



## Adaptive seat to reduce neck injuries for female and male occupants

### Gender as a resource of new innovation

EvaRID – a crash test dummy model of an average female

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# Traffic Safety

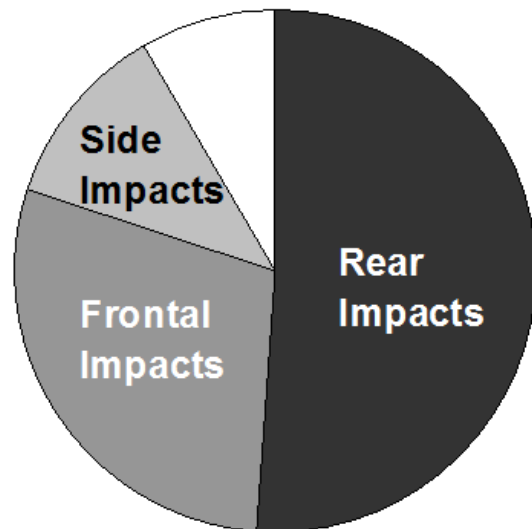
More than 1,2 million fatalities  
(UN/WHO)



Source: Road Crash Costs in Australia 1999, Report 102, Bureau of Transport Economics (Insurance data)  
and Road Traffic Injuries in Sweden 1999, National Statistical Data (police reports)

# Whiplash Injuries

- Most common in rear impacts
- Different level of protection in different car model and seat designs



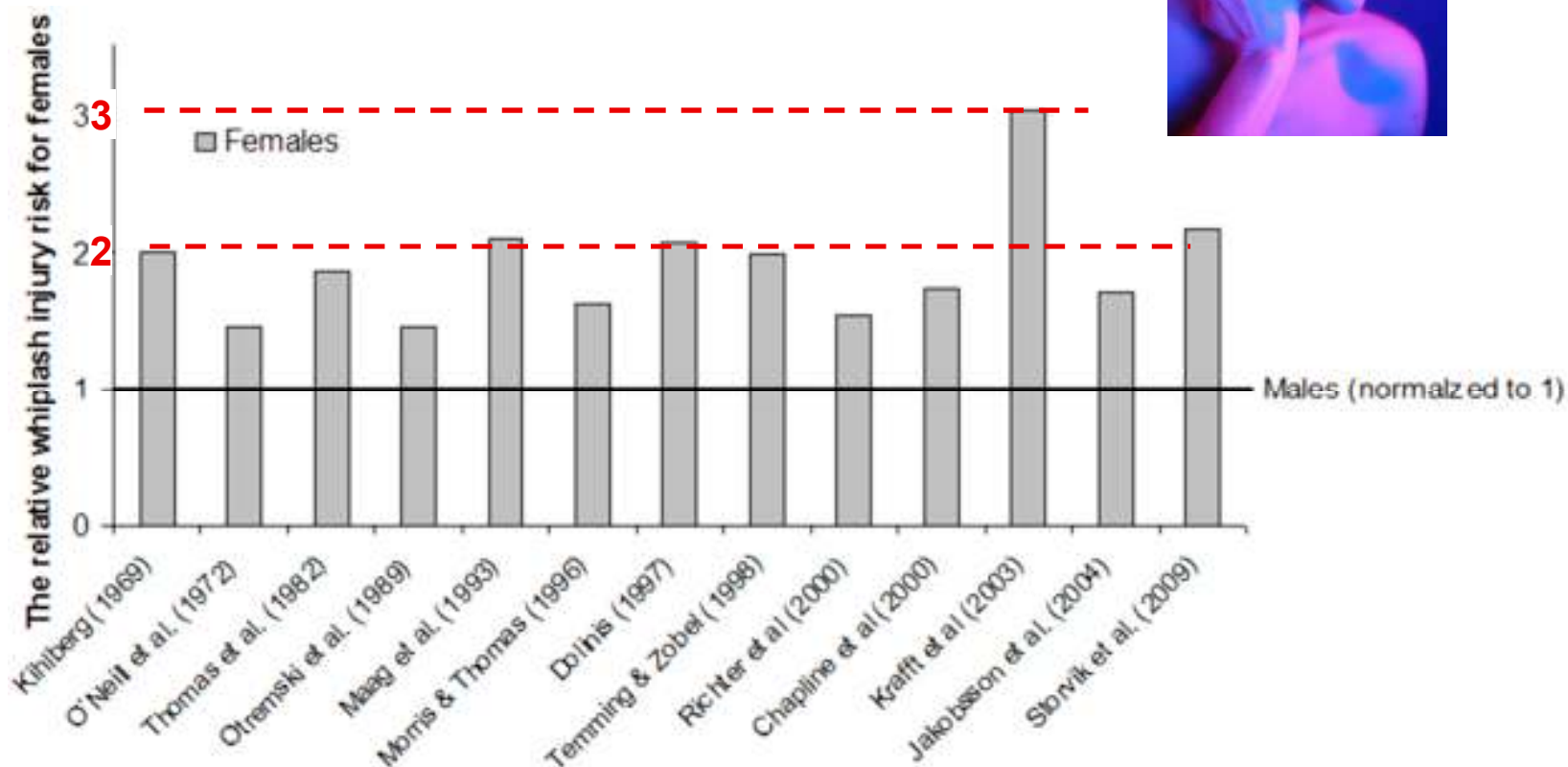
Based on Krafft (1998)



## Whiplash injuries

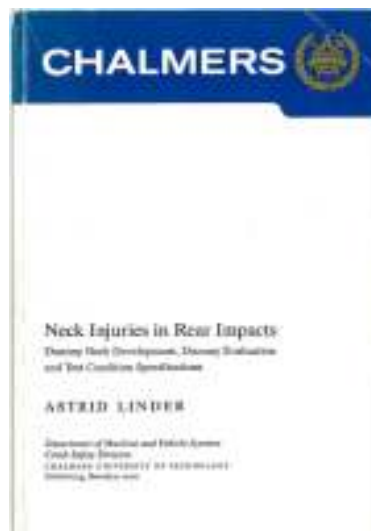
- App. **70% of the costs** of all injuries leading to permanent medical impairment for the insurance companies
- Europe: **300 000** injuries annually, **15 000** result in long term suffering
- **Costs: > 4 billion €** in Europe (estimated on insurance costs)

# Whiplash – Risk of injuries



# Development of the crash test dummy, BioRID

1996-1999

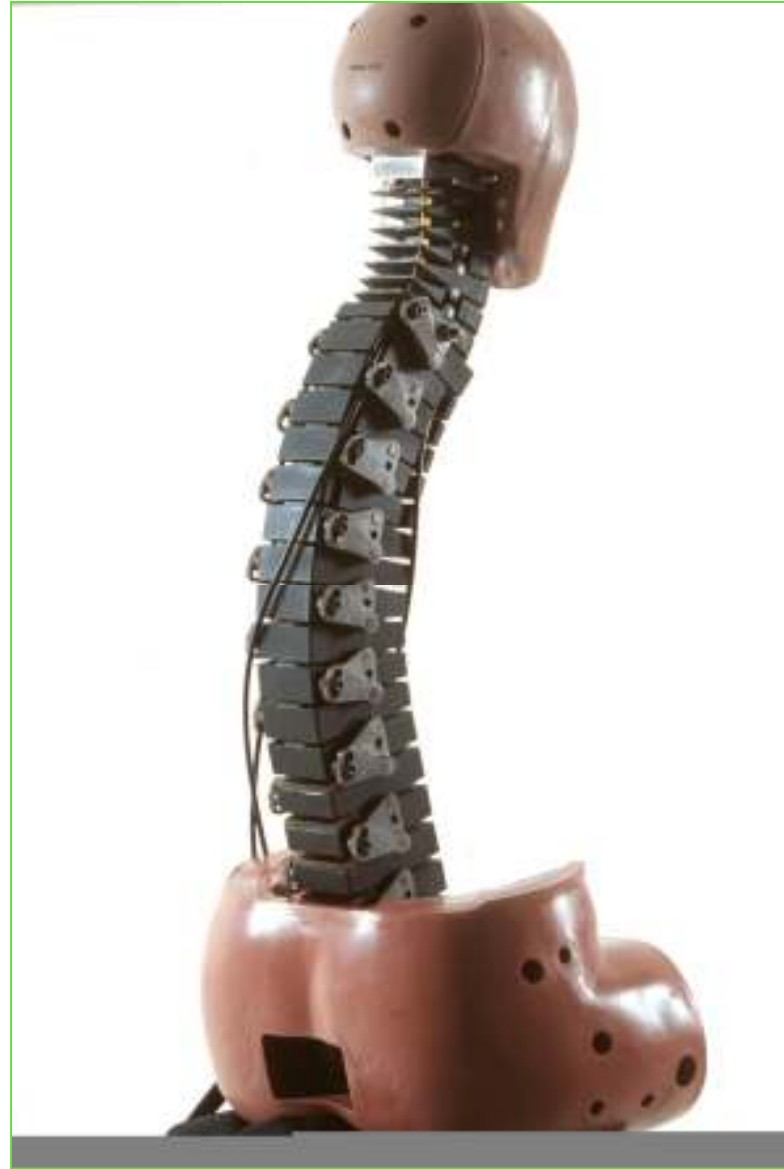
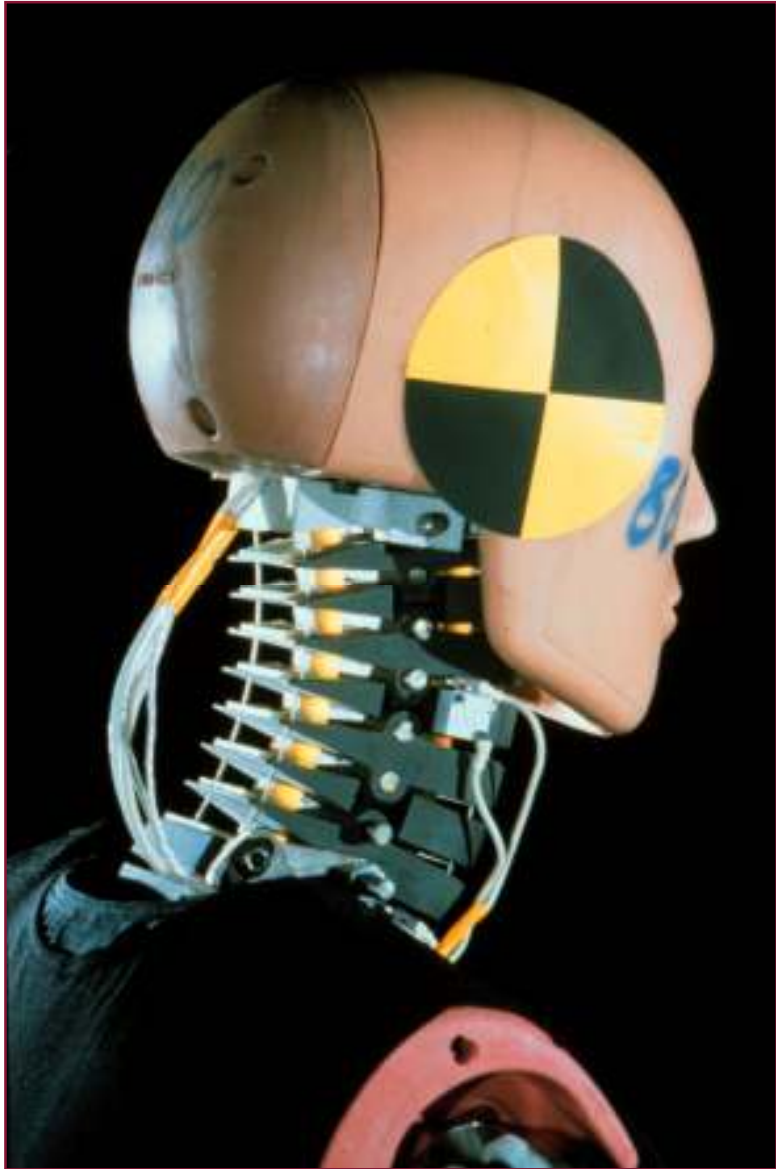


**VOLVO**



**ADSEAT**

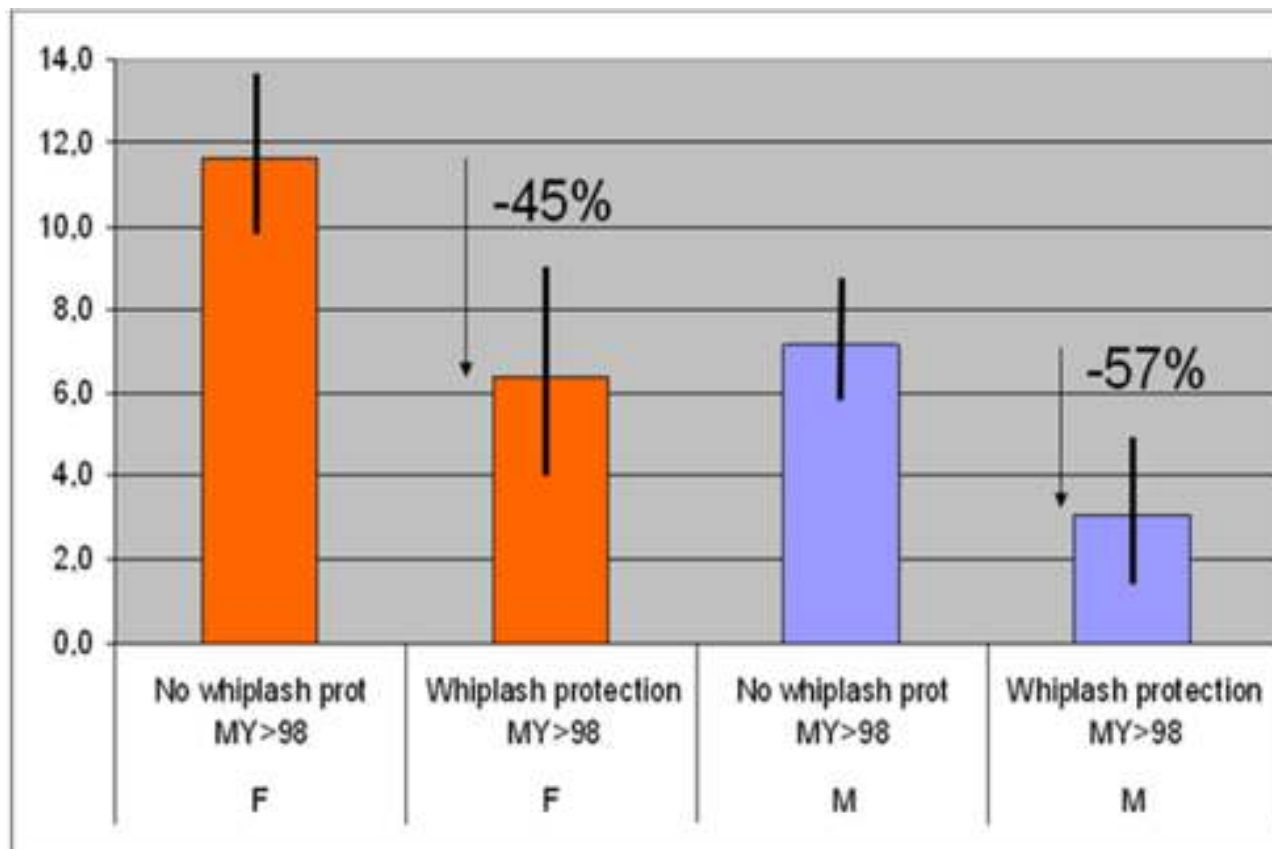




**ADSEAT**



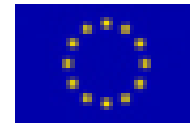
# Whiplash protection concepts



Risk reduction in permanent medical impairment,  
**45%** for females and **57%** for males. (Kullgren & Krafft, IRCOBI 2010)



# ADSEAT the project



## Aims

- Provide guidance in how to reduce the risk of whiplash injuries by development of seat evaluation tools.
- Develop a finite element dummy model of an average female, named EvaRID (Eva – female/RID – Rear Impact Dummy).
- Budget: 3.45 million Euros, 2.5 million Euros from the European Commission, FP7.
- 12 partner
- Duration: 42 months, 2009-2013



# ADSEAT Partners

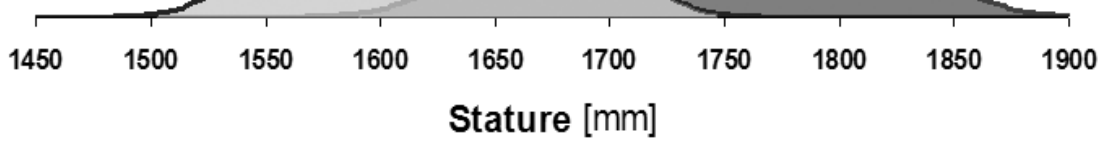
A map of Europe with red dots indicating the locations of the ADSEAT partners. The dots are located in the UK, Spain, Germany, France, and Switzerland.




# ADSEAT

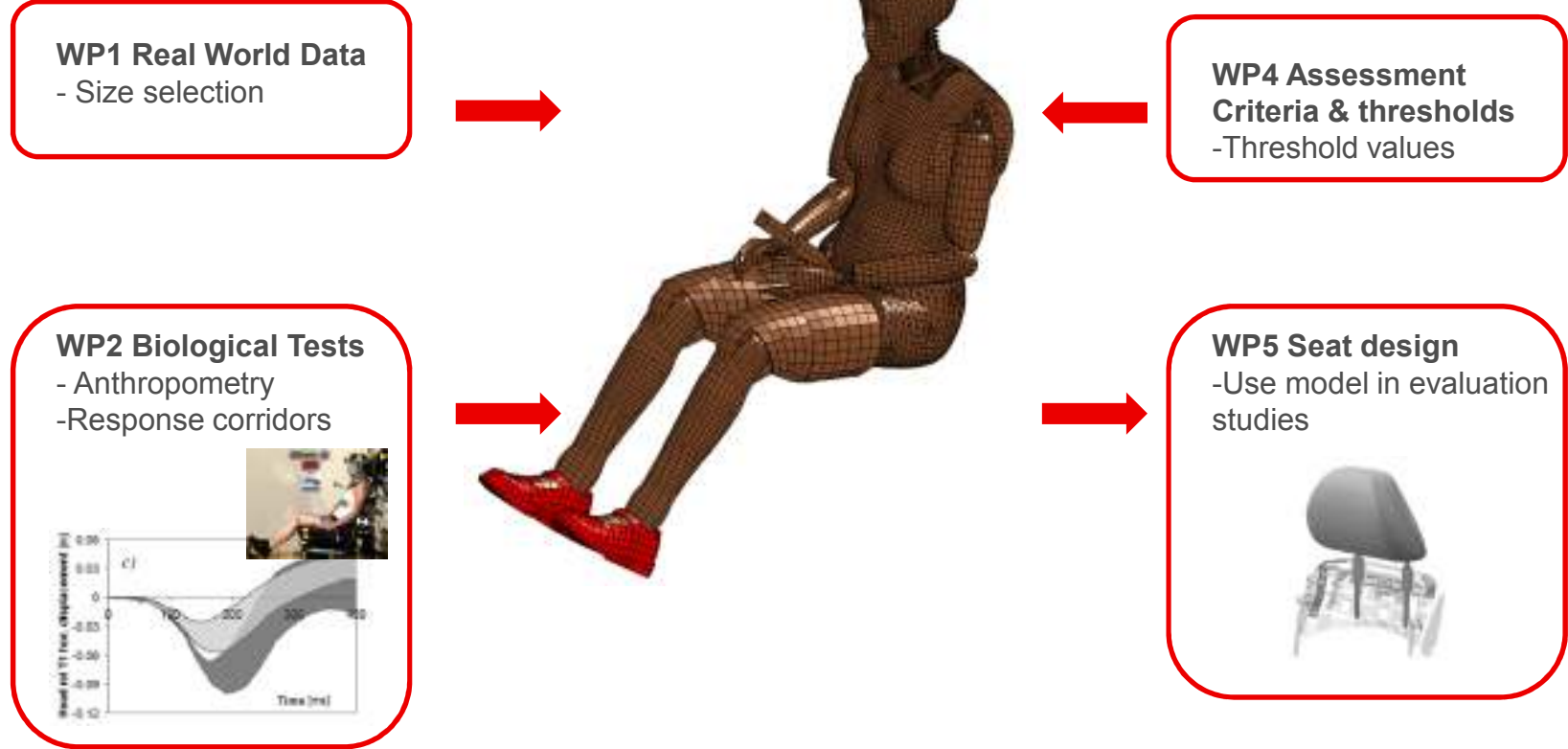
Average female  
Stature } to be defined  
Weight } in ADSEAT

BioRID  
50<sup>th</sup> percentile male  
Stature: ~1.77 m  
Weight: 77.7 kg

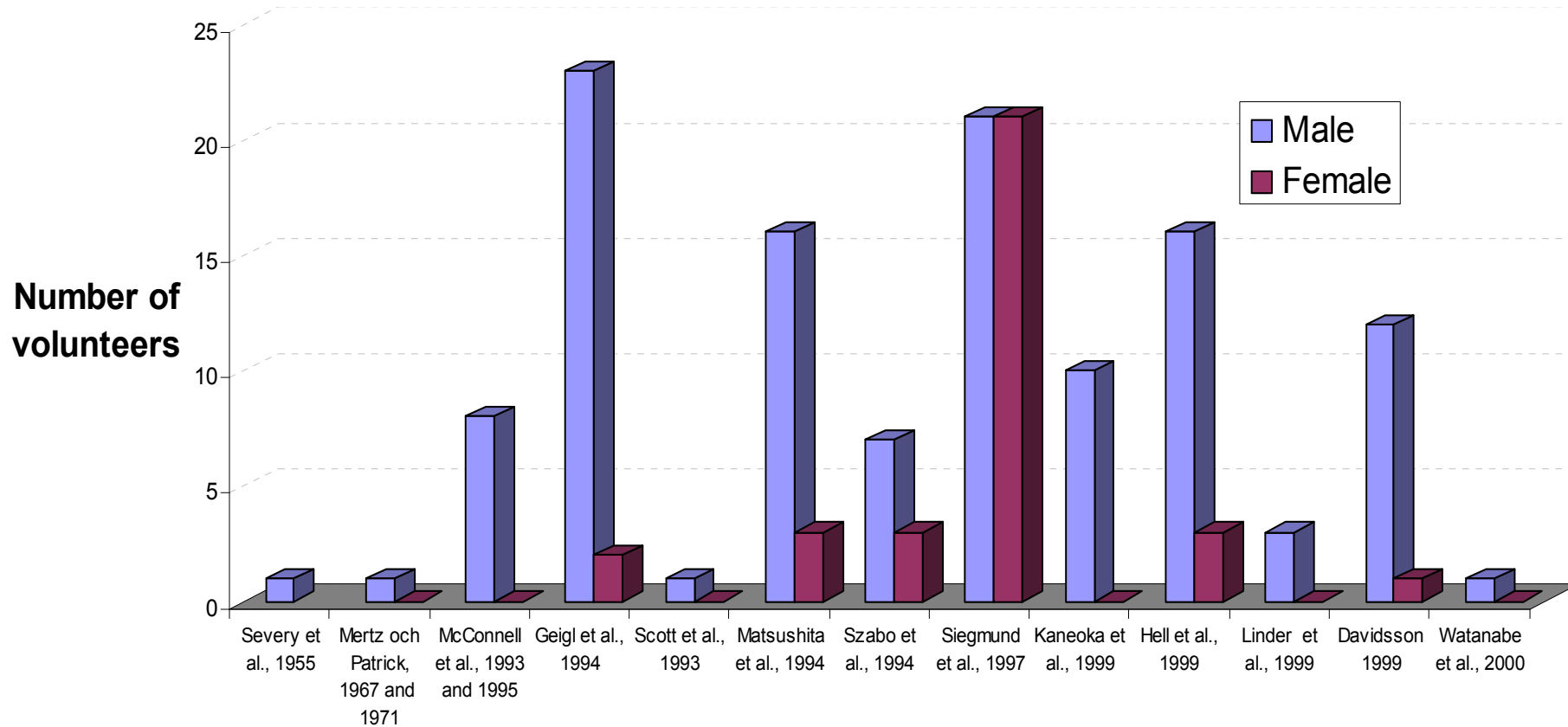


# EvaRID

Platform for implementing research findings ADSEAT



# Volunteer test, rear impacts





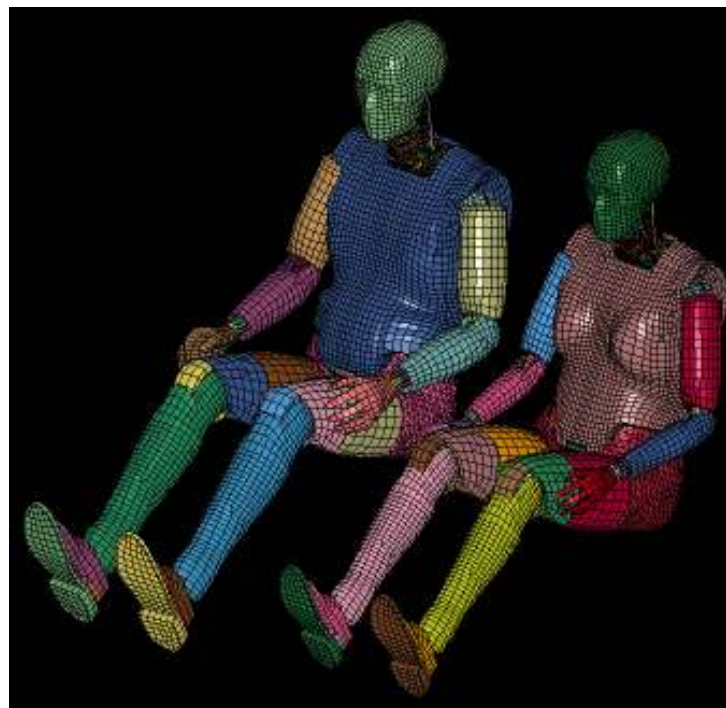
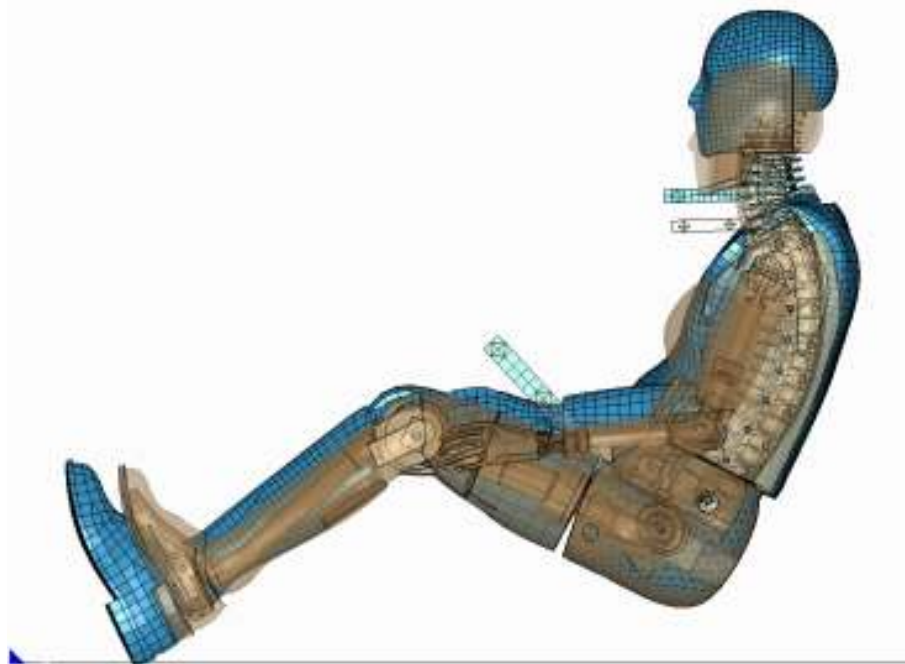
**ADSEAT**



# EvaRID simulation volunteer tests



# BioRID & EvaRID





**Thank you for your attention**



[www.adseat.eu](http://www.adseat.eu)