28 November – 1 December 2004

Xth Accident Compensation Seminar 2004

Institute of Actuaries of Australia

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ANCIS

The Australian National Crash In-depth Study

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Institute of Actuaries of Australia

What is ANCIS?

- Study of modern vehicle real world crash performance and occupant injuries
- Criteria:
  - Occupants of crashed vehicles who have been hospitalised as a result of their injuries
  - The car in which they were travelling was manufactured since 1989

Objectives

- To determine patterns and severities of severe crashes and occupant injury causation
- To help devise countermeasures to minimise these injuries
- To evaluate existing safety features
- To identify crash injury trends and car safety issues
- To understand human, vehicle and environmental factors contributing to crash occurrence

Case Timeline

1. Crash

OCCUPANT TAKEN TO HOSPITAL

2. Occupant Data (Human)

VEHICLE DETAILS FROM OCCUPANT

3. Vehicle Inspection

SITE DETAILS FROM AMB. NOTES, POLICE REPORT

4. Crash Site (Environment)

5. Case Finalisation

Method – Occupant Data

- Purpose: Occupant 'performance', account of crash, injuries, contributing factors
- Research Nurses recruit participants in hospitals
  - Melbourne (6), Sydney (3) and Hobart (1)
- Occupant
  - Patient and/or relative's consent required
  - Structured interview where possible
  - Injury data from medical records

HUMAN
VEHICLE
ENVIRONMENT

Method – Vehicle Inspection

- Purpose: Type and severity of impact(s), performance of vehicle structure, restraint and safety systems
- Vehicle examination
  - Impacts and deformations
  - Structural integrity
  - Intrusion
  - Seating and restraints (inc. child restraints)
  - Occupant contact points with interior

HUMAN
VEHICLE
ENVIRONMENT

Method – Crash Site

- Purpose: Role of road environment
- Retrospective site examination
  - Exact crash location, time and type (DCA)
  - Road and intersection type, configuration, surface
  - Medians and shoulders
  - Traffic control devices
  - Crash evidence
  - Environment and weather

HUMAN
VEHICLE
ENVIRONMENT

Method – Summing Up

- Crash severity (Delta-V, EBS)
- Injury contacts
- Crash circumstances
- Contributing factors
- Review panel
- Summary sheet
- Database entry

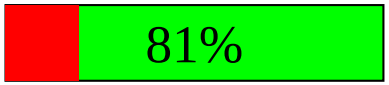
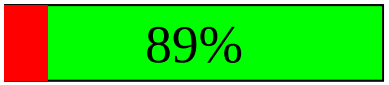
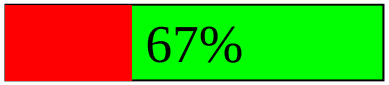
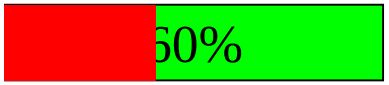
HUMAN
VEHICLE
ENVIRONMENT

Results

Occupant Characteristics

- Overall:
  - 216 cases in database
  - 55% male, 45% female
  - 74% drivers, 18% front seat passengers, 9% rear seat passengers
- Drivers/Front seat passenger
  - Mean age 43 yrs (range 4-87 yrs)
  - 87% belted, 5% unbelted (cf. 95% overall)

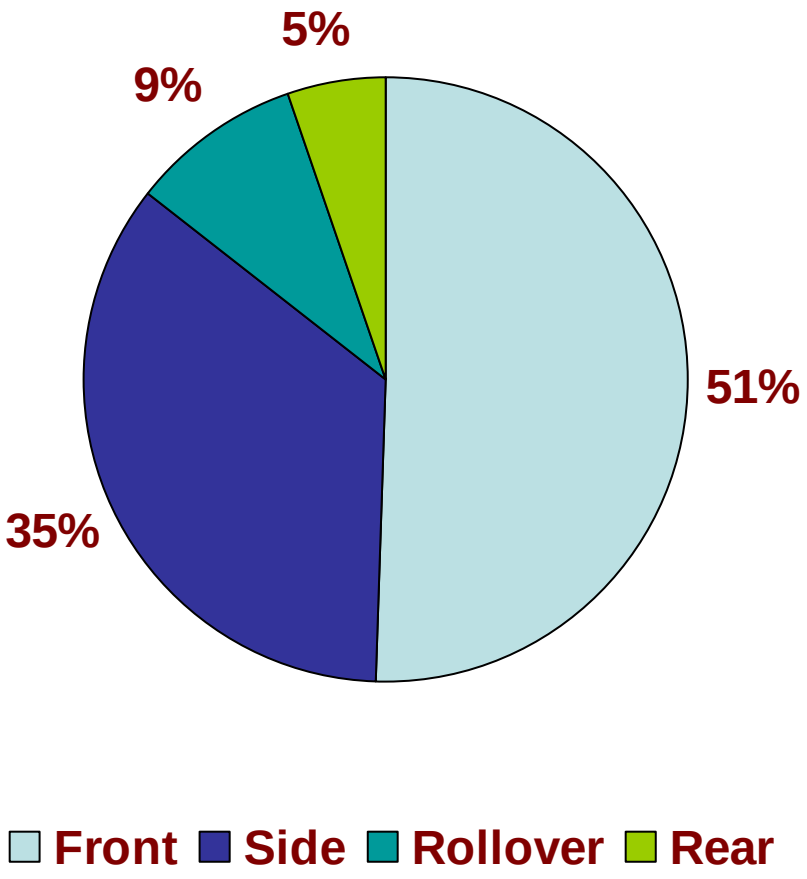
Belt Use

Passenger	Front Centre	Driver
		
Rear Left	**Rear Centre**	**Rear Right**
		

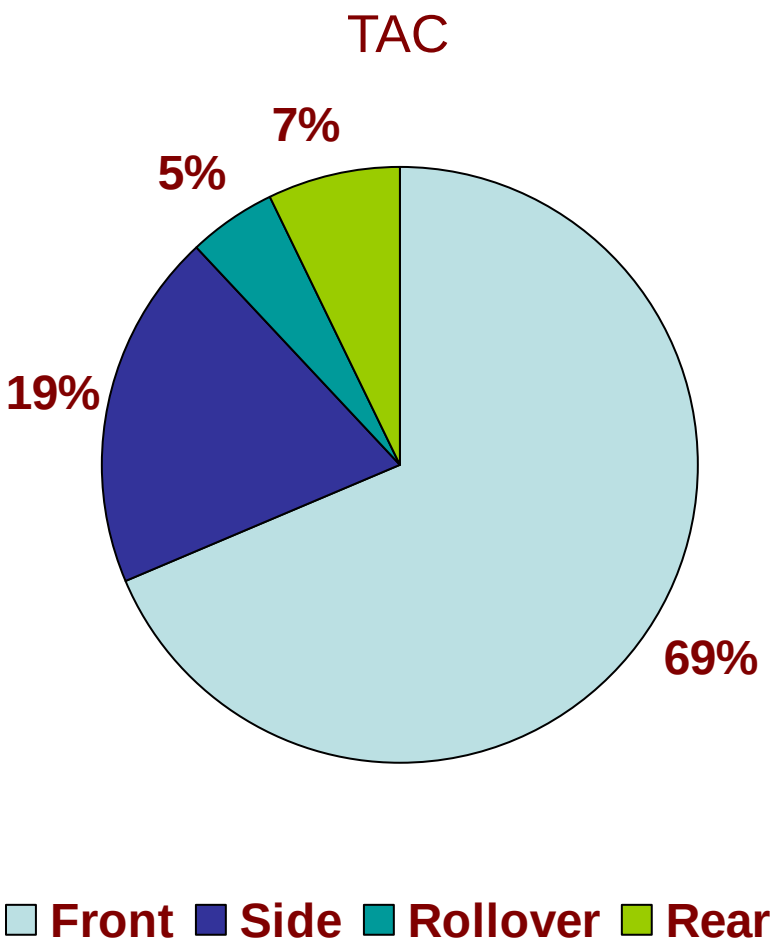
Airbags

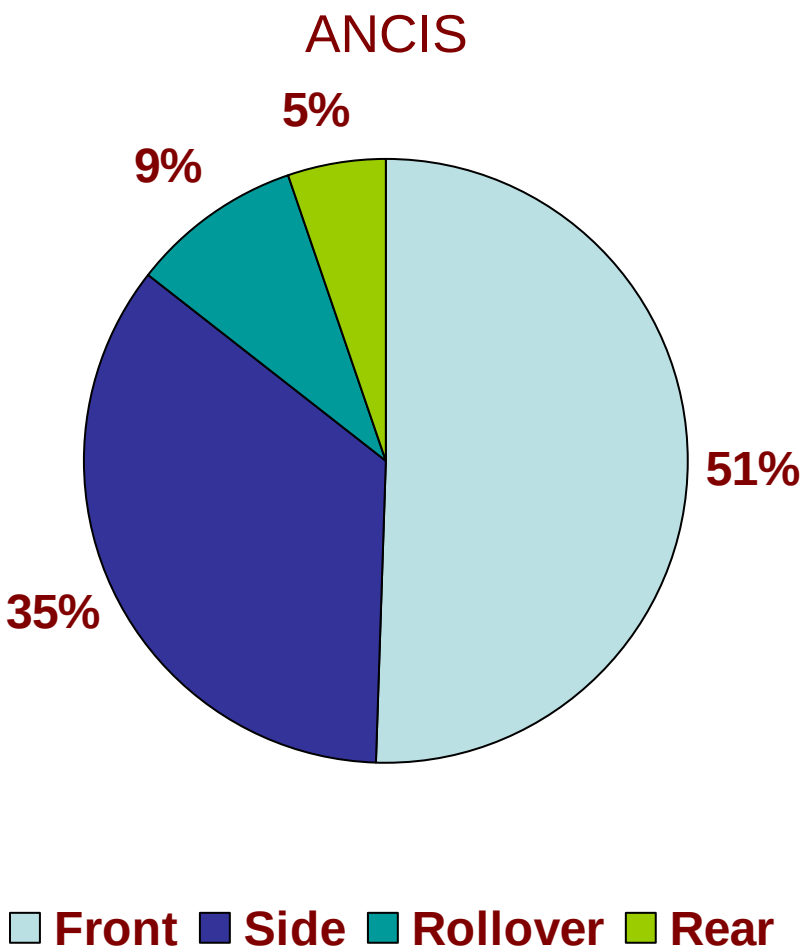
- Front:
  - 24% fitted and deployed
  - 76% not fitted/not deployed
- Side:
  - 3% fitted and deployed
  - 97% not fitted/not deployed

ANCIS Crash Types



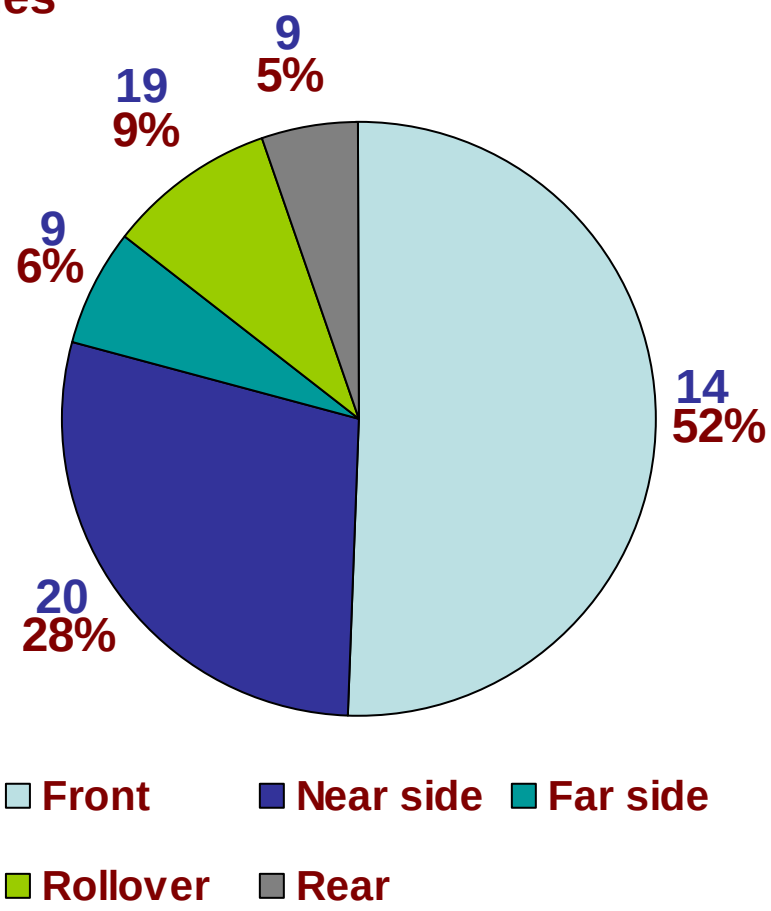
ANCIS vs TAC Crash Types



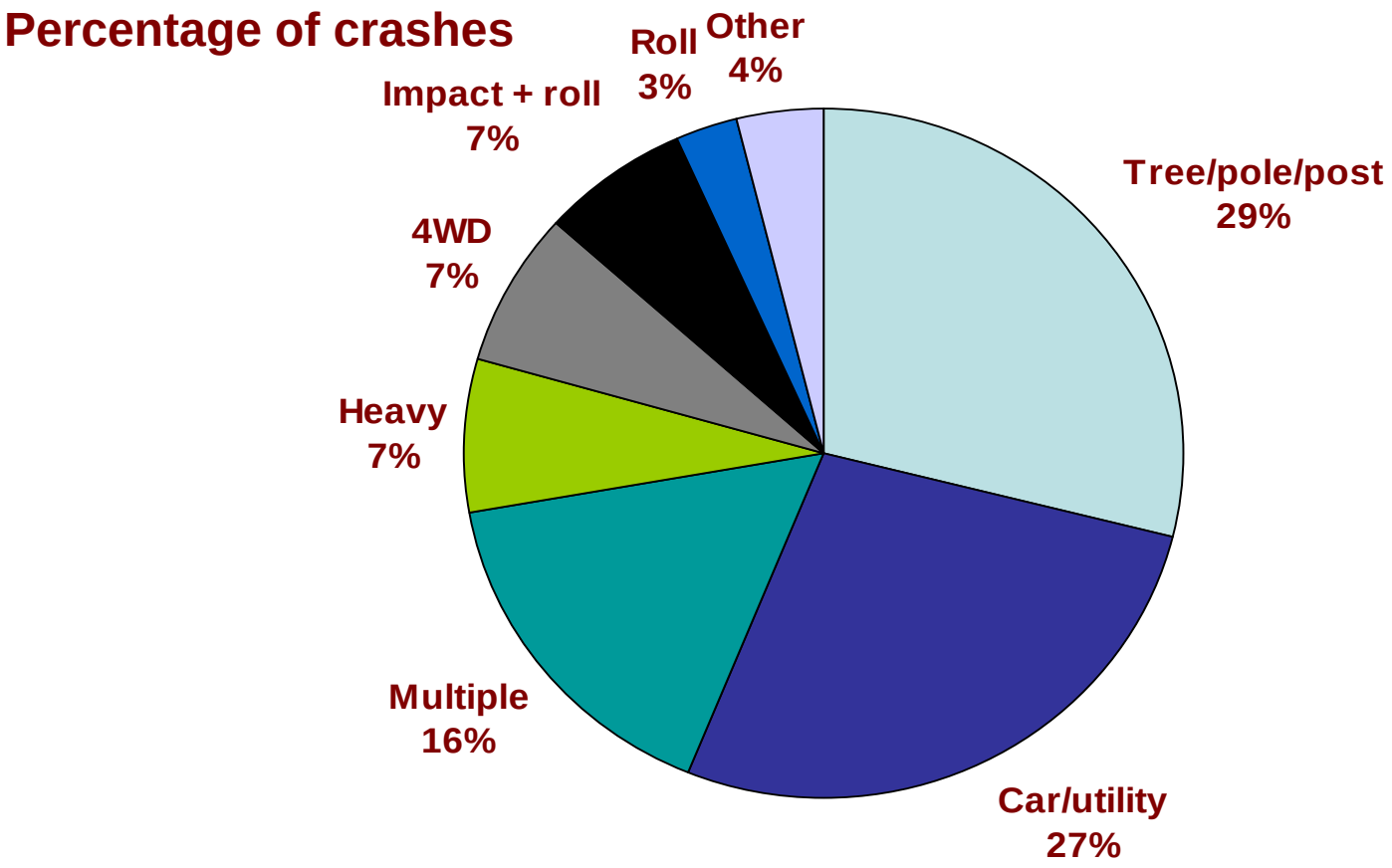


Injury Severity by Impact Type

Percentage of crashes
Mean ISS



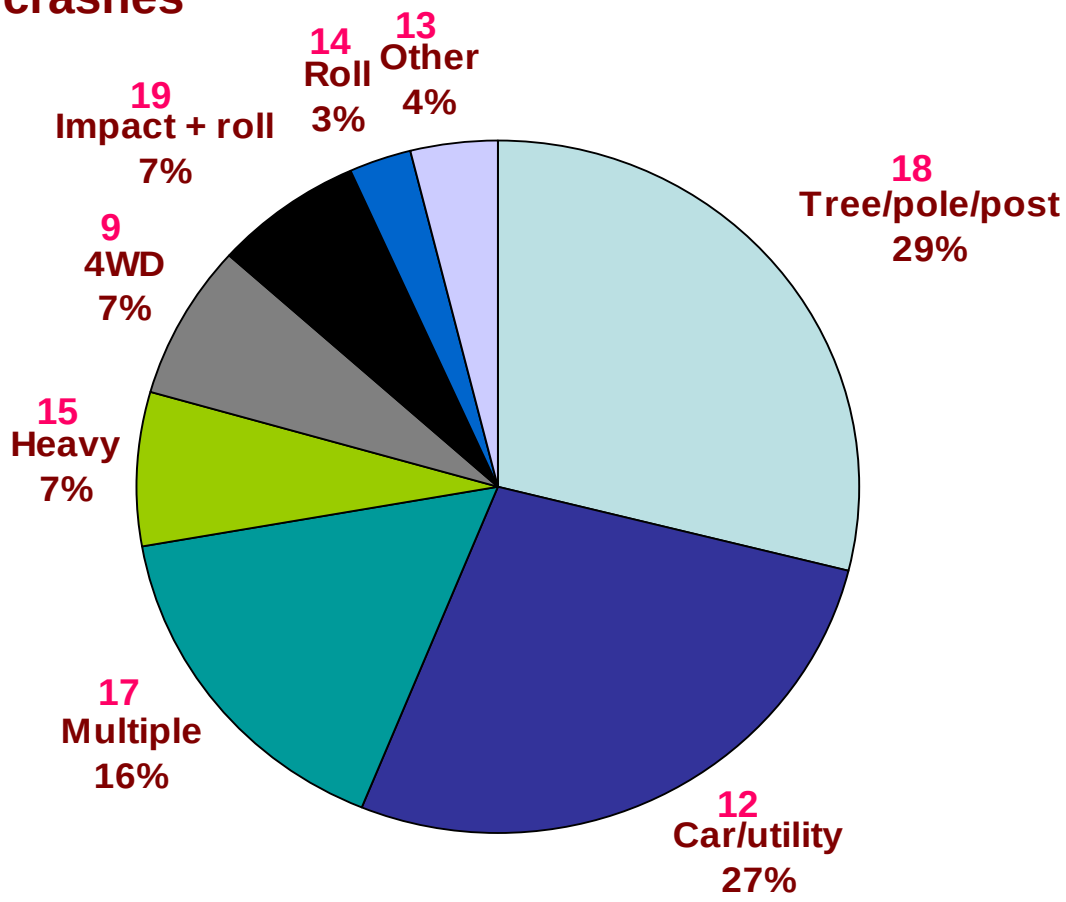
Crash Type by Collision Partner



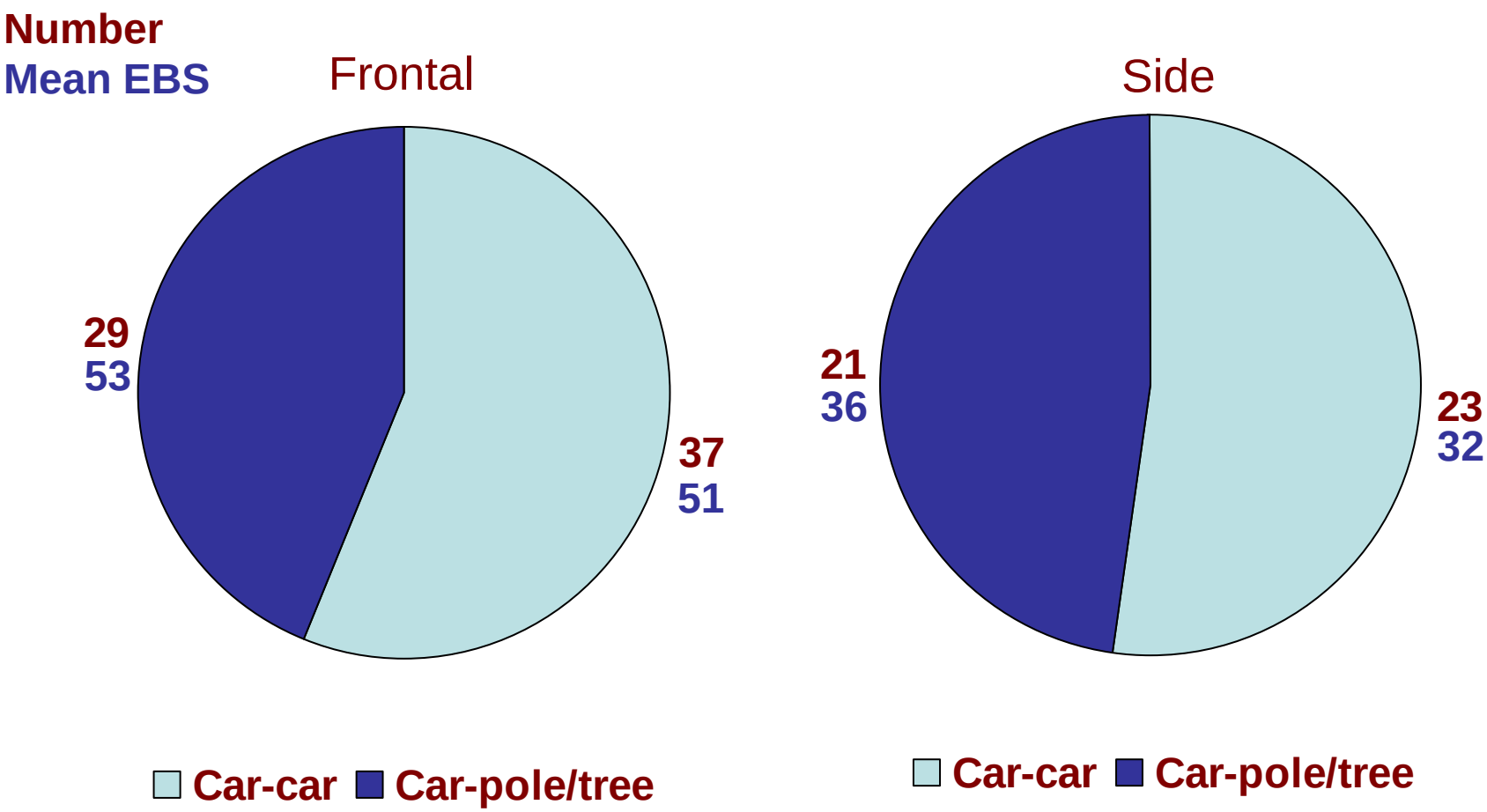
Injury Severity by Collision Partner

Percentage of crashes

Mean ISS



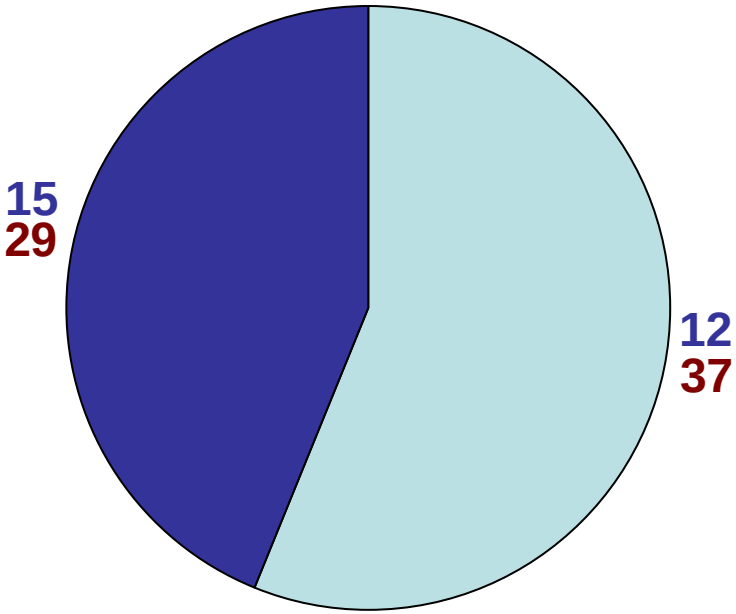
Front/Side Impact Severity



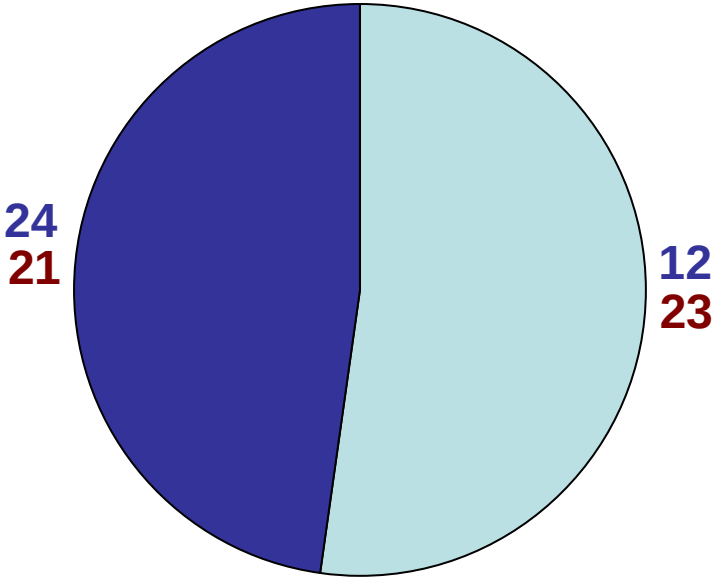
Front/Side Impact Severity

Mean ISS
Number

Frontal



Side



Car-car Car-pole/tree

Car-car Car-pole/tree

AIS2+ Injuries – All Impacts

- Overall injuries suffered
  - 44% chest (69% in car-heavy vehicle)
  - 22% head (35% in rollover)
  - 16% spine (24% in rollover)

AIS2+ Injuries – Side Impacts

- Car-to-car vs car-to-pole/tree
  - Head, 17% vs 43%
  - Abdomen, 22% vs 33%
  - Lower extremity, 48% vs 62%
- Near side vs far side
  - Chest, 60% vs 17%
  - Lower extremities, 57% vs 33%
  - Abdomen, 32% vs 8%
  - Spine 17% vs 33%

What Will ANCIS Contribute?

- Recent Improvements
  - More site information
  - System-wide approach
    - Contributing factors
- Analyses
  - Airbag effectiveness (ADR69)
  - Head injury modelling
  - Characteristics of multiple impacts
  - Road environment modelling

Acknowledgements

- **Sponsors**
  - Australian Transport Safety Bureau
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  - MAA (NSW)
  - NRMA (NSW)
  - RACV (Vic.)
  - RTA (NSW)
  - Toyota Motor Corporation
  - TAC (Vic.)
  - VicRoads
- **Observers**
  - FCAI
  - AAA
  - Mitsubishi
- **Victorian Hospitals**
  - The Alfred
  - Box Hill Hospital
  - Dandenong Hospital
  - Geelong Hospital
  - Monash Medical Centre
  - Royal Children's Hospital
  - The Royal Melbourne Hospital
- **NSW Hospitals**
  - Liverpool Hospital
  - Prince of Wales Hospital
  - St George Hospital
- **Tasmanian Hospitals**
  - Royal Hobart Hospital