

## Astrid Linder, Sweden

## Reconsidering standards: female crash test dummies



**Adjunct Professor in Injury Prevention at Chalmers University and Professor and Research Director of Traffic Safety at VTI.**

*Astrid Linder is a Professor and Research Director at the Swedish National Road and Transport Research Institute (VTI), and an Adjunct Professor in Injury Prevention at Chalmers University of Technology in Sweden. She is an Engineer, has a Master of Science in Engineering Physics, and obtained her PhD in Mechanical Engineering. Her research focuses on the prevention of injury in traffic crashes, and she has a long history of advocating for female crash test dummies in the car industry. Astrid Linder has spoken at Tedx and strives to raise awareness on this issue on many platforms.*

***“What drives me is contributing to the prevention of the loss of life and improving health in our transport system.”***

**Interviewer: Tell me about your background**

In 1996, I started as a PhD student at Chalmers University. I was part of a project that developed the world's first crash test dummy for low-severity rear impacts, the BioRID, which is based on the average male. The purpose of the project was to evaluate protection from whiplash injuries. A whiplash injury can be caused in a low-severity impact where the head moves in relation to the torso, creating loads on the neck structures, which can result in disabilities. Whiplash injury is most common in rear-end collisions in cars but is found in impact collisions from all directions.

**I: How did you discover the need for female crash test dummies?**

I conducted a literature review and noticed that, in injury statistics, women were more likely than men to suffer whiplash injuries and that this had been common knowledge for a long time. The oldest reference showing a higher risk for women dates

back to 1969. At the time, I thought that the next step should then be to address women in the same way as men by developing crash test dummies that represent the female population in the same way as men are represented. There are different types of crash test dummies that are used to test different collision directions. There is not a particular need for female crash test dummies, there is a need to address women in the same way as men. This is about equal terms, not about a dummy. Since then, I have contributed to spreading knowledge about this need and have shown how this can be done through scientific studies. However, there are still no crash test dummies that represent the female part of the population.

**I: Why are there no female crash test dummies?**

I believe a contributing reason lies in the regulation of occupational safety in vehicles which says that a crash test dummy representing an average male should be used in passenger safety

tests. Car manufacturers make an effort to protect the whole population, but this cannot be achieved because there are no models representing the female part of the population when assessing occupant safety in a crash.

I did not know this as a PhD student, but now I know that the requirements that society puts on a product which is demanded in the industry is to use an average male model. Society greenlights it if it works on men.

**I: How do people react when you highlight the need for female crash test dummies?**

It covers the whole spectrum of surprise through to “yes, this is how it is”. It depends on your field of knowledge. Things have started to change slightly in the last few years. In 2018, the Swedish Infrastructure Minister, Thomas Eneroth, expressed concern over the situation. The Swedish government has taken the initiative to propose screening of the UNECE international regulatory framework. The government has assigned this process to the Swedish Transport Agency. I have also received information that a bipartisan bill about equal collision safety has been introduced in the USA. This issue has been raised there by different people. So, there are some things happening right now.

**I: Why have we not made further progress, even though Sweden is viewed as a gender-balanced country?**

This probably goes further back in time than the democracy in the Greek square, and it is only 100 years since women got their voting rights in Sweden. From that perspective, it is not so strange that we have not yet made further progress. The law in the European Union says that women and men shall be treated equally, regulation should reflect that.

**I: What do we need to do to achieve change?**

We can all contribute to create the society we want to have. If you have knowledge, then you also have the responsibility to contribute to development. Many need to contribute, and researchers can do more than publishing their results by participating in discussions and encouraging change. There are many who are doing a great job, otherwise we would not be where we are today.

I have also spoken at Tedx and emphasized the importance of delivering the message in different ways and adapting to those you want to reach out to.

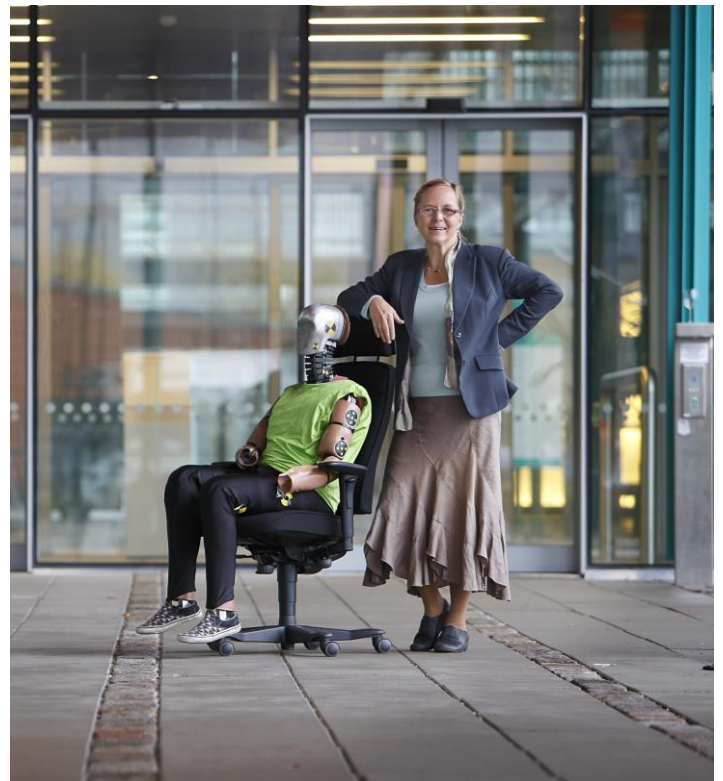




## I: What needs to be done at national and EU level?

Standards for how we evaluate our occupational safety system in vehicles are, today, completely unequal regarding how male and female models are represented as humans in crash test dummies, in the evaluation of protection in a collision. The transport system has a technical component that is designed by our standards, for example, how is the handle you grab designed? What is the norm, what is the standard? A classic example are some smartphones, they don't fit in my hand, but a person with a bigger hand would not necessarily notice this. There is much work to be done. A product should be designed after the sizing factor. It can be a man, or it can be a woman. But you have to ask the question, and this is what we have to do each and every time we design something that is to be used by humans.

We need to keep up the good work and be aware of what needs to be done. There are many good forces available. We have a law in the EU, the Treaty of the Union. Several articles in it say that women and men should be treated equally. It was not formulated like this by chance; a huge amount of work was put into this. We have all the support we can ask for, within the EU, when it comes to equal terms for both women and men. The law is unequivocal. There should not be any gap between what we do and what the law says.



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