

## Seat Belts and Child Restraints

### Why safety restraints?

Safety restraints include seat belts, booster and child seats and are a highly effective way of reducing serious and fatal injuries to car occupants. Universal seat belt use alone could prevent 6,000 deaths and 380,000 injuries every year in Europe according to a study by ICF Consulting<sup>1</sup>. Yet despite the legal obligation to use safety restraints for both adults and children, usage rates still vary greatly across Europe.

Seat belt wearing rates in the EU15 are between 45% and 95% for front seat occupants, and between 9% and 75% for rear seat passengers, according to ETSC estimates<sup>2</sup>.

Country	Wearing rate, front seats (%)	Wearing rate, rear seats (%)
Austria	70	35
Belgium	55	25
Denmark	70	33
Finland	87	66
France	85	45
Germany	95	75
Greece	45	9
Ireland	53	10
Italy	50	10
Luxembourg	55	25
Netherlands	75	47
Portugal	45	10
Spain	61	20
Sweden	85	74
UK	93	75

Table 1. Seat belt wearing rates in the European Union (ETSC, 2003a)

### How do safety restraints work?

Safety restraints work primarily by restraining car occupants in the event of a crash. Without a restraint a car occupant will be thrown forward with a force of between 30 and 60 times his or her body weight in a crash at 48 km/h. Unrestrained car occupants can strike parts of the car interior during a crash as they move within the car, and they can be thrown out through a broken door or window. The chance of being killed or severely injured is about three times greater for occupants who are ejected during the crash.

Safety restraints are most effective in roll-over accidents, frontal collisions and in lower speed crashes, which occur mostly in urban areas. However, the problem of lower seat belt wearing rates in urban areas persists.

For adults, the three point belt is best at reducing injury as it spreads the force over a wider area and restricts occupant movement better than a lap belt. Children need different types of restraints as their body mass is different, and the mass of their head is about 25% of the body mass, whereas the mass of an adult head is about 6% of

the body mass. This means that the relative forces on the head and neck will be much greater on a child in a forward facing situation. The youngest children up to 18 months are therefore best carried rearward facing. Older children are usually carried forwards on child seats or booster seats. A Swedish study demonstrated a link between the low level of child deaths in accident and the fact that they mainly sit still rearward facing up to 3 years old<sup>3</sup>.

Type of restraint	Approx. age of child	Approx. weight of child
Rearward facing baby seat	Birth to 6-8 months	Up to 10 kg
Child or toddler seat	6-8 months to 3-4 years	9 - 18 kg
Booster seat	6-8 months to 7 years	9 - 25 kg
Booster cushion	3-4 years upwards	15 - 36 kg

Table 2. Appropriate child restraints (ETSC 1996)

### EU activities related to seat belts

EU legislation on seat belt and child restraints currently in force (**Directive 91/671/EEC**) requires that all occupants of passenger cars and light vans use seat belts. Children under 12 years of age have to be restrained by an approved restraint system suitable for the child's height and weight. The current Directive leaves however scope for Member States to allow children of 3 years and older to be restrained by an adult seat belt. It also permits Member States to exempt children younger than 3 years of age from wearing child restraints if they are seated in the rear and if child restraints are not available in the car.

In May 2006, a new Directive (**Directive 2003/20/EC**) will come into force that extends the obligatory use of seat belts to occupants of all motor vehicles, including trucks and coaches. It also mandates the use of appropriate child restraint systems for all children traveling in passenger cars and light vans. The only permissible exemption concerns children younger than 3 years of age who may or may not wear seat belts (typically lap belts) in coaches.

### How can usage rates be improved?

Seat belt wearing rates can be improved through a mixture of measures including:

- police enforcement
- education and information campaigns
- vehicle technology

### Police enforcement

Enforcement actions concerning restraint use should be intensive, highly visible and well publicised and as a result increase the felt risk of car users to being checked. Studies have shown that so-called 'blitz' actions, lasting one to four weeks, can be very effective in producing sharp increases in seat belt wearing. To achieve long-term effects, they should be repeated several times a year. High levels of publicity are crucial for optimising the effects of enforcement<sup>4</sup>.

The European Commission<sup>5</sup> recommends that enforcement actions be carried out at least three times a year, with each action lasting at least two weeks. They should be carried out predominantly in those places where there is an increased accident risk. Actions can be combined with other enforcement actions, e.g. concerning drink driving or speeding. It is important that every detected offence is properly followed up and that sanctions are appropriate and dissuasive.

In **FRANCE**, fines issued for non-use of seat belts went up by 15% from 2002 to 2003. In July 2003, penalties were also increased. The use of seatbelts by front seat occupants went up to 90% in urban areas and 97% outside urban areas, resulting in a more than 20% decrease in the number of deaths due to non-use of seat belts. This means that in 2003, the lives of 173 people were saved through increased seat belt use<sup>6</sup>.

In **SWEDEN**, fines for non seat belt use were doubled from 30 EUR to 60 EUR in November 2002. A combination of an information campaign, increase in fines and increased enforcement led to an increased seat belt usage from 79% to 84% which is calculated to have saved about 10 people a year.

Police should also set an example in wearing their seat belts unless they are in an emergency situation.

### Education and information campaigns

Education or information campaigns may involve preparing the public for law change in the field of safety restraints and providing drivers and passengers with information about the consequences of driving belted or unbelted. A wide variety of approaches can be used, ranging from simple information leaflets, elaborate television clips to providing opportunities for the public to experience the forces involved in even very minor crashes. Targeting campaigns at those reluctant to wear seat belts is crucial. Across Europe, there is huge room for improvement to increase belt use in the rear seat, especially by children.

**THE NETHERLANDS** have conducted an extremely effective campaign targeted at increased seat belt wearing rates for 4-12 year olds. The campaign centred on a toy armadillo which is attached to the seat belt and was accompanied with TV and radio adverts, billboards, school resource material ([www.gordeldier.nl](http://www.gordeldier.nl)). The seat belt wearing rate went up from 52% in rear for 4-12 year olds in 2002 to 69% in 2004. In 2005 10 European countries have launched the "Euchires 2005" campaign targeted specifically at children using the successful Dutch model.

The **U.K.** launched an information campaign to increase back seat belt wearing rates for short urban journeys with a TV and cinema advert called 'Backwards'. The effect was an increase in seat belt use from 60% to 66 %.

In 2002 **GERMANY** launched a campaign: "Hat's geklickt?" (Did it click?) targeting truck drivers, only 15% of which wear seat belts ([www.hatsgeklickt.de](http://www.hatsgeklickt.de)). Over half of those killed in accidents do not wear belts. The campaign umbrella is led by the German Road Safety Council (Deutscher Verkehrssicherheitsrat e.V. - DVR) together with the media and industry. The campaign presents reasons as to why they should wear belts based on arguments they cited for not wearing them, such as discomfort and interruption to

their jobs. Campaign stickers are distributed and all those wearing their seat belts and displaying the stickers are automatically entered into a competition. Alongside articles in the media, posters and TV spots an 'Info-truck' travels directly to the work place of truck drivers stopping every week with the motorway police at a different motorway service station. In the 'Info-truck' drivers can experience wearing a belt in a so-called 'belt-sledge'.

To increase the use of child restraints, parents need to be motivated and they also need to know which restraint system is most suitable and how to fit it to the car. Moreover, parents must be willing and capable of buying and renewing the child restraint in time. Age-related child seats can only be used for a limited period and financial restraints might prevent parents from making changes when appropriate. One solution is a rental or loan programme.

In **SWEDEN** loan programmes for infant seats have been used since 1983. They are also common practice in some of the other EU Member States, including Finland, Germany and the UK. For a low fee or sometimes without charge the parents can get an infant seat at the maternity ward where the child is born. Experiences have been very encouraging with positive effects on usage rates of baby seats and on future child restraint use. In Sweden it was found that around 90 % of the families bought a new child seat after the infant seat was returned<sup>7</sup>.

### Vehicle technology

Research has shown that many of the non-wearers of seat belts would use their seat belt if they had an audible seat belt reminder installed in their cars. This is a device that gives a sound warning whenever a seat is occupied, but the seat belt is not fastened. ETSC experts estimate that audible seat belt reminders for front seats can raise seat belt wearing among front seat occupants to 97%. The benefits of requiring audible seat belt reminders for the front seats of cars in the European Union exceed the costs by a ratio of 6 to 1 (ETSC, 2003a).

The European New Car Assessment Programme (EuroNCAP) has started providing added point bonuses for vehicles fitted with seat belt reminders. Today, most of the new models have some form of intelligent seat belt reminder for the driver seat, and an intelligent seat belt reminder for the rear seats was introduced on a car (Volvo's S40) for the first time in 2004.

Efforts are also being made to promote retrofitting of old cars. A study performed by the Swedish Road and Transport Research Institute (VTI) has concluded that a seat belt reminder for retrofit at driver position would reduce road fatalities in Sweden by about 7% yearly if it were fitted into 2 million Swedish cars.

### References

- 1 ICF Consulting (2003): Costs-benefit analysis of road safety improvements. Final Report
- 2 ETSC (2003a): Cost-effective EU transport safety measures
- 3 ETSC (2003b): Transport safety organisation in public and private sectors
- 4 ETSC (1999): Police enforcement strategies to reduce traffic casualties in Europe
- 5 Commission Recommendation of 6 April 2004 on enforcement in the field of road safety (2004/345/EC)
- 6 Documentation Française (2004): La sécurité routière en France: bilan de l'année 2003
- 7 ETSC (1996): Seat belts and child restraints. Increasing use and optimising performance