

# Drivers' lives that are saved through seat belt use

Road Safety PIN Flash 4

Country	Car occupant deaths in 2005	Car driver deaths in 2005	Proportion driver deaths in occupant deaths (%)	Current driver seat belt rate (%) (1)	Lives saved	Total of driver deaths had none used seat belts	Reduction in driver deaths due to seat belt use (%)
Austria	432	331	76,6	83	235	566	41,5
Belgium	624	471	75,5	73	271	742	36,5
Cyprus	54	35	64,8	80	23	58	40,0
Czech Republic	657	396	60,3	74	233	629	37,0
Denmark	169	121	71,6	85	89	210	42,5
Estonia	99	61	61,6	74	36	97	37,0
Finland	231	162	70,1	88	127	289	44,0
France	3065	2216	72,3	97	2.087	4303	48,5
Germany	2833	2095	73,9	96	1.934	4029	48,0
Greece	1658	1053	63,5	60	451	1504	30,0
Hungary	620	372	60,0	67	187	559	33,5
Ireland*	262	171	65,3	86	129	300	43,0
Italy*	4723	3637	77,0	71	2.002	5639	35,5
Latvia	199	106	53,3	77	66	172	38,5
Lithuania	418	227	54,3	60	97	324	30,0
Luxembourg	36	26	72,2	80	17	43	40,0
Malta	11	5	45,5	97	5	10	48,5
Netherlands	337	254	75,4	92	216	470	46,0
Norway	135	91	67,4	91	76	167	45,5
Poland	2526	1467	58,1	77	918	2385	38,5
Portugal	620	394	63,5	86	297	691	43,0
Slovakia	280	157	56,1	65	76	233	32,5
Slovenia	148	93	62,8	90	76	169	45,0
Spain	2393	1564	65,4	74	919	2483	37,0
Sweden	271	192	70,8	92	164	356	46,0
Switzerland	178	132	74,2	82	92	224	41,0
U.K.**	1675	1109	66,2	90	907	2016	45,0
<b>Total EU25</b>	<b>24.341</b>	<b>16.715</b>	<b>69</b>		<b>11.563</b>	<b>28.278</b>	<b>40,9</b>
<b>Total</b>	<b>24.654</b>	<b>16.938</b>	<b>69</b>		<b>11.731</b>	<b>28.669</b>	<b>40,9</b>

\*Data on occupant and driver deaths relates to all motor vehicles.

\*\*Data on occupant and driver deaths relates only to Great Britain.

(1) 2005 rates except for Malta, Norway, Latvia, Portugal and Slovenia (2006); front seat aggregated rates for Estonia, Finland, Italy and Portugal.

Seat belt rate estimated. For Cyprus, the rate is based on a 2002 estimate of 81% and for Luxembourg on an estimate of 81% in 2003. For Lithuania, 60% are estimated by national PIN Panel member Vidmantas Pumputis. For Greece and Slovakia we have taken over the estimates made by SafetyNet project for the front aggregated rate, see Appendix A of the report on country profiles.

Seat belt rate not considered fully comparable with other countries' data.

## Drivers' lives that could be saved with a 99% seat belt wearing rate

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Country	Car occupant deaths in 2005	Car driver deaths in 2005	Current driver seat belt rate (%) (1)	Lives saved with a 99% rate	Proportion in driver deaths (%)	Lives saved including higher risk(2)	Proportion in driver deaths (%)
Austria	432	331	83	45	13,7	59	17,9
Belgium	624	471	73	96	20,5	119	25,3
Cyprus	54	35	80	6	15,8	7	20,4
Czech Rep.	657	396	74	79	19,8	98	24,7
Denmark	169	121	85	15	12,2	20	16,2
Estonia	99	61	74	12	19,8	15	24,7
Finland	231	162	88	16	9,8	22	13,3
France	3065	2216	97	43	1,9	63	2,8
Germany	2833	2095	96	60	2,9	87	4,2
Greece	1658	1053	60	293	27,9	342	32,5
Hungary	620	372	67	90	24,1	108	28,9
Ireland*	262	171	86	20	11,4	26	15,2
Italy*	4723	3637	71	789	21,7	967	26,6
Latvia	199	106	77	19	17,9	24	22,6
Lithuania	418	227	60	63	27,9	74	32,5
Luxembourg	36	26	80	4	15,8	5	20,4
Malta	11	5	97	0	1,9	0	2,8
Netherlands	337	254	92	16	6,5	23	9,1
Norway	135	91	91	7	7,3	9	10,2
Poland	2526	1467	77	262	17,9	332	22,6
Portugal	620	394	86	45	11,4	60	15,2
Slovakia	280	157	65	40	25,2	47	30,0
Slovenia	148	93	90	8	8,2	10	11,3
Spain	2393	1564	74	310	19,8	386	24,7
Sweden	271	192	92	12	6,5	17	9,1
Switzerland	178	132	82	19	14,4	25	18,8
U.K.**	1675	1109	90	91	8,2	125	11,3
<b>Total EU25</b>	<b>24.341</b>	<b>16.715</b>		<b>2.435</b>	<b>14,6</b>	<b>3.036</b>	<b>18,2</b>
<b>Total</b>	<b>24.654</b>	<b>16.938</b>		<b>2.460</b>	<b>14,5</b>	<b>3.070</b>	<b>18,1</b>

\*Data on occupant and driver deaths relates to all motor vehicles.

\*\*Data on occupant and driver deaths relates only to Great Britain.

(1) 2005 rates except for Malta, Norway, Latvia, Portugal and Slovenia (2006);

front seat aggregated rates for Estonia, Finland, Italy and Portugal.

(2) Accident risk of currently unbelted drivers assumed to be 1.5 times that of currently belted drivers.

Seat belt rate estimated. For Cyprus, the rate is based on a 2002 estimate of 81% and for Luxembourg on an estimate of 81% in 2003. For Lithuania, 60% are estimated by national PIN Panel member Vidmantas Pumputis. For Greece and Slovakia we have taken over the estimates made by SafetyNet project for the front aggregated rate, see Appendix A of the report on country profiles.

Seat belt rate not considered fully comparable with other countries' data.

## Estimation of drivers' lives saved through (increased) seat belt use

Explanatory note to PIN Flash 4

Based on the driver seat belt wearing rate and effectiveness, as well as the number of drivers killed in road crashes in an existing situation, the estimated number of drivers' lives that would be saved if the situation changed is calculated using a method developed by Chris Schoon (SWOV) and Richard Allsop (University College London).

**Schoon, C.C. *Toelichting op rekenprogramma's 'Besparing slachtoffers bij gebruik van beveiligingsmiddelen'*. SWOV-report D-94-13, 1994**

### Lives saved if the accident rate is independent of seat belt wearing

Assuming that wearing a seat belt cuts by half the number of drivers who would die in potentially fatal accidents, and a proportion  $D1$  of drivers is wearing belts in an existing situation, then the number  $S1$  of drivers who are actually killed in crashes can be calculated as

$$S1 = N*(1-D1*0.5)$$

where  $N$  is the number of drivers who would be killed in that situation if none wore belts. Then

$$N = S1/(1-D1*0.5) \quad (1)$$

The same holds for another situation, in which a proportion  $D2$  of the same drivers is wearing belts.

$$S2 = N*(1-D2*0.5) \quad (2)$$

To calculate the lives saved in the new situation based on data for the old situation, we substitute (1) in (2).

$$S2 = S1*((1-D2*0.5)/(1-D1*0.5)) \quad (3)$$

The number of lives saved through the difference in seat belt wearing between the two situations is

$$B = S1 - S2 \quad (4)$$

Substituting (3) in (4), this number is

$$B = S1*(D2 - D1)*0.5/(1 - D1*0.5)$$

To estimate the number of lives saved through existing seat belt use,  $D2$  is taken to be zero and the absolute value of  $B$  is the required estimate. To estimate the number of lives saved through a maximum use of 99%,  $D2$  is taken to be 0.99.

### Lives saved if non-wearers have a higher accident rate than wearers

If the accident rate for unbelted drivers is  $X$  times that of belted drivers in both situations, and  $N$  is now the number of drivers that would be killed in the existing situation if all drivers had the accident rate of the belted drivers but none wore belts, then the number of drivers killed in the existing situation is

$$S1 = N * [(1 - D1) * X + 0.5 * D1] \quad (5)$$

and the number of drivers killed in the new situation would be

$$S2 = N * [(1 - D2) * X + 0.5 * (D2 - D1) * X + 0.5 * D1] \quad (6)$$

It then follows that

$$B = S1 * 0.5 * (D2 - D1) * X / [(1 - D1) * X + 0.5 * D1]$$

As before, to estimate the number of lives saved through a maximum use of 99%,  $D2$  is taken to be 0.99. Increased risk on the part of unbelted drivers in the existing situation has no effect on the estimate of the number of lives saved through existing seat belt use.