Person, time, and place predictors of seat belt use in Athens, Greece

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In terms of the effectiveness at the total population level, seat belts represent the front line of passive safety against death and serious injuries from passenger car crashes. They reduce by about 50% the risk of death and serious injury for car occupants; this knowledge, however, is not promptly translated into action and the frequency of seat belt use in the European Union member states varies considerably.[1 2] Greece has one of the highest death rates from motor vehicle crashes among all European Union member states, as well as an increasing trend over time but seat belt use is still very low. Virtually, all cars in Greece are equipped with three point seatbelts (lap/shoulder) in the front seats, but less than half of cars currently in circulation have seat belts in the back seats. In a recent investigation, it was estimated that more than 300 deaths from passenger car accidents could be avoided, if all Greeks wore a seat belt.[3] In the lack of a formal monitoring system of seat belt use, we attempted to estimate the prevalence of seat belt use in the urban Greater Athens area (3.5 million people) and to determine associated demographic characteristics. Most roads in this area are heavy traffic, low speed roads, but it is under these conditions that seat belt use conveys maximum protection.[1]

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Methods

During July and August 1996, teams of one interviewer from the Centre for Research and Prevention among the Young (CEREPRI) and a road traffic policeman randomly stopped some 1400 passenger cars, in 10 sites of randomly selected secondary roads, one site in each of five systematically selected main road arteries and five sites in the principal highways linking the capital of Athens with the rest of the country. This scheme is a reasonable approximation to random sampling, given the different traffic density in the road system of Metropolitan Athens. The policemen stopped the car and subsequently, the interviewer inspected the car restraint availability and use and recorded basic demographic variables, date, and time of the day (8 am to 8 pm) or night (8 pm to 2 am). There were no refusals and the short inspection and interview ended with advice about the substantial health benefits imparted by the regular use of car restraints. Children younger than 12 years were excluded from the analysis. Each person was assigned into one of three categories: seat belt used; seat belt available but not used; and seat belt not available. Cross classification tabulations were produced by place, time, and personal characteristics and subsequently, the data were modelled through multiple logistic regression. Because many cars in Greece are not provided with rear seat belts, and—even if available—rear seat passengers rarely use them, modelling was restricted to front seat occupants for whom a seat belt was available.

Table 1 Seat belt availability in occupied car seats and seat belt use, when available, by time, place, and personal characteristics. Greater Athens area, 1996: individuals 12 years or more

Characteristic	*Seat belt used (a)*	*Seat belt available, not used (b)*	*Seat belt not available (c)*	*Per cent used when seat belt available* $\frac{a \times 100}{a+b}$	*Per cent of seats with seat belt* $\frac{(a+b) \times 100}{a+b+c}$
Sex					
male	165	771	172	18	84
female	149	602	252	20	75
Age (y)					
12–24	52	285	170	15	67
25–34	79	367	87	18	84
35–64	154	648	140	19	85
65+	29	73	27	28	79
Occupied seat					
front, driver	179	556	6	24	99
front, non-driver	116	368	7	24	99
rear	19	449	411	4	53
Hour of day					
day hours	238	883	317	21	78
night hours	76	490	107	13	84
Place					
highways	109	352	97	24	83
main roads	84	327	108	20	79
suburb roads	121	694	219	15	79
Day					
weekdays	282	1178	386	19	79
weekend	32	195	38	14	86

Results

Seat belt use is limited to less than 20% of car occupants, with front seat occupants using it in about 24% of instances, whereas rear seat passengers make use of an available seat belt in only 4% of instances (table 1). The unconditional logistic regression derived data presented in table 2, which is restricted to front seat occupants because only 19 rear seat passengers were properly restrained, are highly informative. Drivers use a seat belt more frequently than front seat passengers and women are twice as likely to use it in comparison to men. Older car occupants use seat belts more frequently, but there is also a non-significant suggestion that the belt is used more frequently by the very young in comparison with those in the 25–64 age group. The belt is less frequently used during the night hours probably because night travellers represent a population group with different attitudes and

Table 2 Multiple logistic regression derived, mutually adjusted odds ratios (OR) for seat belt use and associated 95% confidence intervals (CI) by specified categories of a series of variables. Analysis restricted to occupants of front seats with belts availability (n=1211)

Characteristic	*OR*	*(95% CI)*
Sex		
male	reference	
female	2.0	(1.5, 2.8)
Age (y)		
12–24	1.3	(0.9, 2.0)
25–34	1.0	(0.7, 1.4)
35–64	reference	
65+	2.3	(1.4, 3.9)
Occupied seat		
front, driver	1.5	(1.1, 2.0)
front, non-driver	reference	
Time of inspection		
day hour	reference	
night hour	0.5	(0.4, 0.8)
Place		
highways	2.0	(1.4, 2.7)
main roads	1.7	(1.2, 2.5)
suburb roads	reference	
Day		
weekdays	reference	
weekend	1.0	(0.6, 1.7)

behaviours in comparison with day travellers. The use of seat belt is more common among travellers in highways leading to the city than among those who drive in suburb roads, but, after adjustment for all these factors, weekend travellers are indistinguishable from weekday travellers with respect to seat belt use.

Discussion

In Europe seat belt use varies among front seat occupants from over 90% in Germany, United Kingdom, and Sweden to around 50% in Belgium and Ireland and, among rear seat passengers, from 80% in Sweden to around 30% in Austria and Belgium. Data from Mediterranean countries however are scant, selective, and unreliable.[1] There is no adequate information about traffic patterns throughout the Greater Athens area over time to assure that estimates generated in this study were perfectly unbiased but the unique inspection survey used, probably provides more valid data than those derived from observation surveys usually based on random intersection observations.[4]

With respect to predictors of seat belt use, the results are generally plausible. Female sex and age over 65 years are related with higher seat belt use, but there is also a promising suggestion that the younger generation of less than 25 years old are more frequent seat belt users than those in the age range from 25 to 64 years old. During the more dangerous—for motor vehicle crashes—night hours, the proportion of seat belt users was actually lower than that during day hours, probably because of the largely more risky population subgroups who commute mostly during night hours. Seat belts were more frequently used in highways and city main roads, than in secondary, suburb, and generally low speed roads, reflecting the widely held, erroneous belief that seat belts are more useful in high speed than in low speed travel. The dismal 4% proportion of rear seat belt use prompts for intense behaviour modification efforts aiming to increase seat belt use by rear seat occupants. This should be one of the main targets for any national strategy, combined with amendment of existing legislative gaps for mandatory use of seat belts by all passengers and provision of initiatives for installation of rear seat belts, in the 70% of the relatively old country fleet, which lacks them.

However, the low prevalence of seat belts among front seat occupants, where seat belts are almost universally available, highlights the need to complement these strategies with awareness raising, myth dispelling, and law enforcement efforts to tackle deeply rooted social attitudes against seat belt use, referred to in other cross European studies.[5]

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4 National Highway Traffic Safety Administration. *National occupant protection use survey: controlled intersection study*. Washington DC: US Department of Transportation, 1995.
5 SARTRE. *Social attitudes to road traffic risk in Europe. Report on principal aspects*. Paris: INRETS, 1993.