GENDER RESPONSIVE STANDARDS AND CAR SAFETY

Adj Prof Astrid Linder PhD
Research Director, Traffic Safety
Swedish National Road and Transport Research Institute

WTO Workshop on the role of gender in the development of standards
8 December 2020, Geneva, WTO headquarters, on-line
Vision: By 2030, injury protection performances of new cars will be assessed for both women and men!

Benefits:
• Inclusive crash safety assessment
• Best performing innovations identified
• Improved safety for everyone
Traffic safety

- 1.35 million
- 1/10/100

Source: VTI/Hejdlösa bilder
Numbers, risk and odds of fatalities and injuries

**Killed:** 77% males and 23% females (Source: TRAFA, Swedish official statistics 2018)

<table>
<thead>
<tr>
<th>Reference</th>
<th>Data year/country</th>
<th>Collision type</th>
<th>Driver/passenger</th>
<th>Injury/Body part</th>
<th>Female/male</th>
</tr>
</thead>
</table>

Abbreviated Injury Scale (AIS) scale from AIS 1 to 6, AIS 1 is a minor injury, AIS 6 an unsurvivable injury.

MAIS 2+: all injuries from grade AIS 2 to killed. MAIS 3+: all injuries from grade AIS 3 to killed.
Whiplash injuries

- 60% - 70% of the cost for the insurance companies of all injuries leading to permanent medical impairment

- Most common in rear impacts

- The hypotheses of injury mechanisms: In the retraction motion
Whiplash – Injury risk

Source: Carlsson 2012
Seat performance, risk of PMI (whiplash)
Kullgren et al. (IRCOBI 2013)

WIL/WIPS  Reactive Head Restraint  Standard seat
Seat performance, risk of PMI (whiplash)

- WIL + Whips: -70%
- RHR all: -47%
- Standard seats: -52%

Kullgren et al. (2013) Development of Whiplash Associated Disorders for Male and Female Car Occupants in Cars Launched Since the 80s in Different Impact Directions, IRCOBI Conference.
Review of average sized male and female occupant models in European regulatory safety assessment tests and European laws: Gaps and bridging suggestions

Astrid Linder*a,b,*, Wanna Svedberga

a Swedish National Road and Transport Research Institute, VTI, Rapplsgatan 1, Gothenburg, Sweden
b Chalmers University of Technology, Sweden

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ABSTRACT

There are two parts to the aim of this study. The first part comprised reviewing how men and women are represented in regulatory tests conducted to assess adult occupant safety in vehicles in Europe. This part also contains an overview of some differences between females and males that may influence dynamic responses in a crash. Based on the results of the review an outline for how to better represent the adult population in regulatory tests has been suggested.

The second part was to reflect on these issues from a specific critical legal perspective, that is from a Gender
### Models of the occupant: Legislative vehicle safety test (Europe)

<table>
<thead>
<tr>
<th></th>
<th>ECE R16 Belt test</th>
<th>ECE R94 &amp; R137 Frontal test</th>
<th>ECE R95 &amp; R 135 Side Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average female model</td>
<td><em>X</em></td>
<td><em>X</em></td>
<td><em>X</em></td>
</tr>
<tr>
<td>Average male model</td>
<td>R16 manikin</td>
<td>Hybrid III</td>
<td>ES-2 Side Impact &amp; WorldSID</td>
</tr>
</tbody>
</table>

The legal value of gender equality and non-discrimination: Obligations according to Article 2 and 3 of the Treaty on European Union

- The Union is founded on the values of respect for human dignity, freedom, democracy, equality, the rule of law and respect for human rights, including the rights of persons belonging to minorities. These values are common to the Member States in a society in which pluralism, non-discrimination, tolerance, justice, solidarity and equality between women and men prevail, Article 2.

- The Union shall combat social exclusion and discrimination, and shall promote social justice and protection, equality between women and men, solidarity between generations and protection of the rights of the child, Article 3.

Source: Consolidated version of the Treaty on European Union,
The Treaty on the Functioning of the European Union, Article 8

• The Union shall in all its activities aim to eliminate inequalities, and promote equality, between men and women. The article is addressed to all the institutions of the Union and therefore legally binding at all levels.

• The article expresses the concept of gender mainstreaming which is the main strategy of the Union for achieving gender equality meaning that a gender equality perspective shall be applied to any planned policy actions, including legislation and political programmes in all areas and at all levels of the Union.

Source: Consolidated version of the Treaty on the Functioning of the European Union,
Anthropometry

1. A small female whose height and weight are approximately the 5th percentile values for all U.S. adult females;

2. A mid-sized female whose height and weight are approximately the 50th percentile values for all U.S. adult females;

3. A mid-sized male whose height and weight are approximately the 50th percentile values for all U.S. adult males;

4. A large male whose height and weight are approximately the 95th percentile values for all U.S. adult males.
Current safety testing, occupant diversity

- Small occupant 5th percentile female: Weight: 49 kg, Height: 1.51 m
- Average occupant 50th percentile female: Weight: 62 kg, Height: 1.66 m
- Average occupant 50th percentile male: Weight: 77.7 kg, Height: 1.77 m
- Large occupant 95th percentile male: Weight: 101.3 kg, Height: 1.87 m

Source of pictures: [www.humaneticsatd.com](http://www.humaneticsatd.com), crash-test-dummies/frontal impact/HIII
BioRID
Height 1.77 m
Weight: 78 kg

EvaRID
Height: 1.66 m
Weight: 62 kg

www.adseat.eu
VIRTUAL: Open Access Virtual Testing Protocols for Enhanced Road User Safety

- Duration: 48 Months, started 1 June 2018
- [www.projectvirtual.eu](http://www.projectvirtual.eu)

VIVA+ models, 50F and 50M
Thank you for your attention
astrid.linder@vti.se