

Personal and Behavioural Characteristics of Seat-belt Non-users in Slovenia

M Bilban

ABSTRACT

Objective: In turn, personal and behavioural characteristics found in drivers who use seat-belts affect general traffic safety. The objective of our study was to determine the risk factors that affect seat-belt use across the observed behaviour-related groups of adult citizens of Slovenia.

Methods: Data were collected in late spring 2001, 2004, 2008 and 2012 in a cross-sectional survey, which is conceptually a part of a wider international project in the frame of the Countrywide Integrated Non-communicable Diseases Intervention (CINDI) Programme. A stratified random sample was drawn from the Central Population Registry of the Republic of Slovenia.

Results: The most significant results of our study showed that the important risk factors for seat-belt use in all three periods of examination are as follows: gender, age and education level. We have found seat-belt use in the front and the back car seats among adult citizens of Slovenia to be gradually becoming more and more prevalent. However, there are still a worrisome percentage of people who never use seat-belts.

Conclusion: We will thus have to continue implementing existing activities intended to raise awareness and seat-belt use. In particular, planning stages for various public-health measures should see us focussing on at-risk population groups. Further data will have to be obtained in order for us to be able to exactly evaluate behaviour-affecting risk factors (*eg* psycho-physical wellbeing, use of medicinal products).

Keywords: Behaviour-related groups, risk factors, traffic safety, seat-belt

From: Professor M Bilban, Institute of Occupational Safety, Ljubljana-Polje, Slovenia.

Correspondence: Professor M Bilban, Institute of Occupational Safety, Chengdujska Cesta 25, SI-1260 Ljubljana-Polje. Tel: +386 1 585 51 06; Fax: 386 1 585 51 95
E-mail: marjan.bilban@zvd.si

INTRODUCTION

The seat-belt is a vehicle safety device intended to protect the driver and passengers from serious injuries that could result from a crash or sudden deceleration of the vehicle. Failure to use the seat-belt in an automobile is a risk factor for grave injuries in traffic accidents (1). According to the results of extensive studies, use of a seat-belt decreases the probably of mortal injury in a traffic accident by over 40%, regardless of the speed or the driver's age (2).

Use of a seat-belt is affected by a number of factors connected to personal and behavioural characteristics (3–5). A previous research finding (3–5) shows that young drivers are less likely to use the seat-belt than older drivers and men are less likely to use the seat-belt than women.

Based on European legislation, a recommendation by the European Commission sets a number of requirements regarding seat-belt s in vehicles and their mandatory use during driving. At the national level, the Road Traffic Rules Act (6) prescribes seat-belts in a motor vehicle must be used by passengers in all seats that have them and extends the authority to monitor and punish the failure to use a seat-belt to city wardens. The only persons exempt from having to use a seat-belt are those who are able to demonstrate, with a valid medical certificate, that medical reasons prevent them from using a seat-belt (6).

Numerous studies in Slovenia and abroad show that appropriate legislation is one of the key factors of seat-belt use – in all countries where such legislation was modernised, use of seat-belts has increased both in car drivers and passengers (7–10).

Our study's objective was to define risk factors that affect seat-belt use for each of the three behavioural categories in adult citizens of Slovenia. A side objective was to use the data gathered (in 2001, 2004, 2008 and 2012) to evaluate the effectiveness of public-health measures associated with seat-belt use.

PARTICIPANTS AND METHODS

Data collection

Data were collected in late spring 2001, 2004, 2008 and 2012 in a cross-sectional survey, which is conceptually a part of a wider international project in the frame of the Countrywide Integrated Non-communicable Diseases Intervention (CINDI) Programme. A self-administered postal questionnaire was used based on the CINDI Health Monitor (CHM) Core Questionnaire. The research protocol for the survey was approved by the Ethical Committee of the Republic of Slovenia.

Observed outcomes

The patterns of fastening with seat-belts were assessed on the basis of two questions: (a) “Do you use a seat-belt when driving or as a passenger in the front-seat?” (1 – never; 2 – sometimes; 3 – almost always), and (b) “Do you use a seat-belt in the back-seat ?” (1 – never; 2 – sometimes; 3 – almost always; 4 – there is no seat-belt in the back-seat , 5 - I never travel in the back of the car). On the basis of cross-classification of both questions, participants were classified in three groups according to the level of hazardous behaviour regarding the fastening with seat-belts (observed outcome): 1 – low-risk group (almost always in the front-seat, and almost always in the back-seat , or they never travel in the back of the car); 2 – moderate-risk group (almost always in the front-seat, and never, or sometimes in the back-seat, or there is no seat-belt in the back-seat); and 3 – high-risk group (never, or only sometimes in the front-seat, regardless the answers regarding using seat-belt in the back-seat).

Data analysis

In the analysis of non-use of seat-belts in the front-seat the total sample was used, while participants, who reported that they never travel in the back of the car, or that there was no

seat-belt in the rear seat of their car, were excluded from the analysis of non-use of seat-belts in the rear seat.

The observed outcome was related to (risk factors) gender; age: 25–29, 30–39, 40–49, 50–59, or 60–64 years; level of education: uncompleted primary (less than eight years of education), primary (8 years), vocational (10 to 11 years), secondary (12 years), college (14 to 15 years), or university (16 years or more of education); employment: employed, not employed (housekeeper/student, pensioner/disability pensioner, involuntary unemployed - job seeker); social class (self-classification): lower, labour, middle, upper-middle, or upper; and geographical region: western, central, or eastern for each observed year.

Estimates of prevalence for three levels of observed outcome were assessed for each population subgroup regarding above mentioned characteristics, whereas the strength of the association between the occurrence of observed outcome and each of selected risk factors was univariate estimated using the Chi-squared test.

Multivariate logistic regression analysis was used to estimate the strength of the association between the occurrences of moderate-risk in comparison to low-risk, and high-risk in comparison to low-risk behaviour and selected risk factors. In all statistical tests p -value 0.05 or less was considered significant. SPSS statistical package for Windows Version 21.0 (SPSS Inc., Chicago, IL, USA) was used for analysis.

RESULTS

Description of data

The questionnaires of 8.861 (CHM, 2001), 8.232 (CHM, 2004), 5.885 (CHM, 2008) and 7.562 (CHM, 2012) respondents were eligible for analysis (Table 1).

Results of cross-classification of participants according to their answers on questions about fastening with seat-belt in the front and in the back-seat by year are presented in (Table. 1).

Table. 1: Cross-classification of participants according to their answers on questions about fastening with seat-belt in the front and in the back seat by observed years

Front-seat	Back-seat					Total
	Never	Sometimes	Almost always	No seat-belt in the back-seat	Never travel in the back of the car	
2001 (n = 8.861)						
Never	46	5	0	1	8	60
Sometimes	283	58	0	22	74	437
Almost always	1.873	1.746	2.130	555	2.060	8.364
Total	2.202	1.809	2.130	578	2.142	8.861
2004 (n = 8.232)						
Never	33	5	0	0	3	41
Sometimes	228	57	0	6	56	347
Almost always	1.427	1.854	2.673	224	1.666	7.844
Total	1.688	1.916	2.673	230	1.725	8.232
2008 (n = 5.885)						
Never	21	1	0	0	0	22
Sometimes	55	25	0	2	10	92
Almost always	622	1.033	3.288	61	767	5.771
Total	698	1.059	3.288	63	777	5.885
2012 (n = 7.562)						
Never	17	2	0	0	1	20
Sometimes	60	28	0	0	11	99
Almost always	564	1438	4542	35	864	7.443
Total	641	1468	4547	35	876	7.562

Statistical analysis

According to the different levels of hazardous behaviour: non-hazardous (low-risk) behaviour was observed in 46.4% (CHM, 2001), 50.9% (CHM, 2004), 66.8% (CHM, 2008) and 69.7% (CHM, 2012) participants; hazardous (moderate-risk) behaviour was observed in 46.2% (CHM, 2001), 41.1% (CHM, 2004), 28.3% (CHM, 2008) and 26.3% (CHM, 2012) participants; very hazardous (high-risk) behaviour was observed in 5.5% (CHM, 2001), 4.5% (CHM, 2004), 1.9% (CHM, 2008) and 1.5% (CHM, 2012) participants.

Estimates of prevalence (%) for three levels of hazardous behaviour related to fastening with seat-belts in a car, in different population subgroups in participants of the survey by observed year are presented in Table 2.

Table 2: Estimates of prevalence (%) for three levels of hazardous behaviour related to fastening with seat-belts in a car, in different population subgroups in participants of the survey by years, Slovenia

Population groups		Low risk level				<i>p</i>	Moderate risk level				<i>p</i>	High risk level				<i>p</i>
		Year (%)					Year (%)					Year (%)				
		2001	2004	2008	2012		2001	2004	2008	2012		2001	2004	2008	2012	
Gender	Men	25.8	24.2	20.9	29.1	< 0.001	34.9	31.0	14.6	19.6	< 0.001	41.5	35.3	11.9	11.3	0.010
	Women	21.2	24.0	23.9	30.8		37.7	30.4	15.3	16.6		50.1	33.5	7.0	9.4	
Age (years)	25-29	25.6	24.9	22.1	27.4	< 0.001	36.3	33.1	16.3	14.3	< 0.001	41.9	42.4	7.8	7.8	0.001
	30-39	26.3	24.5	21.8	27.4		37.5	30.4	14.1	18.1		46.4	33.9	9.4	10.3	
	40-49	23.8	24.3	21.9	30.1		40.9	29.6	13.4	16.1		49.8	32.8	9.8	7.5	
	50-59	21.5	23.5	24.1	30.9		32.0	30.4	17.6	20.0		36.1	33.2	14.9	15.9	
	60-64	20.0	24.0	22.1	33.9		32.7	31.1	13.3	22.9		44.8	25.9	8.6	20.7	
Education level	Uncompleted primary	34.6	30.8	19.8	14.8	< 0.001	54.6	28.8	9.2	7.5	< 0.001	53.3	35.0	6.7	5.0	0.104
	Primary	26.6	26.1	22.3	25.0		46.5	28.2	13.8	11.5		48.9	26.7	11.5	13.0	
	Vocational college	27.5	26.2	22.5	23.8		42.3	31.4	14.3	12.0		47.4	34.2	9.7	8.7	
	Secondary college	19.6	21.5	22.2	36.8		31.0	31.3	15.6	22.2		37.4	36.8	11.2	14.6	
	University	23.0	23.8	23.0	30.2		37.4	29.7	13.7	19.2		48.3	38.2	5.6	7.9	
Employment	No	18.2	19.4	24.0	38.4	< 0.001	27.1	29.9	17.6	25.4	< 0.001	45.3	34.0	11.3	9.4	< 0.001
	Yes	22.9	23.9	20.4	32.8		37.3	28.8	13.1	20.8		42.4	29.7	10.0	17.9	
Social class (self-classification)	Lower	23.6	24.4	24.5	27.6	< 0.001	36.2	31.8	16.0	16.0	< 0.001	44.5	36.6	10.6	8.3	< 0.001
	Labour	21.1	18.7	25.3	34.9		32.6	29.7	17.6	20.1		27.0	35.1	10.8	27.0	
	Middle	22.9	22.8	23.0	31.3		39.9	27.3	14.5	18.3		40.7	31.8	12.5	15.0	
	Upper-middle	23.7	23.8	22.2	30.4		35.3	31.2	15.1	18.3		46.5	35.9	8.5	9.1	
	Upper	23.7	27.2	22.7	26.4		32.2	35.5	15.3	16.9		44.0	40.5	11.2	4.3	
Geographic region	Upper	36.3	29.5	11.0	23.3	0.332	40.0	37.1	8.6	14.3	< 0.001	81.8	18.2	0.0	0.0	0.609
	Western	24.1	24.3	21.7	29.9		35.0	29.6	14.8	20.6		43.8	34.0	10.4	11.8	
	Central	23.3	23.4	22.3	30.9		34.9	31.3	16.2	17.6		47.6	35.2	9.7	7.6	
	Eastern	22.9	24.4	23.0	29.6		38.4	30.8	14.3	16.5		43.1	34.8	10.4	11.7	

*Abbreviations: Levels of hazardous behaviour: **low-risk** (almost always in the front-seat, and almost always in the back-seat, or they never travel in the back of the car); **moderate-risk** (almost always in the front-seat, and never or sometimes in the back-seat, or there is no seat-belt in the back-seat); and **high-risk** (never, or only sometimes in the front-seat, and all answers regarding using seat-belt in the back-seat); $p \leq 0.05$

Results of multivariate logistic regression analysis between moderate-risk behaviours related to fastening with seat-belts in a car in comparison to low-risk behaviour by observed year are presented in (Table. 3).

Table. 3: Results of logistic regression analysis of risk factors for moderate-risk behaviour related to fastening with seat-belts in a car in comparison to low-risk behaviour in participants of the survey Slovenia.

Risk factor	Observed category	Reference category	Moderate risk to low risk level								
			Year 2001		Year 2004		Year 2008		Year 2012		
			OR	<i>p</i>	OR	<i>p</i>	OR	<i>p</i>	OR	<i>p</i>	
Gender	Men	Women	1.55	<0.001	1.22	<0.001	1.08	0.245	0.94	0.326	
Age (years)	25-29	50-59	1.17	<0.001	1.13	<0.001	1.20	<0.001	1.11	<0.001	
	30-39	50-59	1.08	<0.001	1.04	0.025	1.05	0.061	1.10	<0.001	
	40-49	50-59	1.07	<0.001	0.99	0.527	0.98	0.246	0.98	0.226	
	60-64	50-59	0.94	0.008	0.95	0.018	0.87	<0.001	0.92	0.001	
Education level	Uncompleted primary	University	0.99	0.768	0.94	0.008	1.00	0.876	1.02	0.553	
	Primary	University	0.98	0.513	0.95	0.007	1.01	0.752	1.00	0.164	
	Vocational	University	0.98	0.471	0.96	0.018	1.02	0.553	1.00	0.329	
	Secondary College	University	1.00	0.709	0.99	0.791	1.01	0.456	1.02	0.226	
Employment	Yes	No	1.02	0.657	0.91	0.003	0.97	0.442	1.02	0.514	
	Social class (self-classification)	Labour	Lower	1.16	0.312	0.82	0.242	0.84	0.336	1.10	0.564
		Middle	Lower	1.04	0.827	0.86	0.390	1.00	0.988	1.20	0.279
		Upper-middle	Lower	0.93	0.666	0.83	0.307	1.01	0.981	1.33	0.141
Geographic region	Upper	Lower	0.84	0.506	0.90	0.709	1.35	0.523	1.55	0.229	
	Western	Eastern	1.03	0.102	1.08	<0.001	1.13	<0.001	1.12	<0.001	
	Central	Eastern	1.01	0.442	1.06	0.001	1.10	<0.001	1.06	0.008	

*Abbreviations: OR - odds ratio; levels of hazardous behaviour - **low-risk** (almost always in the front-seat, and almost always in the back-seat, or they never travel in the back of the car) and **moderate-risk** (almost always in the front-seat and never or sometimes in the back-seat, or there is no seat-belt in the back-seat); $p \leq 0.05$

Results of multivariate logistic regression analysis between high-risk behaviours related to fastening with seat-belts in a car in comparison to low-risk behaviour by observed year are presented in (Table. 4).

Table. 4: Results of logistic regression analysis of risk factors for moderate-risk / high risk behaviour related to fastening with seat-belts in a car in comparison to low-risk behaviour in participants of the survey Slovenia.

Risk factor	Observed category	Reference category	High risk to low risk level							
			Year 2001		Year 2004		Year 2008		Year 2012	
			OR	<i>p</i>	OR	<i>p</i>	OR	<i>p</i>	OR	<i>p</i>
Gender	Men	Women	0.54	<0.001	0.40	<0.001	0.22	<0.001	0.37	<0.001
Age (years)	25-29	50-59	1.24	<0.001	1.38	<0.001	1.12	0.195	1.27	0.003
	30-39	50-59	1.19	<0.001	1.19	<0.001	1.10	0.179	1.15	0.044
	40-49	50-59	1.13	0.002	1.11	0.018	1.06	0.439	1.00	0.821
	60-64	50-59	0.95	0.478	0.85	0.060	0.79	0.097	1.00	0.452
Education level	Uncompleted primary	University	1.17	0.002	1.25	<0.001	1.23	0.063	1.22	0.098
	Primary	University	1.12	0.006	1.13	0.013	1.13	0.143	1.22	0.010
	Vocational	University	1.13	<0.001	1.15	<0.001	1.16	0.026	1.20	0.007
	Secondary	University	1.08	0.021	1.12	0.002	1.17	0.013	1.15	0.023
	College	University	1.08	0.061	1.13	0.004	1.04	0.695	1.13	0.147
Employment	Yes	No	0.90	0.177	0.89	0.157	0.92	0.612	1.03	0.792
Social class (self-classification)	Labour	Lower	1.13	0.738	0.54	0.060	1.00	1.000	0.495	0.067
	Middle	Lower	1.48	0.304	0.67	0.228	1.00	0.980	0.40	0.028
	Upper-middle	Lower	1.94	0.111	0.85	0.659	1.82	0.391	0.36	0.090
	Upper	Lower	3.41	0.022	0.53	0.425	/	/	/	0.998
Geographic region	Western	Eastern	1.09	0.039	1.08	0.089	1.14	0.097	1.11	0.195
	Central	Eastern	1.00	0.941	1.00	0.948	1.00	0.651	0.89	0.186

*Abbreviations: OR - odds ratio; levels of hazardous behaviour - **low-risk** (almost always in the front-seat and almost always in the back-seat, or they never travel in the back of the car) and **high-risk** (never, or only sometimes in the front-seat, and all answers regarding using seat-belt in the back-seat); $p \leq 0.05$.

DISCUSSION

The most significant results of our study have shown the major risk factors affecting seat-belt use in all three periods under investigation were: gender, age and education level.

In the period under investigation, results have shown an increase of the share of drivers who almost always use the seat-belt on either of the front-seats. The trend is particularly significant in seat-belt use on back-seats (from 2001 to 2008, the share increased by 35.0%). At the same time, the percentage of drivers who never use a seat-belt, neither on the front nor on the back-seats, is decreasing.

It is a fact that seat-belt use prevents traffic accident injuries and/or reduces their severity. Numerous studies show an increased awareness regarding the use and perception of the use of seat-belts in professional drivers. Regarding traffic accidents, the European Commission notes that numerous fatalities and cases of serious injury in traffic accidents could be averted if everybody used a seat-belt while travelling by car, resulting in a great decrease of the costs associated with such accidents. A number of studies have found that a 100% seat-belt use rate would halve the number of traffic accident fatalities while reducing the number of serious injuries by as much as 70%. At high speeds, the seat-belt can only cause surface injuries to the body and skin, minor bone fractures; only in exceptional cases does seat-belt use result in serious internal injuries. Injuries potentially suffered with seat-belt use are simply incomparable to those potentially suffered by drivers who fail to use the seat-belt (11).

In case of a traffic accident, failure to use a seat-belt may cause the driver to crash into the steering wheel, the windshield or other parts of the vehicle's interior, or throw the driver out of the vehicle (11). Our research results have shown 0.8% (CHM, 2001) to 0.3% (CHM, 2012) of adult Slovenian citizens never to use the seat-belt on the front-seats. Failure to use the seat-belt is even more frequent on the back-seats: from 24.5% (CHM, 2001) to 8.3% (CHM, 2012).

Just in the EU, failure to use the seat-belt claims almost 7000 lives each year. Traffic safety planners in Europe are thus convinced failure to use the seat-belt should be punished even more severely (12). The stated reasons for failure to use the seat-belt are as follows: 34% of drivers forget to use it; 22% are only driving a short distance and 10% do not use it because it bothers them while they are driving (13). As indicated by the results of our study, efforts in Slovenia should be focussed on the groups that are most at risk, *ie* those between 25 and 29 years of age, those with a low level of education, those living in western Slovenia. Considering the results noted in each year of the study the measures already implemented have been successful. However, we still have to work to determine the population groups that are at the highest risk and design appropriate measures with them in mind.

In addition to warning lights, newer cars often feature an audible warning signal. Estimates in Sweden indicate that an effective system that warns the vehicle's occupants to use their seat-belts may decrease the fatality rate in traffic accidents by about 20%. In the EU, that would mean a difference of approximately 4000 deaths every year (13).

A driver and passenger in the front-seat who are wearing their seat-belts can usually walk from a 64 km/h head-on collision with minor injuries. However, if the driver and passenger are not strapped in, the consequences of a collision at such speed are much more serious (14).

Seat-belt use is lowest in city centres, as people often erroneously think that low speeds make seat-belts unnecessary. However, one should take note of the fact that an adult is only able to resist the weight of his body using his arms and legs up to speeds of about 7 km/h. In a colliding vehicle travelling at 50 km/h, the body is acted upon by forces similar to those that would occur in case of a fall from 10 metres, and the forces only become greater with higher speeds. Studies emphasize different factors (15). In a Nigerian study (16), as much as 86% of respondents answered that the seat-belt must be used during driving, while 95.5% of drivers said that they did not agree

with the statement that the failure to use a seat-belt may cause a traffic accident. In our own study, the share of drivers who always use the seat-belt when driving in front increased.

In northern Italy, where traffic accident-related mortality is about 30% higher than the Italian average, the greatest risk factor for a fatal traffic accident is failure to use the seat-belt. It is believed interventions in criminal prosecution, driver's behaviour and the environment would be necessary to remedy the situation (17). Such measures have already proved effective in Slovenia, as indicated by the results of our study for individual years.

Research carried out in the United Arab Emirates found age, education level, gender, marital status and personal habits to have a significant effect, leading the researchers to believe measures should be implemented as part of traffic safety campaigns to raise awareness regarding seat-belt use (18).

Spanish drivers believe that higher speeds on highways are associated with higher risk and that seat-belts can provide protection in this regard. Failure to use a seat-belt is associated with driving safety awareness, discomfort, social status (low level of education) and distrustfulness regarding seat-belt effectiveness. Fear of punishment for failure to use the seat-belt is not considered significant. They conclude that this necessitates preventive education [social pressure] (19). Among young drivers, failure to use the seat-belt is among the most significant risk factors for having a traffic accident (20). A driver's specific behaviour, consumption of alcohol or drugs and failure to use the seat-belt all significantly increase the probability of major traffic accidents and injuries.

Driving mistakes tend to have less of an effect than the driver's personal characteristics, while age and gender are almost negligible as factors (21). In the United States of America (USA), research has been carried out into the influence of various cultural variables on seat-belt use. It has been discovered that religion, race and political orientation all have a positive-effect, while the effects of income and education were negligible, indicating new possibilities, in education and legislation, to achieve higher seat-belt use and consequently better traffic safety (22). Findings of the

US study show that failure to use the seat-belt is associated with antisocial behaviour and coincident psychological distress. Among those least likely to use the seat-belt are younger men, those with low income and those with higher education. Also, people are less likely to use the seat-belt as passengers in a car if they are under the influence of alcohol or other drugs or if they have committed any offences indicating antisocial behaviour or criminal offences (23).

Among professional drivers of delivery vehicles, as much as 67% answered that they always use the seat-belt (which only 31% of other drivers do). The common reasons for failing to use it are: frequent stops (29%) and ignorance of the risks involved (23%) Seat-belt use is highest among delivery vehicle drivers (88%) followed by bus drivers (87%). On the other hand, seat-belt use is only 60% among truck drivers (5, 24).

A study in Qatar has determined as much as 23% of the drivers who had caused a traffic accident were not using seat-belts at the time, while causes of traffic accidents were determined to be dominated by the human factor (25). Research in Iran has also determined that the level of seat-belt use in cars is very low, prompting researchers to propose development and implementation of effective intervention measures in order to encourage seat-belt use (26).

The greatest part of those injured because of a failure to use the seat-belt is made-up by young male drivers and those driving under the influence of alcohol, involved in single-car accidents on rural roads. Twenty per cent of drivers injured in traffic accidents were not wearing seat-belts, while their share among fatalities was as high as 68%. Non-users involved in traffic accidents are at a significantly higher risk for serious injuries of the head, face, chest, abdomen and lower limbs (27). A study carried out in Boston has found the rate of seat-belt use to be about 80% at the national level, but only around 63% in Massachusetts. Less likely to use a seat-belt were men, those who consume alcohol (over five drinks in a single episode), those who drink during driving and those who responded that they are bothered by the seat-belt or had forgotten to fasten it (28). A Greek study has found seat-belt use in cities to be lower than in the country, and that young and

elderly male drivers were least likely to buckle-up. Seat-belts were especially rarely used by back-seat passengers (29). The results in our study were similar. In 2000, shares of drivers who did not use their seat-belts among all traffic accident fatalities were as follows: 39% in Finland, 31% in Germany, 30% in Ireland, 50% in Austria, 39% in Spain and 42% in Greece (30). The past few decades have seen seat-belt use increase everywhere, including the most developed countries; in the US, for example, the increase was from 27% in 1985, through 49% in 1990, 68% in 1995, 71% in 2000, 82% in 2005, to 93% in 2010 (31).

CONCLUSION

We can conclude seat-belt use among adult citizens of Slovenia is on the rise both in the front and in the back of the car, with the highest increase seen in the front-seats. We will thus have to continue implementing existing activities intended to raise awareness and seat-belt use. Further data will have to be obtained in order for us to be able to exactly evaluate behaviour-affecting risk factors (*eg* psycho-physical wellbeing, use of medicinal products).

ACKNOWLEDGEMENT

The authors would like to thank the National Institute of Public Health for providing us with the data regarding the CINDI Health Monitor studies (2001, 2004, 2008 and 2012). We would also like to thank all members of the task force as well as all who participated in the study.

REFERENCES

1. Shibata A, Fukunda K. Risk factor of fatality in motor vehicle traffic accidents. *Accident Anal Prev* 1994; **26**: 391–7.
2. Bradbury A, Robertson C. Prospective audit of the pattern, severity and circumstances of injury sustained by vehicle occupants as a result of road traffic accidents. *Arch Emerg Med* 1993; **10**: 15–23.
3. Evans L. The effectiveness of safety belts in preventing fatalities. *Accident Anal Prev* 1986; **18**: 229–41.
4. Shinar D, Schechtman E, Compton R. Self-report of safe driving behaviors in relationship to sex, age, education and income in US adult driving population. *Accident Anal Prev* 2001; **33**: 111–6.
5. Kim S, Kim K. Personal, temporal and spatial characteristics of seriously injured crash-involved seat belt non-users in Hawaii. *Accident Anal Prev* 2003; **35**: 121–30.
6. Official Journal of the Republic of Slovenia [Internet]. Road Traffic Rules Act (OJ RS, 35/2010) (in Slovene) [3 Dec 2014]. Available from: <http://www.uradni-list.si/1/content?id=101702>.
7. McIlvenny S, Al Mahrougi F, Al Busaidi T, Al Nabhani A, Al Hikmani F, Al Kharousi Z et al. Rear seat belt use as an indicator of safe road behaviour in a rapidly developing country. *J R Soc Promo Health* 2004; **124**: 280–93.
8. Williams EW, Reid M, Lindo JL, Williams JJ, French S, Singh P et al. Association between exposure/non-exposure to the mandatory seat belt law with regards to compliance in vehicle accident victims – a hospital review. *W Indian Med J* 2007; **56**: 236–49.
9. Shults RA, Elder RW, Sleet DA, Thompson RS, Nichols JL. Primary enforcement seat belt laws effective even in the face of rising belt use rates. *Accident Anal Prev* 2004; **36**: 491–503.
10. Silveira AJ. Seat belt use in Argentina – a 10 year struggle. *Traffic Inj Prev* 2003; **4**: 173–85.
11. NETS, NHTSA & OSHA [Internet]. Guidelines for Employes to Reduce Motor Vehicle Crashes OSHA [12 Dec 2012]. Available from: http://www.osha.gov/Publications/motor_vehicle_guide.pdf.

12. Zupančič A [Internet]. The collision at 50 km per hour as a drop of 10 meters deep (in Slovene), [15 Dec 2012]. Available from: <http://www.dnevnik.si/magazin/svet-vozil/1042551997>.
13. Roškar, B. Seatbelt (in Slovene). Diploma work, Univerza v Mariboru, Fakulteta za varnostne vede; 2010.
14. Kmetič F [Internet]. The safety belt solves-if it is attached (in Slovene), [12 Dec 2012]. Available from: http://www.motorevija.si/si/345/1484/Varnostni_pas_resuje_ce_je_pripet.aspx.
15. Institute of safe way [Internet]. Safety in traffic (in Slovene), [6 Feb 2007]. Available from: <http://www.varna-pot.si/default.aspx>.
16. Onyema CR, Oladepo O. Knowledge and attitude of safety belt use among professional drivers in a tertiary Nigerian institution. *Int J Inj Contr Saf Promot* 2011; **18**: 57–64.
17. Valent F, Schiava F, Savonitto C, Gallo T, Brusaferrero S, Barbone F. Risk factors for fatal road traffic accidents in Udine, Italy. *Accid Anal Prev* 2002; **37**: 71–84.
18. Bendak S, Al-Saleh K. Seat belt utilisation and awareness in UAE. *Int J Inj Contr Saf Promot* 2013; **20**: 342–8.
19. Cunill M, Gras ME, Planes M, Oliveras C, Sullman MJ. An investigation of factors reducing seat belt use amongst Spanish drivers and passengers on urban roads. *Accid Anal Prev* 2004; **36**: 439–45.
20. Ferguson SA. Other high-risk factors for young drivers – how graduated licensing does, doesn't, or could address them. *J Safety Res* 2003; **34**: 71–7.
21. Kim K, Nitz L, Richardson J, Li L. Personal and behavioral predictors of automobile crash and injury severity *Accid Anal Prev* 1995; **27**: 469–81.
22. Molnar LJ, Eby DW, Dasgupta K, Yang Y, Nair VN, Pollock SM. Explaining state-to-state differences in seat belt use: A multivariate analysis of cultural variables. *Accid Anal Prev* 2012; **47**: 78–86.
23. Vaughn MG, Salas-Wright C, Piquero AR. Buckle up: non-seat belt use and antisocial behavior in the United States. *An Epidemiol* 2012, **22**: 825–31.

24. Kim M, Yamashita EY. Attitudes of commercial motor vehicle drivers towards safety belts. *Accid Anal Prev* 2007; **39**: 1097–106.
25. Burgut HR, Bener A, Sidahmed H, Albuz R, Sanya R, Khan WA. Risk factors contributing to road traffic crashes in a fast-developing country: the neglected health problem. *Ulus Travma Acil Cerrahi Derg* 2010; **16**: 497–502.
26. Ali M, Haidar N, Ali NM, Maryam A. Determinations of seat belt use among drivers in Sabzevar, Iran: a comparison of theory of planned behavior and health belief model. *Traffic Inj Prev* 2011; **12**: 104–9.
27. Allen S, Zhu S, Sauter C, Layde P, Hargarten S. A comprehensive statewide analysis of seat belt non-use with injury and hospital admissions: new data, old problem. *Acad Emerg Med* 2006; **13**: 427–34.
28. Fernandez WG, Mehta SD, Coles T, Feldman JA, Mitchell P, Olshakr J. Self-reported safety belt use among emergency department patients in Boston, Massachusetts. *BMC Public Health* 2006; **6**: 111–21.
29. Yannis G, Laiou A, Vardaki S, Papadimitriou E, Dragomanovits A, Kanellaides G. Parameters affecting seat belt use in Greece. *Int J Contr Saf Promot* 2011; **18**: 189–97.
30. ETSC [Internet]. Seat Belt Reminders, [2 Dec 2006]. Available from: http://archive.etsc.eu/documents/ETSC_Seat_belt_reminder_oct_06.pdf.
31. NHTSA [Internet]. National Highway Traffic Safety Administration, US Department of Transport NHTSAs Depr C Stat Admin, [2 Dec 2012]. Available from: <http://www.nhtsa.gov/>