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Trauma Comparison of Civilian Automotive and Military Combat Events

U.S. ARMY RDECOM

ARL open campus

S&T Campaign: Assessment & Analysis
Military Injury Biomechanics

Kathryn Loftis, PhD
Patrick Gillich, (410) 278-6332
Patrick.j.gillich.civ@mail.mil

Research Objective

- To understand the similarities and differences between civilian motor vehicle crash (MVC) and military mounted combat event injuries and mechanisms.
- To leverage similarities between the areas in order to better understand injury biomechanics and protection technologies in both the civilian and military sectors.

Challenges

- Determining injury mechanisms and causes in both civilian and military injury scenarios using repeatable, analytical techniques.
- Re-creating combat events from incomplete information using experiments and models to determine injury mechanism and cause.

ARL Facilities and Capabilities Available to Support Collaborative Research

- Access to both civilian and military datasets.
- Access to specialized computer models and tools, such as VisualAID, to aid in analysis of injuries.
- Expertise as certified coder of Abbreviated Injury Scale (AIS) and AIS methodology created for analysis.

Complementary Expertise / Facilities / Capabilities Sought in Collaboration

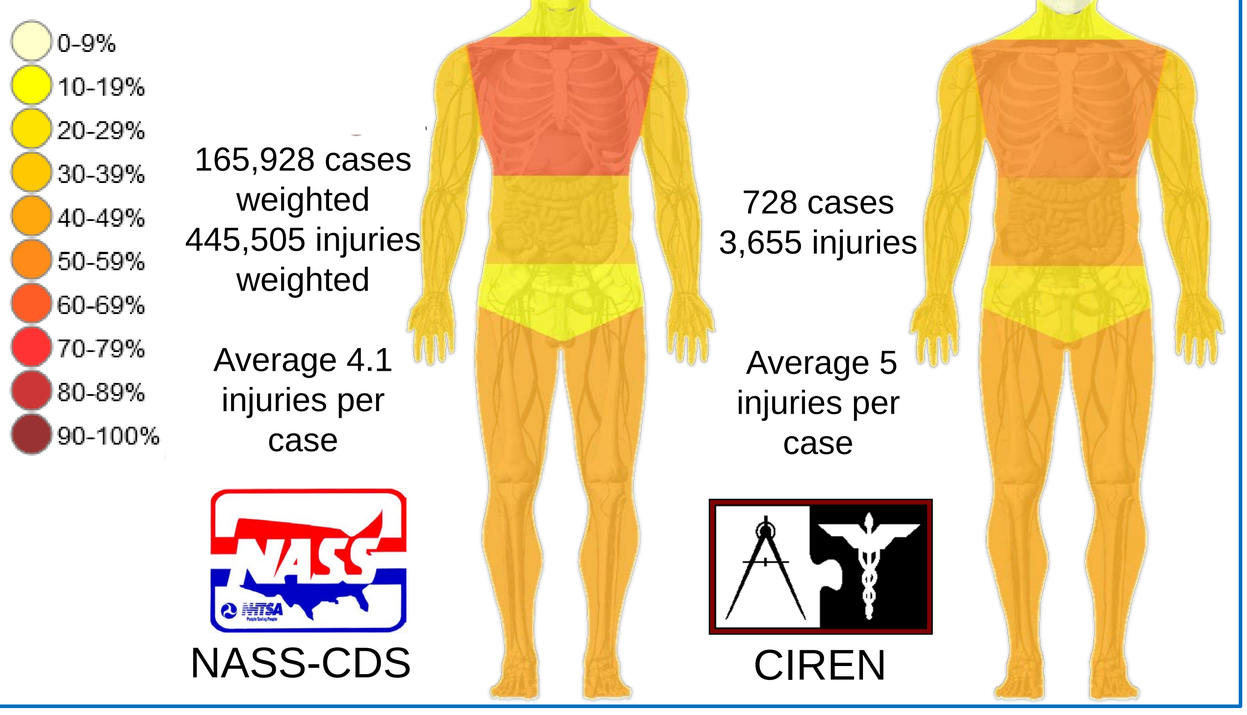
- Additional expertise in coding injury mechanisms and causes – in both civilian and military scenarios.
- Novel analysis ideas to investigate injury severity, especially pertaining to the AIS dictionary.
- Dataset of injury radiology to support injury mechanism investigation for civilian and military research.

Civilian Datasets

Motor Vehicle Crash Databases

National Automotive Sampling System – Crashworthiness Data System (NASS-CDS)

Crash Injury Research and Engineering Network (CIREN)



165,928 cases weighted
445,505 injuries weighted

Average 4.1 injuries per case

NASS-CDS

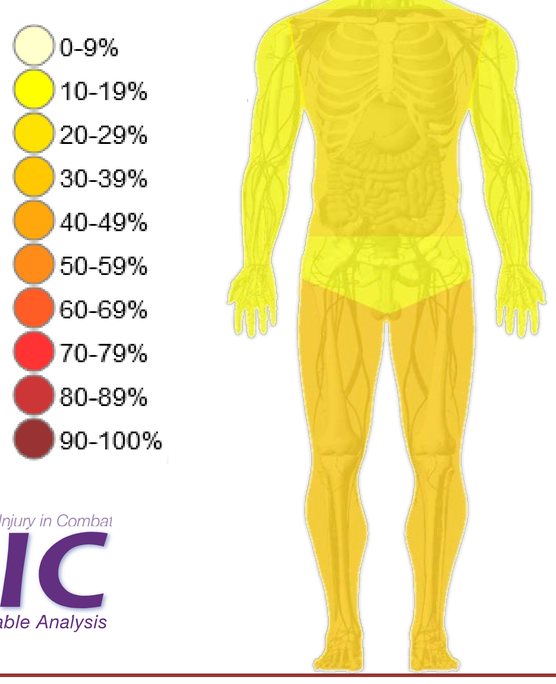
728 cases
3,655 injuries

Average 5 injuries per case

CIREN

Military Dataset

Joint Trauma Analysis and Prevention of Injury in Combat (JTAPIC)



1,963 cases
9,878 injuries

Average 5 injuries per case

Joint Trauma Analysis & Prevention of Injury in Combat
JTAPIC
Preventing Injuries Through Actionable Analysis

Most Frequent Injuries for Civilian and Military Datasets

Rank	NASS-CDS	CIREN	JTAPIC WIA*	JTAPIC KIA*
1	Diffuse Brain Injury	Rib Cage	Diffuse Brain Injury	Cerebrum
2	Rib Cage	Abdomen Injury - Digestive	Skeletal - Lower Leg/Ankle	Abdomen Injury - Digestive
3	Skeletal - Forearm/Wrist	Skeletal - Lower Leg/Ankle	Lumbar Spine Fracture (no cord)	Rib Cage
4	Cerebrum	Thoracic Injury - Respiration	Skeletal - Foot	Thoracic Injury - Lung
5	Thoracic Injury - Respiration	Skeletal - Hip/Pelvis	Thoracic Spine Fracture (no cord)	Skeletal - Hip/Pelvis

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