



Improving Trauma Outcomes

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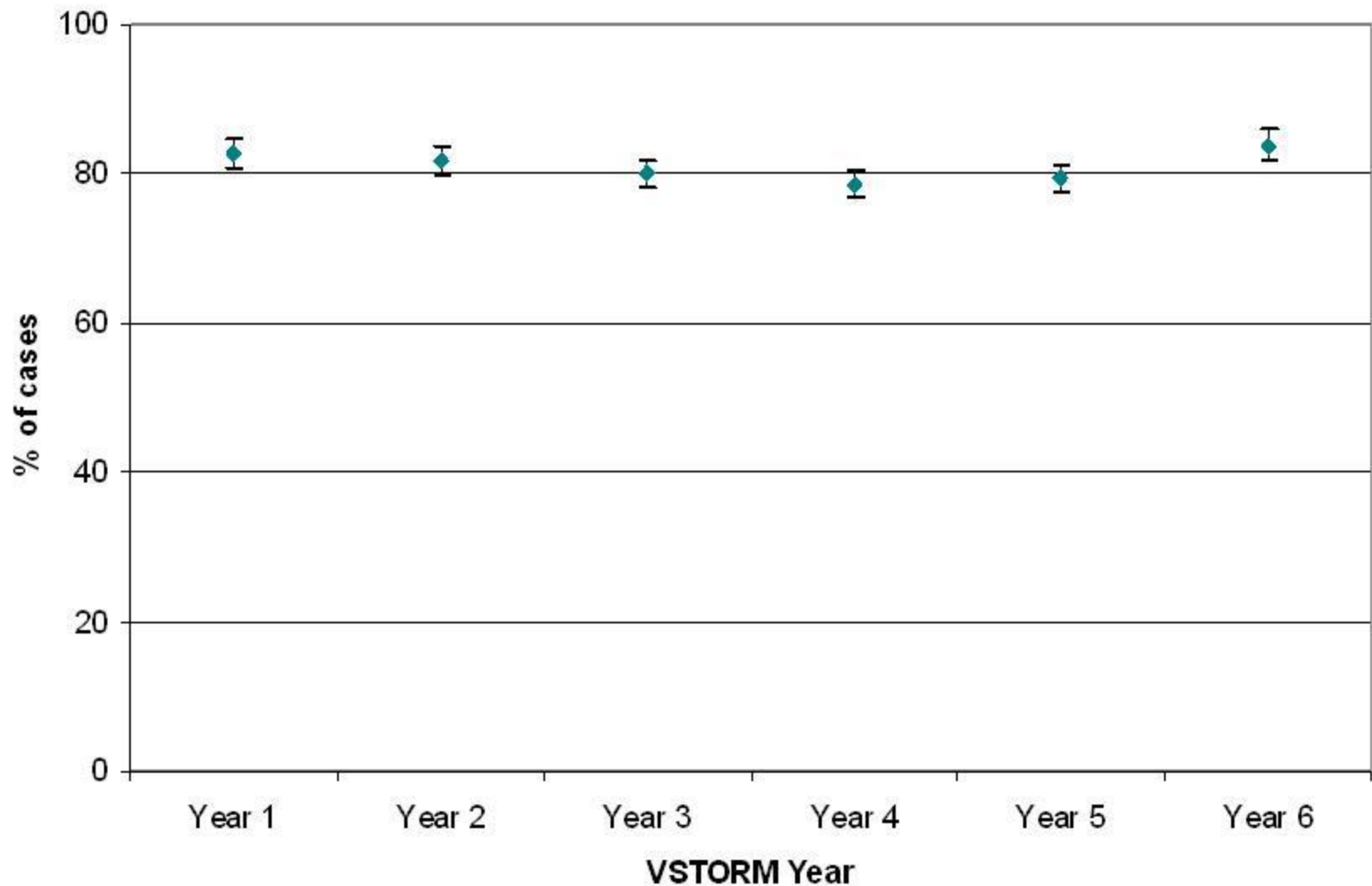
Department of Epidemiology & Preventive Medicine



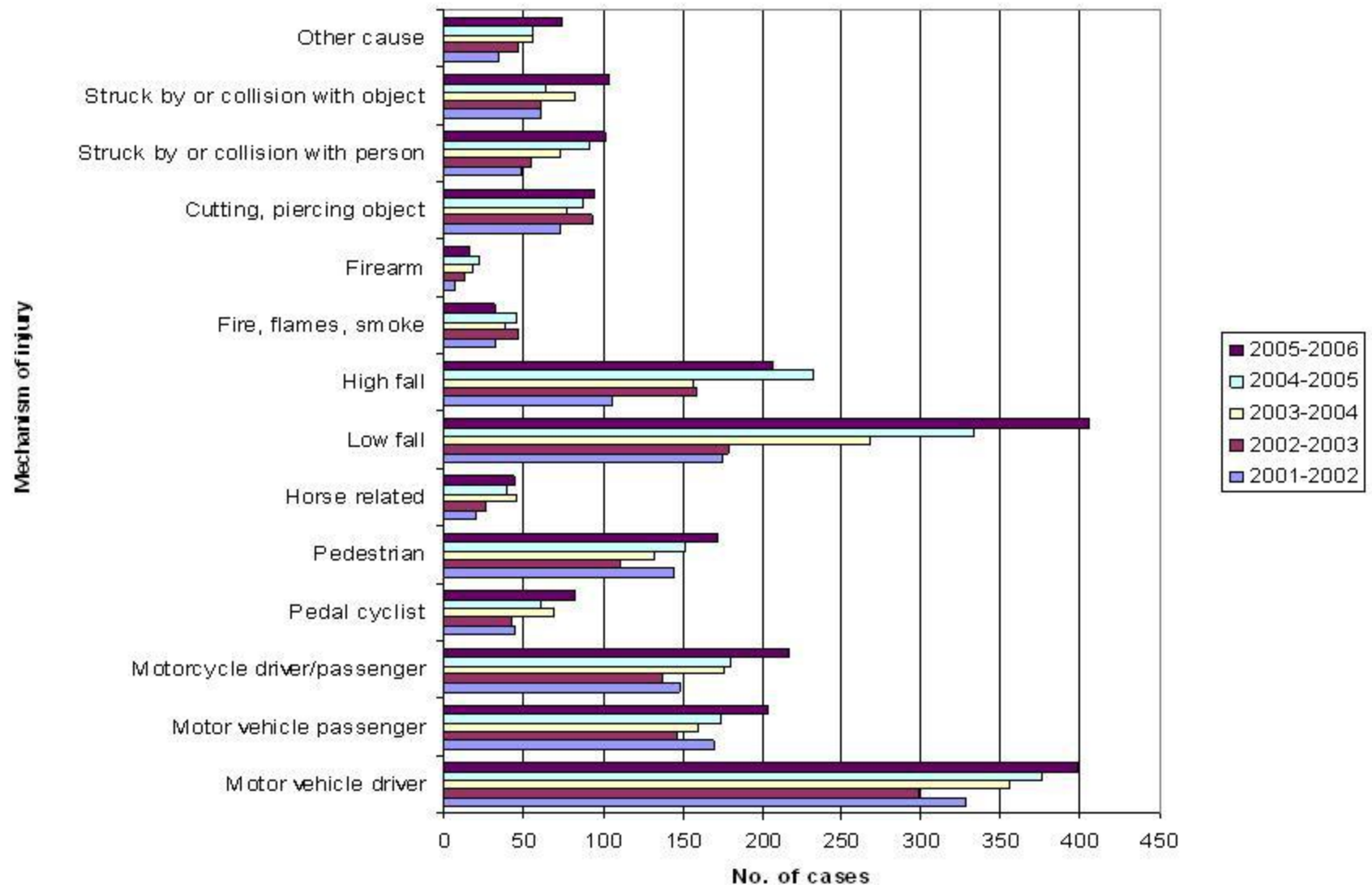
MONASH University

Medicine, Nursing and Health Sciences

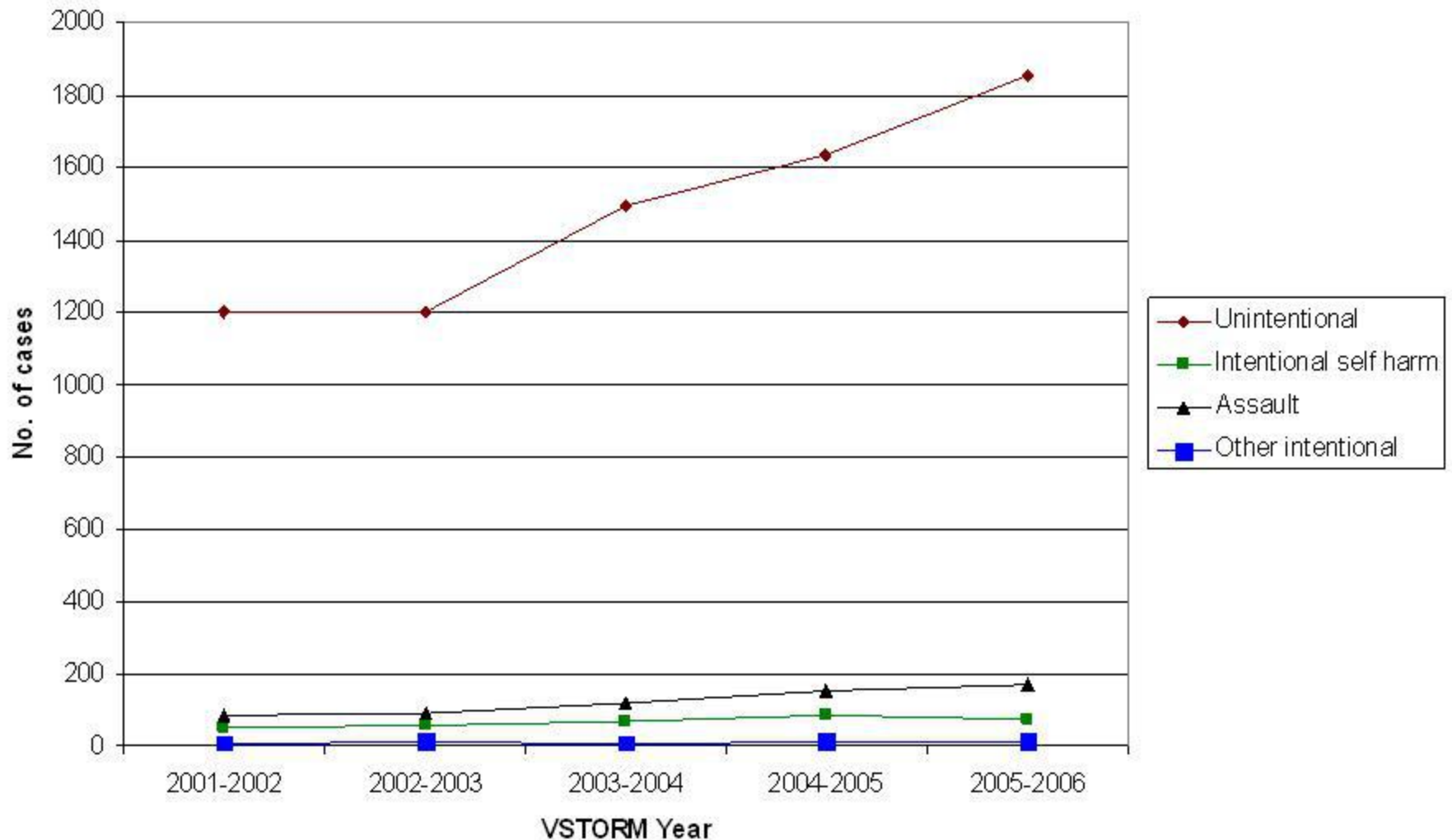
Definitive management at MTS



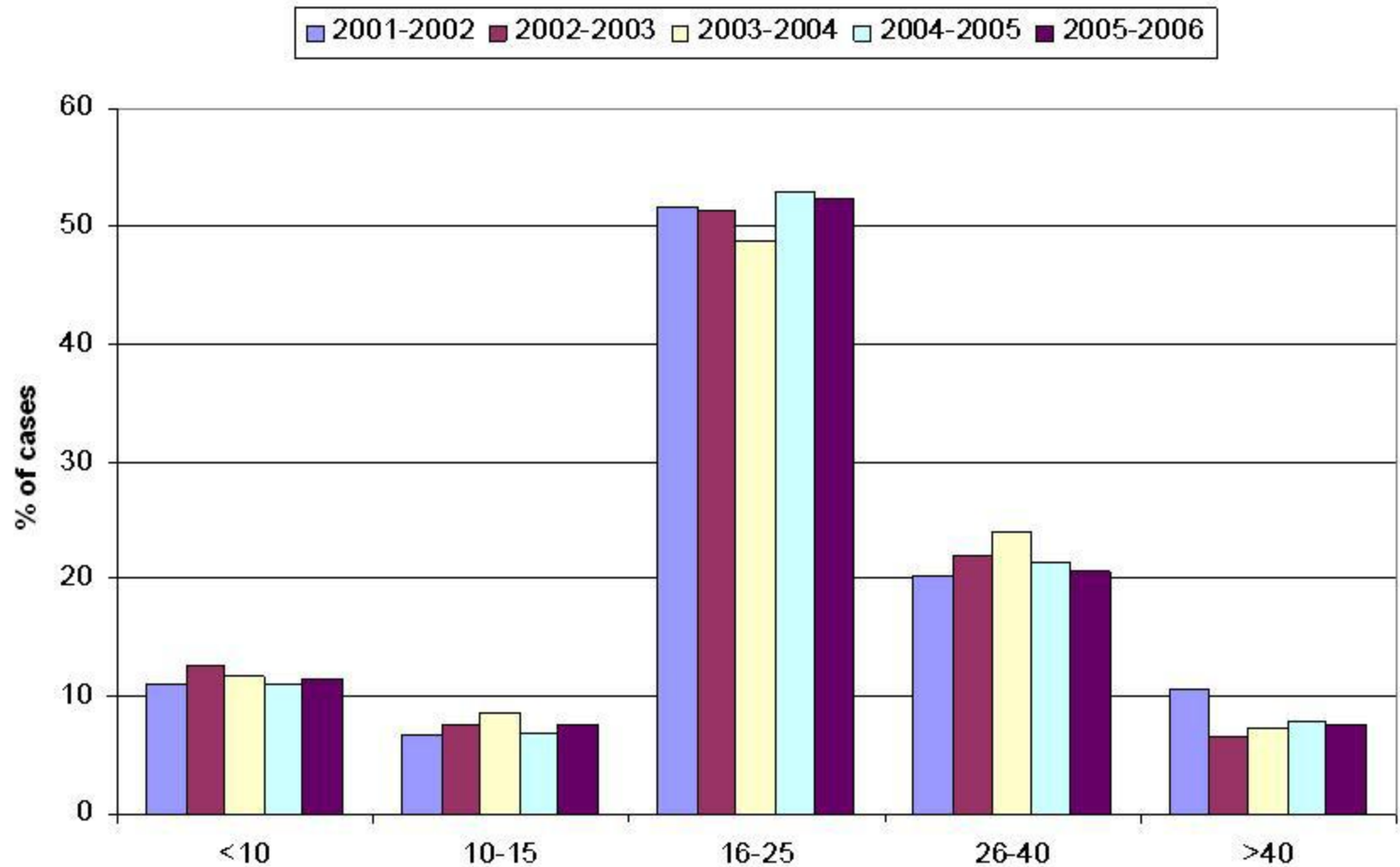
Mechanism of injury



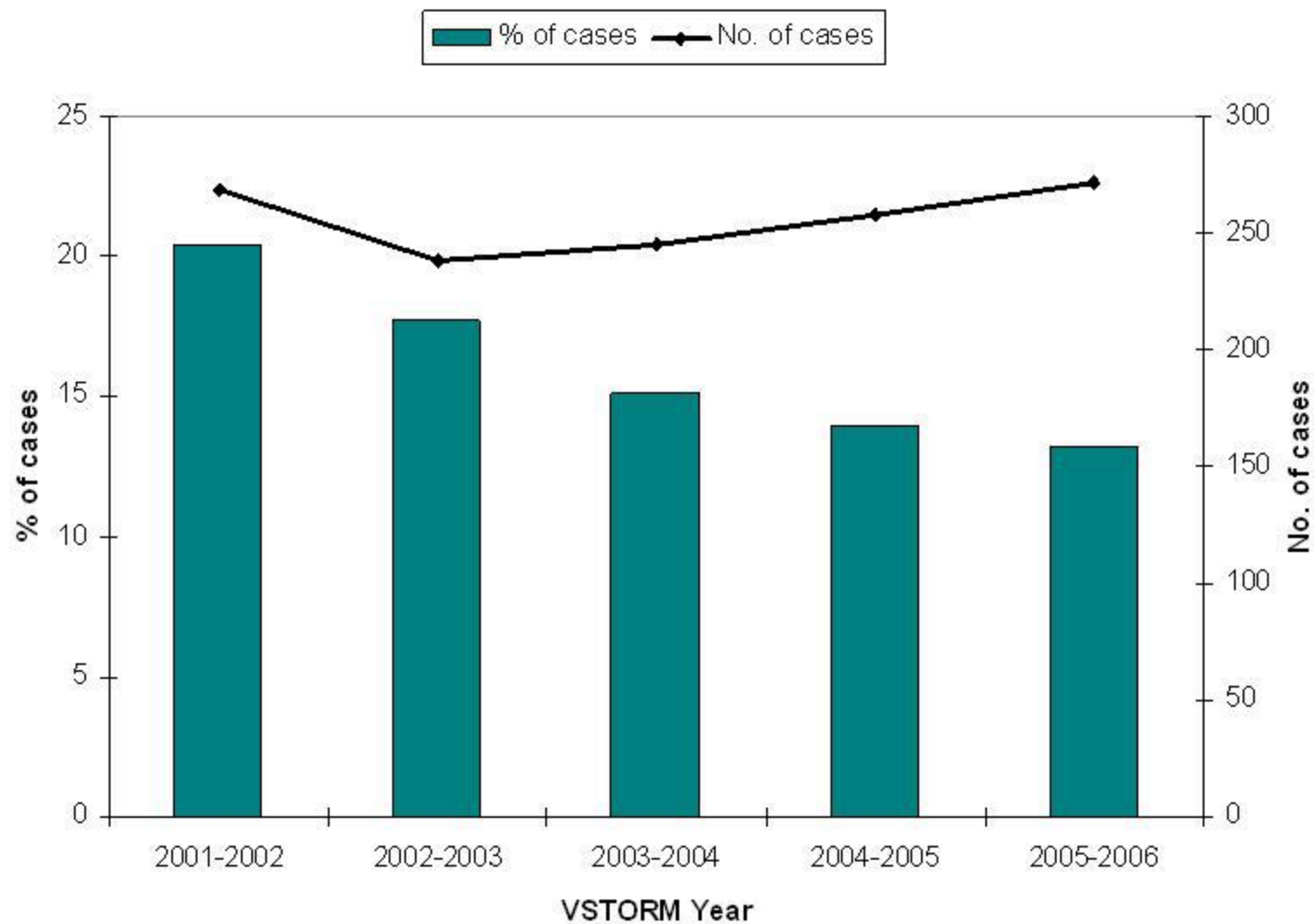
Intent of Injury



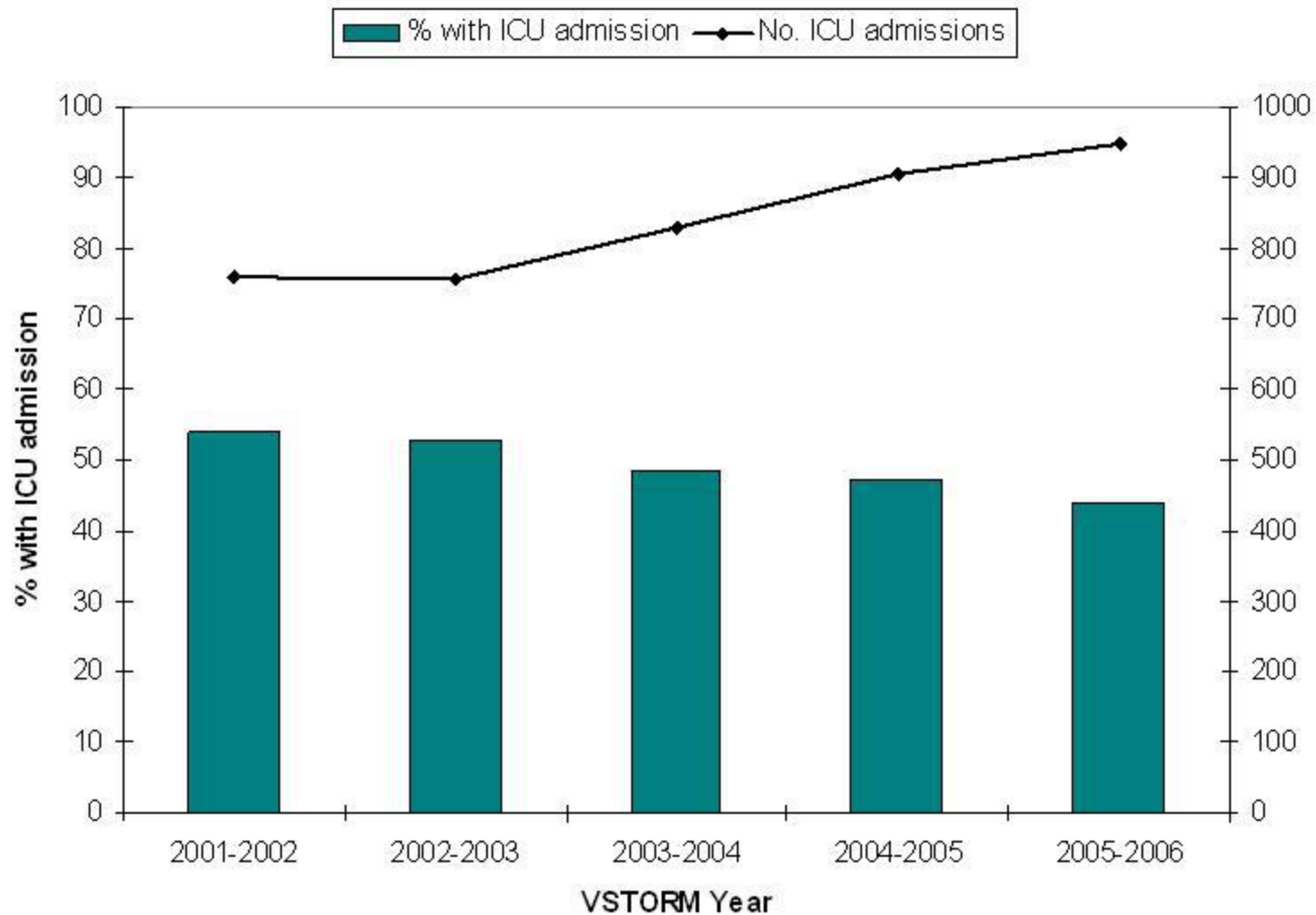
Injury Severity Score



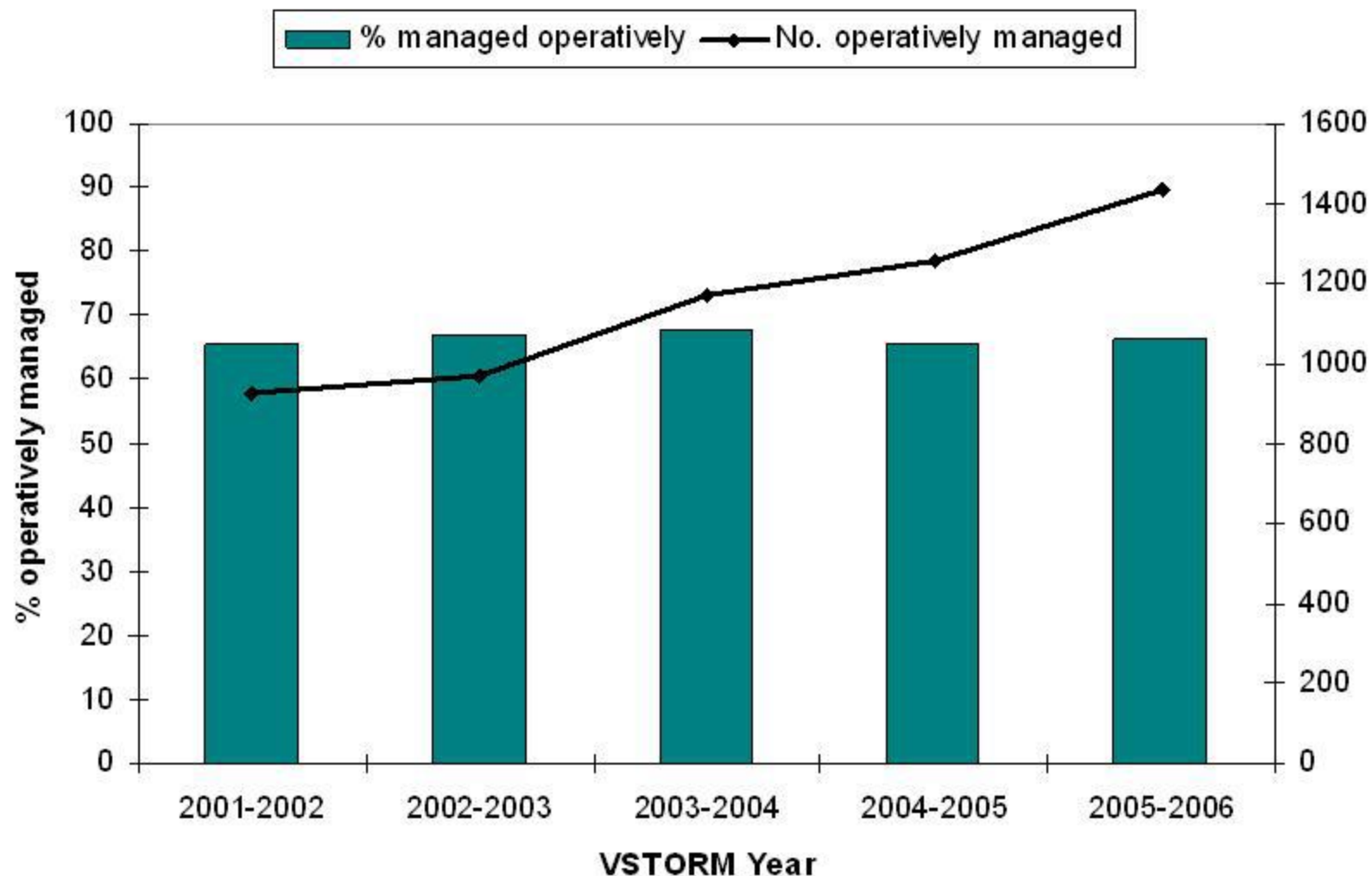
GCS<9



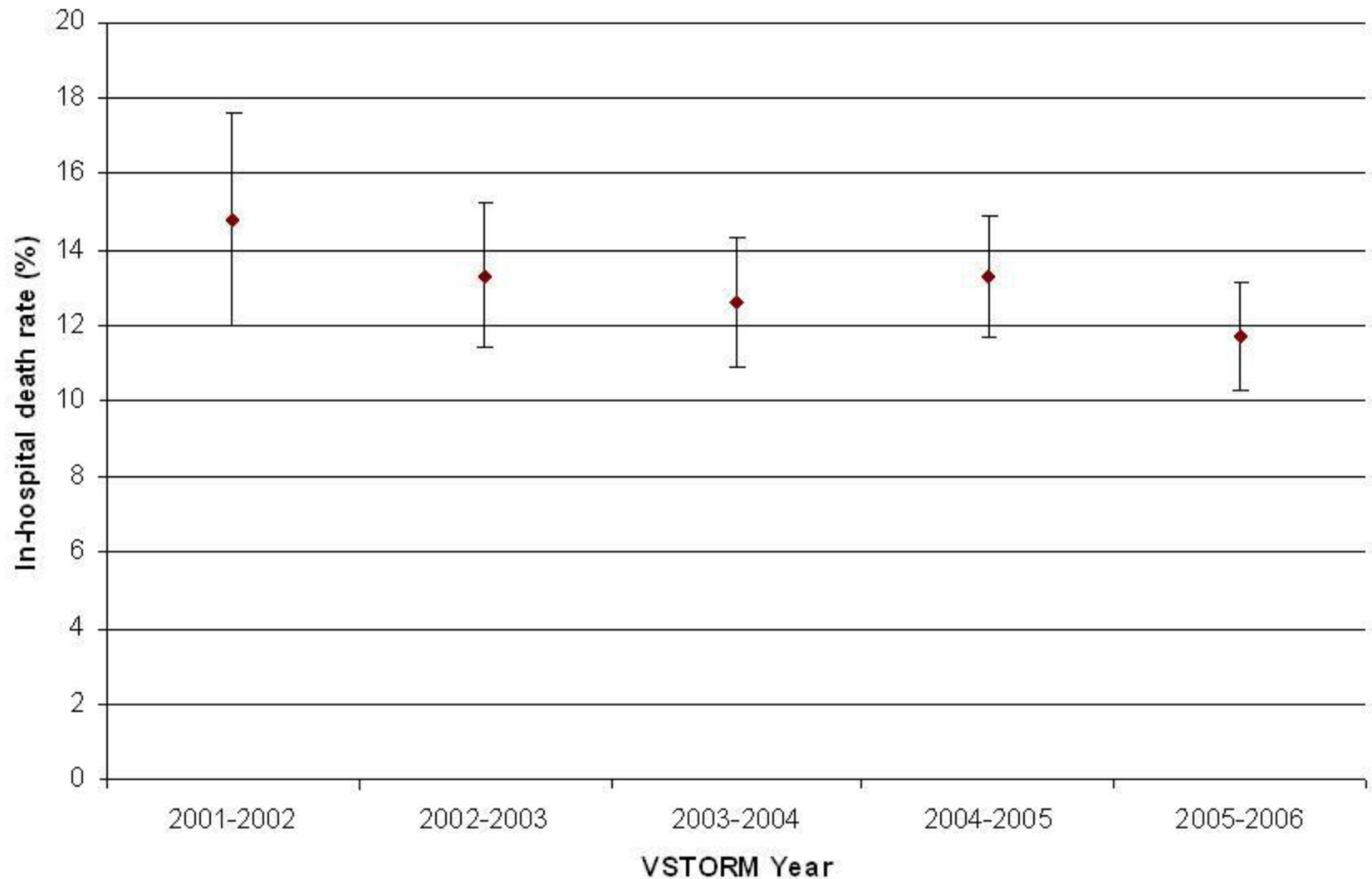
ICU admission



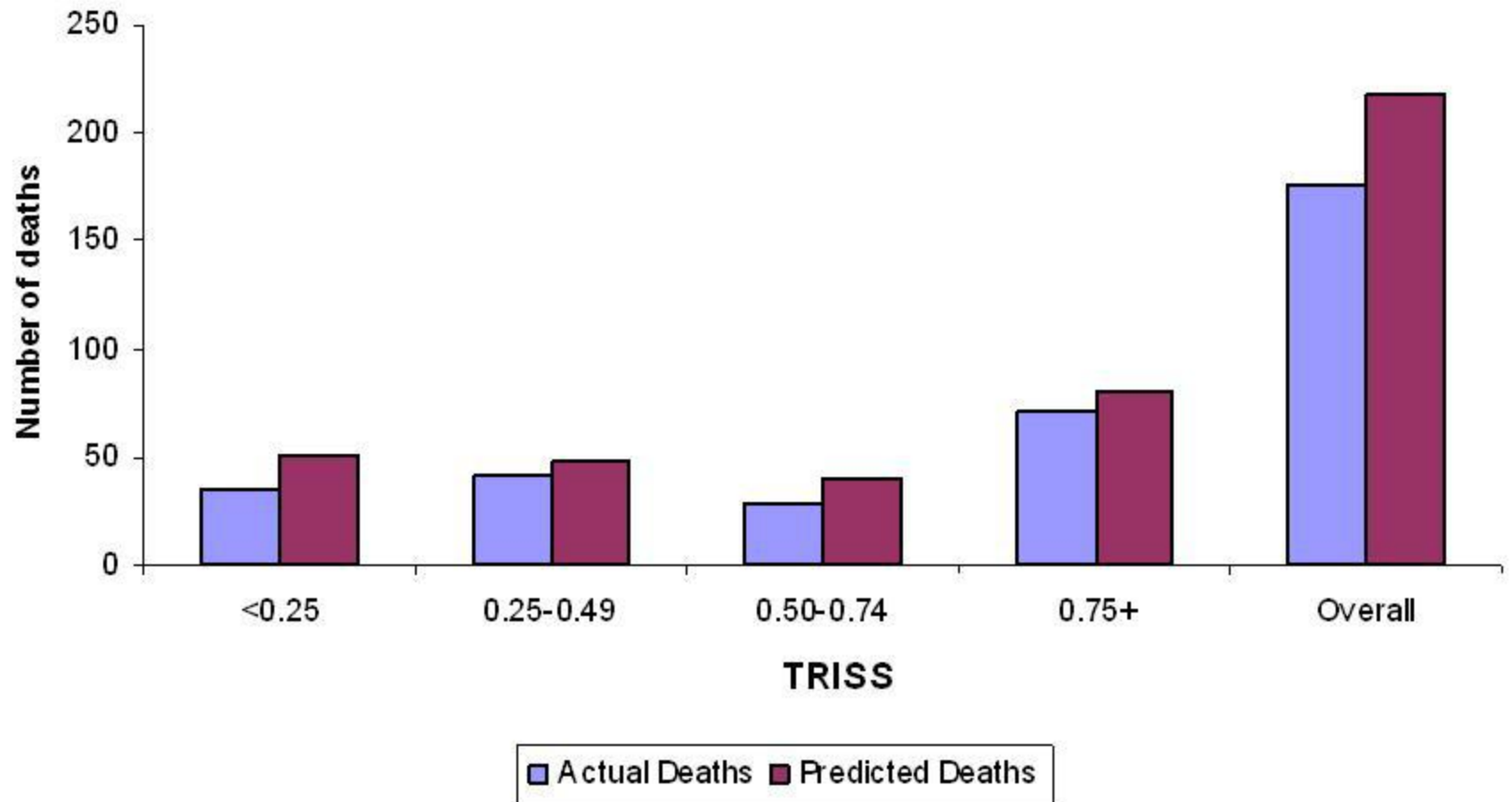
Operative management



In-hospital death rate for major trauma

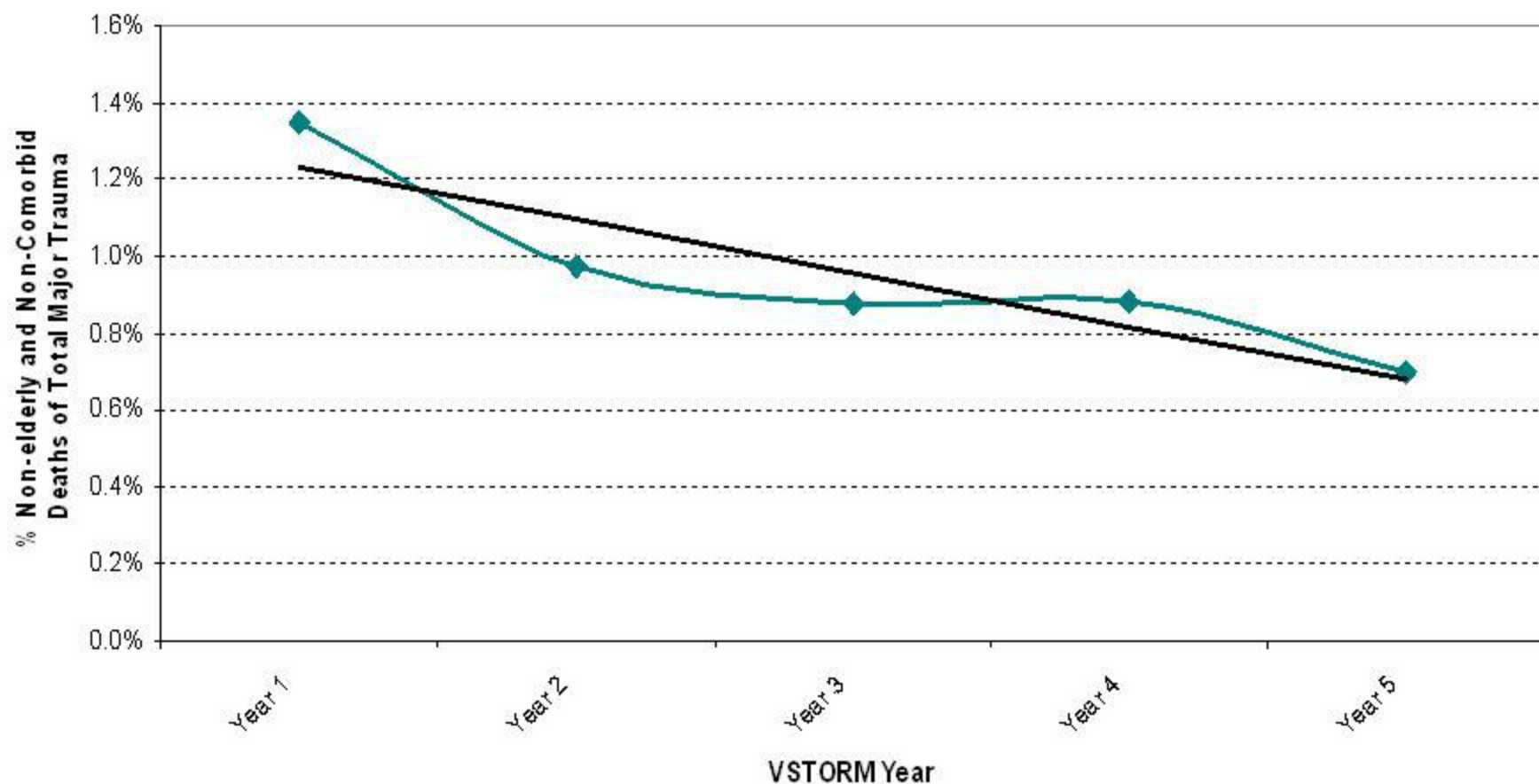


TRISS



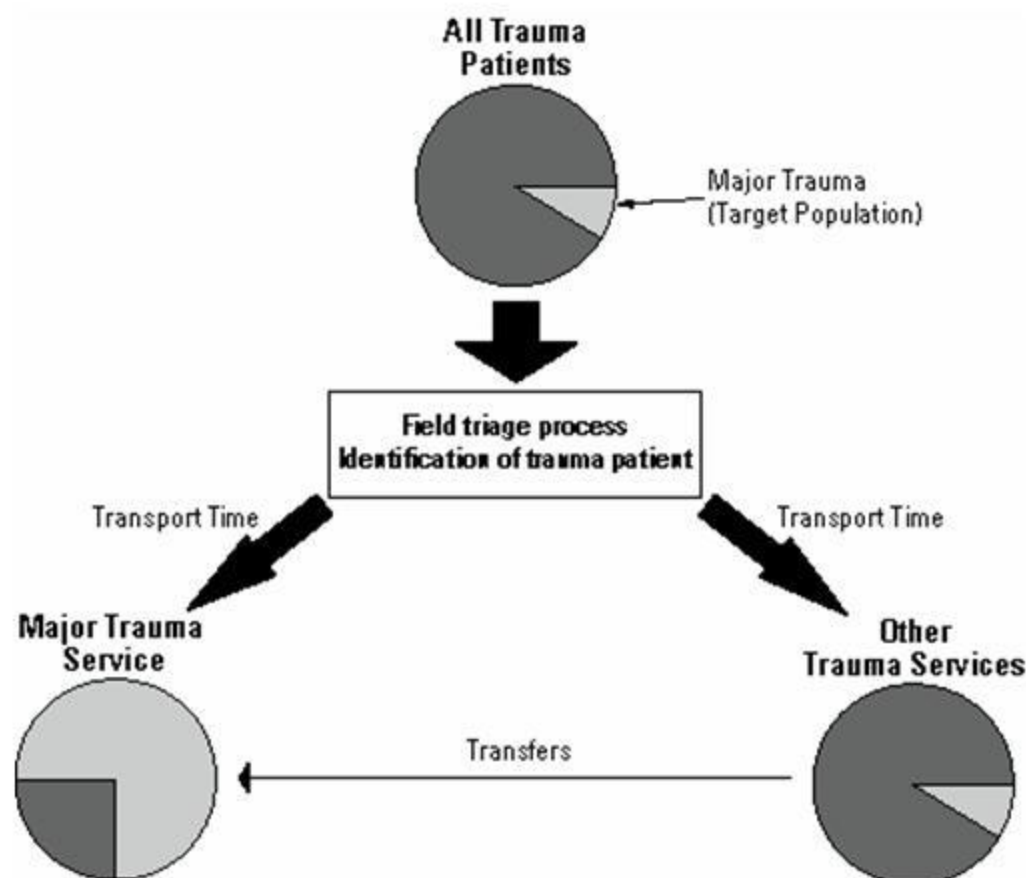
Preventable and Potentially Preventable Deaths

Excluding elderly & patients with comorbid conditions

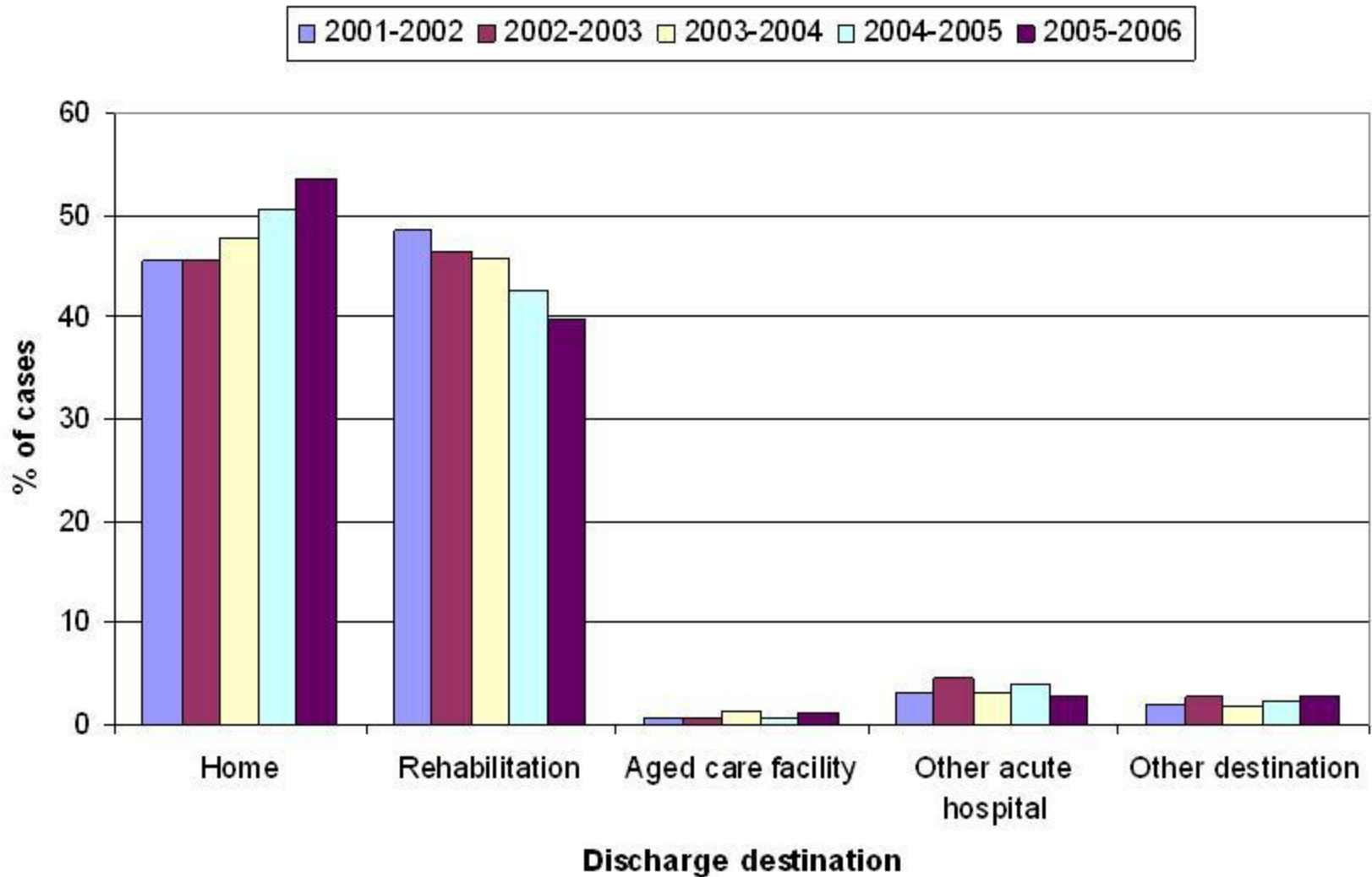


Victorian State Trauma System

- Regional trauma system since 2001



Discharge destination (survivors)





How do we monitor survivors??

No clear direction from other Registries

Potentially labour intensive

Not a research project

Potentially huge loss to follow up

MMMT Project

Instrument		Prediction	Alternate form reliability	Sensitivity	Responsiveness
GOS		-	+++	-/++	+++
GOS-E		-	+++	-/+++	+++
Modified FIM	Loco	-	+	++/+	-
	Feed	-	+++	+/-	-
	Exp	-	++	-/-	-
Modified FIM		-	++	+/-	+
FIM total		++	na	+++/-	+
FIM motor		+++	na	+++/-	+
FIM cognitive		-	na	-/-	-

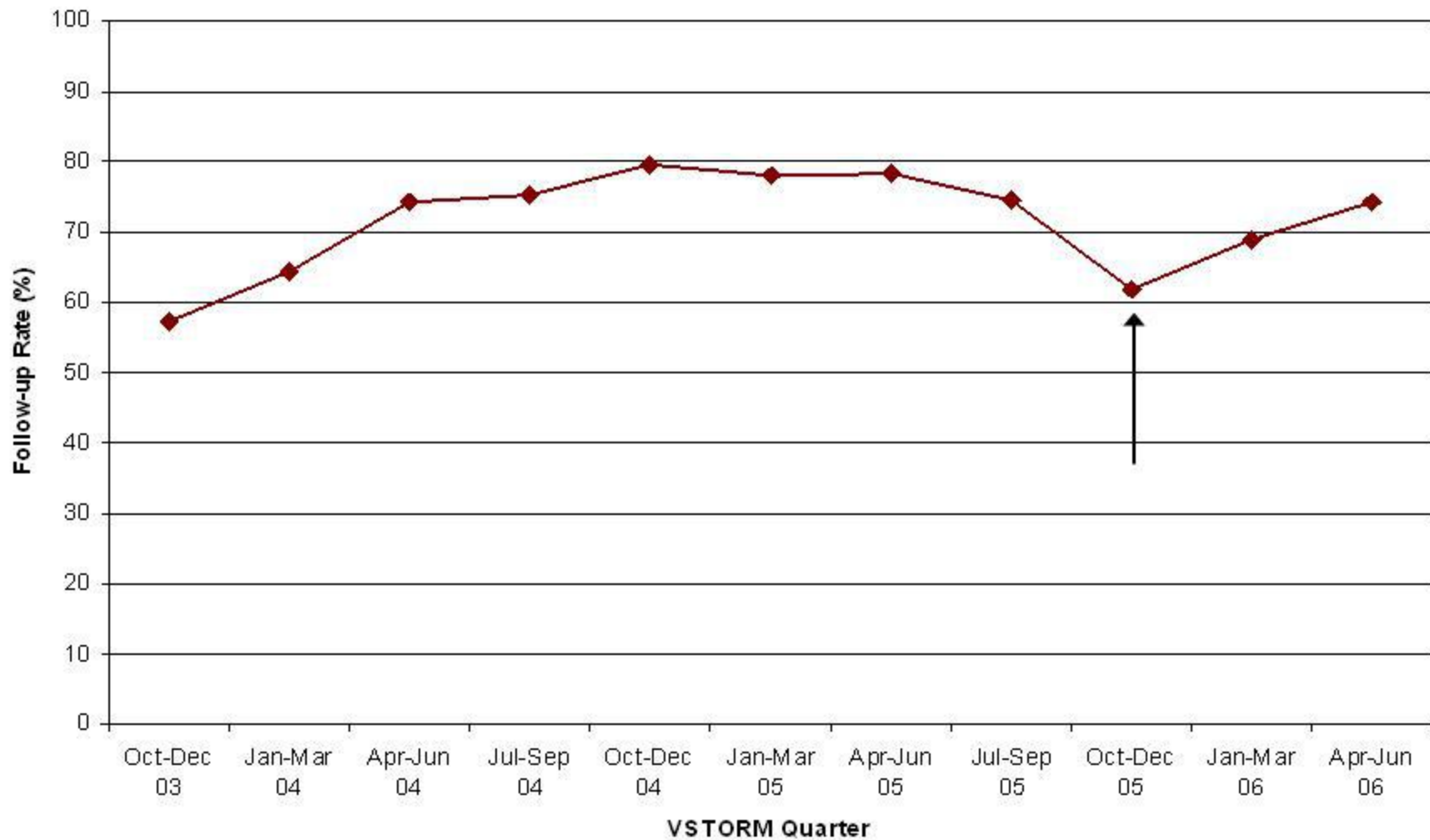
*Consistent for head injury (AIS>2) vs. no head injury

Implementation of MMT findings

- ▶ **Continue with modified FIM at discharge**
 - ▶ NTDB minimum dataset item
 - ▶ No clear alternative
- ▶ **Cessation modified FIM at 6 months**
- ▶ **Commence GOS-E at 6 months**
 - ▶ April/May 2006 implementation
 - ▶ Patients with a date of injury Oct-Dec 2005 (Y3Q2)
- ▶ **All adult major traumas**
 - ▶ i.e. not just MTS hospitals

Major trauma outcomes

Follow-up rates



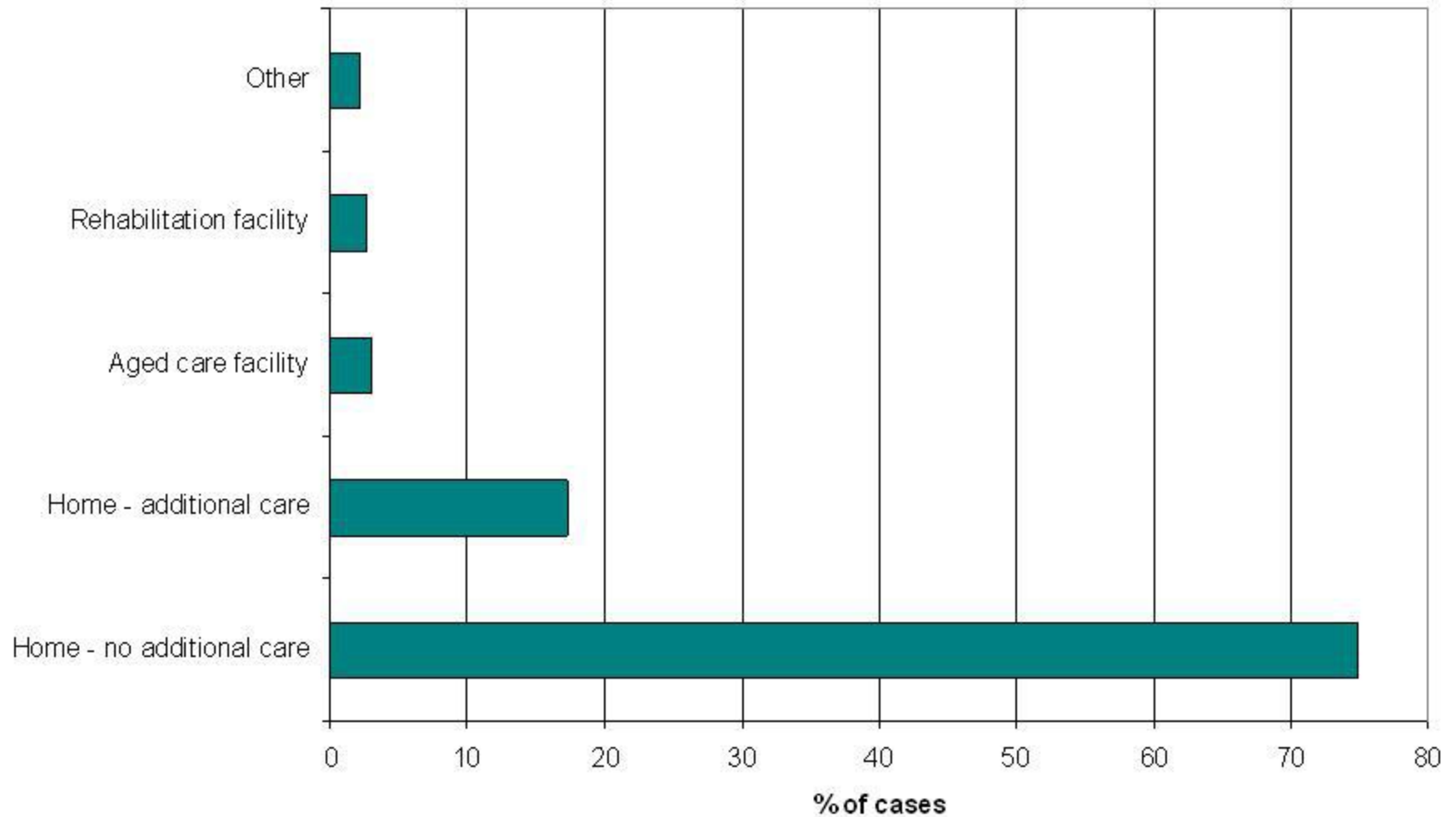
Follow-up and post-discharge death

At 6 months

- ▶ **2,926 followed-up**
- ▶ **Responders**
 - ▶ **More severely injured**
 - ▶ **Less penetrating trauma & assault**
 - ▶ **Less males**
- ▶ **2,836 survivors at 6 months**
 - ▶ **3% mortality rate post-discharge**

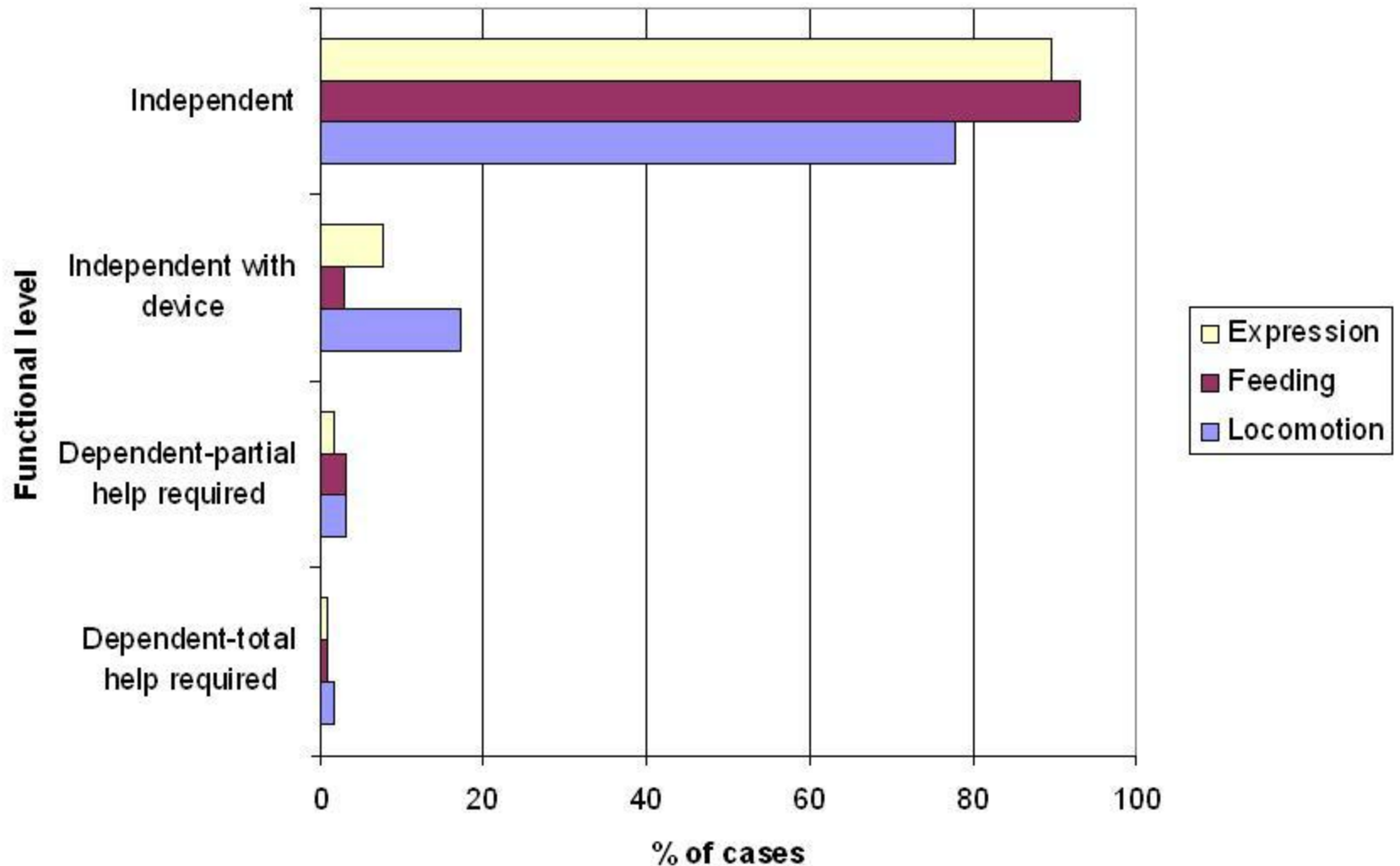
Living status

At 6 months



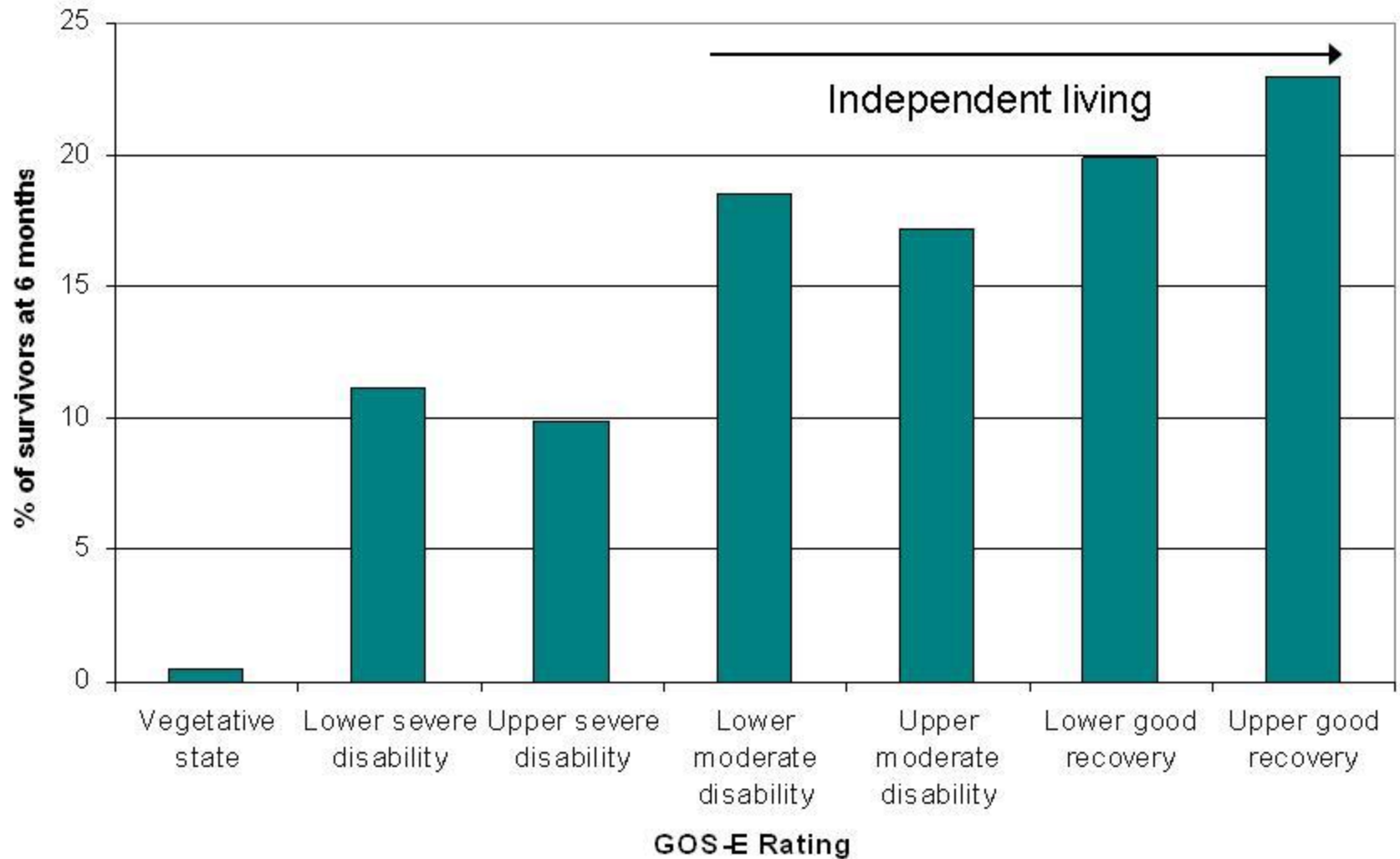
Modified FIM

6 months post-injury



Glasgow Outcome Scale - Extended

6 months post-injury



Victorian State Trauma Registry (VSTORM)

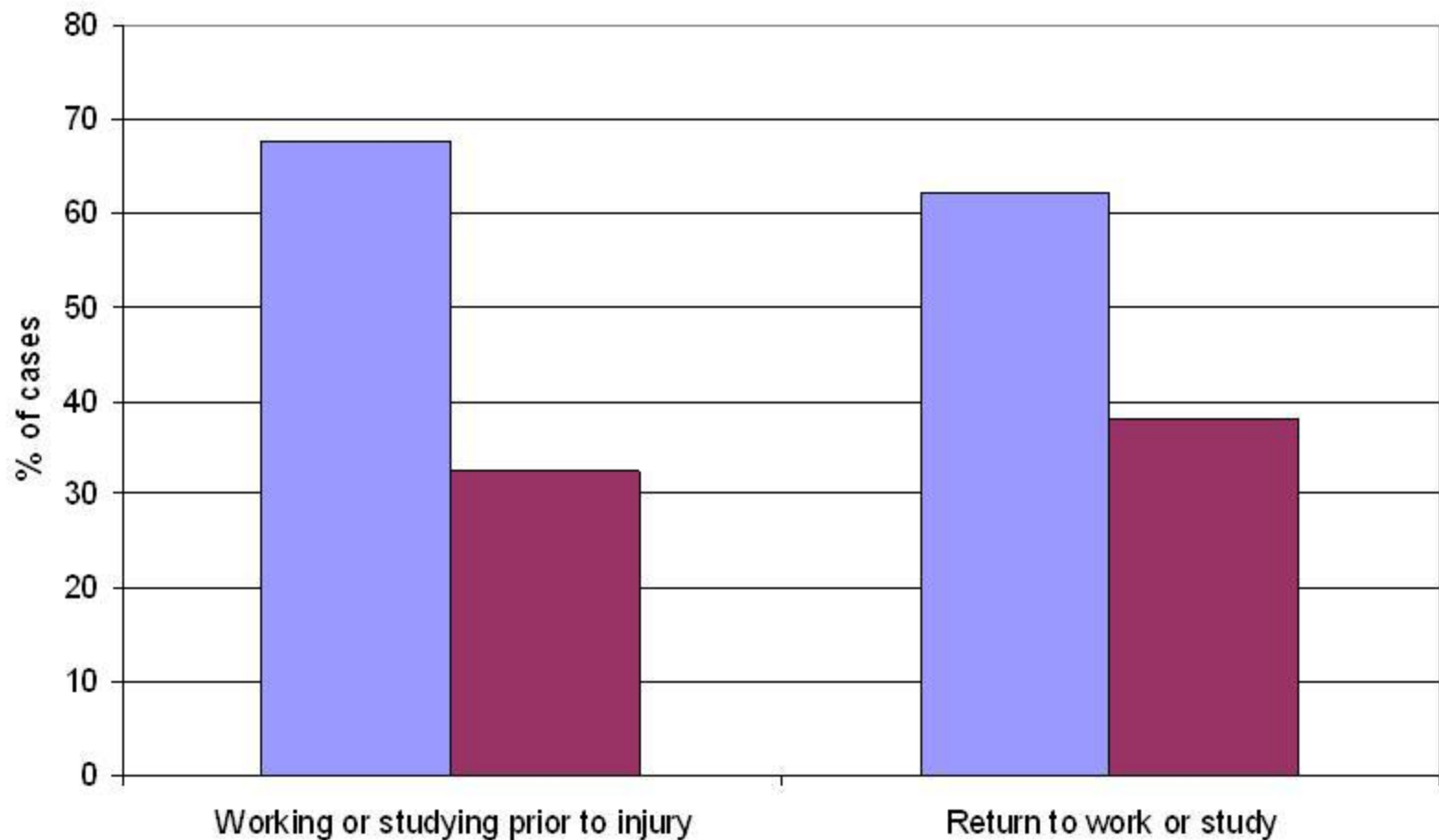
- Established to monitor and evaluate the state's trauma system
 - ▶ State-wide, population-based registry
 - ▶ All health services managing trauma (n=138)
 - ▶ Monitor major trauma patterns
 - ▶ Tracking of patients across the system
 - ▶ Quality improvement
 - ▶ Collecting data since 1st July 2001



Return to work or study

6 months post-injury

Yes No



Moving forward

Achievements

- **Population-based monitoring of adults**
 - ▶ **Unique**
 - ▶ **Identify prevention opportunities**
 - ▶ eg ladder falls (Mittra 2007 MJA)
 - ▶ **Improve Prehospital Triage**
 - ▶ **Assess outcomes in major trauma sub-groups**
 - ▶ **Identify predictors of poor outcomes**
 - ▶ eg compensation (Gabbe 2007 MJA)
 - ▶ **Quality Indicators (Willis 2007 Injury)**
 - ▶ **Monitor changes in outcome over time**
 - ▶ **Capacity to develop benchmarking tools around functional outcomes rather than mortality (>90% survive)**

Limitations

- ▶ **No quality of life measurement**
- ▶ **Is 6 months the right time point for follow-up?**
- ▶ **Limited return to work information**
 - ▶ **Nested cohort funded by VTF**
 - ▶ SF-12, global outcome questions, extended RTW information
 - ▶ 6, 12, 18 and 24 months post-injury
- ▶ **No paediatric follow-up**
 - ▶ **VTF funded project to address this**
 - ▶ KOSCHI, GOS, weeFIM, FIM, PedsQL, CHQ
- ▶ **Follow-up rates**
 - ▶ **Reliant on hospitals for contact details**
 - ▶ **Making progress**
 - ▶ **Difference between a research project and a registry/population study**

Moving forward

- **Outcomes**
 - ▶ Addition of QOL measure
 - ▶ Paediatric outcomes
 - ▶ Further time points
- **System**
 - ▶ Evaluation and improvement of quality of life outcomes
 - ▶ Potential to develop benchmarking for longer term outcomes
 - ▶ Transfers against the system and transfer times
 - ▶ Linkage with compensable datasets
 - ▶ Comparison with other compensation schemes - esp NZ
 - ▶ International benchmarking



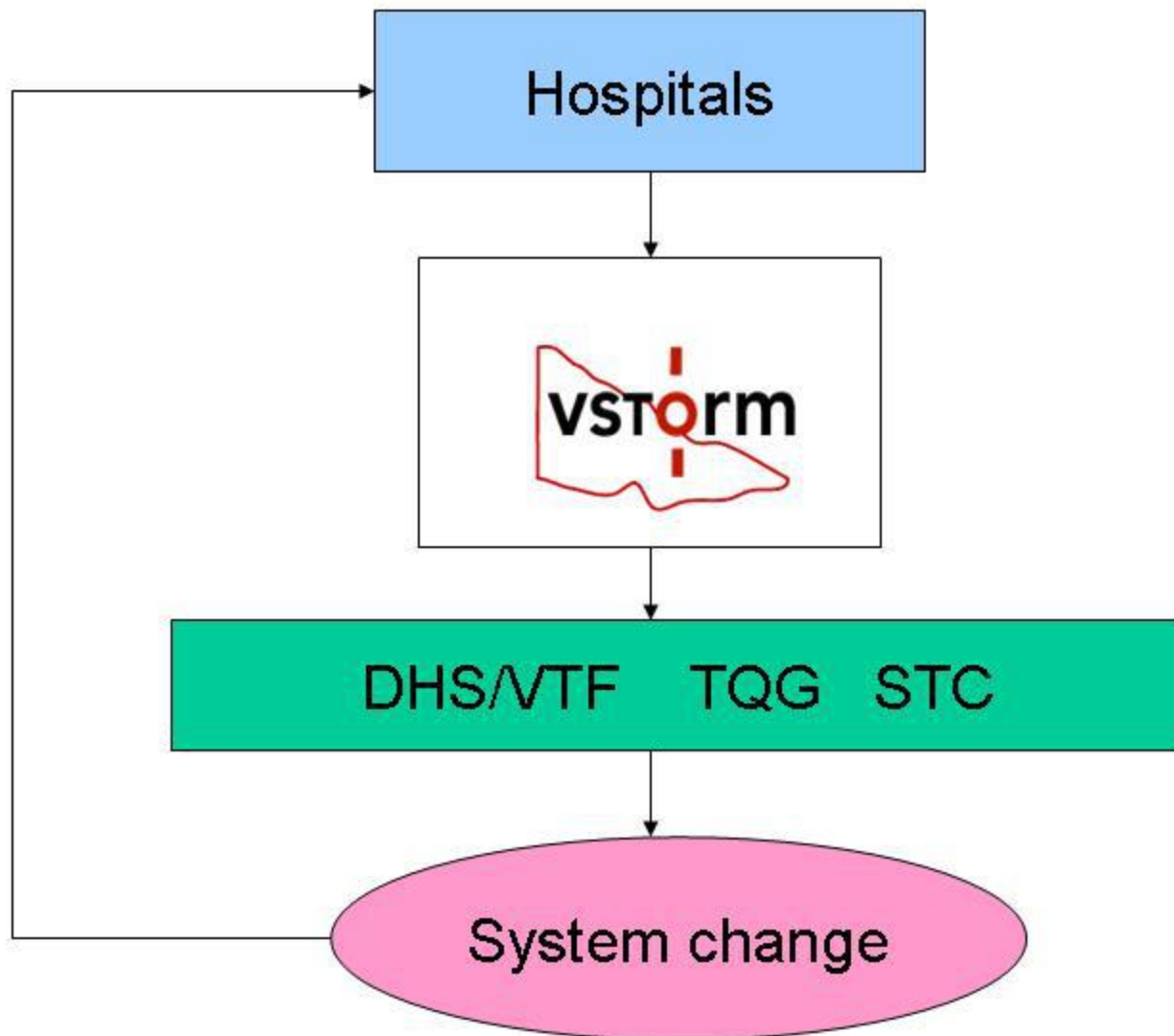
Funding sources

Department of Human Services, Victoria



**This project is proudly supported by the
Victorian Trauma Foundation**

Feedback Loop



Definition of major trauma

- Death due to injury
- ICU stay >24 hours, requiring mechanical ventilation
- Injury Severity Score (ISS) >15
- Urgent surgery



Data collected

- Patient details
 - ▶ Patient demographics
- Injury event details
- Pre-hospital
 - ▶ Ambulance Patient Care Record
- Hospital
 - ▶ Emergency department
 - ▶ ICU
 - ▶ Injury details
 - ▶ Diagnostic data, procedures, etc

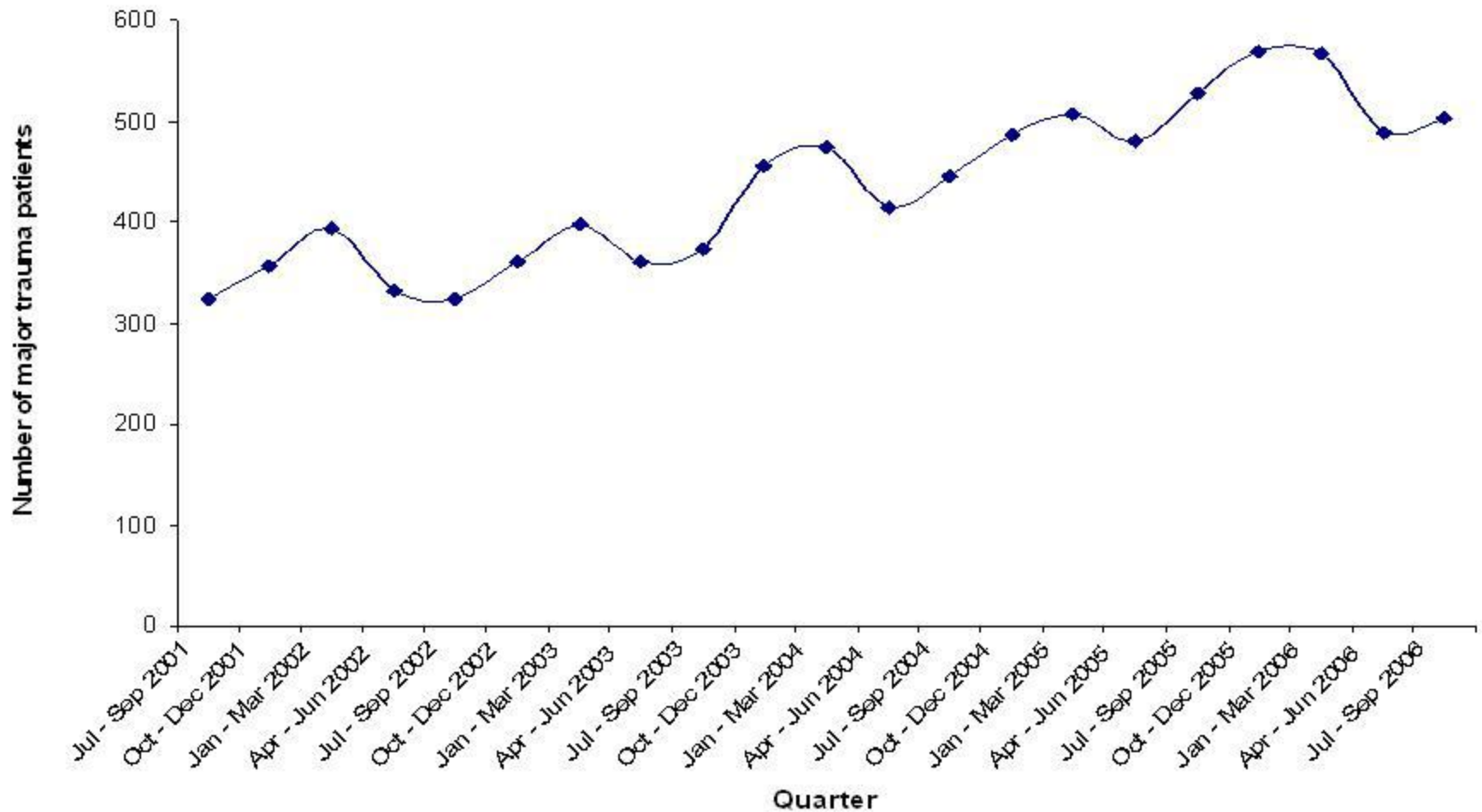


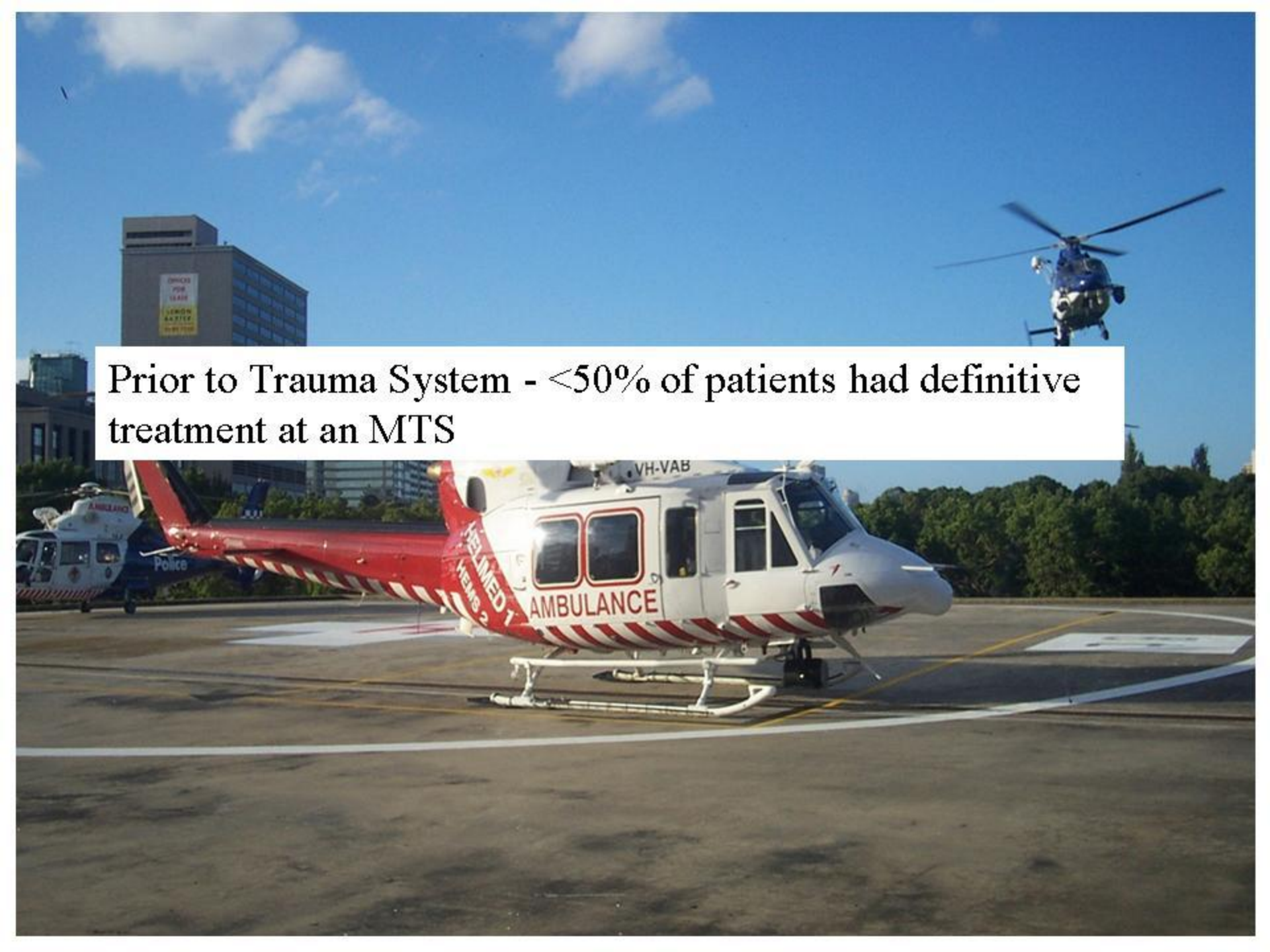
Outcomes collected

- In-hospital mortality
- Discharge functional measure
- Hospital length of stay, discharge destination, etc.
- 6 month outcomes
 - ▶ Death, living status
 - ▶ Functional measure
 - ▶ Return to work
 - ▶ (quality of life)
- (Deaths registry, NCIS, MAS/RAV)



Hospitalised major trauma in Victoria





Prior to Trauma System - <50% of patients had definitive treatment at an MTS