Real World Older Occupant Injury

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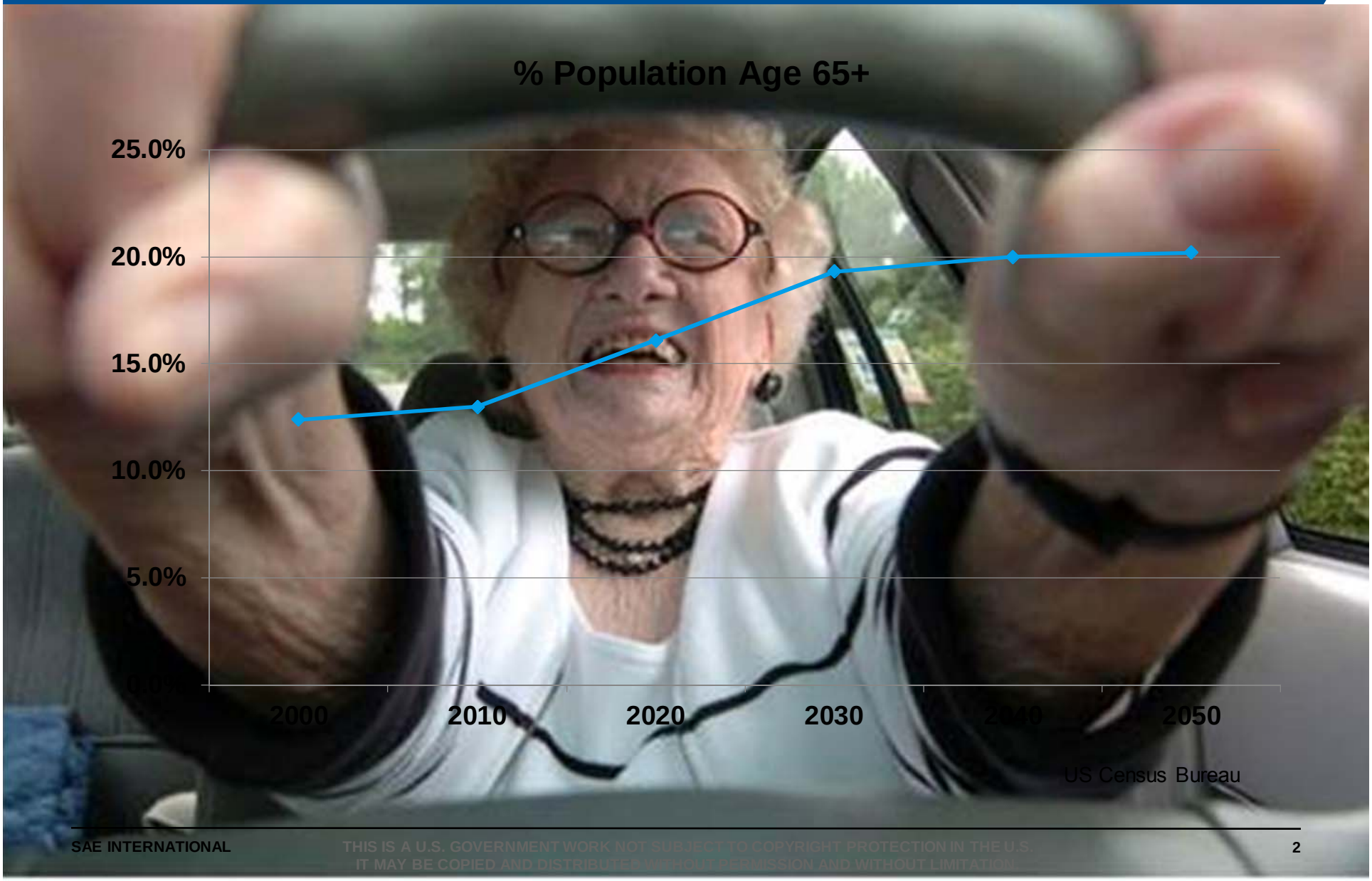
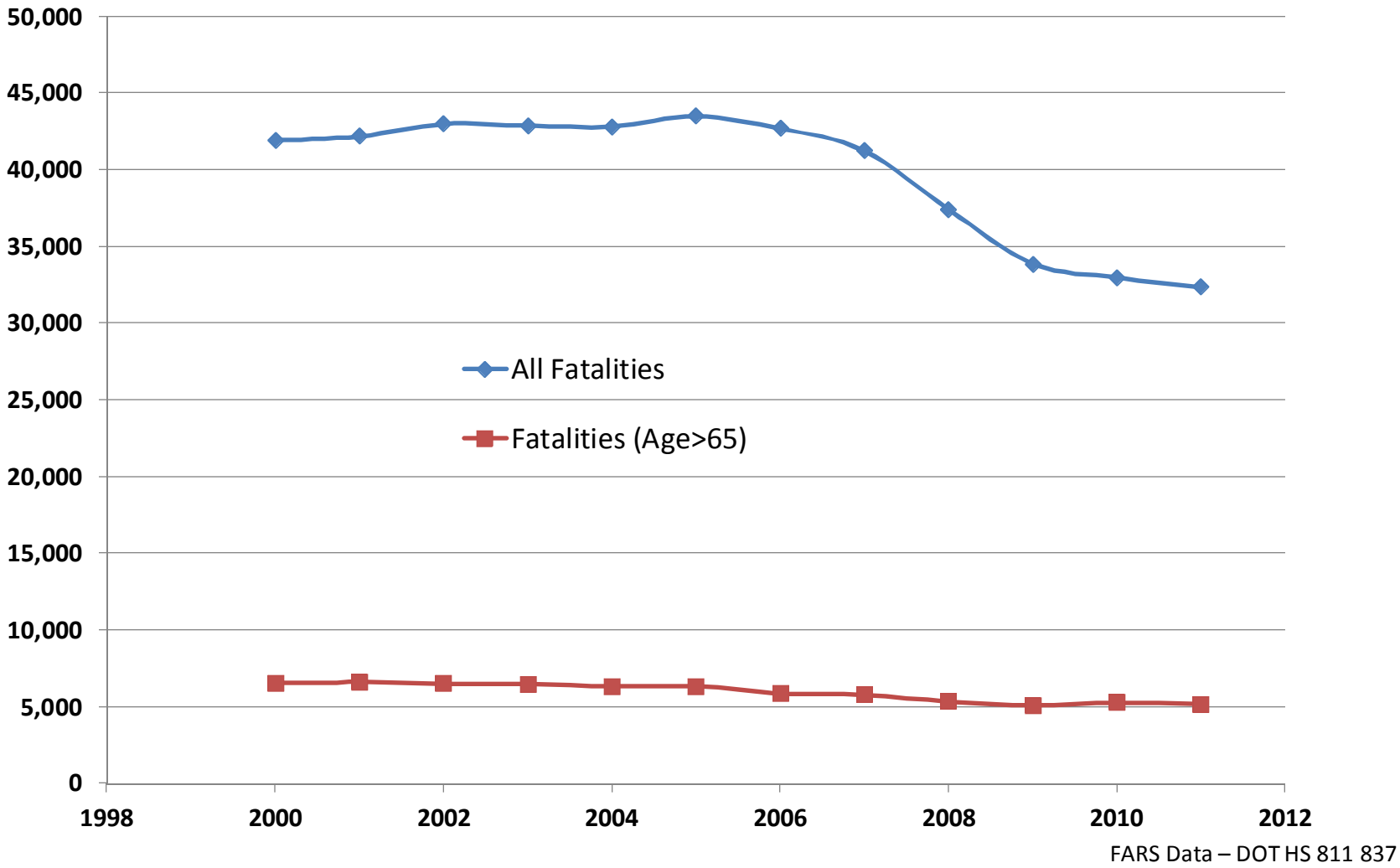
THE “SILVER TSUNAMI”

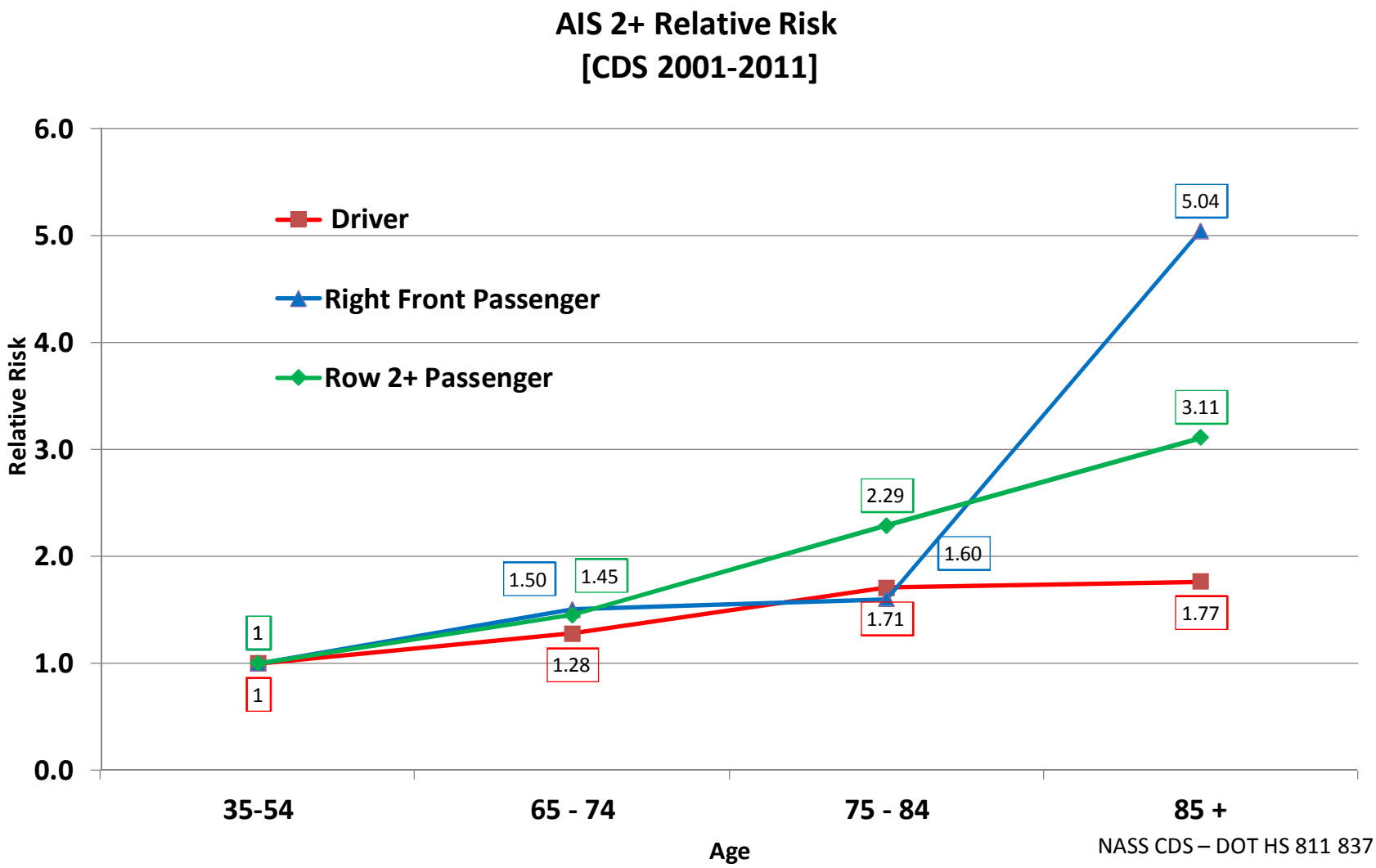


FATALITY DATA



FARS Data – DOT HS 811 837

RISK OF INJURY



NASS CDS – DOT HS 811 837

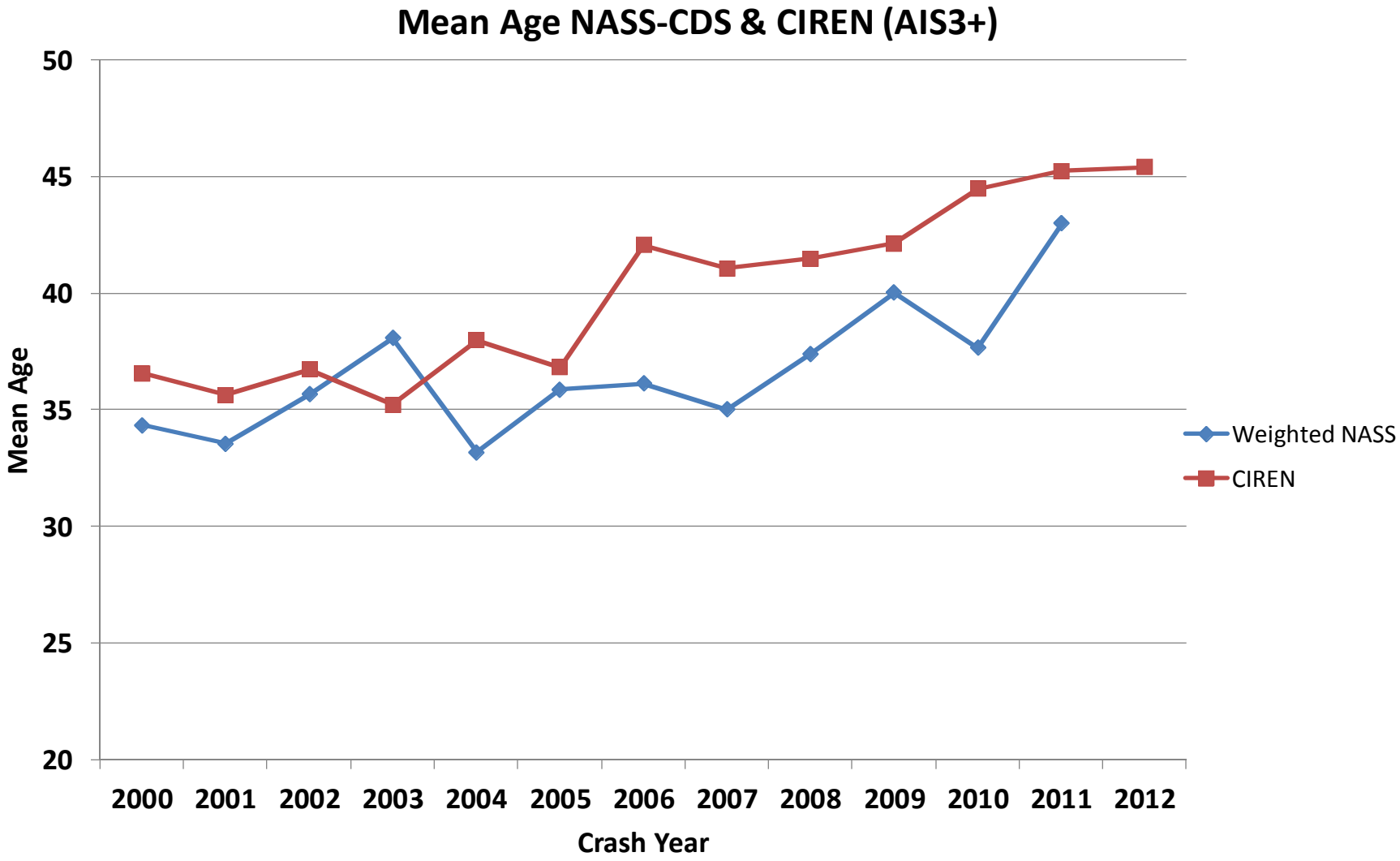
NHTSA PLAN

- **TRAFFIC SAFETY PLAN FOR OLDER PEOPLE 5-YEAR PLAN (2013)**
  - Behavioral
  - Data
  - Pedestrian
  - Vehicle safety
    - Data
    - Frailty
    - **Fragility**

NHTSA PLAN

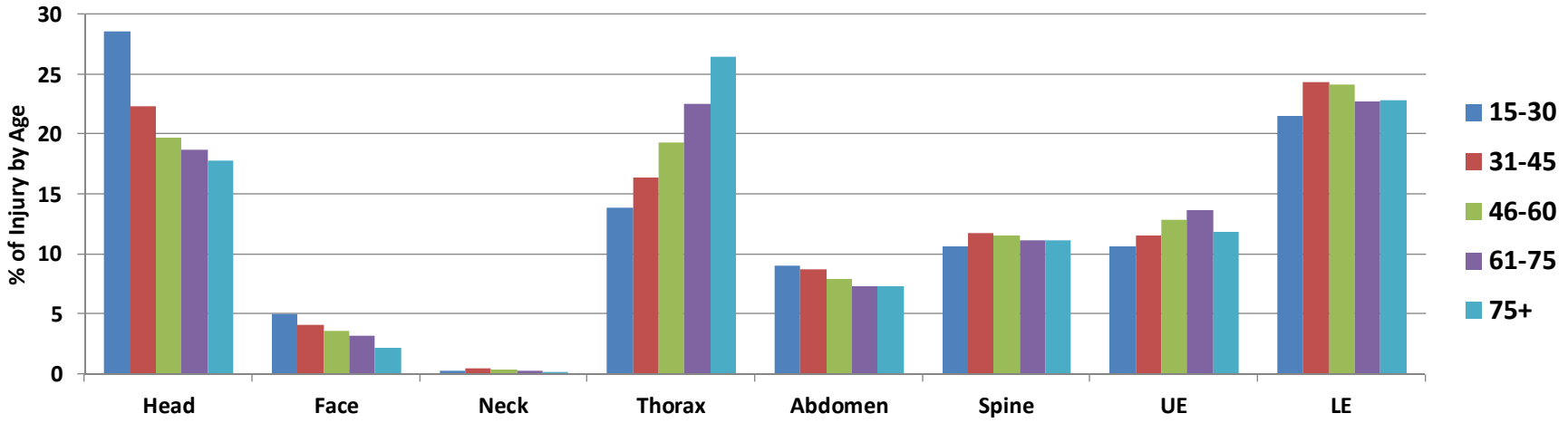
- **TRAFFIC SAFETY PLAN FOR OLDER PEOPLE 5-YEAR PLAN (2013)**
  - Fragility – Areas of concentration for biomechanics
    - Computational human models
    - Appropriate crash condition testing
    - Advanced restraint testing
    - Injury mechanisms and contributing factors
    - Possible “Silver Car” NCAP rating

REAL WORLD

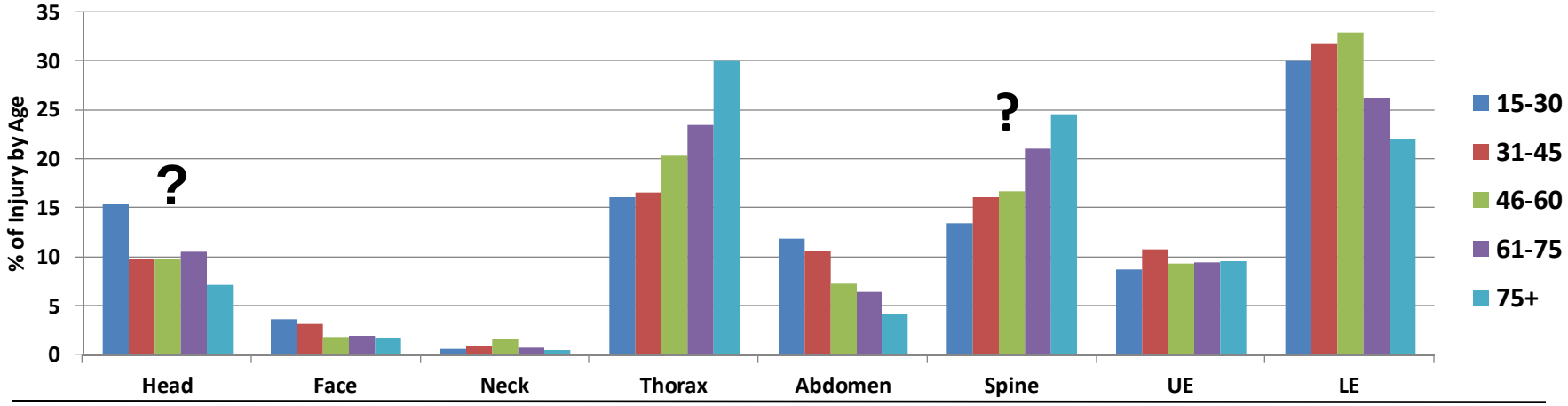


REAL WORLD

2000-2011 NASS CDS AIS2+ by Age

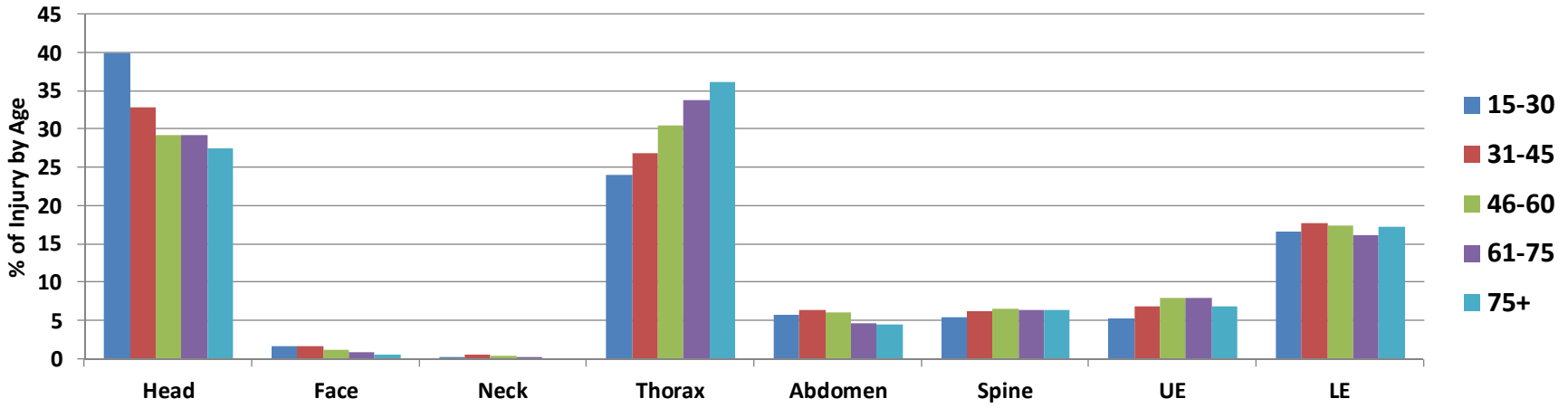


2005-2013 CIREN AIS2+ by Age

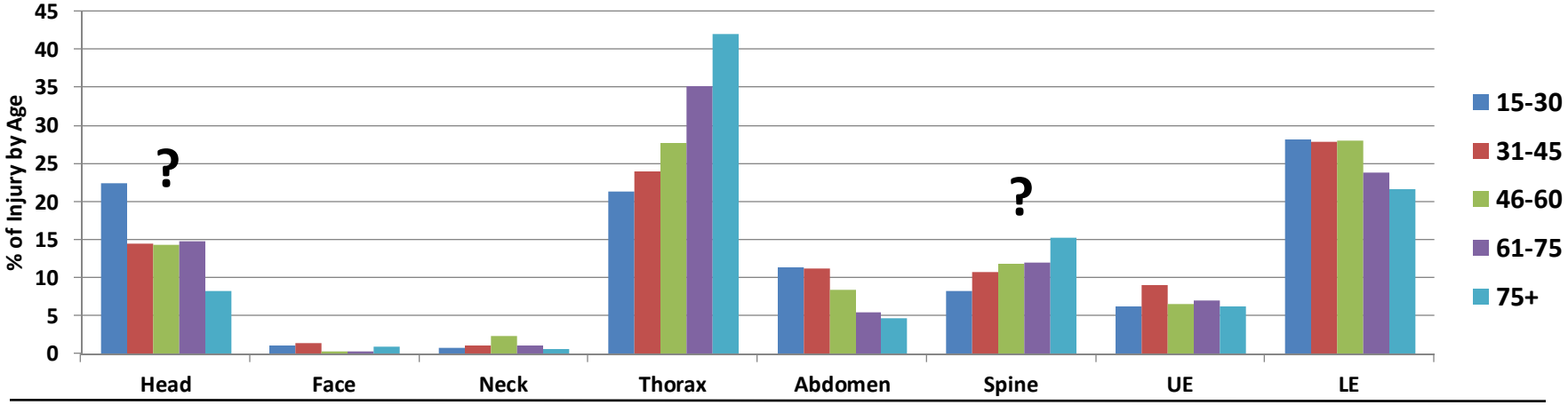


REAL WORLD

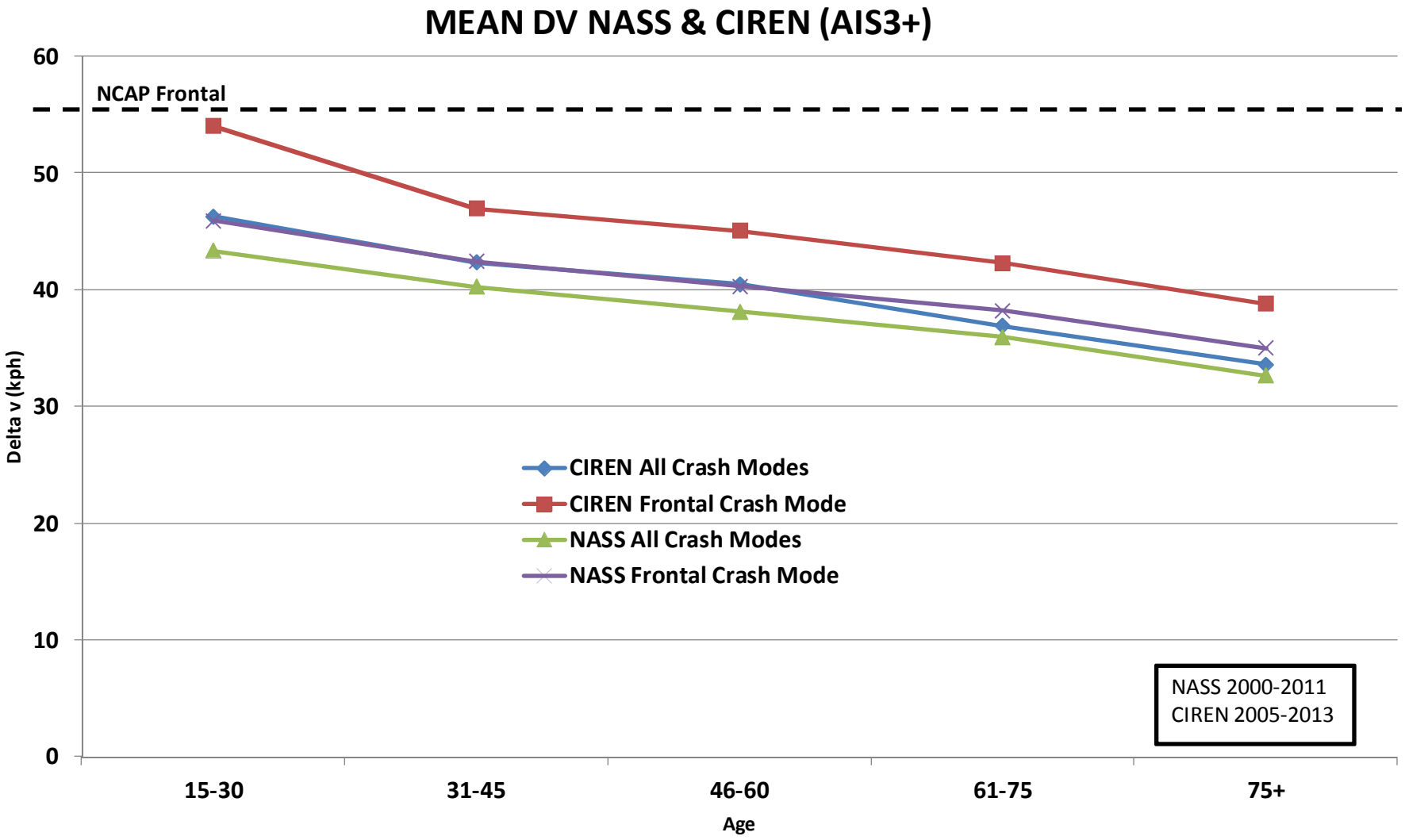
2000-2011 NASS CDS AIS3+ by Age



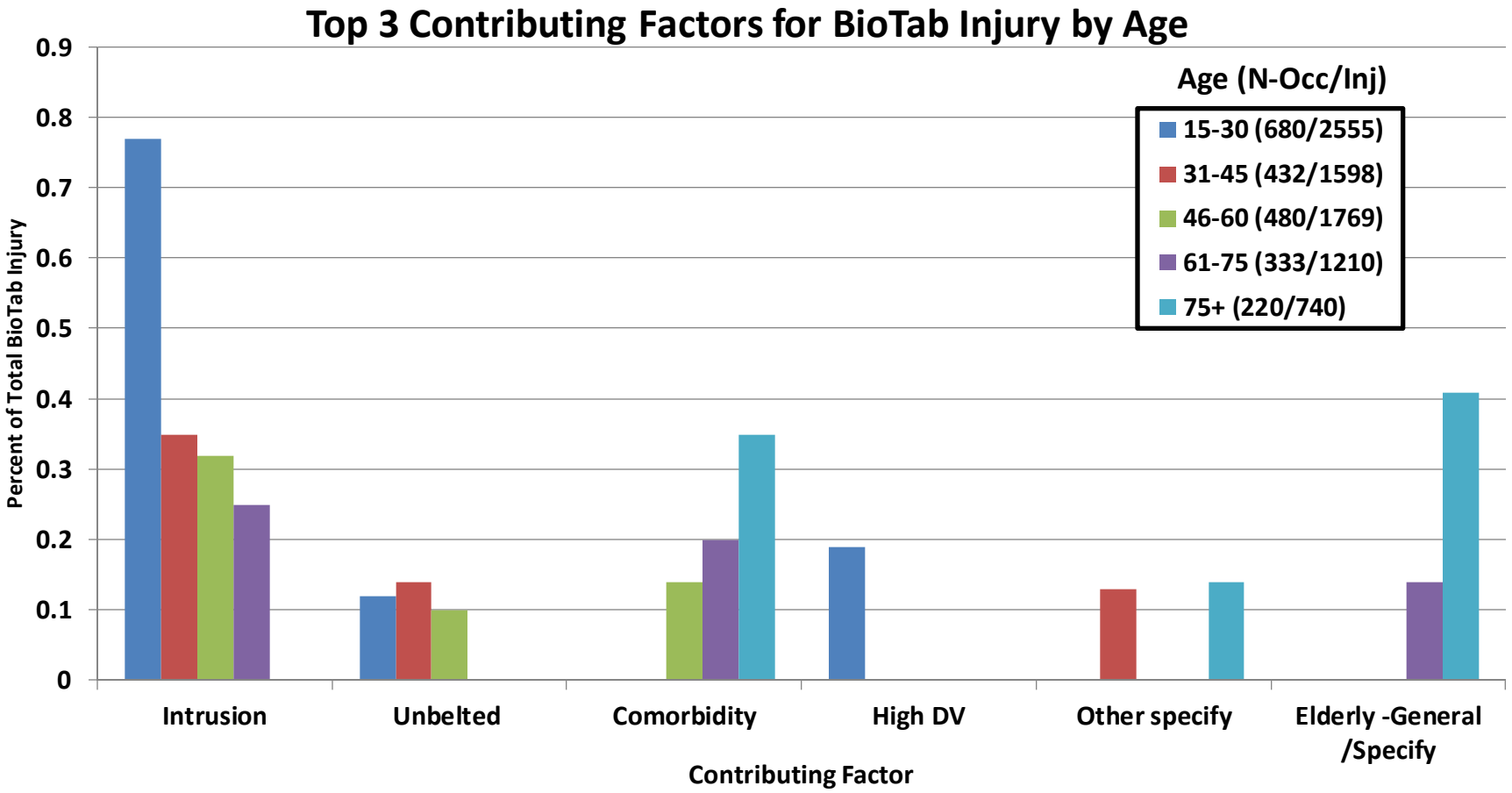
2005-2013 CIREN AIS3+ by Age



REAL WORLD



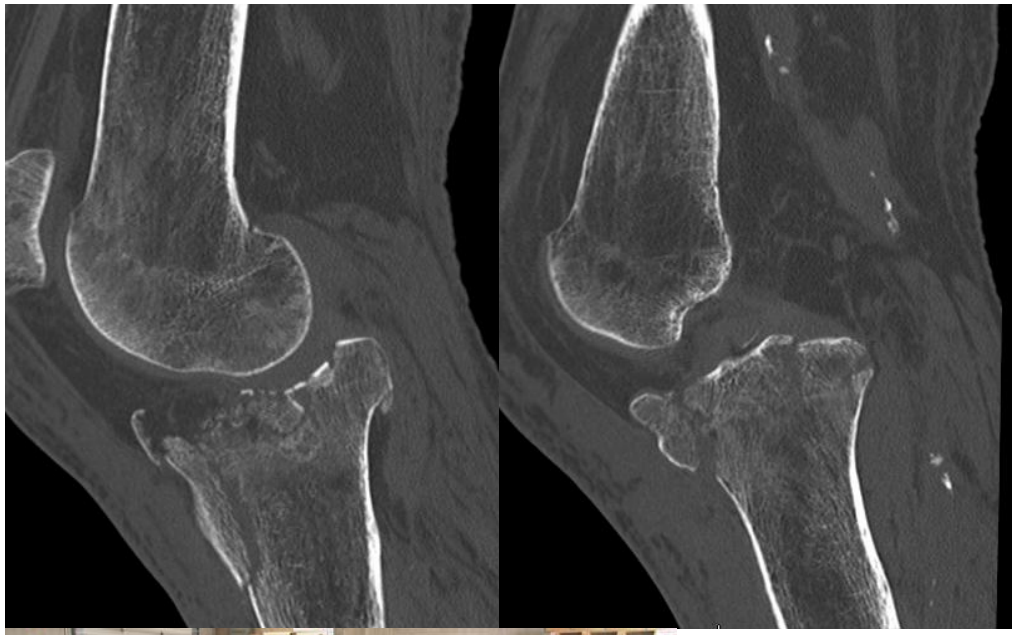
INJURY MECHANISMS AND CONTRIBUTING FACTORS - CIREN



Avg. number of factors coded per occupant
15-30=3.6, 31-45=3.4, 46-60=3.2, 61-75=3.6 and 75+=4.2

Comorbidity - #1=Obesity, #2=Osteoporosis/Osteopenia

INJURY MECHANISMS AND CONTRIBUTING FACTORS (OLDER)

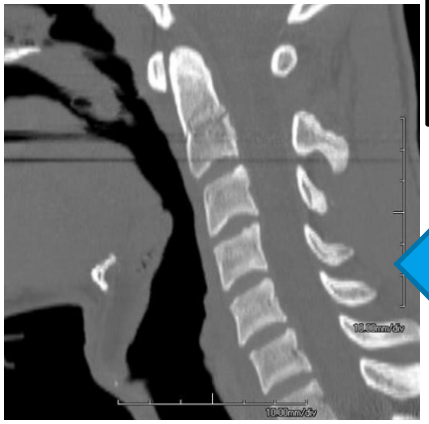


84 y.o. male driver
V2 impact 18 kph/11 mph

Osteoporosis/ Osteopenia

16 y.o. male driver
Tree impact
(BES 26 kph/16 mph)

INJURY MECHANISMS AND CONTRIBUTING FACTORS (OLDER)

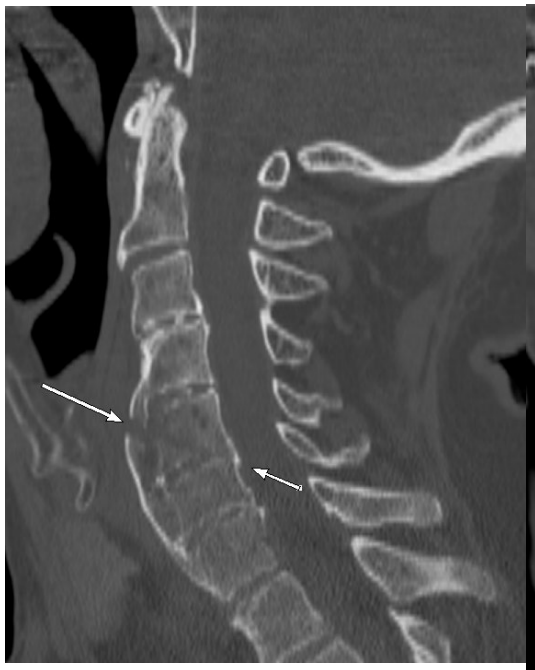


"Normal anatomy"

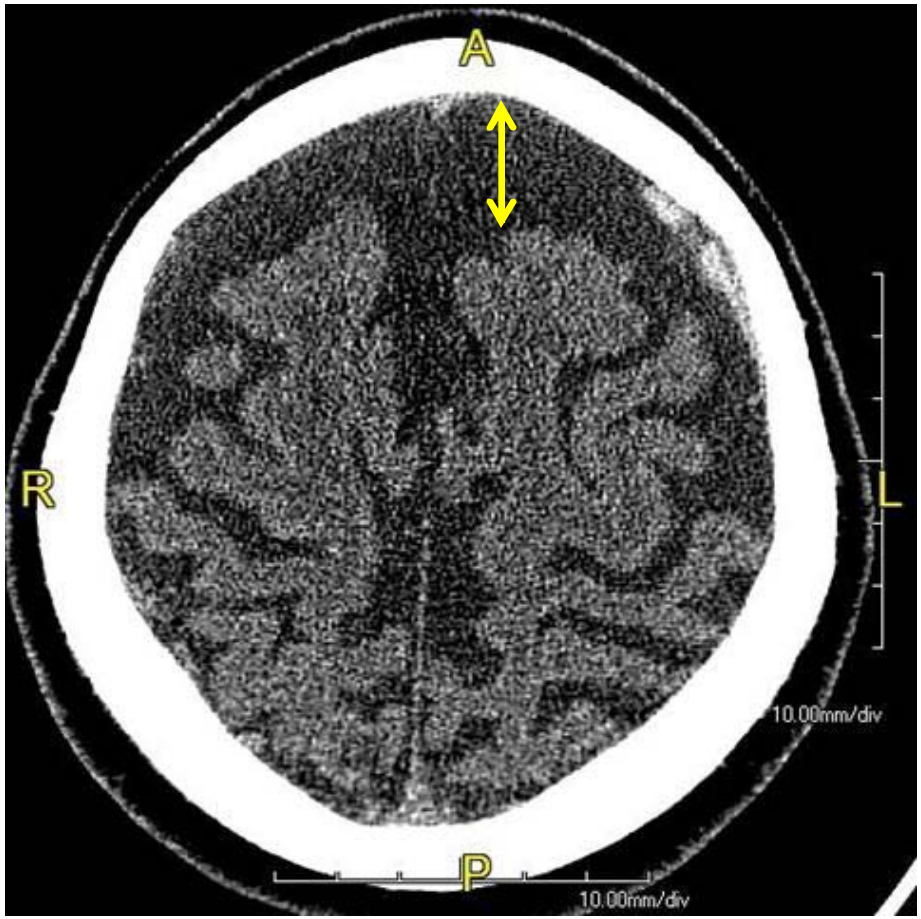
C2 non-displaced fx
20 y.o. male @ 28 kph/17 mph
<u>unbelted</u> w/AB

56 y.o. obese male
Early DISH @ thoracic spine

79 y.o. male @ 18 kph/11 mph belted w/AB
Diffuse idiopathic skeletal hyperostosis (DISH) C5 displaced and comminuted fx



ATROPHY

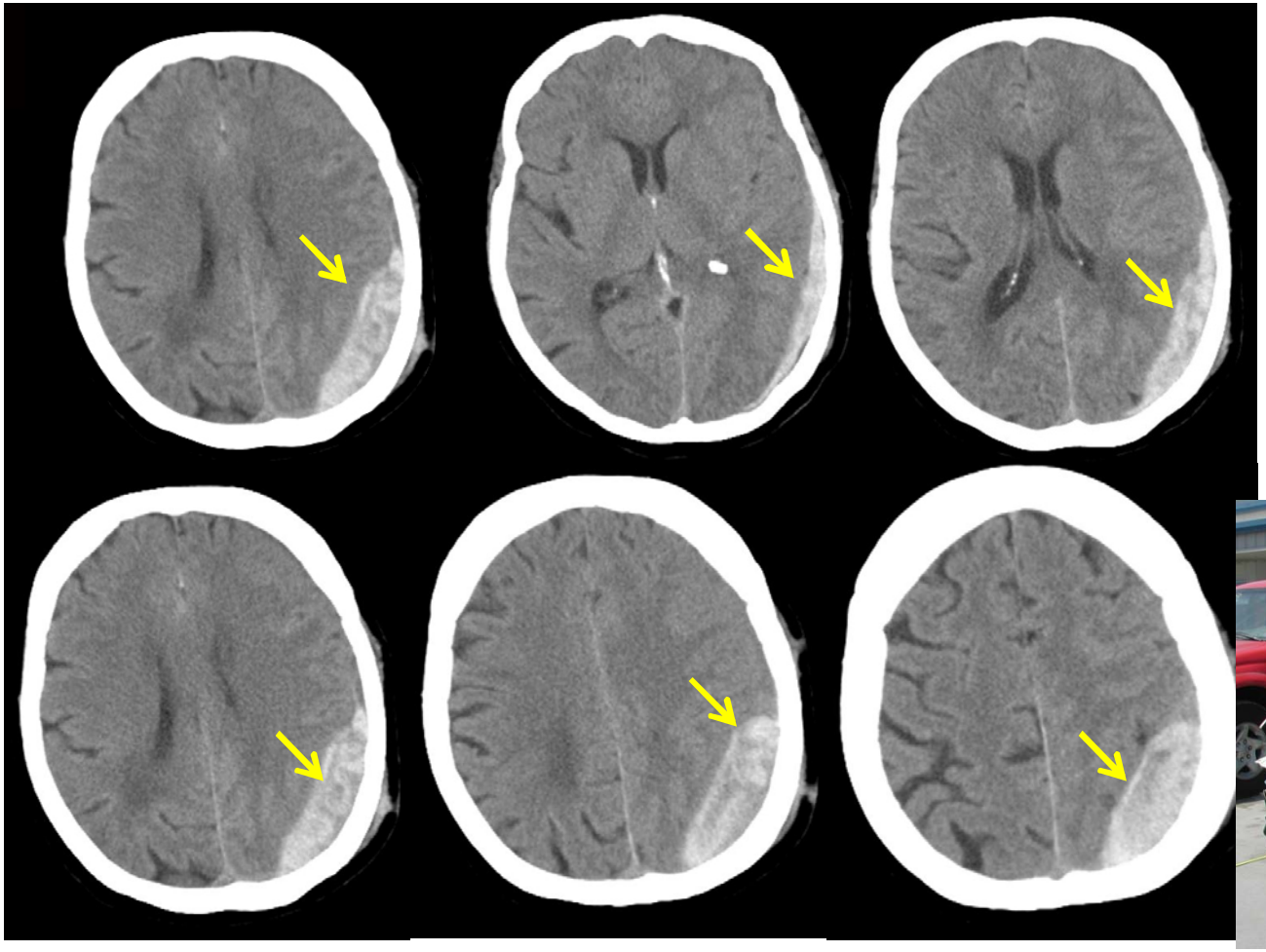


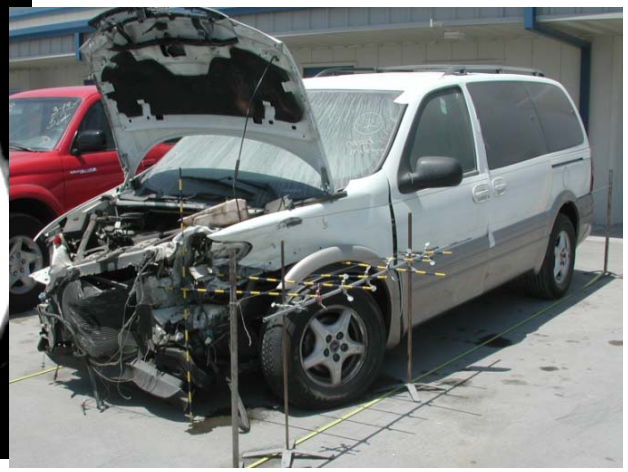
68 y.o. female passenger
Moderate SDH

70 y.o. male driver
Small SDH

BLOOD THINNERS

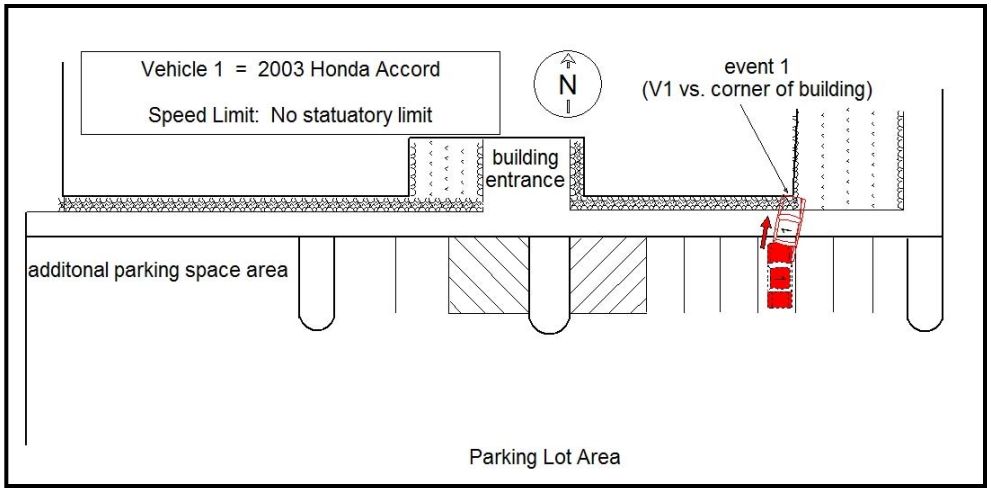
- **76 y.o. female driver**



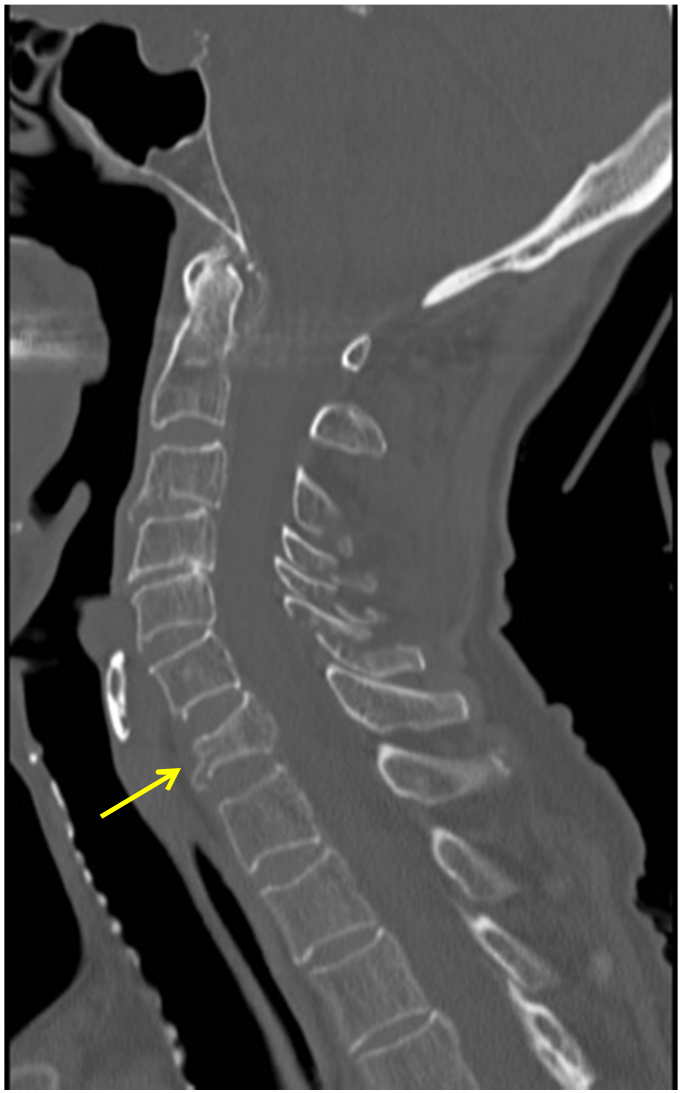


REAL WORLD - CIREN

- **81 y.o. female driver – 2003 Honda Accord**
- **Pedal misapplication**
- **Belted – no AB deployment**
- **12 kph DV (7 mph)**



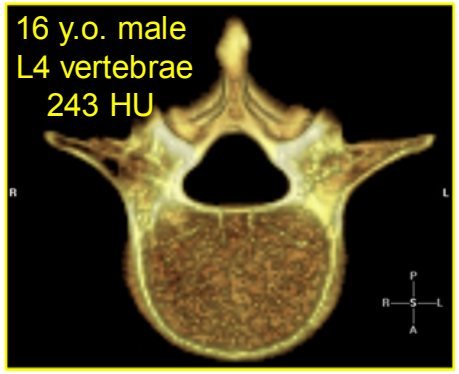
REAL WORLD

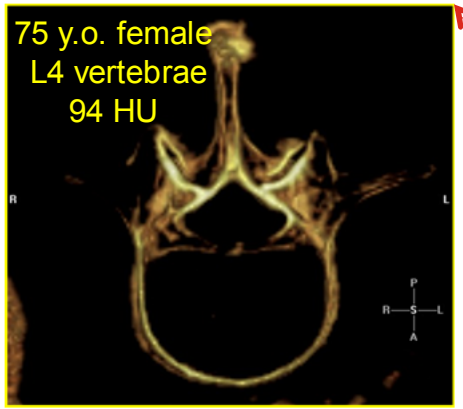


- **C7 Body fx**
  - Flexion/Compression
  - Belt
- **C6 Lamina fxs**
- **C3-C5 Spinous process fxs**
- **5th MT fx**
- **MAIS=3**
- **ISS=13**
- **CF-Comorbidity - Osteoporosis**

NEXT STEPS

- **Continue detailed investigations and data collection**
- **Radiology and complete medical data required**





- **Direct influence on –**
  - Computational models
  - IARVs
  - Test conditions
  - Restraint development

Decrease BMD = decreased injury tolerance

Calcification of structures = reduced flexibility

SUMMARY

- Growing population of older occupants
- Increasing in NASS and CIREN for serious injury
- Higher risk of injury
- Injury causation often influenced by contributing factors
- Contributing factors for older occupant injury are related more to their physical condition
- Appropriate real world injury mechanism coding requires detailed medical data access and analysis

REAL WORLD – OLDER OCCUPANT INJURY

Thank you.

Questions?