Partners for Child Passenger Safety

TraumaLink at
The Children's Hospital of Philadelphia

and State Farm Insurance Companies

Performance of Second Generation Air Bags for Child Occupants

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Air bags and children

- Out of position exposure to deploying PAB shown to cause fatal head and neck injuries in children
  - Mainly unrestrained or gross misuse of belt
- Initial claim: “cost” of air bags outweigh the benefits to children
  - Current recommendations state that all children <13 years of age should sit in the rear

Objective

- To estimate exposure of children to passenger air bag deployment
- To assess the risk of injury to children exposed to PAB
- To explore the differential performance of 1^{st} versus 2^{nd} generation air bag systems for child occupants

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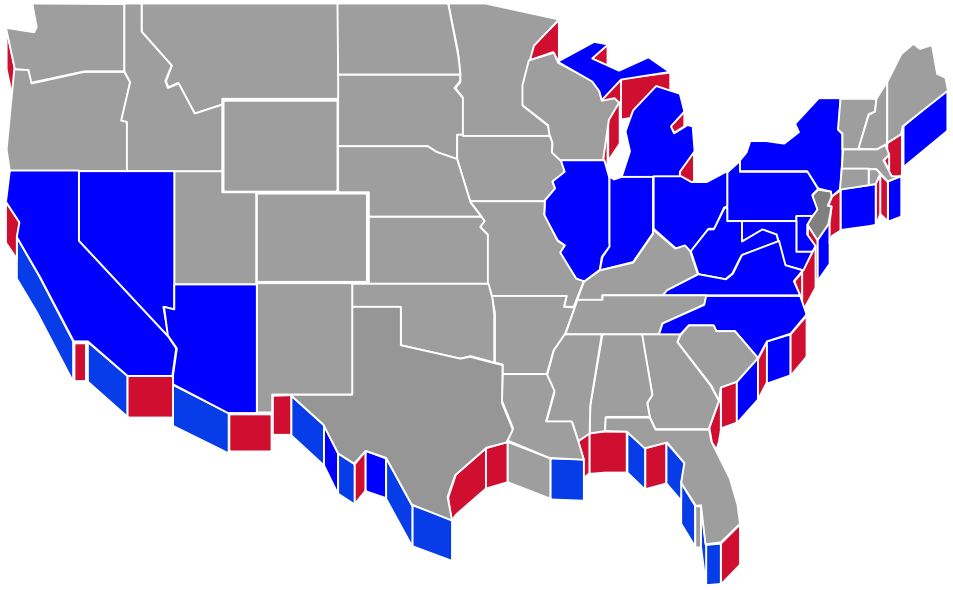
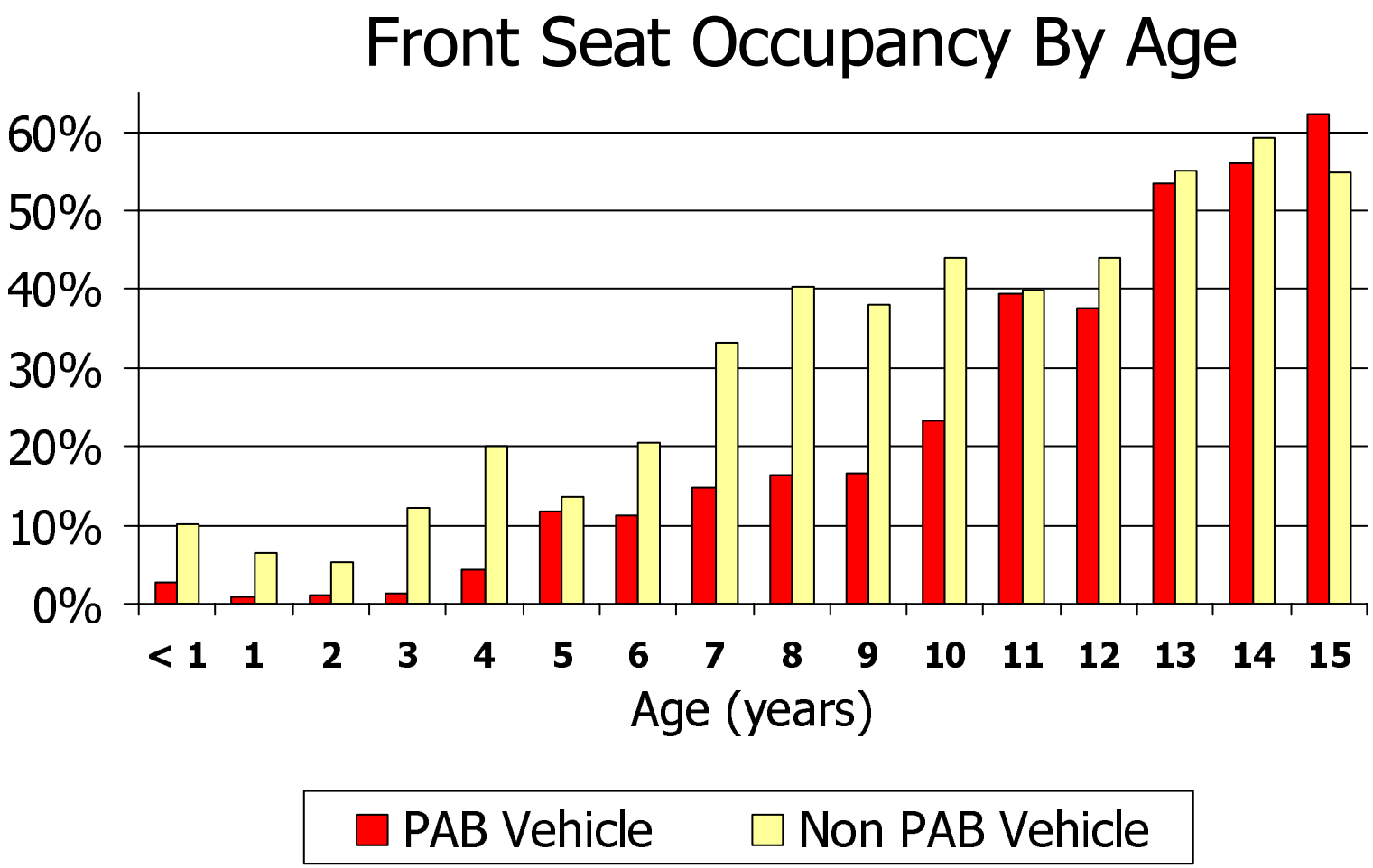
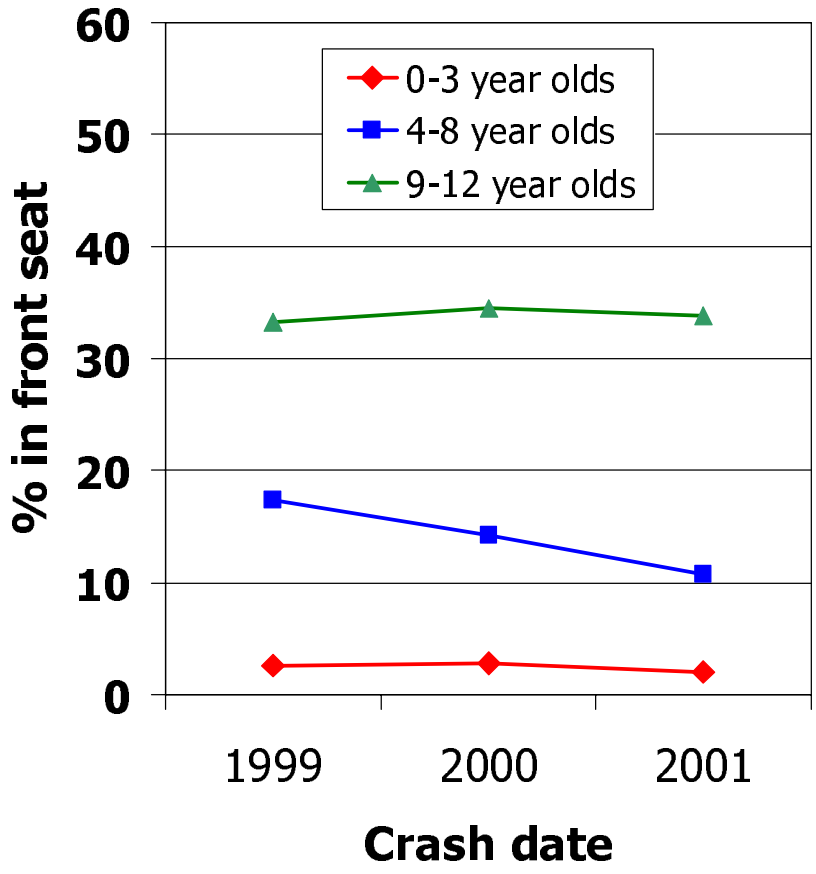
- Inclusion Criteria
  - Child occupant < 16 years of age
  - Insured vehicle
  - Model year ≥ 1990
- On-going data collection began 1998
- Telephone interview and in-depth crash investigation

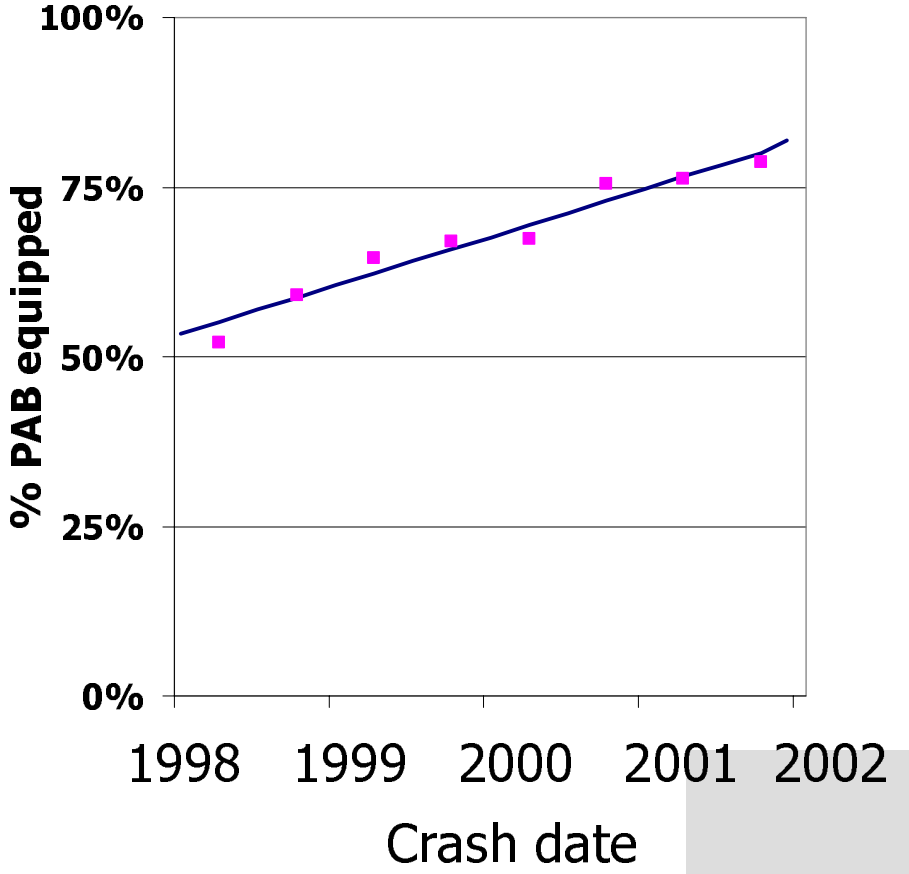


Where are children sitting?

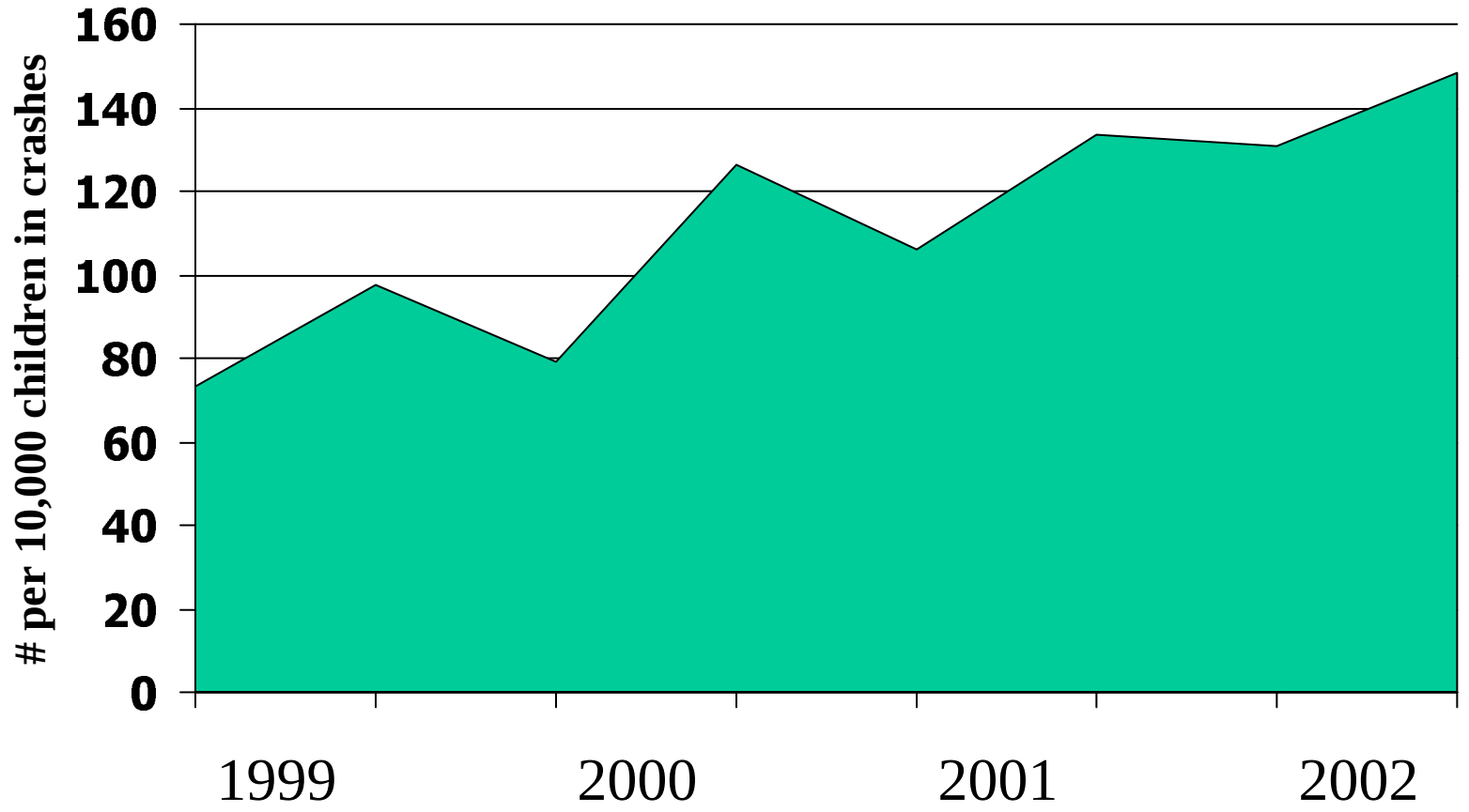


How is exposure changing?





Number of children exposed to air bags is increasing



Risk of injury analyses
Specific inclusion criteria

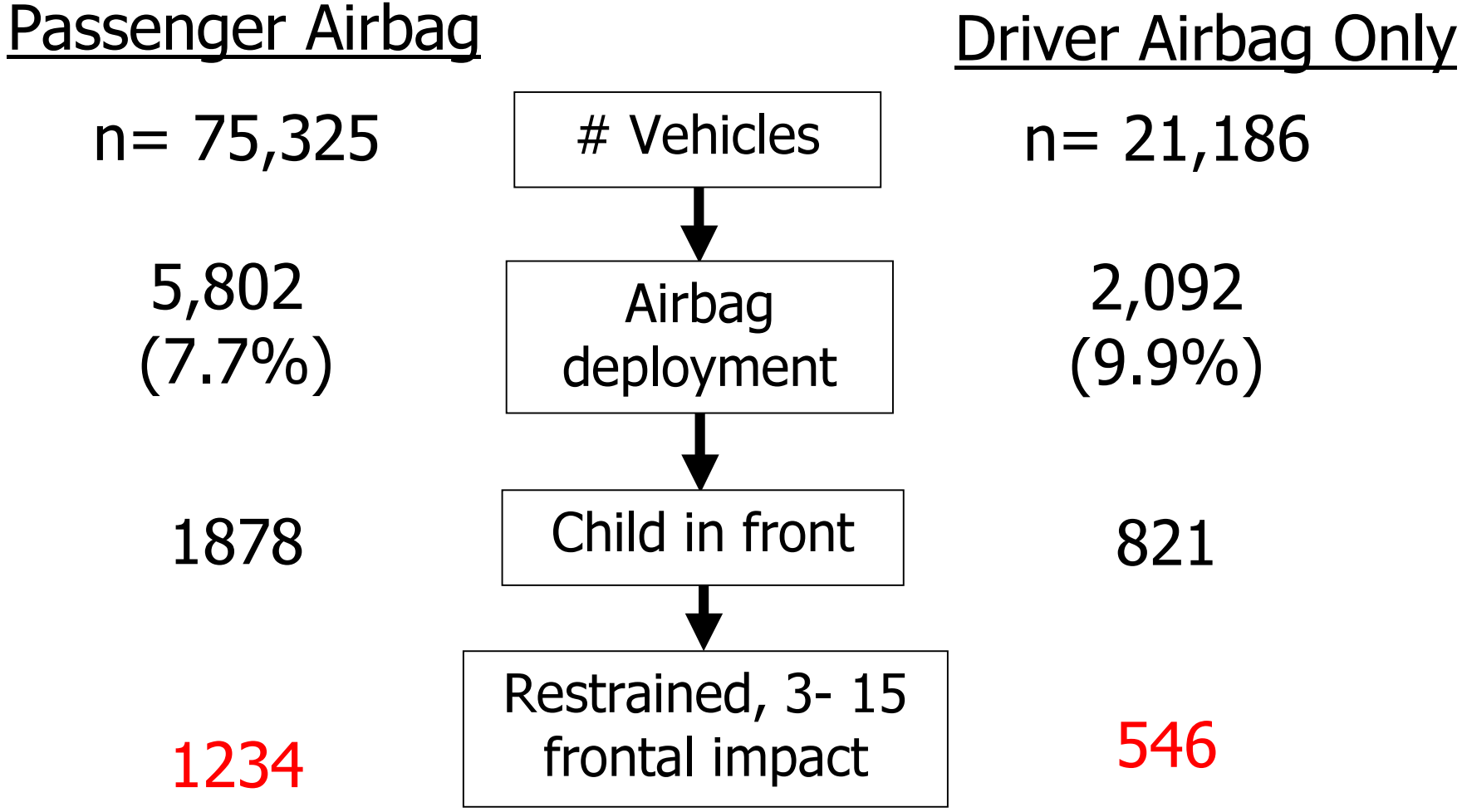
- Restrained children 3- 15 years old
- Frontal impact crashes
- PAB exposed vs front seated children in Driver Airbag (DAB) deployments

Risk of injury analyses
Outcome definition

- Significant Injury
  - All AIS $\geq$2
    - Concussions, other brain injuries, spinal cord injuries, all internal organ injuries, extremity fractures
  - Facial lacerations
- Minor Injury
  - All other lacerations, abrasions, contusions

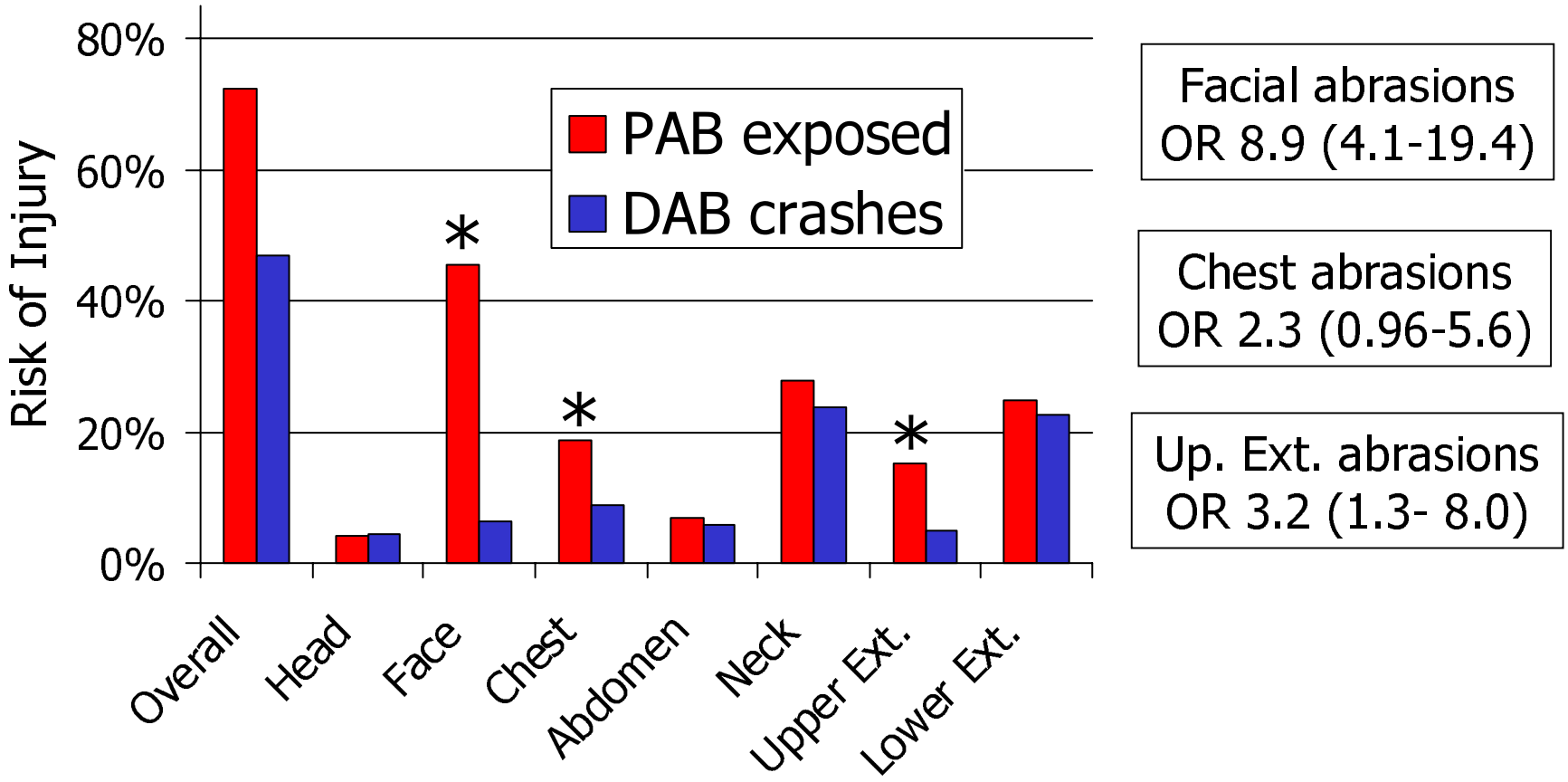
Risk of injury analyses

Risk of Injury

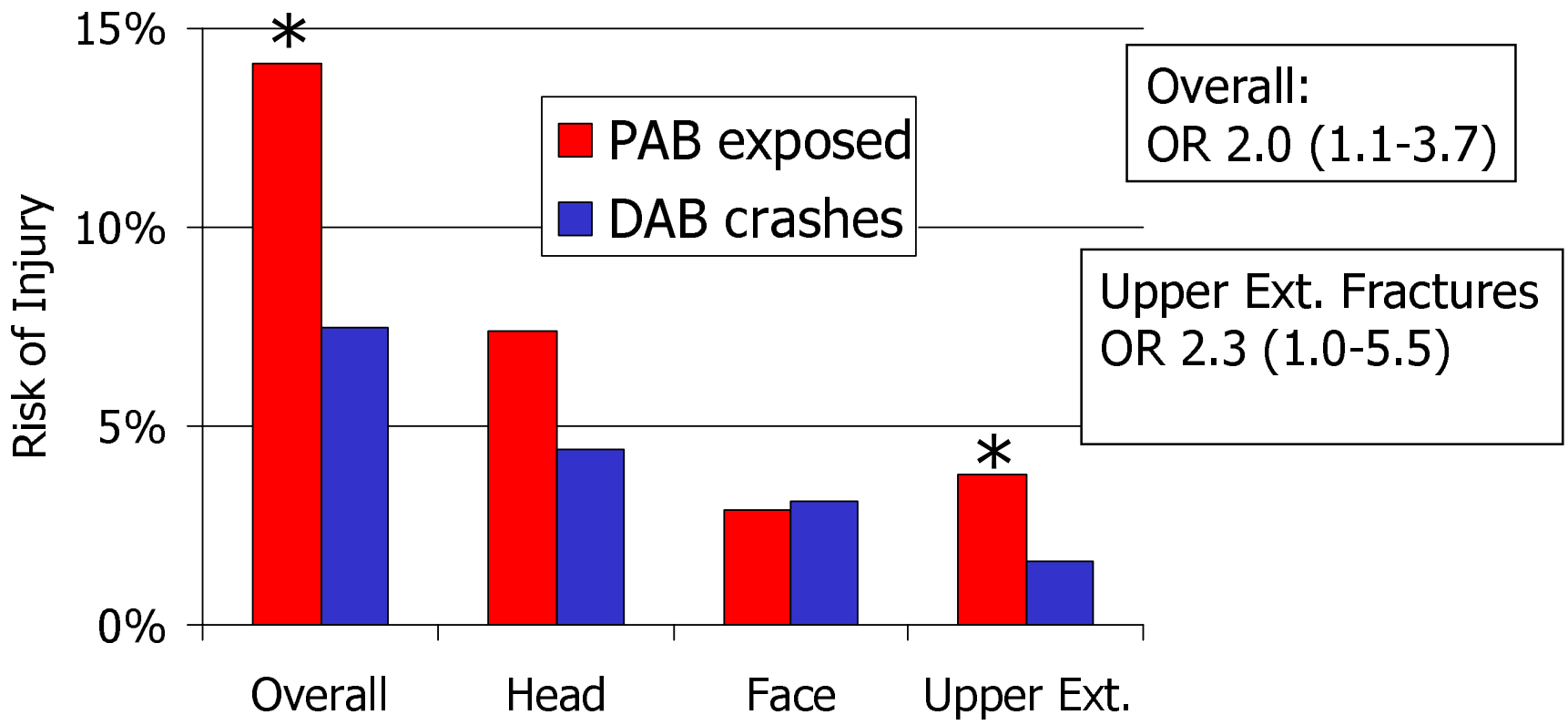


Risk of injury analyses

Minor injury by body region



Risk of injury analyses
Significant injury by body region



Conclusions
Risk of injury

- Exposure to PAB increases risk of minor and significant injury
  - Abrasions to face, chest, upper extremities
  - Upper extremity fractures
- Analyses studied a mixed population of air bag designs
  - How has this changed with 2nd generation air bags?