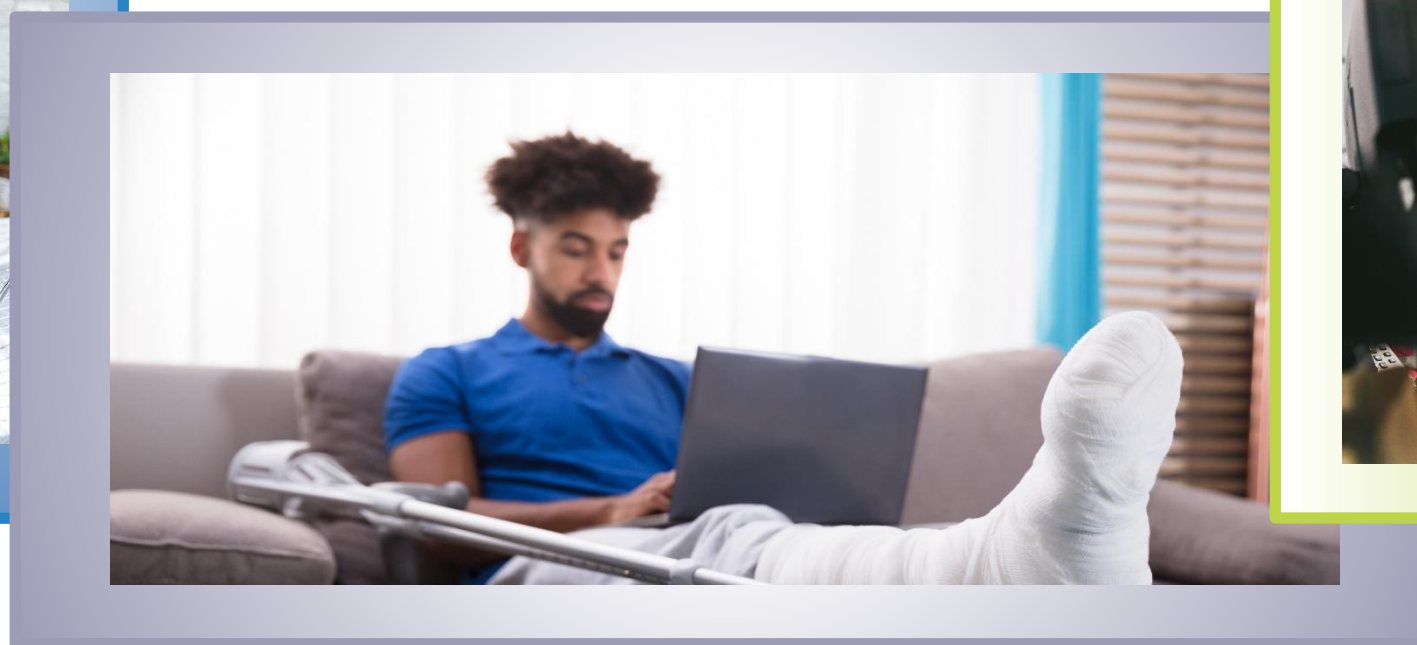
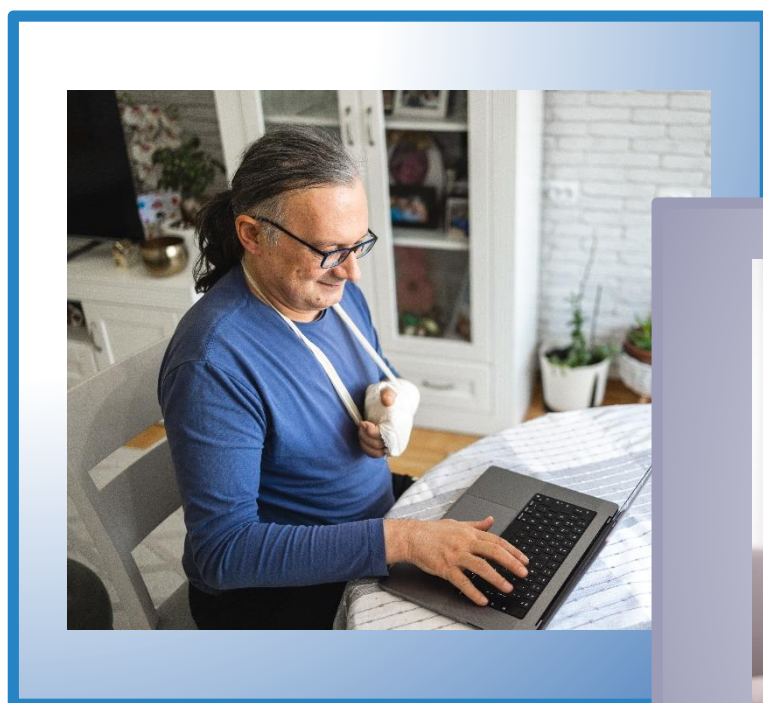
Assessment of an intensive Allied Health Model of Care (AHMOC) for trauma patients

Intensive allied health therapy commenced early in the acute hospitalisation phase following traumatic injury could have a substantial impact on improving hospital and patient outcomes. The aim of this collaborative study between the TAC and Alfred Health was to assess the impact of a purpose-built environment and a new allied health model of care (AHMOC) on patient flow management, levels of health service utilisation and patient-reported return to work rates. The AHMOC patients (n=1732) for 12 months within February 2020 to August 2021* were compared to a baseline group of patients (n=1644) admitted to the trauma ward in 2019.

Being in the AHMOC group was associated with increased odds of discharge directly home (aOR 1.53 (95% CI 1.29, 1.82)) and of having returned to work at 12 months (aOR 1.65 (95% CI 1.24, 2.21)). The median length of stay (4.0 days) was similar in both groups. Uptake of this model of early and intensive allied health therapy should be considered in the development of future trauma models of care and guidelines.

*2020 – interrupted by COVID lockdown period between April 2020 and October 2020



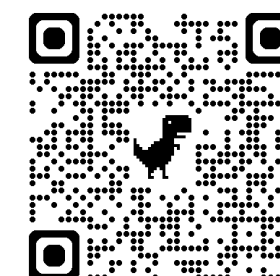


Improving recovery using Patient-Reported Outcome Measures (PROMs)

Collecting patient-reported outcomes in a systematic fashion is important to understand recovery trajectories and compare performance between different services and fields of care. The aim of this collaborative study between VOTOR, the Victorian State Trauma Registry, and the Burns Registry of Australia and New Zealand was to compare follow-up data from three injury registries to quantify patient preference for telephone versus online follow-up, determine predictors for choosing online follow-up, and compare response rates based on the patient's preferred follow-up method in the first 12 months after injury.

Preliminary data for over 8000 patients revealed a greater proportion of orthopaedic trauma patients (41%) initially opted for online follow-up compared to major trauma (31%) and burns patients (24%). A greater proportion of major trauma patients (69%) and burns patients (64%) completed follow-ups at both six- and 12-months post-injury compared to orthopaedic trauma patients (52%).

The findings encourage giving patients a choice between two follow-up methods but suggest the preferred method and type of injury is associated with follow-up and completion rates. Encouraging or diverting certain patients towards a particular follow-up method could be considered to deliver high follow-up rates in an economical way.



VOTOR, Monash University

Access to VOTOR data must comply with ethics requirements and receive approval from the VOTOR Steering Committee

Requests for information from the VOTOR are welcome.

Applications should be made to:

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